Dear Colleagues,

It is my great pleasure to share this report with you, outlining the scholarly accomplishments of the Northeastern University College of Engineering's faculty and graduate students for the past year.

As you can see from the facts in the sidebar, the college is growing rapidly, with **36 new tenured/ tenure-track faculty hires** in the past 3 years. We are also expanding our facilities, with a **220,000 square foot** interdisciplinary science and engineering complex currently under construction (see report cover image.) These investments in engineering research and education are both a sign of thriving programs (with **new enrollments up 52%** in the past 3 years), and a commitment by Northeastern to be a national leader in addressing the engineering grand challenges of the 21st century.

We look forward to collaborating with our colleagues from other institutions on research and education initiatives. Please use this book as a reference, and reach out to us!

Sincerely,

Nadine Aubry

Nadine Aubry, PhD
University Distinguished Professor
Dean of Engineering

QUICK FACTS

36
NEW HIRES
SINCE 2013

151
TENURED/
TENURE-TRACK
FACULTY

69
FELLOWS OF
NATIONAL
PROFESSIONAL
SOCIETIES

50
YOUNG
INVESTIGATOR
AWARDS

12
FEDERALLY
FUNDED
RESEARCH
CENTERS

College of Engineering | 360 Huntington Ave
Northeastern University, Boston, Massachusetts USA

COLLEGE OF ENGINEERING

230 Snell Engineering Center
Northeastern University
360 Huntington Avenue
Boston, MA 02115

coe.neu.edu

COVER IMAGE

On May 21, 2015 Northeastern's President Joseph E. Aoun and Boston's Mayor Martin J. Walsh celebrated the Topping Off ceremony of the Interdisciplinary Science and Engineering Complex. This is a tradition that marks the placement of the final steel beam in the building's structure. The building is scheduled to open in 2016.

The ISEC is being built on a 3.5-acre parcel owned by Northeastern. Designed by the architectural firm Payette, the complex will include wet and dry lab facilities, educational laboratories, classrooms, and offices for faculty members and graduate students. The six-story, LEED-certified facility will feature cutting edge scientific equipment and lab space, both of which will be shared by researchers from Northeastern's College of Science, Bouvé College of Health Sciences, College of Engineering, and College of Computer and Information Science.

Learn more at **bit.ly/1Bglyru**

Northeastern University
College of Engineering

COLLEGE OF ENGINEERING

2014 | 2015

SCHOLARSHIP REPORT

12 Multi-Institutional Research Centers Funded by

- Department of Energy
- Department of Homeland Security
- National Institutes of Health
- National Institute of Standards and Technology
- National Security Agency
- National Science Foundation

36 NEW HIRES SINCE 2013

32 National Science Foundation CAREER Awards
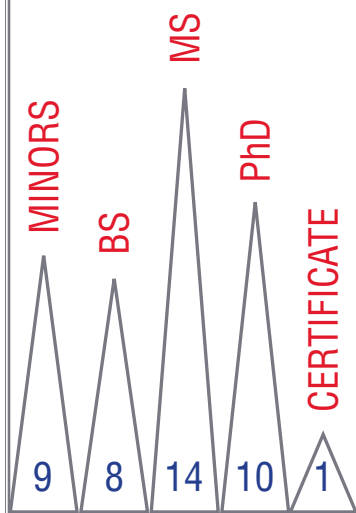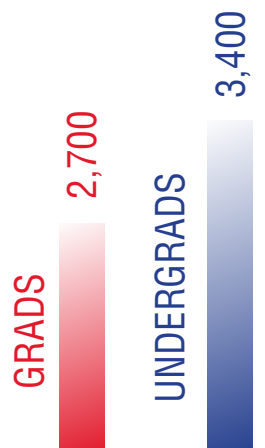
151 TENURED/ TENURE-TRACK FACULTY — Including **69** Fellows of national professional societies

50 YOUNG INVESTIGATOR AWARDS

42 PROGRAMS

GRADS 2,700

UNDERGRADS 3,400

MINORS 9 · BS 8 · MS 14 · PhD 10 · CERTIFICATE 1

4 NATIONAL ACADEMY MEMBERS OF ENGINEERING

NADINE AUBRY
University Distinguished Professor and Dean

ARTHUR COURY
University Distinguished Professor

STEPHEN DIRECTOR
University Distinguished Professor

VINOD SAHNEY
University Distinguished Professor

HONORS

ACHIEVEMENTS

FACULTY HONORS AND AWARDS

Nadine Aubry, University Distinguished Professor and College of Engineering Dean, has been named a Fellow of the National Academy of Inventors for her innovations in fluid mechanics.

The Center for High-rate Nanomanufacturing, led by **Ahmed Busnaina**, WL Smith Chair and University Distinguished Professor of Mechanical and Industrial Engineering, has received a 2015 TechConnect National Innovation Award for their Nanoscale Offset Printing System.

Shashi Murthy, Professor of Chemical Engineering and Founding Director of the Michael J. and Ann Sherman Center for Engineering Entrepreneurship Education, has been awarded a 4-year, **$1.4M grant** from the National Institutes of Health.

Akram Alshawabkeh, George A. Snell Professor of Engineering, received a five-year **$13.5M** award to renew the Puerto Rico Testsite for Exploring Contamination Threats Center from the National Institute of Environmental Health Sciences within the National Institutes of Health.

Auroop Ganguly, Associate Professor of Civil and Environmental Engineering, is co-PI of a **$1.2M NSF CyberSEES grant**, entitled "Spatio-temporal Extremes and Associations: Marine Adaptation and Survivorship under Changes in extreme Ocean Temperatures."
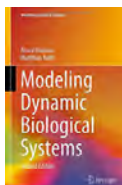
Jerome Hajjar, Professor and Chair of Civil and Environmental Engineering, was recognized as the CDM Smith Professor in Civil Engineering. He also won the 2015 BSCES Clemens Hershel Award from the Boston Society of Civil Engineers Section of the American Society of Civil Engineers.

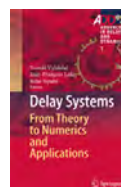**Matthew Eckelman**, Assistant Professor of Civil and Environmental Engineering, was awarded a **$503K NSF CAREER Award** for "Building Chemical Synthesis Networks for Life Cycle Hazard Modeling."

Kaushik Chowdhury, Professor of Electrical and Computer Engineering, was awarded a $489K NSF CAREER Award for his project, "IDEA: Integrated Data and Energy Access for Wireless Sensor Networks."

Professor Ningfang Mi, Assistant Professor of Electrical and Computer Engineering, was awarded a $459K NSF CAREER Award for her project, "Capacity Planning Methodologies for Large Clusters with Heterogeneous Architectures and Diverse Applications."

Matteo Rinaldi, Assistant Professor of Electrical and Computer Engineering, was awarded a $400K NSF CAREER Award for his project, "Nano Electro Mechanical Resonant Sensing Platform for Chip Scale, High Resolution and Ultra-Fast Terahertz Spectroscopy and Imaging."

Marvin Onabajo, Assistant Professor of Electrical and Computer Engineering, was awarded a $500K NSF CAREER grant to investigate "Low-Power Transceiver Design Methods for Wireless Medical Monitoring."

Raymond Fu, Associate Professor of Electrical and Computer Engineering, was awarded an Office of Naval Research Young Investigator Award for his proposal entitled, "Deep Structures Boosted Self-Organized Behavior Pattern Learning for Anomaly Detection."

Ningfang Mi, Assistant Professor of Electrical and Computer Engineering, was awarded an Air Force Young Investigator Award for her proposal entitled, "Creating an Integrated Management Layer to Administer Heterogeneous Resources in Dynamic Workflow Clusters."

Edgar Goluch, Assistant Professor of Chemical Engineering, was awarded a **$770K** grant by the National Science Foundation to create a Nano-constriction Device to automatically isolate and cultivate microbes in their own habitat.

PATENTS

Vincent Harris, Professor of Electrical and Computer Engineering, was awarded a patent for creating "Cobalt Carbide-Based Nanoparticle Permanent Magnet Materials."

Brad Lehman, Professor of Electrical and Computer Engineering, was awarded a patent for his design of a "Non-Superconducting Fault Current Limiter."

Nian Sun, Professor of Electrical and Computer Engineering, was awarded a patent for his invention of "High Energy Density Vibration Energy Harvesting Device with High-Mu Material."

Jeffrey Ruberti, Professor of Bioengineering, was awarded a patent for "Developing Methods and Compositions for Organizing Collagen into Fibrillar Networks".

Ron Willey, Professor of Chemical Engineering, was awarded a patent for his method of creating "Titania Nanotubes Prepared by Anodization in Chloride-containing Electrolytes."

SELECTED FACULTY-AUTHORED BOOKS

Surendra Gupta co-authored "Six Sigma Case Studies with Minitab" (CRC Press 2014)

Rifat Sipahi co-edited "Delay Systems: From Theory to Numerics and Applications" (Springer 2014)

Matthias Ruth co-authored "Modeling Dynamic Biological Systems" (Springer 2014)

Ming Wang co-authored "Sensor Technologies for Civil Infrastructures" (Woodhead Publishing 2014)

DEPARTMENTAL RESEARCH AREAS

BIOENGINEERING

- » Biocomputing
- » Bioimaging and Signal Processing
- » Biomechanics and Mechanobiology
- » BioMEMS/Bionano
- » Biochemical and Bioenvironmental Engineering
- » Cell and Tissue Engineering
- » Motor Control

CHEMICAL ENGINEERING

- » Advanced Materials Research
- » Biological Engineering

CIVIL AND ENVIRONMENTAL ENGINEERING

- » Civil Infrastructure Security
- » Environmental Health
- » Sustainable Resource Engineering

ELECTRICAL AND COMPUTER ENGINEERING

- » Communications and Signal Processing
- » Computer Engineering and Networks
- » Electromagnetics and Optics
- » Microsystems and Devices
- » Power Electronics, Systems and Controls

MECHANICAL AND INDUSTRIAL ENGINEERING

- » Biomechanics
- » Energy
- » Healthcare Systems
- » Operations Research
- » Material Science
- » Mechanics
- » Mechatronics
- » Nanomanufacturing
- » Thermofluids

COLLEGE WIDE RESEARCH INITIATIVES

ADVANCING NANOTECHNOLOGY THROUGH INNOVATION IN MATERIALS ENGINEERING
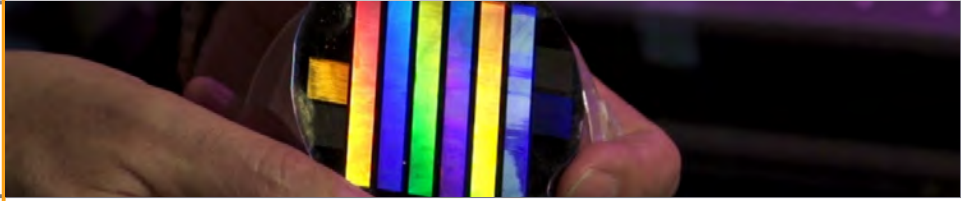
BIOMACHINE INTEGRATION

CRITICAL INFRASTRUCTURE SUSTAINABILITY AND SECURITY
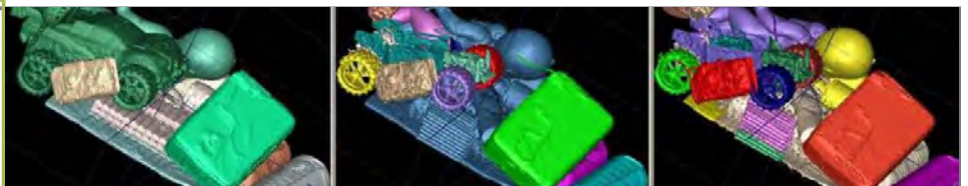
ENGINEERED CYBER-SOCIAL-PHYSICAL SYSTEMS

ENGINEERED WATER, SUSTAINABILITY AND HEALTH

INTEGRATED MODELING, INFERENCE, AND COMPUTING

SECURITY, SENSING AND SURVEILLANCE

ALI ABUR

Professor, Electrical and Computer Engineering

PhD, Ohio State University, 1985
ece.neu.edu/people/abur-ali

Scholarship focus: power system monitoring, estimation and optimization, fault location and identification in power grids

Honors and awards: Fellow, Institute of Electrical and Electronics Engineers

SELECTED PUBLICATIONS

M. Göl, A. Abur
A Fast Decoupled State Estimator for Systems Measured by PMUs, IEEE Transactions on Power Systems, 30(5), 2015, 2766-2771

M. Göl, A. Abur
Hybrid State Estimator for Systems with Limited Number of PMUs, IEEE Transactions on Power Systems, 30(3), 2015, 1511-1517

A. Rouhani, A. Abur
Real-time Dynamic Parameter Estimation for an Exponential Dynamic Load Model, IEEE Transactions on Smart Grids, 99, 2015

M. Göl, A. Abur
A Robust PMU Based Three-phase State Estimator Using Modal Decoupling, IEEE Transactions on Power Systems, 29(5), 2014, 2292-2299

M. Göl, A. Abur
LAV Based Robust State Estimation for Systems Measured by PMUs, IEEE Transactions on Smart Grids, 5(4), 2014, 1808-1814

R. Emami, A. Abur
External System Line Outage Identification Using Phasor Measurement Units, IEEE Transactions on Power Systems, 28, 2013, 1035-1040

L. Zhang, A. Abur
Identifying Parameter Errors via Multiple Measurement Scans, IEEE Transactions on Power Systems, 28(4), 2013, 3916-3923

M. Göl, A. Abur
Observability and Criticality Analyses for Power Systems Measured by Phasor Measurements, IEEE Transactions on Power Systems, 28(3), 2013, 3319-3326

M. Korkali, A. Abur
Robust Fault-location Using Least-absolute-value Estimator, IEEE Transactions on Power Systems, 28(4), 2013, 4384-4392

SELECTED RESEARCH PROJECTS

Engineering Research Center for Ultra-wide Area Resilient Electric Energy Transmission Network
Site Principal Investigator, National Science Foundation
Design of Boundary Measurements to Avoid Spreading of Errors in Power Grids
Principal Investigator, PJM Interconnection

GEORGE ADAMS

COE Distinguished Professor, Mechanical and Industrial Engineering; affiliated faculty: Civil and Environmental Engineering, Electrical and Computer Engineering

PhD, University of California at Berkeley, 1975
mie.neu.edu/people/adams-george

Scholarship focus: contact mechanics including adhesion, friction, and plasticity; modeling and analysis of MEMS; modeling and analysis in nanomechanics

Honors and awards: Fellow, American Society of Mechanical Engineers; Fellow, Society of Tribologists and Lubrication Engineers; Søren Buus Outstanding Research Award, College of Engineering

SELECTED PUBLICATIONS

G.G. Adams
Adhesion and Pull-Off Force of an Elastic Indenter from an Elastic Half-space, Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences, 470, 2014, 20140317

G.G. Adams, D.A. Hills
Analytical Representation of the Non-Square-Root Singular Stress Field at a Finite Angle Sharp Notch, International Journal of Solids and Structures, 51, 2014, 4485-4491

R.P. Basu, Hennessy, G.G. Adams, N.E. McGruer
Hot Switching Damage Mechanisms in MEMS Contacts – Evidence and Understanding, Journal of Micromechanics and Microengineering, 24, 2014, 105004

G.G. Adams
Stick, Partial Slip and Sliding in the Plane Strain Micro Contact of Two Elastic Bodies, Royal Society Open Science, 1, 2014, 140363

H. Pan, Y.-C. Wu, G.G. Adams, G.P. Miller, N.E. McGruer
Interfacial Shear Stress Between Single-Walled Carbon Nanotubes and Gold Surfaces With and Without an Alkanethiol Monolayer, Journal of Colloid and Interface Science, 407, 2013, 133-139

J.R. Parent, G.G. Adams
A Model of a Trapped Particle Under a Plate Adhering to a Rigid Surface, Journal of Applied Mechanics, 80, 2013, 051011

Y.-C. Wu, N.E. McGruer, G.G. Adams
Adhesive Slip Process Between a Carbon Nanotube and a Substrate, Journal of Physics D: Applied Physics, 46, 2013, 175305

R.P. Hennessy, A. Basu, G.G. Adams, N.E. McGruer
Hot-switched Lifetime and Damage Characteristics of MEMS Switch Contacts, Journal of Micromechanics and Microengineering, 23(5), 2013

MD NOOR E ALAM

Assistant Professor, Mechanical and Industrial Engineering

PhD, University of Alberta, 2013
mie.neu.edu/people/alam-md-noor-e

Scholarship focus: applied operations research, large scale optimization and data analytics

Honors and awards: Postdoctoral Fellowship, Natural Sciences and Engineering Research Council of Canada

SELECTED PUBLICATIONS

Md. N.-E. Alam, B. Todd, J. Doucette
Integer Linear Programming Model for Grid-based Wireless Transmitter Location Problems, International Journal of Operational Research, 22(1), 2015, 48-64

Md. N.-E. Alam, J. Doucette
Solving Large Scale Fixed Cost Integer Linear Programming Models for Grid-based Location Problems with Heuristic Techniques, Engineering Optimization, 47(8),2015, 1085-1106

Md. N.-E. Alam, J. Doucette
An Application of Infinite Horizon Stochastic Dynamic Programming in Multi Stage Project Investment Decision Making, International Journal of Operational Research,13(4), 2012, 423-438

Md. N.-E. Alam, A. Ma, J. Doucette
Integer Linear Programming Models for Grid-Based Light Post Location Problem, European Journal of Operational Research, 222, 2012, 17-30

Md. N.-E. Alam, J. Doucette
Relax-and-Fix-Based Decomposition Technique for Solving Large Scale GBLPs, Computers and Industrial Engineering, 63, 2012, 1062-1073

Md. N.-E. Alam, A.Z. Kasem, J. Doucette
ILP Model and Relaxation-based Decomposition Approach for Incremental Topology Optimization in p-Cycle Networks, Journal of Computer Networks and Communication, 2012, 1-10, 2012

Md. N.-E. Alam, T.F. Lipi, Md. A.A. Hasin, A.M.M. Sharif Ullah
Algorithms for Fuzzy Multi Expert Multi Criteria Decision Making (ME-MCDM), Knowledge-Based Systems, 24(3), 2011, 367-377

T.F. Lipi, Md. A.A.Hasin, Md. N.-E. Alam
Fuzzy Multi Objective Machine Reliability & Availability Based Hybrid Flow Shop Scheduling, Asia Pacific Journal of Operational Research, 26(5), 2009, 637-653

Md. N.-E. Alam, Md. A. A. Hasin, A.M.M. Sharif Ullah, T.F. Lipi
Supplier Evaluation with GD based Multi Criteria Decision Making, International Journal of Industrial & Systems Engineering, 3(3), 2008, 368-381

AKRAM ALSHAWABKEH

George A. Snell Professor of Engineering and Civil and Environmental Engineering; Associate Dean for Research; affiliated faculty, Bioengineering

PhD, Louisiana State University, 1994
civ.neu.edu/people/alshawabkeh-akram

Scholarship focus: geoenvironmental engineering, soil and groundwater remediation; electrokinetic and electrochemical processes; contaminant fate and transport; environmental restoration

Honors and awards: Fellow, American Society of Civil Engineers; National Science Foundation CAREER Award; Søren Buus Outstanding Research Award, College of Engineering

SELECTED PUBLICATIONS

N. Gou, S. Yuan, J. Lan, C. Gao, A.N. Alshawabkeh, A.Z. Gu
A Quantitative Toxicogenomics Assay Reveals the Evolution and Nature of Toxicity During the Transformation of Environmental Pollutants, Environmental Science and Technology, 48(15), 2014, 8855-8863

D. Meric, A.N. Alshawabkeh, J.P. Shine, T.C. Sheahan
Bioavailability of Hydrophobic Organic Compounds in Thin-layered Capped Sediments, Chemosphere, 103, 2014, 281-289

D. Meric, S. Barbuto, T.C. Sheahan, J.P. Shine, A.N. Alshawabkeh
Benchscale Assessment of the Efficacy of a Reactive Core Mat to Isolate PAH-spiked Aquatic Sediments, Soil Sediment Contamination, 23(1), 2014, 1-23

D. Tang, N. Yang, Y. Yang, X. Zhang, W. Xiao,...A.N. Alshawabkeh
Enhanced Adsorption of Aqueous Perchlorate on Quaternary Ammonium Chloride Surfactant-modified Activated Carbon Fibers, Desalination and Water Treatment, 55(2), 2014, 484-495

L. Rajic, N. Fallahpour, S. Yuan, A.N. Alshawabkeh
Electrochemical Transformation of Trichloroethylene in Aqueous Solution by Electrode Polarity Reversal, Water Research, 67, 2014, 267-275

M. Tong, S. Yuan, P. Zhang, P. Liao, AN. Alshawabkeh, X. Xie, Y. Wang
Electrochemically Induced Oxidative Precipitation of Fe(II) for As(III) Oxidation and Removal in Synthetic Groundwater, Environmental Science and Technology, 48(9), 2014, 5145-5153

S. Yuan S, Liao P, A.N. Alshawabkeh
Electrolytic Manipulation of Persulfate Reactivity by Iron Electrodes for TCE Degradation in Groundwater, Environmental Science and Technology, 48(1), 2014, 656-663

SELECTED RESEARCH PROJECTS

Puerto Rico Testsite for Exploring Contamination Threats (PROTECT), a National Institute of Environmental Health Sciences Superfund Research Center. PROTECT investigates the relationship between environmental contamination and preterm birth
Principal Investigator, National Institutes of Health

Induced Partial Saturation (IPS) Through Transport and Reactivity for Liquefaction Mitigation
Co-Principal Investigator, National Science Foundation

MANSOOR AMIJI

Distinguished Professor and Chair, Pharmaceutical Sciences; affiliated faculty, Chemical Engineering, Bioengineering

PhD, Purdue University, 1992
che.neu.edu/people/amiji-mansoor

Scholarship focus: polymeric biomaterials, drug delivery systems, nanomedical technologies

Honors and awards: Fellow, American Association of Pharmaceutical Scientists; Fellow, Controlled Release Society; T. Nagai Award, Controlled Release Society

SELECTED PUBLICATIONS

M. Talekar, Q. Ouyang, M. Goldberg, M.M. Amiji
  Co-silencing of PKM-2 and MDR-1 Sensitizes Multidrug Resistant Ovarian Cancer Cells to Paclitaxel in a Murine Model of Ovarian Cancer, Molecular Cancer Therapeutics, 14(7), 2015, 1521-1531

A. Singh, M. Talekar, A. Raikar, M.M. Amiji
  Macrophage-targeted Delivery Systems for Nucleic Acid Therapy in Inflammatory Diseases, Journal of Controlled Release, 190, 2014, 515-530

S. Ganta, A. Singh, T.P. Coleman, D. Williams, M. Amiji
  Pharmaceutical Nanotechnology: Overcoming Drug Delivery Challenges in Contemporary Medicine, Nanomedicine: Principles and Perspectives, Published by Springer Publishing, New York, NY, Chapter 10, 2014, 191-236

M.M. Amiji
  Nanotechnology for Cancer Therapy, Published by CRC Press, LLC, Boca Raton, FL, 2007

M.M. Amiji
  Polymeric Gene Delivery: Principles and Applications, Published by CRC Press, LLC, Boca Raton, FL, 2004

SELECTED RESEARCH PROJECTS

Combinatorial-designed Nano-platforms to Overcome Tumor Drug Resistance
  Principal Investigator, National Institutes of Health

Multi-modal Gene Therapy for Pancreatic Cancer with Targeted Nanovectors
  Principal Investigator, National Institutes of Health

IGERT-Nanomedical Science and Technology
  Co-Investigator, National Science Foundation

Integrated Image-guided Targeted Therapy for Refractory Ovarian Cancer
  Principal Investigator, Nemucore Medical Innovations, Inc.

Impact of Lipids on Compound Absorption: Mechanistic Studies and Modeling
  Co-Investigator, National Institutes of Health

Hepatic Insulin Resistance and Metabolic Disease
  Principal Investigator, National Institutes of Health

Targeted Platinates/siRNA Combination Therapy for Resistant Lung Cancer
  Principal Investigator, National Institutes of Health

MAHSHID AMIRABADI

Assistant Professor, Electrical and Computer Engineering

PhD, Texas A&M University, 2013
ece.neu.edu/people/amirabadi-mahshid

Scholarship focus: design, modeling and control of power converters, power electronics for renewable energy systems, microgrids, variable speed drives and wireless power transfer

SELECTED PUBLICATIONS

M. Amirabadi, H. A. Toliyat, J. Baek
  Bidirectional Soft-switching Series AC-link Inverter, IEEE Transactions on Industry Applications, 51, 2015, 2312-2320

M. Amirabadi, J. Baek, H.A. Toliyat, W.C. Alexander
  Soft-switching AC-Link threephase AC-AC Buck-Boost Converter, IEEE Transactions on Industrial Electronics, 62, 2015, 3-14

M. Amirabadi
  Extremely Sparse Parallel AC-Link Universal Power Converters, Proceedings of IEEE Energy Conversion Congress and Exposition (ECCE), 2014, 1534-1541

M. Amirabadi, A. Balakrishnan, H. Toliyat, W.C. Alexander
  High Frequency AC-Link PV Inverter, IEEE Transactions on Industrial Electronics, 61, 2014, 281-291

M. Amirabadi, J. Baek, H.A. Toliyat
  Sparse AC-link Buck-boost Inverter, IEEE Transactions on Power Electronics, 29, 2014, 3942-3953

M. Amirabadi, H. A. Toliyat, W.C. Alexander
  A Multi-port AC Link PV Inverter with Reduced Size and Weight for Stand-alone Application, IEEE Transactions on Industry Applications, 49, 2013, 2217-2228

TEIICHI ANDO

Professor, Mechanical and Industrial Engineering

PhD, Colorado School of Mines, 1982
mie.neu.edu/people/ando-teiichi

Scholarship focus: rapid solidification processing, droplet-based materials processing, powder metallurgy, material processing by severe plastic deformation, processing-structure-property relationships in materials

Honors and awards: Fellow, American Society of Materials International; Søren Buus Outstanding Research Award, College of Engineering

SELECTED PUBLICATIONS

B. Yildirim, H. Fukunuma, T. Ando, A. Gouldstone, S. Muftu
A Numerical Investigation into Cold Spray Bonding Processes, Journal of Tribology, 137, 2015, 11102-11113

S. Gheybi Hashemabad, T. Ando
Ignition Characteristics of Hybrid Al-Ni-Fe2O3 and Al-Ni-CuO Reactive Composites Fabricated by Ultrasonic Powder Consolidation, Combustion and Flame, 162, 2015, 1144-1152

T. Hu, S. Zhalehpour, A. Gouldstone, S. Muftu, T. Ando
A Method for the Estimation of the Interface Temperature in Ultrasonic Joining, Metallurgical and Materials Transactions A, 45A, 2014, 2545-2552

D. Erdeniz, T. Ando
Fabrication of Micro/Nano Structured Aluminum-Nickel Energetic Composites by Ultrasonic Powder Consolidation, International Journal of Materials Research, 104(4), 2013, 387-391

Z. Gu, Q. Cui, J. Chen, J. Buckley, T. Ando, et al.
Fabrication, Characterization and Applications of Novel Nanoheater Structures, Surface Coatings and Technology, 215, 2013, 493-502

T. Ando
Production, Characterization and Application of Mono-size Alloy Droplets, Powder Metallurgy, 55(5), 2012, 395-401

S. Onel, T. Ando
Comparison and Extension of Free Dendritic Growth Models with Application to Ag-15at.%Cu Alloy, Metallurgical and Materials Transactions A, 39A, 2008, 2449-58

SELECTED RESEARCH PROJECTS

A Fundamental Investigation of the Mechanisms of Ultrasonic Powder Consolidation and its to Hard-facing of Forging Dies
Principal Investigator, Hitachi Metals, Ltd

Collaborative Research: Microscale Joining Using Nanoheaters
Principal Investigator, National Science Foundation

Fundamentals of Bonding in Kinetic Consolidation Processes
Co-Principal Investigator, National Science Foundation

Metallographic Characterization of Cold Sprayed Materials
Principal Investigator, Fukuda Metal Foil

NASIM ANNABI

Assistant Professor, Chemical Engineering

PhD, University of Sydney, Australia, 2010
che.neu.edu/people/annabi-nasim

Scholarship focus: engineering advanced biomaterials for cardiovascular tissue engineering applications

SELECTED PUBLICATIONS

N. Annabi, A. Tamayol, J. Alfredo Uquillas, M. Akbari, L. Bertassoni, C. Cha, G. Camci-Unal, M. Dokmeci, N.A. Peppas, A. Khademhosseini
25th Anniversary Article: Rational Design and Applications of Hydrogels in Regenerative Medicine, Advanced Materials, 26(1), 2013, 85-124

N. Annabi, S.M. Mithieux, G. Camci-Unal, M.R. Dokmeci, A.S. Weiss, A. Khademhosseini
Elastomeric Recombinant Protein-based Biomaterials, Biochemical Engineering, 77, 2013, 110-118

N Annabi, S.M. Mithieux, P. Zorlutuna, G. Camci-Unal, A.S. Weiss, A. Khademhosseini
Engineered Cell-laden Human Protein-based Elastomer, Biomaterials, 34(22), 2013, 5496-5505

N. Annabi, Š. Selimovic, J.P.A. Cox, D. Heintze, D. Cropek, A.S. Weiss, A. Khademhosseini
Extracellular Matrix Coated Microfluidic Channels for Cardiomyocyte Culture, Lab Chip,13, 2013, 3569-3577

N. Annabi, K. Tsang, S.M. Mithieux, M. Nikkhah, A Ameri, A. Khademhosseini, A.S. Weiss
Highly Elastic Micropatterned Hydrogels for Engineering Functional Cardiac Tissues, Advanced Functional Materials, 23(39), 2013, 4950-4959

ANAND ASTHAGIRI

Associate Professor, Bioengineering; jointly appointed, Chemical Engineering

PhD, Massachusetts Institute of Technology, 1995
bioe.neu.edu/people/asthagiri-anand

Scholarship focus: elucidates design principles for engineering living cells and tissues

SELECTED PUBLICATIONS

D.I. Walsh III, M.L. Lalli, J.M. Kassas, A.R. Asthagiri, S.K. Murthy
Cell Chemotaxis on Paper for Diagnostics, Analytical Chemistry, 87(11), 2015, 5505-5510

M.L. Lalli, A.R. Asthagiri
Collective Migration Exhibits Greater Sensitivity but Slower Dynamics of Alignment to Applied Electric Fields, Cellular and Molecular Bioengineering, 8(2), 2015, 247-257

J.H. Kim, L.J. Dooling, A.R. Asthagiri
Intercellular Mechanotransduction During Multicellular Morphodynamics, Royal Society Interface, 7(3), 2010, 341-350

K.S. Kushiro, A. Chang, A.R. Asthagiri
Reprogramming Directional Cell Motility by Tuning Micropattern Features and Cellular Signals, Advanced Materials, 22, 4516, 2010, 4516-4519

C.A. Giurumescu, A.R. Asthagiri
Systems Approaches to Developmental Patterning, Systems Biomedicine, Eds: Douglas A. Lauffenburger, Edison Liu and Garry Nolan, Elsevier Press, 2010

S.A. Chapman, A.R. Asthagiri
Quantitative Role of Scaffolding on Signal Propagation, Molecular Systems Biology, 5(313), 2009

C.A. Giurumescu, P.W. Sternberg, A.R. Asthagiri
Predicting Phenotypic Diversity and the Underlying Quantitative Molecular Transitions, PLoS Computational Biology, 5(4), 2009, 1-13

SELECTED RESEARCH PROJECTS

Multi-scale Complex Systems Transdisciplinary Analysis of Response to Therapy
Co-Principal Investigator, National Institutes of Health

Quantitative Analysis of Epithelial Cell Scatter
Principal Investigator, National Institutes of Health

NADINE AUBRY

University Distinguished Professor and Dean of the College of Engineering, Mechanical and Industrial Engineering

PhD, Cornell University, 1987
mie.neu.edu/people/aubry-nadine

Scholarship focus: fluid dynamics, microfluids, chaotic mixing, particle manipulation

Honors and awards: Member, National Academy of Engineering; Fellow, National Academy of Inventors; Fellow, American Association for the Advancement of Science; Fellow, American Institute of Aeronautics and Astronautics; Fellow, American Physical Society; Fellow, American Society of Mechanical Engineers; National Science Foundation Presidential Young Investigator Award; Former Chair, National Academies' U.S. National Committee for Theoretical and Applied Mechanics (USNC/TAM); Former Chair, Division of Fluid Dynamics of the American Physical Society (APS)

SELECTED PUBLICATIONS

R. Chabreyrie, C. Chandre, N. Aubry
Complete Chaotic Mixing in an Electro-osmotic Channel by Destabilization of Key Periodic Orbits, Physics of Fluids, 23, 2011, 072002

P. Singh, D.D. Joseph, N. Aubry
Dispersion and Attraction of Particles Floating on Fluid-liquid Surfaces, Soft Matter, 6, 2010, 4310-4325

M. Janjua, S. Nudurupati, P. Singh, N. Aubry
Electrohydrodynamic Removal of Particles from Drop Surfaces, Physical Review E, 80, 2009, 010402

A.K. Uguz, O. Ozen, N. Aubry
Electric Field Effect on a Two-fluid Interface Instability in Channel Flow for Fast Electric Times, Physics of Fluids, 20, 2008, 031702

N. Aubry, P. Singh, M. Janjua, S. Nudurupati
Micro- and Nanoparticles Self-assembly for Virtually Defect-free, Adjustable Monolayers, Proceedings of the National Academy of Sciences USA (PNAS), 105, 2008, 3711-3714

N. Aubry, P. Singh
Physics Underlying Controlled Self-assembly of Micro and Nanoparticles at a Two-fluid Interface Using an Electric Field, Physical Review E, 77, 2008, 056302

A.K. Uguz, N. Aubry
Quantifying the Linear Instability of a Flowing Electrified Two-fluid Layer in a Channel for Fast Electric Times, Physics of Fluids, 20, 2008, 092103

S. Pillapakkam, P. Singh, D. Blackmore, N. Aubry
Transient and Steady State of a Rising Bubble in a Viscoelastic Fluid, Journal of Fluid Mechanics, 589, 2007, 215-252

F. Li, O. Ozen, N. Aubry, D. Papageorgiou, P. Petropoulos
Linear Instability of a Two-fluid Interface for Electro-hydrodynamic Mixing in a Channel, Journal of Fluid Mechanics, 583, 2007, 347-377

JOSEPH AYERS

Professor, Marine and Environmental Sciences; affiliated faculty: Biology, Bioengineering, Civil and Environmental Engineering, Electrical and Computer Engineering

PhD, University of California at Berkeley, 1975
bioe.neu.edu/people/ayers-joseph

Scholarship focus: development of underwater robots for civil infrastructure and explosive sensing; neurophysiology and behavior biomimetics

SELECTED PUBLICATIONS

J. Lu, J. Yang, Y.-B. Kim, J. Ayers, K.K. Kim
  Implementation of Excitatory CMOS Neuron Oscillator for Robot Motion Control Unit, Journal of Semiconductor Technology and Science, 14(4), 2014, 383-390

J. Ayers, et al.
  Special Issue on the 2013 International SoC Design Conference, Journal of Semiconductor Technology and Science, 14(4), 2014, 1-2

L. Lewis, J. Ayers
  Temperature Preference and Acclimation in the Jonah Crab, Cancer Borealis, Journal of Experimental Marine Biology and Ecology, 455, 2014, 7-13

W. Westphal, D. Blustein, J. Ayers
  A Biomimetic Neuronal Network-based Controller for Guided Helicopter Flight, Biomimetic and Biohybrid, Springer, 2013, 299-310

D. Blustein, N. Rosenthal, J. Ayers
  Designing and Implementing Nervous System Simulations on LEGO Robots, Journal of Visualized Experiment, 75, 2013

SELECTED RESEARCH PROJECTS

Biomimetics of Jellyfish Tentacles
  Principal Investigator, Schlumberger Doll, Inc

RoboBees: A Convergence of Body, Brain and Colony
  Principal Investigator, National Science Foundation

Modernization and Enhancement of the Seawater System and Research Infrastructure at Northeastern University's Marine Science Center
  Co-Principal Investigator, National Science Foundation

Utilizing Synthetic Biology to Create Programmable Micro-Bio-Robots
  Co-Principal Investigator, Office of Naval Research

JAYDEEP BARDHAN

Assistant Professor, Mechanical and Industrial Engineering

PhD, Massachusetts Institute of Technology, 2006
mie.neu.edu/people/bardhan-jaydeep

Scholarship focus: multiscale continuum models; electrolyte solutions in biophysics; boundary-integral methods; fast numerical algorithms

SELECTED PUBLICATIONS

J.P. Bardhan, M.G. Knepley
  Modeling Charge-sign Asymmetric Solvation Free Energies using Nonlinear Boundary Conditions, Journal of Chemical Physics (Communication), 141, 2014, 131103

J.P. Bardhan, P. Jungwirth, L. Makowski
  Affine-response Model of Molecular Solvation of Ions: Accurate Predictions of Asymmetric Charging Free Energies, Journal of Chemical Physics, 137, 2012, 124101

R. Yokota, J.P. Bardhan, M.G. Knepley, L.A. Barba, T. Hamada
  Biomolecular Electrostatics using a Fast Multipole BEM on up to 512 GPU and a Billion Unknowns, Computer Physics Communications, 182, 2011, 1272-1283

J.P. Bardhan
  Nonlocal Continuum Electrostatic Theory Predicts Surprisingly Small Energetic Penalties for Charge Burial in Proteins, Journal of Chemical Physics, 135, 2011, 104113

S. Park, J.P. Bardhan, B. Roux, L. Makowski
  Simulated X-ray Scattering of Protein Solutions using Explicit-solvent Models, Journal of Chemical Physics, 130, 2009, 134114

SELECTED RESEARCH PROJECTS

Critical Analysis of Long-range Interactions in Molecular Dynamics
  Principal Investigator, Battelle

Predicting pH-dependent Protein Behavior
  Principal Investigator, National Institutes of Health

STEFANO BASAGNI

Associate Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, University of Texas, Dallas, 2001
PhD, University of Milan, Italy, 1998
coe.neu.edu/people/basagni-stefano

Scholarship focus: wireless networks; ad hoc networks; underwater and terrestrial sensor networking; protocol design and testing

SELECTED PUBLICATIONS

D. Spenza, M. Magno, S. Basagni, L. Benini, M. Paoli, et al.
Beyond Duty Cycling: Wake-up Radio with Selective Awakenings for Long-lived Wireless Sensing Systems, Proceedings of IEEE Infocom 2015, Hong Kong, China, April 26-30, 2015

D. Mishra, S. De, S. Jana, S. Basagni, K.R. Chowdhury, et al.
Smart RF Energy Harvesting Communications: Challenges and Opportunities, Communications Magazine, IEEE, 53(4), 2015, 70-78

M.Y. Naderi, K.R. Chowdhury, S. Basagni
Wireless Sensor Networks with RF Energy Harvesting: Energy Models and Analysis, Proceedings of IEEE WCNC 2015, New Orleans, LA, March 9-12, 2015, 1494-1499

C. Petrioli, M. Nati, P. Casari, M. Zorzi, S. Basagni
ALBA-R: Load-balancing Geographic Routing Around Connectivity Holes in Wireless Sensor Networks, IEEE Transactions on Parallel and Distributed Systems, 24(3), 2014, 529-539

S. Basagni, C. Petrioli, R. Petroccia, D. Spaccini
CARP: A Channel-aware Routing Protocol for Underwater Acoustic Wireless Networks, Ad Hoc Networks, Available on-line, August 2014

M.Y. Naderi, K.R. Chowdhury, S. Basagni, W. Heinzelman, et al.
Experimental Study of Concurrent Data and Wireless Energy Transfer for Sensor Networks, Proceedings of IEEE Globecom 2014, Austin, TX, December 8-12, 2014, 2543-2549

S. Basagni, L. Boloni, C. Petrioli, C.A. Phillips, D. Turgut
Maximizing the Value of Sensed Information in Underwater Wireless Sensor Networks via an Autonomous Underwater Vehicle, in Proceedings of IEEE Infocom 2014, Toronto, Canada, April 27- May 2, 2014, 988-996

L. Chen, S. Cool, H. Ba, W. Heinzelman, S. Basagni, et al.
Range Extension of Passive Wake-up Radio Systems through Energy Harvesting, Proceedings of IEEE ICC 2013, Ad Hoc and Sensor Networking Symposium, Budapest, Hungary, June 9-13, 2013, 1549-1554, Best Paper Award

SELECTED RESEARCH PROJECTS

Development of the Northeastern University Marine Observatory NETwork
Principal Investigator, National Science Foundation

JAMES BEAN

Provost and Senior Vice President of Academic Affairs; Professor, Mechanical and Industrial Engineering; Professor, D'Amore-McKim School of Business

PhD, Stanford University, 1980
mie.neu.edu/people/bean-james

Honors and awards: Fellow, Institute of Operations Research and the Management Sciences; George E. Kimball Medal, Institute of Operations Research and the Management Sciences; Member, Institute for Operations Research and the Management Sciences

SELECTED PUBLICATIONS

S. Xu, J. Bean
Scheduling Parallel-machine Batch Operations to Maximize On-time Delivery Performance, to appear in Journal of Scheduling, 2015

S. Xu, J. Bean
A Genetic Algorithm for Scheduling Parallel Non-identical Batch Processing Machines, Proceedings of the IEEE Symposium on Computational Intelligence in Scheduling, 2007, 143–150

Z.-Z. Lin, J. Bean, C. White III
A Hybrid Genetic/Optimization Algorithm for Finite Horizon Partially Observed Markov Decision Processes, INFORMS Journal on Computing, 16, 2004, 27-38

J. Ohlmann, J. Bean, S. Henderson
Convergence in Probability of Compressed Annealing, Mathematics of Operations Research, 29, 2004, 837-860

C. Kim, G. Keoleian, D. Grande, J. Bean
Life Cycle Optimization of Automobile Replacement: Model and Application, Environmental Science & Technology, 37, 2003, 5407-5413

Z.-Z. Lin, J. Bean, C. White III
Chapter 15: A Genetic Algorithm Heuristic for Finite Horizon Partially Observed Markov Decision Problems, Evolutionary Optimization, Eds. R. Sarkar, X. Yao and M. Mohammadian, Kluwer Academic, Boston, 2002, 371-398

R. Hughes, J. Bean, D. Chaffin
A Method for Classifying Co-contraction of Lumbar Muscle Activity, Journal of Applied Biomechanics, 17, 2001, 253-258

B. Norman, J. Bean
Scheduling Operations on Parallel Machine Tools, IIE Transactions, 32, 2000, 449-459

R. EDWARD BEIGHLEY

Associate Professor, Civil and Environmental Engineering

PhD, University of Maryland, 2001
coe.neu.edu/people/beighley-edward

Scholarship focus: hydrologic and hydraulic modeling; remote sensing of the hydrologic cycle; hydrologic impacts of climate and/or land use change; flood hazard and risk assessment

SELECTED PUBLICATIONS

H. Seyyedi, E.N. Anagnostou, R.E. Beighley, J. McCollum
Hydrologic Evaluation of the Satellite and Re-analysis Precipitation Datasets over Mid-latitude Basins, Atmospheric Research, 2015, 164-165, 37-48

F. Hossain, J. Arnold, A. Mitra, B. Arch, R.E. Beighley, et al.
Local-to-regional Landscape Drivers of Extreme Weather and Climate: Implications for Water Infrastructure Resilience, ASCE Journal of Hydrologic Engineering, 20(7), 2015, 02515002

H. Lee, T. Yuan, H.C. Jung, R.E. Beighley
Mapping Wetland Water Depths Over the Central Congo Basin Using PALSAR SCANSAR Scansar, ENVISAT Altimetry, and MODIS VCF Data, Remote Sensing of the Environment, 159, 2015, 70-79

R.E. Beighley, K. Eggert, C.J. Wilson, J.C. Rowland, H. Lee, 2015.
A Hydrologic Routing Model Suitable for Climate Scale Simulations of Arctic Rivers: Application to the Mackenzie River Basin, Hydrological Processes, 29(12), 2015, 2751-2768

Y. Yoon, R.E. Beighley
Simulating Streamflow on Regulated Rivers Using Characteristic Reservoir Storage Patterns Derived From Remotely Sensed Water Surface Elevations, Hydrological Processes 29, 2015, 2014-2026

T. Pavelsky, M.T. Durand, K.M. Andreadis, R.E. Beighley, et al.
Assessing the Potential Global Impact of SWOT River Observations, Journal of Hydrology 519(Part B), 2014, 1516-1525

SELECTED RESEARCH PROJECTS

Decomposing the Water Storage Signal from Basins in Varied Climate Settings with Remote Sensing and Modeling
Principal Investigator, National Aeronautics and Space Administration

Gravity Recovery and Climate Experiment (GRACE) Mission Science Team Program, Enhancement of GRACE Temporal Gravity Field Solutions to Study Terrestrial Water Dynamics in the Congo Basin
Co-Principal Investigator, National Aeronautics and Space Administration

JAMES BENNEYAN

Director, Healthcare Systems Engineering Institute; Professor, Mechanical and Industrial Engineering

PhD, University of Massachusetts, Amherst, 1997
mie.neu.edu/people/benneyan-james

Scholarship focus: healthcare process improvement, healthcare systems engineering, operations research, quality and reliability engineering, statistical quality control

Honors and awards: Senior Fellow, Institute for Healthcare Improvement; Fellow, Society for Health Systems; Lifetime Fellow, Healthcare Information and Management Systems Society; Fellow, Institute of Industrial Engineers

SELECTED PUBLICATIONS

H. Musdal, B. Shiner, M.E. Ceyhan, B.V. Watts, J.C. Benneyan
In-person and Video-based Post-traumatic Stress Disorder Treatment for Veterans: A Location-allocation Model, Journal of Military Medicine, 179(2), 2014, 150-156

J.S. Peck ,D.J. Nightingale, S.A. Gaehde, J.C. Benneyan
Generalizability of a Simple Approach for Predicting Hospital Admission from an Emergency Department, Academic Emergency Medicine, 20(11), 2013, 1156-1163

L. Romeo, J.C. Benneyan
An Economic Model and Sub-optimality Analysis of the CMS Readmissions Incentive and Penalty Policy, National Science Foundation IUCRC/CHOT center white paper series, 2012

S. Demirkan, A. Taseli, J.B. Benneyan
Readmissions from a Statistical Quality Engineering Perspective, 2012

J.C. Benneyan
Design, use, and Performance of Statistical Process Control Charts for Clinical Process Improvement, International Journal of Six Sigma, 4(3), 2008, 209-239

SELECTED RESEARCH PROJECTS

Scalable Healthcare Systems Engineering Regional Extension, a CMS Healthcare Systems Engineering Center
Center Director and Principal Investigator, Centers for Medicare and Medicaid Services

Center for Healthcare Organizational Transformation (CHOT)-I/UCRC
Co-Director and Site Principal Investigator, National Science Foundation

Drug Safety Risk-Benefit Models
Principal Investigator, National Science Foundation

Reducing Preventable Hospital Readmissions
Principal Investigator, Purdue University

DIONISIO BERNAL

Professor, Civil and Environmental Engineering

PhD, University of Tennessee, 1979
civ.neu.edu/people/bernal-dionisio

Scholarship focus: system identification, fault detection and fault localization, earthquake engineering, soil structure interaction, structural stability

Honors and awards: Moisseiff Award, American Society of Civil Engineers

SELECTED PUBLICATIONS

D. Bernal
Complex Eigenvector Scaling from Mass Perturbations, Mechanical Systems and Signal Processing, 45(1), 2014, 80-90

D. Bernal
Damage Localization and Quantification from the Image of Changes in Flexibility, Journal of Engineering Mechanics, ASCE, 140(2), 2014, 279-286

D. Bernal
Fixed Base Poles and Eigenvectors from Transmission Zeros, Mechanical System and Signal Processing, 45(1), 2014, 68-79

D. Bernal, A. Ussia
Sequential Deconvolution Input Reconstruction, Mechanical Systems and Signal Processing, 50, 2014, 41-55

D. Bernal
The Zero-Order Hold in Time Domain Identification: An Unnecessary Operating Premise, Structural Control and Health Monitoring, 18(5), 2010, 510-518

D. Bernal
Load Vectors for Damage Location in Systems Identified from Operational Loads, Journal of Engineering Mechanics, 136(1), 2010, 31-39

D. Bernal
Damage Localization from Transmission Zeros of Delta Systems, Journal of Engineering Mechanics, 135(2), 2009, 93-99

SELECTED RESEARCH PROJECTS

Assessment of Seismic Provisions on Effects of Multi-Component Excitation Using Instrumental Data and Adaptive Principal Component Reconstruction Scheme
Principal Investigator, California Strong Motion Instrumentation Program

PENNY BEUNING

Associate Professor, Chemistry and Chemical Biology; affiliated faculty, Bioengineering

PhD, University of Minnesota, 2000
bioe.neu.edu/people/beuning-penny

Scholarship focus: chemical biology and biotechnology

Honors and awards: National Science Foundation CAREER Award; Cottrell Scholar Award; American Cancer Society Research Scholar Award

SELECTED PUBLICATIONS

P. Nevin, X. Lu, K. Zhang, J.R. Engen, P.J. Beuning
Non-cognate DNA Damage Prevents Formation of Active Conformation of Y-family DNA Polymerases DinB and Pol Kappa, The FEBS Journal, 282, 2015, 2646-2660

P. Nevin, V. Kairys, C. Venclovas, J.R. Engen, P.J. Beuning
Conformational Analysis of Processivity Clamps in Solution Demonstrates That Tertiary Structure Does not Correlate with Protein Dynamics, Structure, 22, 2014, 572-581

J.N. Ollivierre, J.L. Sikora, P.J. Beuning
Dimer Exchange and Cleavage Specificity of the DNA Damage Response Protein UmuD, Biochimica et Biophysica Acta-Proteins and Proteomics, 1834, 2013, 611-620

J.M. Walsh, P.J. Ippoliti, E.A. Ronayne, E. Rozners, P.J. Beuning
Discrimination Against Major Groove Adducts by Y Family Polymerases of the DinB Subfamily, DNA Repair, 12, 2013, 713-722

K.R. Chaurasiya, C. Ruslie, M.C. Silva, L. Voortman, P. Nevin, S. Lone, P.J. Beuning, M.C. Williams
Polymerase Manager Protein UmuD Directly Regulates E. coli DNA Polymerase III Binding to ssDNA, Nucleic Acids Research, 41, 2013, 8959-8968

SELECTED RESEARCH PROJECTS

Chemical Signatures for the Discovery of Protein Function
Co-Principal Investigator, National Science Foundation

DANA BROOKS

Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, Northeastern University, 1991
ece.neu.edu/people/brooks-dana

Scholarship focus: biomedical signal and image processing; medical imaging; statistical signal processing; inverse problems; electrocardiography; bio-optical imaging; magnetic resonance imaging; transcranial neuromodulation; estimation of protein conformations from Xray scattering; regularization; optimization

Honors and awards: Søren Buus Outstanding Research Award, College of Engineering

SELECTED PUBLICATIONS

A.E. Onut, M, Akcakaya, J.P. Bardhan, D. Erdogmus, D.H. Brooks, L. Makowski
  Constrained Maximum Likelihood Estimation of Relative Abundances of Protein Conformation in a Heterogeneous Mixture from Small Angle X-Ray Scattering Intensity Measurements, IEEE Transactions on Signal Processing, 63(20), 2015, 5383-5394

J. Sourati, D. Erdogmus, J.G. Dy, D.H. Brooks
  Accelerated Learning-based Interactive Image Segmentation using Pairwise Constraints, IEEE Transactions on Image Processing, 23(7), 2014, 3057-3070

S. Kurugol, K. Kose, B. Park, J.G Dy, D.H. Brooks, M. Rajadhyaksha
  Automated Delineation of Dermal-epidermal Junction in Reflectance Confocal Microscopy Image Stacks of Human Skin, Journal of Investigative Dermatology, 135(3), 2014

B. Erem, J. Coll-Font, R. Martinez-Orellana, P. Stovicek, D. Brooks
  Using Transmural Regularization and Dynamic Modeling for non-Invasive Cardiac Potential Imaging of Endocardial Pacing with Imprecise Thoracic Geometry, IEEE Transactions on Medical Imaging, 3(3), 2014, 726-738

S. Eichelbaum, M. Dannhauer, M. Hlawitschkae, D. Brooks, T.R. Knosche, G. Scheuermann
  Visualizing Simulated Electrical Fields from Electroencephalography and Transcranial Electric Brain Stimulation: A Comparative Evaluation, NeuroImage, 2014, 513-530

SELECTED RESEARCH PROJECTS

Center for Integrative Biomedical Computing
  Co-Investigator, National Institutes of Health

Precise Characterization of Conformational Ensembles
  Co-Investigator, National Science Foundation

Automated Image Guidance for Diagnosing Skin Cancer with Confocal Microscopy
  Co-Investigator, National Institutes of Health

AHMED BUSNAINA

William Lincoln Smith Professor, Mechanical and Industrial Engineering; affiliated faculty, Bioengineering, Electrical and Computer Engineering

PhD, Oklahoma State University, 1983
mie.neu.edu/people/busnaina-ahmed

Scholarship focus: nano engineering, nano and micro-contamination control, particulate and chemical contamination and defects, high rate nanomanufacturing, MEMS and NEMS devices with micro and nano-scale channels, nanomaterials

Honors and awards: Fellow, American Society of Mechanical Engineers; Fellow, the Adhesion Society; Søren Buus Outstanding Research Award, College of Engineering

SELECTED PUBLICATIONS

S. Siavoshi, C. Yilmaz, S. Somu, T. Musacchio, A. Busnaina, et al.
  Size-selective Template-assisted Electrophoretic Assembly of Nanoparticles for Biosensing Applications, Journal of ACS, Langmuir, 27, 2011, 7301-7303

Y.L. Kim, B. Li, X. An, M.G. Hahm, A. Busnaina, et al.
  Highly Aligned Scalable Platinum-decorated Single-wall Carbon Nanotube Arrays for Nanoscale Electrical Interconncets, ACS Nano, 3, 2009, 2818-2826

Y. Jung, X. Xiong, L. Jaberansari, M. Hahm, A. Busnaina
  Building Highly Organized Single-walled Carbon Nanotube Networks Using Template Guided Fluidic Assembly, Small, 3(12), 2007, 2006-2010

A. Busnaina
  Nanomanufacturing Handbook, Taylor and Francis Group, CRC Press, 2007

P. Makaram, S. Selvarasah, X. Xiong, C. Chen, A. Busnaina, et al.
  Three-dimensional Assembly of Single-walled Carbon Nanotube Interconnects using Dielectrophoresis, Nanotechnology, 18(39), 2007, 395204, *Journal Cover

SELECTED RESEARCH PROJECTS

Collaborative Research in Nanomanufacturing
  Principal Investigator, Massachusetts Technology Collaborative

Designing & Integrating LCA Methods for Nanomanufacturing Scale-up
  Co-Principal Investigator, National Science Foundation

Electrostatic Deposition of a Seed Layer on Ceramic Substrates using Nanoparticles that Enables Electroplating
  Principal Investigator, Rogers Corp.

Fabrication and Characterization of Nanoscale films
  Principal Investigator, HC Starck, Inc.

LED manufacturing using Directed Assembly of Nanoparticles
  Principal Investigator, Rogers Corp.

NSF Nanoscale Science and Engineering Center for High-Rate Nanomanufacturing
  Principal Investigator and Director, National Science Foundation

OCTAVIA CAMPS

Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, University of Washington, 1992
ece.neu.edu/people/camps-octavia

Scholarship focus: robust computer vision; image processing; and machine learning

SELECTED PUBLICATIONS

Y. Cheng, J.A. Lopez, O. Camps, M. Sznaier
A Convex Optimization Approach to Robust Fundamental Matrix Estimation, Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition, 2015, 2170-2178

S. Markovic, L. Siyuan, M. Sznaier, O. Camps, M. Niedre
Computer Vision in Vivo Flow Cytometry of Low-abundance Circulating Cells, Bio-Optics: Design and Application Conference, 2015

C. Dicle, O. Camps, M. Sznaier
The Way They Move: Tracking Multiple Targets with Similar Appearance, IEEE International Conference on Computer Vision (ICCV), Sydney, Australia, 2013

M. Ayazoglu, B. Yilmaz, M. Sznaier, O. Camps
Finding Causal Interactions in Video Sequences, IEEE International Conference on Computer Vision (ICCV), Sydney, Australia, 2013

F. Xiong, Y. Cheng, O. Camps, M. Sznaier, C. Lagoa
Hankel Based Maximum Margin Classifiers: A Connection Between Machine Learning and Wiener Systems Identification, 2013 IEEE 52nd Annual Conference on Decision and Control, 2013, 6005-6010

SELECTED RESEARCH PROJECTS

Robust Identification of a Class of Structured Systems with High Dimensional Outputs and Applications
Co-Principal Investigator, National Science Foundation

LUCA CARACOGLIA

Associate Professor, Civil and Environmental Engineering

PhD, University of Trieste, 2001
civ.neu.edu/people/caracoglia-luca

Scholarship focus: structural dynamics; wind engineering; wind energy; wind-induced vibration; linear and nonlinear cable dynamics; climate change

Honors and awards: National Science Foundation Early CAREER Development Award

SELECTED PUBLICATIONS

P. Egger, L. Caracoglia
Analytical and Experimental Investigation on a Multiple-Mass-Element Pendulum Impact Damper for Vibration Mitigation, Journal of Sound and Vibration, 353, 2015, 38-57

L. Caracoglia
Comparison of Reduced-order Models to Analyze the Dynamics of a Tall Building under the Effects of Along-wind Loading Variability, ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Part A: Civil Engineering, 2015, 2376-7642

F. Moghim, F.T. Xia, L. Caracoglia
Experimental Analysis of a Stochastic Model for Estimating Wind-borne Compact Debris Trajectory in Turbulent Winds, Journal of Fluids and Structures, 54, 2015, 900-992

D.-W. Seo, L. Caracoglia
Exploring the Impact of "Climate Change" on Lifetime Replacement Costs for Long-Span Bridges Prone to Torsional Flutter, Journal of Wind Engineering and Industrial Aerodynamics, 140, 2015, 1-9

T.-H. Le, L. Caracoglia
Reduced-order Wavelet-Galerkin Solution for the Coupled, Nonlinear Stochastic Response of Slender Buildings in Transient Winds, Journal of Sound and Vibration, 344, 2015, 179-208

W. Cui, L. Caracoglia
Simulation and Analysis of Intervention Costs due to Wind-induced Damage on Tall Buildings, Engineering Structures, 87, 2015, 183-197

P. Pourazam, L. Caracoglia, M. Lackner, Y. Modarres-Sadeghi
Stochastic Analysis of Flow-Induced Dynamic Instabilities of Wind Turbine Blades, Journal of Wind Engineering and Industrial Aerodynamics, 137, 2015, 37-45

L. Caracoglia
A Stochastic Model for Examining Along-wind Loading Uncertainty and Intervention Costs due to Wind-induced Damage on Tall Buildings, Engineering Structures, 78, 2014, 121-132

SELECTED RESEARCH PROJECTS

Wavelet-Galerkin Analysis Method for the Dynamic Response of Vertical Structures against Transient Winds with a Focus on Tall Buildings and Wind Turbines
Principal Investigator, National Science Foundation

REBECCA CARRIER

Associate Professor, Chemical Engineering; Associate Chair of Research; affiliated faculty, Bioengineering

PhD, Massachusetts Institute of Technology, 2000
che.neu.edu/people/carrier-rebecca

Scholarship focus: interaction between biological systems and materials, with specific applications in drug delivery and regenerative medicine; intestinal and retinal engineering; oral lipid systems

Honors and awards: College of Engineering Faculty Fellow; National Science Foundation CAREER Award

SELECTED PUBLICATIONS

H.M. Yildiz, L. Speciner, C. Ozdemir, D.E. Cohen, R.L. Carrier
Food-associated Stimuli Enhance Barrier Properties of Gastrointestinal Mucus, Biomaterials, 54, 2015, 1-8

H.M. Yildiz, T.L. Carlson, A.M. Goldstein, R.L. Carrier
Mucus Barriers to Microparticles and Microbes are Altered in Hirschsprung's Disease, Macromol Biosci, 5(5), 2015, 712-718

P. Baranov, A. Michaelson, J. Kundu, R.L. Carrier, M. Young
Interphotoreceptor Matrix-poly(caprolactone) Composite Scaffolds for Human Photoreceptor Differentiation, Journal of Tissue Engineering, 5, 2014

C.A. Pfluger, B.J. McMahon, R.L. Carrier, D.D. Burkey
Precise, Biomimetic Replication of the Multiscale Structure of Intestinal Basement Membrane using Chemical Vapor Deposition, Tissue Engineering, 19(5-6), 2013, 649-656

S. diMaio, R.L. Carrier
Gastrointestinal Contents Post-lipid Ingestion: In vivo Measurements and in Vitro Models for Studying Oral Drug Delivery, Journal of Controlled Release, 151(2), 2011, 110-122

SELECTED RESEARCH PROJECTS

Combinatorial-designed Nano-platforms to Overcome Tumor Drug Resistance
Co-Principal Investigator, National Institutes of Health

Impact of Lipids on Compound Absorption: Mechanistic Studies and Modeling
Principal Investigator, National Institutes of Health

Impact of Lipids on Intestinal Mucus Transport and Structural Properties
Principal Investigator, National Institutes of Health

Interphotoreceptor Matrix Based Cell Delivery Vehicle for Retinal Regeneration
Principal Investigator, National Institutes of Health

Intestinal Mucus Barrier: Role in Necrotizing Enterocolitis (NEC) and Prophylactic "Mucus-strengthening" Treatment to Prevent NEC
Principal Investigator, March of Dimes

SRINATH CHAKRAVARTHY

Assistant Professor, Mechanical and Industrial Engineering

PhD, University of Connecticut, 2007
mie.neu.edu/people/chakravarthy-srinath

Scholarship focus: multi-scale (spatio temporal)/meso-scale numerical methods in development of predictive material modeling of micro/nanostructural features

SELECTED PUBLICATIONS

A.D. Orsi, S. Chakravarthy, P.K. Canavan, E. Peña, R. Goebel, A. Vaziri, H.Nayeb-Hashemi
The Effects of Knee Joint Kinematics on Anterior Cruciate Ligament Injury and Articular Cartilage Damage, Computer Methods in Biomechanics and Biomedical Engineering, 2015, 1-14

S. Chakravarthy, W.A. Curtin
Stress Gradient Plasticity: Concepts and Applications, Proceedia IUTAM, 10, 2014, 453-461

S. Olarnrithinun, S. Chakravarthy, W.A. Curtin
Discrete Dislocation Modeling of Fracture in Plastically Anisotropic Metals, Journal of the Mechanics and Physics of Solids, 61(6), 2013, 1391-1406

B.A. Szajewski, S. Chakravarthy, W.A. Curtin
Operation of a 3D Frank–read Source in a Stress Gradient and Implications for Size-dependent Plasticity, Acta Materialia, 61(5), 2012, 1469-1477

S. Chakravarthy, W.A. Curtin
New Algorithms for Discrete Dislocation Modeling of Fracture, Modelling and Simulation in Materials Science and Engineering, 19(4), 2011, 1-12

S. Chakravarthy, W.A. Curtin
Origin of Plasticity Length-scale Effects in Fracture, Physical Review Letters, 105, 2011, e115502

S. Chakravarthy, W.A. Curtin
Stress Gradient Plasticity, Proceedings of the National Academy of Sciences, 108(38), 2011, 15716-15720

SUNHO CHOI

Assistant Professor, Chemical Engineering

PhD, University of Minnesota, 2008
che.neu.edu/people/choi-sunho

Scholarship focus: demonstrating innovative processing strategies for nanostructured materials and functional hybrids engineered for challenging applications in clean and renewable energy

SELECTED PUBLICATIONS

S. Choi, M. L. Gray, C. W. Jones
  Amine-tethered Solid Adsorbents Coupling High Adsorption Capacity and Regenerability for CO_2 Capture Applications Including the air Capture, ChemSusChem, 4(5), 2011, 628-635

S. Choi, J. Drese, M. Gray, R.R. Chance, P. Eisenberger, C. Jones
  Application of Amine-tethered Solid Sorbents for Direct CO_2 Capture from the Ambient Air, Environmental Science and Technology, 45(6), 2011, 2420-2427

W. Kim, S. Choi, S. Nair
  Swelling, Functionalization, and Structural Changes of the Nanoporous Layered Silicates AMH-3 and MCM-22, Langmuir, 27(12), 2011, 7892-7901

J.H. Lee, P.I. Zapata, S. Choi, J.C. Meredith
  Effect of Nanowhisker-modified Zeolites on Mechanical and Thermal Properties of Poly(vinyl acetate) Composites with Pure-silica MFI, Polymer, 51(24), 2010, 5744-5755

L. Wei, C.S. Gill, S. Choi, C.W. Jones
  Recoverable & Recyclable Magnetic Nanoparticle Supported Aluminum Isopropoxide for Ring-opening Polymerization of e-Caprolactone, Dalton Transactions, 39(6), 2010, 1470-1472

SELECTED RESEARCH PROJECTS

Amino-pillared Nanosheet (APN) Adsorbents for High Performance CO_2 capture
  Principal Investigator, Northeastern University

KAUSHIK CHOWDHURY

Associate Professor, Electrical and Computer Engineering

PhD, Georgia Institute of Technology, 2009
ece.neu.edu/people/chowdhury-kaushik

Scholarship focus: dynamic spectrum access; energy harvesting sensor networks; 5G technology; intra-body communication; protocol design for wireless

Honors and awards: Chair of the IEEE Technical Committee on Simulation; National Science Foundation CAREER Award

SELECTED PUBLICATIONS

A. Al-Ali, Y. Sun, M. DiFelice, J. Paavola, K.R. Chowdhury
  Accessing Spectrum Databases using Interference Alignment in Vehicular Cognitive Radio Networks, IEEE Transactions on Vehicular Technology, 64(1), 2015, 263-272

S. De, D. Mishra, K.R. Chowdhury
  Charging Time Characterization for Wireless RF Energy Transfer, IEEE Transactions on Circuits and Systems II, 64(4), 2015, 362-366

D. Mishra, S. De, S. Jana, S. Basagni, K.R. Chowdhury, et al.
  Smart RF Energy Harvesting Communications: Challenges and Opportunities, IEEE Communications Magazine, 33(4), 2015, 1-14

Y. Sun, K.R. Chowdhury
  Enabling Emergency Communication through Cognitive Radio Vehicular Network, IEEE Communications Magazine, 52(10), 2014, 68-75

M.Y. Naderi, P. Nintanavongsa, K.R. Chowdhury
  RF-MAC: A Medium Access Control Protocol for Re-chargeable Sensor Networks Powered by Wireless Energy Harvesting, IEEE Transactions on Wireless Communication, 13(7), 2014, 3926-3937

R. Doost-Mohammady, M.Y. Naderi, K.R. Chowdhury
  Spectrum Allocation and QoS Provisioning Framework for Cognitive Radio with Heterogeneous Service Classes, IEEE Transactions on Wireless Communication, 13(7), 2014, 3938-3950

SELECTED RESEARCH PROJECTS

A Flexible and Extensible Solution to Incorporating new RF Devices and Capabilities into EWI ISR Networks
  Principal Investigator, Defense Advanced Research Projects Agency

CAREER: IDEA: Integrated Data and Energy Access for Wireless Sensor Networks
  Principal Investigator, National Science Foundation

EAGER: Network Protocol Stack for Galvanic Coupled Intra-body Sensor
  Principal Investigator, National Science Foundation

Transport Layer Design and Analysis for Cognitive Radio Ad Hoc Networks
  Principal Investigator, Office of Naval Research

JOHN W. CIPOLLA

Donald W. Smith Professor, COE Distinguished Professor, Mechanical and Industrial Engineering

PhD, Brown University, 1970
mie.neu.edu/people/cipolla-jr-john

Scholarship focus: mathematical methods and modeling; thermodynamics; fluid dynamics; kinetic theory of gases; thermophoresis of aerosols

Honors and awards: Fellow, American Society of Mechanical Engineers; Edwin F. Church Medal, American Society of Mechanical Engineers

SELECTED PUBLICATIONS

G. Jia, Y. Yener, J.W. Cipolla
 Thermophoresis of a Radiating Aerosol in Laminar Boundary Layer Flow, Journal of Thermophysics and Heat Transfer, 6(3), 1992, 476-482

G. Jia, Y. Yener, J.W. Cipolla
 Radiation between Two Concentric Spheres Separated by a Participating Medium, Journal of Quantitative Spectroscopy and Radiative Transfer, 46(1), 1991, 11-19

D. DiGiovanni, T.F. Morse, J.W. Cipolla
 Theoretical Modeling of the Incorporation of Phosphorus Doping in the MCVD Process, Journal of American Ceramic Society, 71(11), 1988, 914-923

J.W. Cipolla, T.F. Morse
 Laser Modification of Thermophoretic Deposition, Journal of Colloid and Interface Science, 97(1), 1984, 137-148

J.W. Cipolla, M.B. Silevitch
 On the Temporal Development of a Plasma Sheath, Journal of Plasma Physics, 25(3), 1981, 373-389

J.W. Cipolla, H. Lang, S.K. Loyalka
 Kinetic Theory of Condensation and Evaporation II, Journal of Chemical Physics, 61(1), 1974, 69

J.W. Cipolla, T.F. Morse
 Kinetic Theory of an Optically Pumped Gas, Physics of Fluids, 14(9), 1971, 1850

HEATHER CLARK

Associate Professor, Pharmaceutical Sciences; affiliated faculty, Bioengineering, Chemical Engineering

PhD, University of Michigan, 1999
bioe.neu.edu/people/clark-heather

Scholarship focus: optical nanosensors for biological analysis

Honors and awards: Young Faculty Award, Defense Advanced Research Projects Agency

SELECTED PUBLICATIONS

K.J. Cash, C. Li, L.V. Wang, H.A. Clark
 Photoacoustic Imaging of Nanosensors for Therapeutic Drugs, In Vivo, 9(2), 2015, 1692-1698

M.K. Balaconis, H.A. Clark
 Gel Encapsulation of Glucose Nanosensors for Prolonged in Vivo Lifetime, Journal of Diabetes Science and Technology, 7(1), 2013, 53-61

T.T. Ruckh, A.A. Mehta, J.M. Dubach, H.A. Clark
 Polymer-Free Optode Nanosensors for Dynamic, Reversible, and Ratiometric Sodium Imaging in the Physiological Range, Scientific Reports, 3(3366), 2013

K.J. Cash, H.A. Clark
 Phosphorescent Nanosensors for in Vivo Tracking of Histamine Levels, Analytical Chemistry, 85(13), 2013, 6312-6318

T.T. Ruckh, H.A. Clark
 Implantable Nanosensors: Toward Continuous Physiologic Monitoring, Analytical Chemistry, 86(3), 2013, 1314-1323

K.J. Cash, H.A. Clark
 In Vivo Histamine Optical Nanosensors, Sensors, 12(9), 2012, 11922-11932

SELECTED RESEARCH PROJECTS

Polymer-free Nanosensors to Visualize Biochemical Dynamics in Dendritic Spines
 Principal Investigator, National Institutes of Health

ARTHUR COURY

University Distinguished Professor, Chemical Engineering

PhD, University of Minnesota, 1965
che.neu.edu/people/coury-arthur

Scholarship focus: polymeric biomaterials for medical products such as implantable electronic devices, hydrogel-based devices and drug delivery systems

Honors and awards: Fellow, American Chemical Society; Fellow, American Institute for Medical and Biological Engineering; Fellow, Biomaterials Science and Engineering; Member, National Academy of Engineering

SELECTED PUBLICATIONS

A. Coury
Forces and Imperatives in Translating Medical Concepts to the Marketplace, BE 502 "From Lab Bench to Marketplace" Department of Bioengineering, University of Pennsylvania, 2013

A. Coury
Issues in Translation of Advanced Composites from the Bench to the Medical Marketplace, MRS Conference, Boston, MA, 2013

A. Coury
Progress in the Prevention of Tissue Adhesions, Tenth International Symposium on Frontiers in Biomedical Polymers, Vancouver, British Columbia, Canada, 2013

A. Coury
Organic Chemistry: Passport to a "Hybrid" Career, Presentation to Department of Chemistry, University of Minnesota, upon Receipt of Distinguished Alumni Award, 2013

A. Coury
Technology, Service and Bucking Convention: A Prescription for a Rewarding Biomaterials Career, Transactions of Society for Biomaterials, 2(3), 101S-110S, in conjunction with receipt of 2013 C. William Hall Award, Boston, MA, 2013

A. Coury, P. Jarrett
Tissue Adhesives and Sealants for Surgical Applications, in Joining and Assembly of Medical Materials and Devices, Edited by Y.N. Zhou and M.D. Breyen (Woodhead Publishing Limited), 2013, 449-490

A. Coury
Tissue Engineering: Scope, Products, and Commercialization Strategies, Chapter 17, Scaffolds for Tissue Engineering: Biological Design, Materials, and Fabrication, Edited by Claudio Migliaresi and Antonella Motta, CRC Press (Taylor & Francis), 2014, 614-625

ERIN J. CRAM

Associate Professor, Biology; affiliated faculty, Bioengineering

PhD, University of California, Berkeley, 2000
bioe.neu.edu/people/cram-erin

Scholarship focus: cell migration and mechanotransduction in C. elegans; improving production of drug compounds by medicinal plants

SELECTED PUBLICATIONS

M.F. Doherty, G. Adelmant, A.D. Cecchetelli, J.A. Marto, E.J. Cram
Proteomic Analysis Reveals CACN-1 is a Component of the Spliceosome in C. elegans, G3: Genetics, Genes, and Genomes, 4(8), 2014, 1555-1564

I. Kovacevic, J.M. Orozco, E.J. Cram
Filamin and Phospholipase C Epsilon are Required for Calcium Signaling in the C. elegans Spermatheca, PLOS Genetics,10, 2013, 1371

S. Goklany, N.F. Rizvi, R. Loring, E.J. Cram, C. W.T. Lee-Parsons
Jasmonate Dependent Alkaloid Biosynthesis in Catharanthus Roseus Hairy Root Cultures is Correlated with the Relative Expression of Orca and Zct Transcription Factors, Biotechnology Progress, 29(6), 2013, 1367-1376

J. Weaver, S. Goklany, N.F. Rizvi, E.J. Cram, C.W.T. Lee-Parsons
Optimizing the Transient Fast Agro-mediated Seedling Transformation (FAST) Method in Catharanthus Roseus Seedlings, Plant Cell Reports, 33(1), 2013, 89-97

I. Kovacevic, R. Ho, E.J. Cram
CCDC-55 is Required for Larval Development and Distal Tip Cell Migration in Caenorhabditis Elegans, Mechanisms of Development, 128(11), 2012, 548-559

SELECTED RESEARCH PROJECTS

In Vivo Analysis of Mechanotransduction
Principal Investigator, National Institutes of Health

Zinc Finger Transcription Factors: Regulators of Growth, Development, and Alkaloid Biosynthesis
Co-Principal Investigator, National Science Foundation

STEVEN CRANFORD

Assistant Professor, Civil and Environmental Engineering

PhD, Massachusetts Institute of Technology, 2012
civ.neu.edu/people/cranford-steven

Scholarship focus: materiomics and material design; full atomistic molecular modeling of materials; molecular dynamics; multiscale modeling and model development; nanomechanics and molecular mechanics; structural mechanics and engineering

SELECTED PUBLICATIONS

J. Meng, Y. Zhang, S. Cranford, M. Minus
Nanotube Dispersion and Polymer Conformational Confinement in a Nano-Composite Fiber: A Joint Computational Experimental Study, Journal of Physical Chemistry B, 118(31), 2014, 9476-9485

A. Kocsis, N.A. Yedama and S. Cranford
Confinement and Controlling the Effective Compressive Stiffness of Carbyne, Nanotechnology, 25(33), 2014, 335709, *IOP Select paper

K. Kwan, S. Cranford
'Unsticking' and Exposing the Surface Area of Graphene Bilayers via Randomly Distributed Nanoparticles, Chemical Physics Letters, 609, 2014, 65-69

R. Roman, S. Cranford
Strength and Toughness of Graphdiyne/Copper Nanocomposites, Advanced Engineering Materials, 16(7), 2014, 862–871

K. Kwan, S. Cranford
Scaling of the Critical Free Length for Progressive Unfolding of Self-Bonded Graphene, Applied Physics Letters, 104, 2014, 1-6

A. Meyer, N. Pugno, S. Cranford
Compliant Threads Maximize Spider Silk Connection Strength and Toughness, Journal of the Royal Society Interface, 11(98), 2014, 20140561

SELECTED RESEARCH PROJECTS

Multi-phase Topologically Controlled Structural Fuses Inspired by Nature
Principal Investigator, Haythornthwaite Research Initiation

Disease Diagnosis and Monitoring using Breath and Saliva Based Nano-Bio Sensing System
Co-Principal Investigator, Northeastern University

THOMAS CULLINANE

Program Director, Engineering Management; Professor, Mechanical and Industrial Engineering; affiliated faculty, Business Administration

PhD, Virginia Polytechnic Institute and State University, 1972
mie.neu.edu/people/cullinane-thomas

Scholarship focus: analysis and design of efficient facilities focusing on inventory space control, materials handling and staffing levels

Honors and awards: Fellow, Institute of Industrial Engineers

SELECTED PUBLICATIONS

S. Erbis, S. Kamarthi, T. Cullinane, J.A. Isaacs
Multistage Stochastic Programming Model (MSP) for carbon Nanotube Production Capacity Expansion Planning, ACS Sustainable Chemistry and Engineering, 2(7), 2014, 1633-1641

A. Topcu, J. Benneyan, T. Cullinane
A Simulation Optimization Approach for Reconfigurable Inventory Space Planning in Remanufacturing Facilities, International Journal of Business Performance and Supply Chain Modeling, 5(1), 2013, 86-114

T. Cullinane, T. Marion, J.H. Friar
A Multi-disciplinary New Product Development Course for Technological Entrepreneurs, Journal of the Academy of Business Education, 13, 2012, 71-89

SELECTED RESEARCH PROJECTS

A Computer Game to Teach Sustainability in Business and Engineering
Co-Principal Investigator, Northeastern University

JACK DENNERLEIN

Professor, Physical Therapy, Movement, and Rehabilitation Sciences; affiliated faculty, Bioengineering

PhD, University of California, Berkeley,1996
bioe.neu.edu/people/dennerlein-jack

Scholarship focus: musculoskeletal disorders; work place injury prevention and health; occupational biomechanics

SELECTED PUBLICATIONS

J.H. Lee, D.S. Asakawa, J.T. Dennerlein, D.L. Jindrich
Finger Muscle Attachments for an OpenSim Upper-extremity Model, PLoS One, 10(4), 2015, e0121712

M.B. Trudeau, D.S. Asakawa, D.L. Jindrich, J.T. Dennerlein
Two-handed Grip on a Mobile Phone Affords Greater Thumb Motor Performance, Decreased Variability, and a More Extended Thumb Posture Than a One-handed Grip, Applied Ergonomics, 52, 2015, 24-28

S.S. Kim, C. Okechukwu, L. Boden, J.T. Dennerlein, et al.
Association Between Work-family Conflict and Musculoskeletal Pain Among Hospital Patient Care Workers, American Journal of Industrial Medicine, 56(4), 2013, 488-495

P. Morency, L. Miranda-Moreno, W. Willett, J.T. Dennerlein, et al.
Bicycle Guidelines and Crash Rates on Cycle Tracks in the United States, American Journal of Public Health, 103(7), 2013, 1240-1248

J.G. Young, M.B. Trudeau, D. Odell, K. Marinelli, J.T. Dennerlein
Wrist and Shoulder Posture and Muscle Activity During Touch-screen Tablet use: Effects of Usage Configuration, Tablet Type, and Interacting Hand, Work: A Journal of Prevention, Assessment and Rehabilitation, 45(1), 2013, 59-71

SELECTED RESEARCH PROJECTS

Development and Evaluation of Contractor Safety Pre-Qualification Tool
Principal Investigator, National Institute for Occupational Safety and Health

Enhancing Safety Climate through Leadership
Principal Investigator, National Institute for Occupational Safety and Health

Modifying the Workplace to Decrease Sedentary Behaviour and Improve Health
Co-Principal Investigator, National Institute for Occupational Safety and Health

Randomized Controlled Trial of a Whole Body Vibration Intervention in Truck Drivers
Principal Investigator, National Institute for Occupational Safety and Health

ANTHONY DEVANEY

COE Distinguished Professor, Electrical and Computer Engineering

PhD, University of Rochester, 1971
ece.neu.edu/people/devaney-anthony

Scholarship focus: electromagnetic wave propagation, inverse scattering tomography

SELECTED PUBLICATIONS

A.J. Devaney, E.A. Marengo, F.K. Gruber
Time-reversal-based Imaging and Inverse Scattering of Multiply Scattering Point Targets, The Journal of the Acoustical Society of America, 118, 2005, 3129-3138

F.K. Gruber, E.A. Marengo, A.J. Devaney
Time-reversal Imaging with Multiple Signal Classification Considering Multiple Scattering Between the Targets, The Journal of the Acoustical Society of America, 115, 2004, 3042-3047

S.K. Lehman, A.J. Devaney
Transmission Mode Time-reversal Super-resolution Imaging, The Journal of the Acoustical Society of America, 113, 2003, 2742-2753

CHARLES DIMARZIO

Associate Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering, Mechanical and Industrial Engineering

PhD, Northeastern University, 1996
ece.neu.edu/people/dimarzio-charles

Scholarship focus: optics, microscopy, coherent detection, interaction of light and sound waves, hyperspectral imaging, diffusive optical tomography and ultrasound, landmine detection, magneto-optic sensors, and multi-model imaging. Activities include computer modeling, designing, building, and testing of hardware, and processing the resulting datae

SELECTED PUBLICATIONS

J.L. Hollmann, R. Horstmeyer, C. Yang, C.A DiMarzio
 Diffusion Model for Ultrasound-Modulated Light, Journal of Biomedical Optics, 19(3), 2014, 035005

J.L. Hollmann, R.Horstmeyer, C. Yang, C.A. DiMarzio
 Analysis and Modeling of an Ultrasound-Modulated Guide Star to Increase the Depth of Focusing in a Turbid Medium, Journal of Biomedical Optics, 18(2), 2013, 025004

Z. Lai, J. Kerimo, Y. Mega, C.A. DiMarzio
 Stepwise Multiphoton Activation Fluorescence Reveals a New Method of Melanin Detection, Journal of Biomedical Optics,18(6), 2013, 061225

Z.R. Hoffman, C. DiMarzio
 Structured Illumination Microscopy Using Random Intensity Incoherent Reflectance, Journal of Biomedical Optics, 2013

SELECTED RESEARCH PROJECTS

Coded-illumination Fourier Ptychography for High-content Multimodal Imaging
 Principal Investigator, National Science Foundation

JENNIFER DY

Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, Purdue University, 2001
ece.neu.edu/people/dy-jennifer

Scholarship focus: machine learning; data mining; statistical pattern recognition; computer vision and image processing

Honors and awards: National Science Foundation CAREER Award

SELECTED PUBLICATIONS

S.M. Brown, A. Webb, R.S. Mangoubi, J.G. Dy
 A Sparse Combined Regression-classification Formulation for Learning a Physiological Alternative to Clinical Post-Traumatic Stress Disorder Scores, Twenty-ninth AAAI Conference on Artificial Intelligence, 2015

J. Ross, P. Castaldi, M. Cho, J.G. Dy
 Dual Beta Process Priors for Latent Cluster Discovery in Chronic Obstructive Pulmonary Disease, ACM SIGKDD Knowledge Discovery and Data Mining, 2014

D. Niu, J.G. Dy, M.I. Jordan
 Iterative Discovery of Multiple Alternative Clustering Views, IEEE Transactions on Pattern Analysis and Machine Intelligence, 36(7), 2014, 1340-1353

Y. Yan, R. Rosales, G. Fung, J.G. Dy
 Active Learning from Crowds, Proceedings of the 28th International Conference on Machine Learning (ICML), 2011, 1161-1168

Y. Guan, J.G. Dy, M.I. Jordan
 A Unified Probabilistic Model for Global and Local Unsupervised Feature Selection, Proceedings of the 28th International Conference on Machine Learning (ICML), 2011, 1073-1080

M. Masaeli, G. Fung, J.G. Dy
 From Transformation-Based Dimensionality Reduction to Feature Selection, Proceedings of the 27th International Conference on Machine Learning (ICML), 2010, 751-758

Y. Yan, R. Rosales, G. Fung, M. Schmidt, J.G. Dy, et al.
 Modeling Annotator Expertise: Learning when Everybody Knows a Bit of Something, Proceedings of the Thirteenth International Conference on Artificial Intelligence and Statistics (AISTATS), 9, 2010, 932-939

SELECTED RESEARCH PROJECTS

Automated Image Guidance for Diagnosing Skin Cancer With Confocal Microscopy
 Principal Investigator, National Institutes of Health

Genetic Epidemiology of COPD
 Co-Principal Investigator, National Institutes of Health

Spatio-temporal Extremes and Associations Marine Adaptation and Survivorship under Climate Change and Rising Ocean Temperatures
 Principal Investigator, National Science Foundation

ENO EBONG

Assistant Professor, Chemical Engineering affiliated faculty, Bioengineering

PhD, Rensselaer Polytechnic Institute, 2006
che.neu.edu/people/ebong-eno

Scholarship focus: studying the means by which endothelial cell mechanotransduction occurs in order to prevent or promote atherosclerosis

SELECTED PUBLICATIONS

E. Ebong, S.V. Lopez-Quintero, V. Rizzo, D.C. Spray, J.M.Tarbell
  Shear-induced Endothelial NOS Activation and Remodeling via Heparin Sulfate, Glypican-1, and Syndecan-1, Integrative Biology: Quantitative Biosciences from Nano to Macro, 6(3), 2014, 338-347

M. Thi, E. Ebong, D. Spray, S. Suadicani
  Interaction of the Glycocalyx with the Actin Cytoskeleton, Neuromethods, Springer Publishing, 79, 2013, 43-62

E. Ebong, N. Depaola
  Specificity in the Participation Of Connexin Proteins in Flow-Induced Endothelial gap Junction Communication, European Journal of Physiology, 465(9), 2013, 1293-302

Y. Zeng, E. Ebong, B. Fu, J. Tarbell
  The Structural Stability of the Endothelial Glycocalyx after Enzymatic Removal of Glycosaminoglycans, PLoS ONE, 7(8), 2012, e43168

E. Ebong, F. Macaluso, D. Spray, J. Tarbell
  Imaging the Endothelial Glycocalyx In Vitro by Rapid Freezing/ Freeze Substitution Transmission Electron Microscopy, Arteriosclerosis Thrombosis and Vascular Biology, 31(8), 2011, 1908-1915

E. Ebong, F. Macaluso, D. Spray, J. Tarbell
  Life-like Preservation and TEM Visualization of the Glycocalyx Reveals that it is Substantial in Vitro, Proceedings of the 2011 IEEE 37th Annual Northeast Bioengineering Conference, 2011, 1-2

SELECTED RESEARCH PROJECTS

Atheroprotective vs Atherogenic Glycocalyx Mechanotransduction Mechanisms
  Principal Investigator, National Institutes of Health

MATTHEW ECKELMAN

Assistant Professor, Civil and Environmental Engineering; affiliated faculty: Chemical Engineering, Public Policy and Urban Affairs

PhD, Yale University, 2009
civ.neu.edu/people/eckelman-matthew

Scholarship focus: environmental engineering and sustainability; life cycle assessment; energy efficiency and emissions modeling; environmental assessment of bio and nanomaterials; material and energy use in urban buildings and infrastructure

Honors and awards: National Science Foundation CAREER Award; International Laudise Prize in Industrial Ecology

SELECTED PUBLICATIONS

P. Nuss, M.J. Eckelman
  Life Cycle Assessment of Metals: A Scientific Synthesis, PLoS ONE, 9(7), 2014, e101298

M.J. Eckelman, M. Altonji, A. Clark, M. Jenkins, B. Lakin
  Life Cycle Environmental and Economic Assessment of Municipal Water Storage Options: Infrastructure Refurbishment Versus Replacement, ASCE Journal of Infrastructure Systems, 20(3), 2014, e05014004

M. Saha, M.J. Eckelman
  Urban Scale Mapping of Concrete Degradation From Projected Climate Change, Urban Climate, 9, 2014, 101-114

R. Wang, M.J. Eckelman, J.B. Zimmerman
  Consequential Environmental and Economic Life Cycle Assessment of Green and Gray Stormwater Infrastructures for Combined Sewer Systems, Environmental Science and Technology, 47(19), 2013, 11189-11198

M.J. Eckelman
  Life Cycle Assessment in Support of Sustainable Transportation, Environmental Research Letters, 8, 2013, 021004

M.J. Eckelman, M.S. Mauter, J.A. Isaacs, M. Elimelech
  New Perspectives on Nanomaterial Aquatic Ecotoxicity: Production Impacts Exceed Direct Exposure Impacts for Carbon Nanotubes, Environmental Science and Technology, 46(5), 2012, 2902-2910

SELECTED RESEARCH PROJECTS

CAREER: Building Chemical Synthesis Networks for Life Cycle Hazard Modeling
  Principal Investigator, National Science Foundation

Ethics Education in Life Cycle Design, Engineering, and Management
  Principal Investigator, National Science Foundation

Designing and Integrating Life Cycle Assessment Methods for Nanomanufacturing Scale-up
  Co-Principal Investigator, National Science Foundation

ADAM EKENSEAIR

Assistant Professor, Chemical Engineering; affiliated faculty, Bioengineering

PhD, University of Texas at Austin, 2010
che.neu.edu/people/ekenseair-adam

Scholarship focus: synthesis and application of novel polymeric biomaterials for tissue engineering and regenerative medicine applications

SELECTED PUBLICATIONS

A.K. Ekenseair, F.K. Kasper, A.G. Mikos
  Perspectives on the Interface of Drug Delivery and Tissue Engineering, Advanced Drug Delivery Reviews, 65, 2013, 89-92

A.K. Ekenseair, N.A. Peppas
  Network Structure and Methanol Transport Dynamics in Poly(methyl methacrylate), AIChE Journal, 58(5), 2012, 1600-1609

A.K. Ekenseair, K.W.M. Boere, S.N. Tzouanas, T.N. Vo, F.K. Kasper, A.G. Mikos
  Structure-Property Evaluation of Thermally and Chemically Gelling Injectable Hydrogels for Tissue Engineering, Biomacromolecules, 13, 2012, 2821-2830

A.K. Ekenseair, K.W.M. Boere, S.N. Tzouanas, T.N. Vo, F.K. Kasper, A.G. Mikos
  Synthesis and Characterization of Thermally and Chemically Gelling Injectable Hydrogels for Tissue Engineering, Biomacromolecules, 13, 2012, 1908-1915

A.K. Ekenseair, R.N. Seidel, N.A. Peppas
  Tuning the Transport Dynamics of Small Penetrant Molecules in Glassy Polymers, Polymer, 53(18), 2012, 4010-4017

RANDALL ERB

Assistant Professor, Mechanical and Industrial Engineering

PhD, Duke University, 2009
mie.neu.edu/people/erb-randall

Scholarship focus: structure/property relationships in composites and ceramics, magnetic manipulation, colloidal physics

SELECTED PUBLICATIONS

J.J. Martin, M.S. Riederer, M.D. Krebs, R.M. Erb
  Understanding and Overcoming Shear Alignment of Fibers During Extrusion, Soft Matter, 11, 2015, 400-405

R. Soheilian, Y. Choi, A.E. David, H. Abdi, C.E. Maloney, R.M. Erb
  Toward Accumulation of Magnetic Nanoparticles into Tissues of Small Porosity, Langmuir, 31(30), 2015, 8267-8274

A.R. Studart, R.M. Erb
  Bioinspired Materials That Self-Shape Through Programmed Microstructures, Soft Matter, 10(9), 2014, 1284-1294

R.M. Erb, J. Sander, R. Grisch, A.R. Studart
  Self-shaping Composites with Programmable Bioinspired Microstructures, Nature Communications, 4(1712), 2013, 1-8

R. M. Erb, R. L. Libanori, N. Rothfuchs, A.R. Studart
  Composites Reinforced in Three Dimensions by Using Low Magnetic Fields, Science, 335, 2012, 199-204

R. Libanori, R.M. Erb, A. Reiser, H. Le Ferrand, M. Süess, R. Spolenak, A.R. Studart
  Soft, Hard and Stretchable Heterogeneous Composites, Nature Communications, 3(1265), 2012

R.M. Erb, H.S. Son, B. Samanta, V.M. Rotello, B.B. Yellen
  Magnetic Assembly of Colloidal Superstructures with Multipole Symmetry, Nature, 457, 2009, 999-1002

SELECTED RESEARCH PROJECTS

CPS: Breakthrough: A Cyber-Physical Framework for MRI Guided Magnetic NanoParticles
  Principal Investigator, National Science Foundation

EAGER: Dispersion Control of Colloidal Assembly for Graded Architectures in Composites
  Principal Investigator, National Science Foundation

Screen-printing of low-loss, High-permittivity Ferrite Films with Ductility
  Principal Investigator, Rogers Corporation

The Roles of Heterogeneities and Anisotropy in Fracture Toughness and Crack Propagation
  Co-Principal Investigator, National Science Foundation

DENIZ ERDOGMUS

Associate Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, University of Florida, 2002
ece.neu.edu/people/erdogmus-deniz

Scholarship focus: brain computer interfaces, cognitive and interactive systems, nonlinear and statistical signal processing, information theory, machine learning

Honors and awards: National Science Foundation CAREER Award; Søren Buus Outstanding Research Award, College of Engineering; College of Engineering Faculty Fellow

SELECTED PUBLICATIONS

B.S. Oken, U. Orhan, B. Roark, D. Erdogmus, A. Fowler, A. Mooney, B. Peters, M. Miller, M. Fried Oken
BrainComputer Interface with Language ModelEEG Fusion for Lockedin Syndrome, Neurorehabilitation and Neural Repair, 28(4), 2014, 387-394

A. Fowler, B. Roark, U. Orhan, D. Erdogmus, M. Fried-Oken
Improved Inference and Autotyping in EEGbased BCI Typing Systems, ASSETS 2013, Bellevue, WA, Oct 2013

H. Nezamfar, U. Orhan, S. Purwar, K. Hild, B. Oken, D. Erdogmus
Decoding of Multichannel EEG Activity from the Visual Cortex in Response to Pseudorandom Binary Sequences of Visual Stimuli, International Journal of Imaging Systems and Technology, 21(2), 2011, 139-147

Y. Huang, D. Erdogmus, M. Pavel, S. Mathan, K.E. Hild II
A Framework for Rapid Visual Image Search using Singletrial Brain Evoked Responses, Neurocomputing, 74, 2011, 2041-2051

D. Erdogmus
BCI: A Timely Opportunity for Projectbased Learning, National Academy of Engineering Frontiers in Engineering Education Workshop, Irvine, California, Dec 2010

SELECTED RESEARCH PROJECTS

CAREER: Signal Models, Channel Capacity, and Information Rate for Noninvasive Brain Interfaces
Principal Investigator, National Science Foundation

Automated Classification of Retinopathy of Prematurity using Machine Learning
Investigator, National Institutes of Health

Strengthening Human Adaptive Reasoning and Problem Solving (SHARP)
Principal Investigator, Intelligence Advanced Research Projects Activity

The Rehabilitation Engineering Center Research Center on Augmentative and Alternative Communication
Principal Investigator, U.S. Department of Education

ÖZLEM ERGUN

Associate Professor, Mechanical and Industrial Engineering

PhD, Massachusetts Institute of Technology, 2001
mie.neu.edu/people/ergun-ozlem

Scholarship focus: design and management of large-scale networks, supply chain design, collaboration, humanitarian logistics

Honors and awards: National Science Foundation CAREER Award; Winner, EURO/INFORMS2007Management Science Strategic Innovation Prize

SELECTED PUBLICATIONS

M. Celik, Ö. Ergun, P. Keskinocak
The Post-disaster Debris Clearance Problem with Incomplete Information, Operations Research, 63(1), 2015, 65-85

L. Gui, A. Atasu, Ö. Ergun, B. Toktay
Fair and Efficient Implementation of Collective Extended Producer Responsibility Legislation, Management Science, 2014, 1-56

Ö. Ergun, L. Gui, J.L. Heier Stamm, P. Keskinocak, J.L. Swann
Improving Humanitarian Operations through Collaboration, Production and Operations Management special issue on Humanitarian Operations and Crisis Management, 23(6), 2014, 1002-1014

Ö. Özener, Ö. Ergun, M. Savelsbergh
Allocating Cost of Service to Customers in Inventory Routing, Operations Research, 61(1), 2013, 112-125

Ö. Ergun, G. Karakus, P. Kerl, P. Keskinocak, J. Swann, et al.
Disaster Response Planning in the Private Sector and the Role of Operations Research, Handbook of Operations Research for Homeland Security, Springer, 183, 2012, 197-217

R. Agarwal, Ö. Ergun
Network Design and Allocation Mechanisms for Carrier Alliances in Liner Shipping, Operations Research, 58(6), 2010, 1726-1742

D. Altner, Ö. Ergun, N.A. Uhan
On the Maximum Flow Network Interdiction Problem, Operations Research Letters, 38, 2010, 33-38

R. DesRoches, Ö. Ergun, J. Swann
Haiti's Eternal Weight, Op-ed in New York Times, July 7, 2010

SELECTED RESEARCH PROJECTS

Staff Reassignment: Negotiations and Compromises to Enhance Stable Matching
Co-Principal Investigator, National Science Foundation

Resource Allocation with Learning in Dynamic and Partially Observable Networks
Principal Investigator, National Science Foundation

Human in the Loop Design and Optimization for Resilient Infrastructure Networks
Co-Principal Investigator, Northeastern University

QIANQIAN FANG

Assistant Professor, Bioengineering

PhD, Dartmouth College, 2005
bioe.neu.edu/people/fang-qianqian

Scholarship focus: innovations in translational medical imaging devices to better diagnose cancers, low-cost point-of-care diagnostic tools to delivery life-saving medicines to the resource-poor regions, and high performance computing tools to facilitate the development of the next-generation imaging methods

Honors and awards: Leading Innovation in Reimagining Global Health, Innovation Countdown 2030 Initiative

SELECTED PUBLICATIONS

B. Deng, M. Fradkin, J.M. Rouet, R.H. Moore, D.B. Kopans, D.A. Boas, M. Lundqvist, Q. Fang
  Characterizing Breast Lesions Through Robust Multi-modal Data Fusion Using Independent Diffuse Optical and X-ray Breast Imaging, Journal of Biomedical Optics Letters, 20(8), 2015, 080502, 1-4

B. Deng, D. H. Brooks, D. A. Boas, M. Lundqvist, Q. Fang
  Characterization of Structural-prior Guided Optical Tomography Using Realistic Breast Models Derived from Dual-energy X-ray Mammography, Biomedical Optics Express, 6(7), 2015, 2366-2379

Q. Fang, J. Selb, S. A. Carp, et al.
  Combined Optical and Tomosynthesis Breast Imaging, Radiology, 258(1), 2011, 89-97 *cover article

Q. Fang
  Mesh-based Monte Carlo Method Using Fast Ray-tracing in Plücker Coordinates, Biomedical Optics Express, 1(1), 2010, 165-175 *top-downloaded paper

Q. Fang, D. Boas
  Monte Carlo Simulation of Photon Migration in 3D Turbid Media Accelerated by Graphics Processing Units, Optics Express, 17(22), 2009, 20178-20190 *featured article

SELECTED RESEARCH PROJECTS

GPU-Accelerated Monte Carlo Photon Transport Simulation Platform
  Principal Investigator, National Institutes of Health

Non-contact Mobile Oximeter for Rapid Birth Asphyxia and Childhood Pneumonia Assessment
  Principal Investigator, US Agency for International Development

Combined Optical and Mammographic Imaging of Breast Function and Structure for Early Cancer Detection
  Principal Investigator, Massachusetts Life Sciences Center

DAVID FANNON

Assistant Professor, School of Architecture; jointly appointed, Civil and Environmental Engineering

MS, University of California, Berkeley, 2015
civ.neu.edu/people/fannon-david

Scholarship focus: sustainable and high performance building design; development of sustainable building technologies; human comfort within the built environment

SELECTED RESEARCH PROJECTS

Decision Frameworks for Resilient and Sustainable Buildings
  Co-Investigator, National Science Foundation

Building Resilience: A Tool for Adaptability Planning and Decision-Making
  Co-Principal Investigator, Northeastern University

Cost-effective Thermal Envelope Retrofits in Wood-frame Residential Buildings
  Co-Principal Investigator, Northeastern University

NASSER FARD

Associate Professor, Mechanical and Industrial Engineering

PhD, University of Arizona, 1982
mie.neu.edu/people/fard-nasser

Scholarship focus: systems reliability; accelerated life testing in reliability prediction; big data-data driven decision making in spatiotemporal streaming environment; life data (survival data) analysis; robust design of experiments

Honors and awards: American Statistical Association Natrella Scholarship Award; Outstanding Presentation Award from the Reliability and Maintainability Symposium; Associate Editor, IEEE Transactions on Reliability; Associate Editor, International Journal of Reliability, Quality and Safety Engineering; Certified Quality Engineer by American Society for Quality (#11909)

SELECTED PUBLICATIONS

N. Fard, H. Xu, Y. Fang
A Unique Solution for Principal Component Analysis-based Multi-response Optimization Problems, International Journal of Advanced Manufacturing Technology, 79, 2015, 1-4

N. Fard, K. Sadeghzadeh
Heuristic Ranking Classification Method for Complex Large-scale Survival Data, Advances in Intelligent Systems and Computing, 360, 2015, 47-55

K. Sadeghzadeh, N. Fard
Nonparametric Data Reduction Approach for Large-scale Survival Data Analysis, IEEE Xplore, 2015, 1-6

K. Sadeghzadeh, N. Fard
Variable Selection Methods for Right-censored Time-to-event Data with High-dimensional Covariate, Journal of Quality and Reliability Engineering, 795154, 2015, 1-9

A. Mendes, N. Fard
Accelerated Failure Time Models Comparison to the Proportional Hazard Model for Time-dependent Covariates with Recurrent Events, International Journal of Reliability, Quality and Safety Engineering, 21(2), 2014, 1450010

A. Mendes, N. Fard
Binary Logistic Regression and PHM Analysis for Reliability Data, International Journal of Reliability, Quality and Safety Engineering, 21(5), 2014, 1450023

K. Sadeghzadeh, N. Fard
Multidisciplinary Decision-making Approach to High-dimensional Event History Analysis through Variable Reduction, European Journal of Economics and Management, 1(2), 2014, 1-9

A. Motaeia, T. A. Niaki, N. Fard
Bayes Interval Estimation on the Parameters of the Weibull Distribution for Complete and Censored Tests, International Journal of Engineering, Transactions C: Aspects, 26(9), 2013, 985-996

YUNSI FEI

Associate Professor, Electrical and Computer Engineering

PhD, Princeton University, 2004
ece.neu.edu/people/fei-yunsi

Scholarship focus: computer architecture, embedded systems, hardware-oriented security, design automation, mobile computing, underwater sensor networks

Honors and awards: National Science Foundation CAREER Award; College of Engineering Faculty Fellow

SELECTED PUBLICATIONS

B. Jiang, Y. Fei
Smart Home in Smart Microgrid: A Cost-effective Energy Ecosystem with Intelligent Hierarchical Agents, IEEE Transactions on Smart Grid, 6(1), 2015, 3-13

Y. Han, Y. Fei
TARS: A Traffic-adaptive Receiver-Synchronized MAC Protocol for Underwater Sensor Networks, International Symposium on Modeling, Analysis and Simulation of Computer and Telecommunication Systems (MASCOTS), 2015

P. Luo, L. Zhang, Y. Fei, A.A. Ding
Towards Secure Cryptographic Software Implementation Against Side-channel Power Analysis Attacks, International Conference on Application-specific Systems, Architectures, and Processors (ASAP), 2015

A.A. Ding, L. Zhang, Y. Fei, P. Luo
A Statistical Model for Multivariate DPA on Masked Devices, International Workshop on Cryptographic Hardware and Embedded Systems, 2014, 147-169

J.C. Martinez-Santos, Y. Fei
Leveraging Speculative Architectures for Run-time Program Validation, ACM Transactions on Embedded Computing Systems, 13(1), 2013, 498-505

SELECTED RESEARCH PROJECTS

MRI: Development of a Testbed for Side-Channel Analysis and Security Evaluation-TeSCASE
Principal Investigator, National Science Foundation

Security Vulnerability Evaluation of Blackfin BF70x Processor Family Using Side Channel Attack
Principal Investigator, Analog Devices, Incorporated

TWC: Medium: Collaborative: A Unified Statistics-based Framework for Side-channel Attack Analysis and Security Evaluation of Cryptosystems
Principal Investigator, National Science Foundation

HICHAM FENNIRI

Professor, Chemical Engineering

PhD, Université Louis Pasteur, 1994
che.neu.edu/people/fenniri-hicham

Scholarship focus: nanotechnology for biomedical applications, nanoscale materials for drug delivery, and cell therapeutics and regenerative medicine

Honors and awards: National Science Foundation CAREER Award; Cottrell Teacher-Scholar Awardee

SELECTED PUBLICATIONS

K. Ong, T. MacCormack, R. Clark, J. Ede, L. Felix, V. Ortega, M. Dang, G. Ma, H. Fenniri, J. Veinot, G. Goss
  Widespread Nanoparticle-assay Interference: Implications for Nanotoxicity Testing, PLoS One, 9(3), 2014, e90650

E. Fine, L. Zhang, H. Fenniri, T.J. Webster
  Enhanced Endothelial Cell Functions on Helical Rosette Nanotubes Coated Titanium Vascular Stents, International Journal of Nanomedicine, 4, 2009, 91–97

W.S. Journeay, S.S. Suri, J.G. Moralez, H. Fenniri, B. Singh
  Macrophage Inflammatory Response to Self-assembling Rosette Nanotubes, Small, 5, 2009, 1446–1452

S.S. Singh, F. Rakotondradany, A.J. Myles, H. Fenniri, B. Singh
  The Role of RGD-Tagged Rosette Nanotubes in the Induction of Inflammation and Apoptosis in Human Adenocarcinoma Cells Through p38 MAP Kinase, Biomaterials, 30, 2009, 3084–3090

W.S. Journeay, S.S. Singh, J.G. Moralez, H. Fenniri, B. Singh
  Low Inflammatory Activation by Self-assembling Rosette Nanotubes in Human Calu-3 Pulmonary Epithelial Cells, Small, 4(6), 2008, 817–823

SELECTED RESEARCH PROJECTS

Assembling Functional Organic Nanomaterials Using Novel Supramolecular Synthetic Strategies
  Principal Investigator, Natural Sciences and Engineering Research Council of Canada

NCC-Reinforced Foam-core Sandwich Composite Structures
  Principal Investigator, American Institute of Biological Sciences

Raman Flow Cytometry for Diagnostics and Drug Discovery
  Co-Principal Investigator, National Institutes of Health

Targeted Delivery of Oligonucleotides into Plant Cells Using Self-assembled Rosette Nanotubes
  Principal Investigator, Nuclear Regulatory Commission

LORETTA FERNANDEZ

Assistant Professor, Civil and Environmental Engineering; jointly appointed, Marine and Environmental Sciences

PhD, Massachusetts Institute of Technology, 2010
civ.neu.edu/people/fernandez-loretta

Scholarship focus: environmental organic chemistry; passive sampling methods for organic contaminants in water and sediments; transport, transformation, and biological exchange of organic contaminants in the environment

Honors and awards: National Research Council, Research Associateship; National Science Foundation, Graduate Research Fellowship

SELECTED PUBLICATIONS

M.M. Perron, R.M. Burgess, M.G. Cantwell, L. Fernandez
  Evaluating Cost When Selecting Performance Reference Compounds for the Environmental Deployment of Polyethylene Passive Samplers, Integrated Environmental Assessment and Management, 11(2), 2015, 256-265

L. Fernandez, P.M. Gschwend
  Predicting Bioaccumulation of Polycyclic Aromatic Hydrocarbons in Soft-shelled Clams (Mya arenaria) Using Field Deployments of Polyethylene Passive Samplers, Environmental Toxicology and Chemistry, 34(5), 2015, 993-1000

L. Fernandez, W. Lao, K. A. Maruya, R. M. Burgess
  Calculating the Diffusive Flux of Persistent Organic Pollutants Between Sediments and the Water Column on the Palos Verdes Shelf Superfund Site Using Polymeric Passive Samplers, Environmental Science & Technology, 48, 2014, 3925-3924

SELECTED RESEARCH PROJECTS

Non-equilibrium Passive Sampling for Quantitative Thermodynamic Exposure Assessment (Q-TEA)
  Principal Investigator, US Army Environmental Laboratory

STEPHEN FLYNN

Professor, Political Science; co-Director, George J. Kostas Research Institute for Homeland Security; affiliated faculty, Civil and Environmental Engineering

PhD, Tufts University, 1991
civ.neu.edu/people/flynn-stephen

Scholarship focus: critical infrastructure resilience; public policy

SELECTED PUBLICATIONS

I. Linkov, D. Eisenberg, M. Bates, D. Chang, M. Convertino, J. Allen, S. Flynn, T. Seager
Measurable Resilience for Actionable Policy, Environmental Science & Technology, 47(18), 2013, 10108-10110

N. Bakshi, S. Flynn, N. Gans
Countering the Threat of Nuclear Terrorism at Domestic and Foreign Ports, Informed Decisions on Catastrophic Risks, The Wharton School, University of Pennsylvania, 57(1), 2012

N. Bakshi, S. Flynn, N. Gans
Estimating the Operational Impact of Container Inspections at International Ports, Management Science, 57(1), 2011, 1-20

L. Wein, Y. Liu, Z. Cao, S. Flynn
The Optimal Spatiotemporal Deployment of Radiation Portal Monitors can Improve Detection at Overseas Ports, Science & Global Security, 15(2), 2008, 211-233

S. Flynn
Drug Trafficking, the International System, and Decision Constraints: A Policy-making Simulation, International Studies Perspectives, 1(1), 2000, 45-55

SELECTED RESEARCH PROJECTS

Bolstering Counter-proliferation Efforts with Global Supply Chains
Principal Investigator, MacArthur Foundation

Devising Economic Incentives for Advancing Infrastructure Resilience
Principal Investigator, Department of Homeland Security

Infrastructure Resilience Metrics for Man-made (explosive) and Natural Hazard Incidents
Principal Investigator, Department of Homeland Security

YUN RAYMOND FU

Associate Professor, Electrical and Computer Engineering; jointly appointed, Computer and Information Science

PhD, University of Illinois, 2008
ece.neu.edu/people/fu-yun

Scholarship focus: machine learning and computational intelligence, social media analytics, human-computer interaction, and cyber-physical systems

Honors and awards: Office of Naval Research Young Investigator Award; Army Research Office Young Investigator Award; International Neural Network Society's Young Investigator Award

SELECTED PUBLICATIONS

S. Li, Y. Fu
Learning Balanced and Unbalanced Graphs via Low-rank Coding, IEEE Transactions on Knowledge and Data Engineering (T-KDE), 27(5), 2015, 1274-1287

Y. Fu
Human-centered Social Media Analytics, Springer, 2014

Y. Kong, Y. Jia, Y. Fu
Interactive Phrases: Semantic Descriptionsfor Human Interaction Recognition, IEEE Transactions on Pattern Analysis and Machine Intelligence, 36(9), 2014, 1775-1788

Y. Fu
Low-rank and Sparse Modeling for Visual Analysis, Springer, 2014

K. Li, Y. Fu
Prediction of Human Activity by Discovering Temporal Sequence Patterns, IEEE Transactions on Pattern Analysis and Machine Intelligence, 36(8), 2014, 1644-1657

SELECTED RESEARCH PROJECTS

Pinpoint Geolocation using Multi-source Multi-dimensional Big Data from Social Media
Principal Investigator, Naval Postgraduate School

Deep Structures Boosted Self-organized Behavior Pattern Learning for Anomaly Detection
Principal Investigator, Office of Naval Research

Wireless Sensing of Speech Kinematics & Acoustics for Remediation
Co-Principal Investigator, National Science Foundation

Intention Sensing Through Video-based Imminent Activity Prediction
Principal Investigator, Army Research Office

Methods for Multimedia Search and Retrieval by Fusing Data across Various Sources or Domains
Principal Investigator, MIT Lincoln Laboratory

Multimodal Speech Translation for Assistive Communication
Co-Principal Investigator, National Institutes of Health

Sensing and Modeling Behavior in Response to Environmental Changes
Principal Investigator, Air Force Office of Scientific Research

PETER FURTH

Professor, Civil and Environmental Engineering

PhD, Massachusetts Institute of Technology, 1981
civ.neu.edu/people/furth-peter

Scholarship focus: traffic signal control; transit signal priority; transit operations modeling; transit data collection and sampling

SELECTED PUBLICATIONS

P. Furth, T.H. Muller
  Conditional Bus Priority at Signalized Intersections: Better Service with Less Traffic Disruption, Journal of the Transportation Research Board, 1731, 2014, 23-30

P. Furth, A. Rahbee
  Optimal Bus Stop Spacing Through Dynamic Programming and Geographic Modeling, Journal of the Transportation Research Board, 1731, 2014, 15-22

P. Furth, B. Cesme, T.H.J. Muller
  Lost Time and Cycle Length for an Actuated Traffic Signal, Transportation Research Record: Journal of the Transportation Research Board, 2009, 2128, 152-160

S. Altun, P. Furth
  Scheduling Buses to Take Advantage of Transit Signal Priority, Transportation Research Record, Journal of the Transportation Research Board, 2111, 2009, 50-59

T.H.J. Muller, P. Furth
  Transfer Scheduling and Control to Reduce Passenger Waiting Time, Transportation Research Record: Journal of the Transportation Research Board, 2112, 2009, 111-118

SELECTED RESEARCH PROJECTS

Self-organizing Traffic Signals
  Principal Investigator, National Science Foundation

Bicycle Network Analysis
  Principal Investigator, Delaware Department of Transportation

AUROOP GANGULY

Associate Professor, Civil and Environmental Engineering

PhD, Massachusetts Institute of Technology, 2002
civ.neu.edu/people/ganguly-auroop

Scholarship focus: climate extremes and water sustainability; data sciences for complex systems

SELECTED PUBLICATIONS

D. Wang, T.C. Gouhier, B.A. Menge, A.R. Ganguly
  Intensification and Spatial Homogenization of Coastal Upwelling Under Climate Change, Nature, 518, 2015, 390-394

E.A. Kodra, A.R. Ganguly
  Asymmetry of Projected Increases in Extreme Temperature Distributions, Scientific Reports, 4, 2014, 5884

A.R. Ganguly, E.A. Kodra, et al.
  Toward Enhanced Understanding And Projections of Climate Extremes Using Physics-guided Data Mining Techniques, Nonlinear Processes in Geophysics, 21, 2014, 777-795

S. Ghosh, D. Das, S.-C. Kao, A.R. Ganguly
  Lack of Uniform Trends but Increasing Spatial Variability in Observed Indian Rainfall Extremes, Nature Climate Change, 2, 2012, 86-91

E. Kodra, K.S. Steinhaeuser, A.R. Ganguly
  Persisting Cold Spells in the 21st Century Warming Environment, Geophysical Research Letters, 38, 2011, L08705

A.R. Ganguly, K. Steinhaeuser, D.J. Erickson, M. Branstetter, E.S. Parish, N. Singh, J.B. Drake, L. Buja
  Higher Trends but Larger Uncertainty and Geographic Variability In 21st Century Temperature and Heat Waves, Proceedings of the National Academy of Sciences of the United States of America, 106(37), 2009, 15555-15559

SELECTED RESEARCH PROJECTS

High-dimensional Statistical Machine Learning for Spatio-Temporal Data, with applications to Climate Science
  Principal Investigator, National Science Foundation

Expeditions in Computing: Understanding Climate Change: A Data-driven Approach
  Co-Principal Investigator, National Science Foundation

Spatio-temporal Extremes & Association: Marine Adaptation and Survivability under Climate change and rising Ocean Temperatures
  Co-Principal Investigator, National Science Foundation

EDGAR GOLUCH

Di Pietro Assistant Professor, Chemical Engineering; affiliated faculty, Bioengineering

PhD, University of Illinois, 2007
che.neu.edu/people/goluch-edgar

Scholarship focus: detection of biomolecules at the nanoscale, specifically inside micro and nanofluidic channels. This is applied to a broad range of scientific fields including: biophysics, micro and systems biology, ecology, environmental sensing, and analytical instrumentation

SELECTED PUBLICATIONS

G.E. Aninwene II, P.N. Abadian, V. Ravi, E.N. Taylor, D.M. Hall, A. Mei, G.D. Jay, E.D. Goluch, T.J. Webster
Lubricin: a Novel Means to Decrease Bacterial Adhesion and Proliferation, Journal of Biomedical Materials Research, Part A, 103, 2015, 451-462

P.N. Abadian, E.D. Goluch
Using Surface Plasmon Resonance Imaging (SPRi) to Evaluate Bacterial Adhesion on Surface Coatings, Analytical Methods, 7, 2015, 115-122, *featured as a hot article in Analytical Methods

P.N. Abadian, C.P. Kelley, E.D. Goluch
Cellular Analysis and Detection using Surface Plasmon Resonance (SPR) Techniques, Analytical Chemistry, 86, 2014, 2799-2812

T.A. Webster, H.J. Sismaet, J.L Conte, I.J. Chan, E.D. Goluch
Detection of Pseudomonas aeruginosa in Human Samples via Pyocyanin, Biosensors and Bioelectronics, 60, 2014, 265-270

N. Tandogan, P.N. Abadian, S. Epstein, Y. Aoi, E.D. Goluch
Isolation of Microorganisms using Sub-micrometer Constrictions, PLoS ONE, 9(6), 2014, e101429

H.J. Sismaet, T.A. Webster, E.D. Goluch
Up-regulating Pyocyanin Production by Amino Acid Addition for Early Identification of Pseudomonas aeruginosa, Analyst, 139, 2014, 4241-4246, *featured as a hotarticle in the Analyst

P.N. Abadian, N. Tandogan, J.J. Jamieson, E.D. Goluch
Using Surface Plasmon Resonance Imaging (SPRi) to Study Bacterial Biofilms, Biomicrofluidics, 8(2), 2014, 021804

SELECTED RESEARCH PROJECTS

Breath and Saliva Based Nano-bio Sensing System for Disease Diagnosis and Monitoring
Co-Investigator, Northeastern University

IDBR: TYPE A Nano-constriction Devices for Isolation and Cultivation of Environmental Microbes
Principal Investigator, National Science Foundation

TARIK GOUHIER

Assistant Professor, Marine and Environmental Sciences; affiliated faculty, Civil and Environmental Engineering

PhD, McGill University, 2010
civ.neu.edu/people/gouhier-tarik

Scholarship focus: dynamical models of ecological and environmental processes for marine species; adaptive management strategies of interconnected coastal ecosystems

SELECTED PUBLICATIONS

D. Wang, T.C. Gouhier, B.A. Menge, A.R. Ganguly
Intensification and Spatial Homogenization of Coastal Upwelling Under Climate Change, Nature, 518, 2015, 390-394

B. Spiecker, T.C. Gouhier, F. Guichard
Reciprocal Feedbacks Between Spatial Subsidies and Reserve Networks in Coral Reef Meta-ecosystems, Ecological Applications, 2015, 1-41

T.C. Gouhier, F. Guichard
Synchrony: Quantifying Variability in Space and Time, Methods in Ecology and Evolution, 5(6), 2014, 524-533

P. Pillai, T.C. Gouhier, S.V. Vollmer
The Cryptic Role of Biodiversity in the Emergence of Host-microbial Mutualisms, Ecology Letters, 17(11), 2014, 1437-1446

T.C. Gouhier, F. Guichard, B.A. Menge
Designing Effective Reserve Networks for Non-equilibrium Metacommunities, Ecological Applications, 23(6), 2013, 1488-1503

T.C. Gouhier, F. Guichard, B.A. Menge
Ecological Processes Can Synchronize Marine Population Dynamics Over Continental Scales, Proceedings of the National Academy of Sciences of the United States of America, 107(18), 2010, 8281-8286

SELECTED RESEARCH PROJECTS

Coral-microbial Interactions as Determinants of Disease Dynamics
Principal Investigator, National Science Foundation

Integrating Broad-scale Regional Variation in Environmental Forcing and Benthic-pelagic Coupling
Co-Principal Investigator, National Science Foundation

Mapping and Modeling Demersal Fish Habitat Suitability and Productivity in the Gulf of Maine
Co-Principal Investigator, The Nature Conservancy

Spatio-temporal Extremes and Association: Marine Adaptation and Survivability under Climate change and rising Ocean Temperatures
Co-Principal Investigator, National Science Foundation

ANDREW GOULDSTONE

Associate Professor, Associate Department Chair and Program Director of Mechanical Engineering; affiliated faculty, Bioengineering, Chemical Engineering

PhD, Massachusetts Institute of Technology, 2001
mie.neu.edu/people/gouldstone-andrew

Scholarship focus: biomechanics; material science; engineering mechanics

Honors and awards: College of Engineering Faculty Fellow; National Science Foundation CAREER Award

SELECTED PUBLICATIONS

T. Hu, S. Zhalehpour, A. Gouldstone, et al.
A Method for the Estimation of the Interface Temperature in Ultrasonic Joining, Metallurgical And Materials Transactions A-Physical Metallurgy And Materials Science, 45A(5), 2014, 2545-2552

C.T. Nguyen, H.M. Gonnermann, Y. Chen, A. Gouldstone
Film Drainage and the Lifetime of Bubbles, Geochemistry Geophysics Geosystems, 14(9), 2013, 3616-3631

J.H. Kim, A. Gouldstone, C.S. Korach
Analysis of Spherical Indentation of an Elastic Bilayer Using a Modified Perturbation Approach, MEMS and Nanotechnology, 4, 2011, 53-57

B. Choi, Y. Wu, S. Sampath, A. Gouldstone
Modified Indentation Techniques to Probe Inelasticity in Ni5%Al Coatings from Different Processes, Journal of Thermal Spray Technology, 18(1), 2009, 65-74

L.H. Weng, A. Gouldstone, Y.H. Wu, W.L. Chen
Mechanically Strong Double Network Photocrosslinked Hydrogels from N,N-Dimethylacrylamide and Glycidyl Methacrylated Hyaluronan, Biomaterials, 29(14), 2008, 2153-2163

SELECTED RESEARCH PROJECTS

Fundamentals of Bonding in Kinetic Consolidation Processes
Co-Principal Investigator, National Science Foundation

Garde: An Interdisciplinary Approach to Accommodate Fine Motor Control Disorders
Co-Principal Investigator, National Science Foundation

IDR/Collaborative Research: Activities in Thermal Spray Processing and Volcanology
Principal Investigator, National Science Foundation

JACKIE GRIFFIN

Assistant Professor, Mechanical and Industrial Engineering

PhD, Georgia Institute of Technology, 2012
mie.neu.edu/people/griffin-jacqueline

Scholarship focus: health care resource allocation with multi-objective resource allocation models

SELECTED PUBLICATIONS

J. Griffin, J. Swann, P. Keskinocak
Allocating Scarce Healthcare Resources in Developing Countries: A Case for Malaria Prevention, Handbook of Healthcare Operations Management. Ed. Brian Denton, International Series in Operations Research & Management Science, Springer Science + Business Media New York 2013

J. Griffin, P. Keskinocak
Patient-bed Assignment Policies in Hospital Systems, INFORMS 2013 Annual Meeting, Chicago, IL, 2013

J. Griffin, P. Keskinocak, C. Stokes, N. O'Hara, A. Vats
Development of Patient-bed Assignment Algorithms to Support Bed Management Processes for Improvements in the Rate of Overflow Assignments and Average Request to Assign Metrics, Critical Care Medicine, 40(12), 2012, 48

J.A. Griffin, S. Xia, S. Peng, P. Keskinocak
Improving Patient Flow in an Obstetric Unit, Health Care Management Science, 15(1), 2012, 1-14

J. Griffin, P. Keskinocak
The Bed Manager's Dilemma: A Dynamic Bed Assisgnment Problem, INFORMS 2012 Annual Meeting, Phoenix, AZ, 2012

D.V. Laborde, J.A. Griffin, H.K. Smalley, P. Keskinocak, G. Mathew
A Framework for Assessing Patient Crossover and Health Information Exchange Value, Journal of the American Medical Informatics Association, 18(5), 2011, 698-703

J. Griffin, P. Griffin, M. Savelsbergh
Optimizing Health Care Delivery in Sub Saharan Africa, INFORMS 2008 Annual Meeting, Washington, D.C., 2008

W. Glankwamdee, J. Griffin, J. Linderoth, J. Shen
Easing Rescheduling Complexity for a Bulk Gas Production and Distribution Problem, INFORMS 2006 Annual Meeting, Pittsburgh, PA, 2006

SELECTED RESEARCH PROJECTS

BWH Ambulatory Services Patient Flow Simulation Project
Principal Investigator, Brigham and Womens Hospital

APRIL GU

Associate Professor, Civil and Environmental Engineering; affiliated faculty, Bioengineering

PhD, University of Washington, 2003
civ.neu.edu/people/gu-april

Scholarship focus: application of biotechnology for water quality improvement; biological treatment processes and bioremediation; ecotoxicology and toxicity assessment; biosensors for water quality monitoring

Honors and awards: College of Engineering Faculty Fellow; National Science Foundation CAREER Award; National Science Foundation Education BRIGE Award; Søren Buus Outstanding Research Award, College of Engineering

SELECTED PUBLICATIONS

D. Bello, J. Lan, A.Z. Gu, P. Demoktritou P. Gaines, et al.
Evaluation of Cytotoxic Genotic And Inflammatory Reponses of Nanoparticles from Photocopiers in Three Human Cell Lines, Particle and Fibre Toxicology, 10(42), 2014, 1743-8977

S.T. O'Connor, J. Lan, M. North, A. Loguinov, L. Zhang, M. T. Smith, A.Z.Gu, C. Vulpe
Genome-wide Functional and Stress Response Profiling Reveals Toxic Mechanism and Genes Required for Tolerance to Benzo[a]pyrene in S. cerevisiae, Frontiers in Genetics, 3(316), 2013

N. Gou, A. Onnis-Hayden, A.Z. Gu
Mechanistic Toxicity Assessment of Nanomaterials by Whole-Cell-Array Stress Genes Expression Analysis, Environmental Science and Technology, 2010, 44(15), 5964-5970

Yildirim N, Long F, Gao C, He M, Shi HC and Gu AZ
Aptamer-based Optical Biosensor for Rapid and Sensitive Detection of 17-Estradiol in Water Samples, Environmental Science & Technology, 2010, 46(6), 3288-3294

A. Onnis-Hayden, H. Weng, M. He, S. Hansen, V. Ilyin, K. Lewis, A. Gu
Prokaryotic Real-time Gene Expression Profiling for Toxicity Assessment, Environmental Science & Technology, 2009, 43(12), 4574-4581

SELECTED RESEARCH PROJECTS

Assessment of Potential Ecological and Health Impact of Coal Ash Spill in Dan River North Carolina
Principal Investigator, National Science Foundation

CAREER: Mechanistic Toxicity Assessment Of Emerging Contaminants for Water Quality Monitoring
Principal Investigator, National Science Foundation

Novel S2EBPR Process for Sustainable Phosphorus Removal in Wastewater
Principal Investigator, Water Environment Research Foundation

Mechanistic and Predictive Genotoxicity Assessment of Nanomaterials
Principal Investigator, National Science Foundation

SURENDRA M. GUPTA

Professor, Mechanical and Industrial Engineering

PhD, Purdue University, 1977
mie.neu.edu/people/gupta-surendra

Scholarship focus: green manufacturing; green supply chains; disassembly modeling; remanufacturing; reverse logistics; managing end of life products; environmentally conscious manufacturing; manufacturing sustainability; reverse and closed-loop supply chains; just-in-time (jit) manufacturing and materials management; operations research: stochastic and simulation modeling

Honors and awards: Søren Buus Outstanding Research Award, College of Engineering; Best Dissertation Advisor National Award: American Society for Engineering Management

SELECTED PUBLICATIONS

C.B. Kalayci, O. Polat, S.M. Gupta
A Variable Neighbourhood Search Algorithm for Disassembly Lines, Journal of Manufacturing Technology Management, 26(2), 2015, 182-194

S.M. McGovern, S.M. Gupta
Unified Assembly-and Disassembly-line Model Formulae, Journal of Manufacturing Technology Management, 26(2), 2015, 195-212

O. Ondemir, S.M. Gupta
A Multi-criteria Decision Making Model for Advanced Repair-to-Order and Disassembly-to-Order System, European Journal of Operational Research, 233(2), 2014, 408-419

C.B. Kalayci, S.M. Gupta
A Tabu Search Algorithm for Balancing a Sequence-dependent Disassembly Line, Production Planning and Control, 25(2), 2014, 149-160

A. Korugan, S.M. Gupta
An Adaptive CONWIP Mechanism for Hybrid Production Systems, International Journal of Advanced Manufacturing Technology, 74(5-8), 2014, 715-727

M.A. Ilgin, O. Ondemir, S.M. Gupta
An Approach to Quantify the Financial Benefit of Embedding Sensors into Products for End-of-Life Management: A Case Study, Production Planning and Control, 25(1), 2014, 26-43

O. Ondemir, S.M. Gupta
Quality Management in Product Recovery using the Internet of Things: An Optimization Approach, Computers in Industry, 65(3), 2014, 491-504

C.B. Kalayci, S.M. Gupta
Artificial Bee Colony Algorithm for Solving Sequence-dependent Disassembly Line Balancing Problem, Expert Systems With Applications, 40(18), 2013, 7231-7241

C.B. Kalayci, S.M. Gupta
A Particle Swarm Optimization Algorithm with Neighborhood-based Mutation for Sequence-dependent Disassembly Line Balancing Problem, International Journal of Advanced Manufacturing Technology, 69(1-4), 2013, 197-209

JEROME HAJJAR

CDM Smith Professor and Chair, Civil and Environmental Engineering

PhD, Cornell University, 1988
civ.neu.edu/people/hajjar-jerome

Scholarship focus: steel and composite steel/concrete structures; earthquake engineering; structural stability; large-scale experimental testing of structures; computational simulation

Honors and awards: Fellow, American Society of Civil Engineers; Fellow, Structural Engineering Institute; Norman Medal, American Society of Civil Engineers; Shortridge Hardesty Award, American Society of Civil Engineers; T. R. Higgins Lectureship Award, American Institute of Steel Construction; Special Achievement Award, American Institute of Steel Construction; Walter L. Huber Civil Engineering Research Prize, American Society of Civil Engineers; Breakthrough Award, Popular Mechanics; BSCES Clemens Hershel Award

SELECTED PUBLICATIONS

J.S. Steelman, E.T. Filipov, L.A. Fahnestock, J.R. Revell, J.M. LaFave, J.F. Hajjar, D.A. Foutch
Experimental Behavior of Steel Fixed Bearings and Implications for Seismic Bridge Response, Journal of Bridge Engineering, Special Issue: Recent Advances in Seismic Design, Analysis and Protection of Highway Bridges, ASCE, 19(8), 2014, A4014007

T. Perea, R.T. Leon, J.F. Hajjar, M.D. Denavit
Full-scale Tests of Slender Concrete-filled Steel Tubes: Interaction Behavior, Journal of Structural Engineering, ASCE, 140(9), 2014, 04014054

S. Szyniszewski, B.H. Smith, J.F. Hajjar, B.W. Schafer, S.R. Arwade
The Mechanical Properties of a Sintered, Hollow Sphere, Steel Foam, Materials and Design, 54, 2014, 1083-1094

M.R. Eatherton, X. Ma, H. Krawinkler, G.G. Deierlein, J.F. Hajjar
Quasi-static Behavior of Controlled Rocking Steel Frames, Journal of Structural Engineering, ASCE, 140(11), 2014, 04014083

S.B. Walsh, D.J. Borello, B. Guldur, J.F. Hajjar
Data Processing of Point Clouds for Object Detection for Structural Engineering Applications, Computer-aided Civil and Infrastructure Engineering, 28(7), 2013, 495-508

SELECTED RESEARCH PROJECTS

Deconstructable Systems for Sustainable Design of Steel and Composite Structures
Principal Investigator, National Science Foundation

NRI: Large: Collaborative Research: Fast and Accurate Infrastructure Modeling and Inspection with Low-flying Robots
Principal Investigator, National Science Foundation

Reliability-based Hurricane Risk Assessment for Offshore Wind Farms
Co-Principal Investigator, National Science Foundation

ROBERT HANSON

Professor, Medicinal Chemistry; affiliated faculty, Bioengineering

PhD, University of California, Berkeley, 1973
bioe.neu.edu/people/hanson-robert

Scholarship focus: bioorganic and medicinal chemistry

Honors and awards: Fellow, National Science Foundation; Fellow, National Institutes of Health

SELECTED PUBLICATIONS

R.N. Hanson, P. Tongcharoensirikul, K. Barnesley, M.J. Ondrechen, A. Hughes, E.R. DeSombre
Synthesis and evaluation of 2-halogenated-1,1-bis (4-hydroxyphenyl)-2-(3-hydroxyphenyl)-Ethylenes as Potential Estrogen Receptor-targeted Radiodiagnostic and Radiotherapeutic Agents, Steroids, 96, 2015, 50-62

P.T. Weiser, C.-Y. Chang, DP. McDonnell, R.N. Hanson
Synthesis and Preliminary Evaluation of 4,4'-Unsymmetrically Substituted 3,3' Biphenyls as Alpha Helical Proteomimetics, Bioorganic and Medicinal Chemistry, 22, 2014, 917-926

E.B. Corcoran, R.N. Hanson
Imaging EGFR and HER2 by PET and SPECT: A Review, Medicinal Research Reviews, 34(3), 2013, 596-643

SELECTED RESEARCH PROJECTS

CaNCURE: Cancer Nanomedicine Co-ops for Undergraduate Research Experiences
Co-Investigator, National Institutes of Health

Combinatorial-designed Nano-platforms to Overcome Tumor Drug Resistance
Co-Principal Investigator, National Institutes of Health

VINCENT G. HARRIS

University Distinguished Professor, William Lincoln Smith Professor, Electrical and Computer Engineering; jointly appointed, Chemical Engineering

PhD, Northeastern University, 1990
ece.neu.edu/people/harris-vincent

Scholarship focus: design and processing of advanced materials with emphasis on high frequency device applications for radar, communication, and sensing

Honors and awards: Fellow, Institute of Electrical and Electronics Engineers; Fellow, American Physical Society; Fellow, Institute of Physics; Fellow, Institute of Engineering and Technology; Institute of Metal Research's Lee Hsun Lecture Award; Fulbright Senior Fellow; Søren Buus Outstanding; Research Award, College of Engineering

SELECTED PUBLICATIONS

Y. Peng, X. Wu, Z. Chen, F. Wang, X. Wang, V.G. Harris, et al.
$BiFeO_3$ Tailored Low Loss M-type Hexaferrite Composites Having Equivalent Permeability and Permittivity for Very High Frequency Applications, Journal of Alloys and Compounds, 630, 2015, 48-53

T. Zhou, D. Zhang, L. Jia, F. Bai, L. Jin, V.G. Harris, et al.
Effect of NiZn Ferrite Nanoparticles Upon the Structure, Magnetic, and Gyromagnetic Properties of Low-Temperature Processed LiZnTi Ferrites, Journal of Physical Chemistry C, 119(23), 2015, 13207-13214

X. Wang, Q. Li, Z. Su, W. Gong, R. Gong, Y. Chen, V.G. Harris
Enhanced Microwave Absorption of Multiferroic Co_2 Z Hexaferrite–BaTiO 3 Composites with Tunable Impedance Matching, Journal of Alloys and Compounds, 643, 2015, 111-115

M. Zamanpour, S.P. Bennett, L. Majidi, Y. Chen, V.G. Harris
Process Optimization and Properties of Magnetically Hard Cobalt Carbide Nanoparticles via Modified Polyol Method, Journal of Alloys and Compounds, 625, 2015, 138-143

Z. Su, Q. Li, X Wang, B. Hu, Z. Feng, Y. Chen, V.G. Harris
Tunable Permittivity and Permeability of Low Loss Z+ Y-type Ferrite Composites for Ultra-high Frequency Applications, Journal of Applied Physics, 117(17), 2015, 17E506

SELECTED RESEARCH PROJECTS

Accelerated Development of Magnetodielectrics Having Equivalent Permeability and Permittivity for RF Applications
Principal Investigator, Rogers Corp

Design and Development of Mulitfunctional Electromechanical Ceramics
Principal Investigator, Army Research Office

Magnetodielectric Heterostructures and Composites
Principal Investigator, Rogers Corp

Nonlinear Properties of Ferrite Materials
Principal Investigator, Raytheon

The Northesastern University Program in Strategic Materials
Co-Principal Investigator, Army Research Office

FERDI HELLWEGER

Associate Professor, Civil and Environmental Engineering; affiliated faculty, Bioengineering

ScD, Columbia University, 2004
civ.neu.edu/people/hellweger-ferdinand

Scholarship focus: surface water quality, microbial ecology and systems bioecology (the combination of systems biology and systems ecology)

Honors and awards: Environmental Merit Award, U.S. Environmental Protection Agency

SELECTED PUBLICATIONS

F.L. Hellweger
100 Years Since Streeter and Phelps: It is Time to Update the Biology in Our Water Quality Models, Environmental Science and Technology, 49(11), 2015, 6372-6373

F.L. Hellweger, N. Fredrick, J.A. Berges
Age-correlated Stress Resistance Improves Fitness of Yeast: Support from Agent-based Simulations, BMC Systems Biology, 8(18), 2014, 1-10

F.L. Hellweger, E. van Sebille, N.D. Fredrick
Biogeographic Patterns in Ocean Microbes Emerge in a Neutral Agent-based Model, Science, 345(6202), 2014, 1346-1349

J.-U. Kreft, C. Plugge, V. Grimm, F. Hellweger, et al.
Mighty Small: Observing and Modeling Individual Microbes Becomes Big Science, PNAS, 110(45), 2013, 18027-18028

N. Fredrick, J.A. Berges, B. Twining, D. Nuñez-Milland, F.L. Hellweger
Exploring Mechanisms of Intracellular P Heterogeneity in Cultured Phytoplankton Using Agent Based Modeling, Applied and Environmental Microbiology, 79(14), 2013

F.L. Hellweger
Escherichia Coli Adapts to Tetracycline Resistance Plasmid (pBR322) by Mutating Endogenous Potassium Transport: in Silico Hypothesis Testing, FEMS Microbiology Ecology, 83(3), 2013, 622-631

SELECTED RESEARCH PROJECTS

Dimensions: Collaborative Research: Anthropogenic Nutrient Input Drives Genetic, Functional and Taxonomic Biodiversity in Hypereutrophic Lake Taihu, China
Principal Investigator, National Science Foundation

Collaborative Research: Causes and Mechanisms of Cell Death in Freshwater Phytoplankton
Principal Investigator, National Science Foundation

Consortium for Ocean Sensing In the Nearshore Environment (COSINE)
Principal Investigator, National Oceanic and Atmospheric Administration

SHEILA S. HEMAMI

Professor and Chair, Electrical and Computer Engineering

PhD, Stanford University, 1994
ece.neu.edu/people/hemami-sheila

Scholarship focus: multimedia signal processing; image and video compression and transmission; visual psychophysics

Honors and awards: Fellow, Institute of Electrical and Electronics Engineers

SELECTED PUBLICATIONS

R. Vanam, E.A. Riskin, R.E. Ladner, S.S. Hemami
Fast Algorithms for Designing Nearly Optimal Lookup Tables for Complexity Control of the H. 264 Encoder, Signal, Image and Video Processing, 7(5), 2013, 991-1003

H.R. Wu, A.R. Reibman, W. Lin, F. Pereira, S.S. Hemami
Perceptual Visual Signal Compression and Transmission, Proceedings of the IEEE, 101(9), 2013, 2025-2043

L. McLaughlin, S.S. Hemami
Reduced-reference Video Quality Assessment with Scalable Overhead, IEEE International Conference on Image Processing, 2013, 1622-1626

A. Wang, S.S. Hemami, A. Molnar
Angle-sensitive Pixels: A New Paradigm for Low-power, Low-cost 2D and 3D Sensing, IS&T/SPIE Electronic Imaging, 2012, 1-13

S.S. Hemami, F.M. Ciaramello, S.S. Chen, N.G. Drenkow, et al.
Comparing User Experiences in 2D and 3D Videoconferencing, IEEE International Conference on Image Processing, Orlando, Florida, 2012

F.M. Ciaramello, S.S. Hemami
A Computational Intelligibility Model for Assessment and Compression of American Sign Language Video, IEEE Transactions on Image Processing, 2011, 3014-3027

D.M. Rouse, S.S. Hemami, R. Pepion, P. Le Callet
Estimating the Usefulnessof Distorted Natural Images Using an Image Contour Degradation Measure, Journal of the Optical Society of America: A, 28(2), 2011, 157-188

D.S. Swamy, K.J. Butler, D.M. Chandler, S.S. Hemami
Parametric Quality Assessment of Synthesized Textures, IS&T/SPIE Electronic Imaging, 7865, 2011, 1-9

CARLOS HIDROVO

Assistant Professor, Mechanical and Industrial Engineering

PhD, Massachusetts Institute of Technology, 2001
mie.neu.edu/people/hidrovo-chavez-carlos

Scholarship focus: fluid mechanics and mechanics of mecroscale multiphase transport phenomena with applications in portable biochemical diagnostics, thermal management and water desalination

Honors and awards: National Science Foundation CAREER Award; Defense Advanced Research Projects Agency Young Faculty Award; American Society of Mechanical Engineers Robert T. Knapp Award

SELECTED PUBLICATIONS

O.N. Demirer, C. Hidrovo
Laser Induced Fluorescence Visualization of Ion Transport in a Pseudo-Porous Capacitive Deionization Microstructure, Microfluidics and Nanofluidics, 16(1-2), 2014, 109-122

R. Hale, R.T. Bonnecaze, C. Hidrovo
Optimization of Capillary Flow through Square Micropillar Arrays, International Journal of Multiphase Flow, 58, 2014, 39-51

A. Chhabra, R. Kanapuram, T.J. Kim, J. Geng, A. da Silva, C. Bielawski, C. Hidrovo
Humidity Effects on the Wetting Characteristics of Poly(N-isopropylacrylamide) During a Lower Critical Solution Transition, Langmuir, 29(25), 2013, 8116-8124

B. Carroll, C. Hidrovo
Droplet Collision Mixing Diagnostics Using Single Fluorophore LIF, Experiments in Fluids, 53(5), 2012, 1301-1316

T.J. Kim, C. Hidrovo
Pressure and Partial Wetting Effects on Superhydrophobic Friction Reduction in Microchannel Flow, Physics of Fluids, 24(11), 2012, 112003-112018

SELECTED RESEARCH PROJECTS

Advanced Thermo-Adsorptive Battery Climate Control System
Co-Principal Investigator, Advanced Research Projects Agency-Energy

CAREER: Inertial Two-Phase Gas-Liquid Droplet Microflows
Principal Investigator, National Science Foundation

HANCHEN HUANG

Professor and Chair, Department of Mechanical and Industrial Engineering

PhD, University of California at Los Angeles, 1995
mie.neu.edu/people/huang-hanchen

Scholarship focus: growth of nanorods using theoretical formulations, experiments, and atomistic simulations; mechanics and radiation damage of nanostructured materials using atomistic stimulations

Honors and awards: Fellow, American Society of Mechanical Engineers; Member, Connecticut Academy of Sciences and Engineering; Senior Member, Chinese Mechanical Engineering Society; Royal Society of London KTP Visiting Professor in Hong Kong; Keynote/invited speaker of 120 lectures or seminars

SELECTED PUBLICATIONS

X. B. Niu, S.P. Stagon, H. Huang, J.K. Baldwin, A. Misra
Smallest Metallic Nanorods Using Physical Vapor Deposition, Physical Review Letters, 110(13), 2013, 136102

H. Huang, H. van Swygenhoven
Atomistic Simulations of Mechanics of Nanostructures, MRS Bulletin, 34(3), 2009, 160-163

L.G. Zhou, H. Huang
A Characteristic Length Scale of Nanorods Diameter during Growth, Physical Review Letters, 101(26), 2008, 266102

H. Huang
Insight: Multiscale Modeling and Simulation, Sandia Technology, 2007, 8-9

J. Wang, H. Huang, S.V. Kesapragada, D. Gall
Growth of Y-shaped Nanorods through Physical Vapor Deposition, Nano Letters, 5(12), 2005, 2505-2508

SELECTED RESEARCH PROJECTS

A New Characteristic Length Scale on Surfaces
Principal Investigator, National Science Foundation

Characteristic Length Scales of Growing Nanorods
Principal Investigator, Department of Energy Office of Basic Energy Science Core Program

Characteristic Length Scales of Growing Nanorods
Principal Investigator, Defense Threat Reduction Agency

Collaborative Nuclear Fellowship Program Applied Research in Radiation Damage and Mitigation
Principal Investigator, Nuclear Regulatory Commission

Collaborative Research: Atomistic Mechanisms of Stabilizing Oxide Nanoparticles in Oxide-dispersion Strengthened Structural Materials
Principal Investigator, National Science Foundation

From Nanofabrication to Commercial Production of Solar Cells
Principal Investigator, National Science Foundation

VINAY INGLE

Associate Professor, Electrical and Computer Engineering

PhD, Rensselaer Polytechnic Institute, 1981
ece.neu.edu/people/ingle-vinaykumar

Scholarship focus: multidimensional signal processing and Hyperspectral imaging

SELECTED PUBLICATIONS

S. Niu, S.E. Golowich, V. Ingle, D.G. Manolakis
Hyperspectral Chemical Plume Quantification and Temperature Estimation, Proceedings of SPIE conference on Defense and Security (9088); Sensor Technologies; 2014, 90880V

S. Niu, S.E. Golowich, V. Ingle, D.G. Manolakis
New Approach to Remote Gas-phase Chemical Quantification: Selected-band Algorithm, Optical Engineering, 53(2), 2014, 021111

R. Herrero, V. Ingle
Ultraspectral Image Preprocessing with Tridimensional Space Filling Curves, Open Transactions on Information Processing; 1(1), 2014, 27-42

R. Herrero, V. Ingle
Analytical and Comparative Analysis of Lossy Ultraspectral Image Compression, SPIE DSS Conference, 2013

C. Brett, R. DiPietro, D. Manolakis, V. Ingle
Efficient Implementation of Hyperspectral Chemical Detection, SPIE Security and Defense Conference, Dresden Germany, 2013

R. Herrero, V. Ingle
Space-Filling Curves Applied To Compression Of Ultra-Spectral Images, Journal of Signal, Image and Video Processing, Springer, 9(6), 2013, 1249-1257

S. Niu, S. Golowich, V. Ingle, D. Manolakis
Implications and Mitigation of Model Mismatch and Covariance Contamination for Hyperspectral Chemical Agent Detection, Journal of Optical Engineering–SPIE, 52(2), 2013, 026202

S. Niu, S. Golowich, V. Ingle, D. Manolakis
New Approach to Remote Gasphase Chemical Quantification: Selected-Band Algorithm, Journal of Optical Engineering–SPIE, 53(2), 2013, 021111

SELECTED RESEARCH PROJECTS

Algorithms for Vector Time Series Data Analysis
Principal Investigator, Massachusetts Institute of Technology Lincoln Lab

Hyperspectral Detection Algorithms with False Alarm Mitigation
Principal Investigator, Massachusetts Institute of Technology

Signal Processing of Long Wave Hyperspectral Imagery
Principal Investigator, Massachusetts Institute of Technology Lincoln Lab

STRATIS IOANNIDIS

Assistant Professor, Electrical and Computer Engineering

PhD, University of Toronto, 2009
ece.neu.edu/people/ioannidis-efstratios

Big data and privacy in distributed systems, particularly the recommender systems that are prevalent in e-commerce companies and online services such as Yahoo, Facebook, Amazon, and Netflix

SELECTED PUBLICATIONS

K. Nayak, X.S. Wang, S. Ioannidis, U. Weinsberg, N. Taft, E. Shi
  GraphSC: Parallel Secure Computation Made Easy, Symposium on Security and Privacy (S&P), San Jose, CA, 2015

A. Karbasi, S. Ioannidis, L. Massoulié
  From Small-world Networks to Comparison-based Search, IEEE Transactions on Information Theory (IT), 2015, 1-42

Y. Sun, S. Ioannidis, A. Montanari
  Learning Mixtures of Linear Classifiers, International Conference on Machine Learning (ICML), Beijing, China, 2014

S. Ioannidis, A. Montanari, U. Weinsberg, S. Bhagat, N. Fawaz, N. Taft
  Privacy Tradeoffs in Predictive Analytics, International Conference on Measurements and Modeling of Computer Systems (SIGMETRICS), Austin, TX, 2014

JACQUELINE ISAACS

Professor, Mechanical and Industrial Engineering; affiliated faculty, School of Public Policy and Urban Affairs

PhD, Massachusetts Institute of Technology, 1991
mie.neu.edu/people/isaacs-jacqueline

Scholarship focus: economic-environmental assessment of alternative manu/nanomanufacturing routes towards sustainable design and manufacturing, societal implications of nanomanufacturing, with interdisciplinary collaborations in political science, philosophy, industrial hygiene and industrial engineering, development and assessment of educational games for engineering students and for K-12 outreach activities

Honors and awards: National Science Foundation CAREER Award; ELATE Fellow; College of Engineering Excellence in Mentoring Award; Northeastern University Excellence in Teaching Award; Northeastern University Aspiration Award

SELECTED PUBLICATIONS

J.A. Isaacs, C.L. Alpert, M. Bates, C.J. Bosso, M.J. Eckelman, I. Linkov, W.C. Walker
  Engaging Stakeholders in Nano-EHS Risk Governance, Environment Systems and Decisions, 35(1), 2015, 24-28

L.M. Gilbertson, A.A. Busnaina, J.A. Isaacs, J.B. Zimmerman, M.J. Eckelman
  Life Cycle Impacts and Benefits of a Carbon Nanotube-enabled Chemical Gas Sensor, Environmental Science and Technology, 48(19), 2014, 11360-11368

V.S. Espinoza, S. Erbis, L. Pourzahedi, M.J. Eckelman, J.A. Isaacs
  Material Flow Analysis of Carbon Nanotube Lithium-ion Batteries used in Portable Computers, ACS Sustainable Chemistry & Engineering, 2(7), 2014, 1642-1648

S. Erbis, S. Kamarthi, T.P. Cullinane, J.A. Isaacs
  Multistage Stochastic Programming (MSP) Model for Carbon Nanotube Production Capacity Expansion Planning, ACS Sustainable Chemistry & Engineering, 2(7), 2014, 1633–1641

A.A. Busnaina, J. Mead, J. Isaacs, S. Somu
  Nanomanufacturing and Sustainability: Opportunities and Challenges, Journal of Nanoparticle Research, 15(1984), 2013

SELECTED RESEARCH PROJECTS

ADVANCE: Institutional Transformation Award
  Co-Principal Investigator, National Science Foundation

Designing and Integrating LCA Methods for Nanomanufacturing Scale-up
  Principal Investigator, National Science Foundation

Ethics Education in Life Cycle Design, Engineering, and Management
  Co-Principal Investigator, National Science Foundation

Research Collaborative Networks: Sustainable Energy Systems
  Co-Principal Investigator, National Science Foundation

NADER JALILI

Professor and Associate Chair for Graduate Studies and Research, Mechanical and Industrial Engineering; affiliated faculty, Bioengineering

PhD, University of Connecticut, 1998
mie.neu.edu/people/jalili-nader

Scholarship focus: piezoelectric-based actuators and sensors, dynamic modeling and vibration control of distributed-parameters systems, dynamics and control of MEMS and NEMS sensors and actuators, control and manipulation at the nanoscale

Honors and awards: Fellow, American Society of Mechanical Engineers; National Science Foundation CAREER Award; Northeastern University Excellence in Teaching Award; College of Engineering Translational Research Award; College of Engineering Martin Essigman Outstanding Teaching Award

SELECTED PUBLICATIONS

M. Khabiry, N. Jalili
  A Microfluidic Platform Containing Sidewall Microgrooves for Cell Positioning and Trapping, Nanobiomedicine, 2015

S. Faegh, N. Jalili, S. Sridhar
  Ultrasensitive Piezoelectric-based Microcantilever Biosensor: Theory and Experiment, IEEE/ASME Transactions on Mechatronics, 20(1), 2015, 308-312

S. Eslami, N. Jalili
  Model Development and Boundary Interaction Force Control of A Piezoresistive-based Microcantilever, Robotica, 2014, 1-19

S. Faegh, N. Jalili
  Comprehensive Distributed-parameters Modeling and Experimental Validation of Microcantilever-based Biosensor with Application to Ultrasmall Biological Species Detection, Journal of Micromechanics and Microengineering, 23(2), 2013, 025007

N. Jalili
  Piezoelectric-based Vibration Control: From Macro to Micro/ Nano Scale Systems, Springer, New York, NY, 1st Ed., 2010, 517 pages, with 293 figures

SELECTED RESEARCH PROJECTS

Design and Development of Nanoscale Package-embedded Vibration Sensing and Active Isolation – Phases I-IV
  Principal Investigator, Raytheon

High Temperature and High Acceleration End-Effector Pads for Semiconductor Applications – Phases I-III: Carbon Nanotube (CNT)-based Surface Treatment for Improved Adhesion and Friction Properties
  Principal Investigator, Brooks Automation Inc.

Robotic Leg Advancement Device
  Principal Investigator, National Science Foundation

The Gear Bearing Drive: A Novel Compact Actuator for Robotic Joints
  Principal Investigator, National Science Foundation

YUNG JOON JUNG

Associate Professor, Mechanical and Industrial Engineering

PhD, Rensselaer Polytechnic Institute, 2003
mie.neu.edu/people/jung-yung-joon

Scholarship focus: synthesis of low dimensional nanomaterials and engineering their molecular structures; assembly, transfer and integration of nanomaterials and nanostructured architectures and study properties and underlying fundamental science; nanoelectronics, flexible devices, chemical sensors and energy application

SELECTED PUBLICATIONS

B. Li, Y. He, S. Lei, S. Najmaei, Y. Gong, X. Wang, J. Zhang, L. Ma, Y. Yang, S. Hong, J. Hao, G. Shi, A. George, K. Keyshar, P. Dong, L. Ge, R. Vajtai, J. Lou, Y.J. Jung, P. Ajayan
  Scalable Transfer of Suspended Two Dimensional Single Crystals, Nano Letters, 15(8), 2015, 5089-5097

H. Jung, S. Kar, J. Kong, M.S. Dresselhaus, Y.J. Jung, et al.
  Sculpting Carbon Bonds: Allotropic Transformation Through Solid-state re-engineering of–sp^2 carbon, Nature Communications, 5(4941), 2014

Y. Kim, H. Jung, S. Park, B. Li, F. Liu, J. Hao, Y.J. Jung, et al.
  Voltage-switchable Photocurrents in Single-wall Carbon Nanotube – Silicon Junctions for Analogue and Digital optoelectronics, Nature Photonics, 8, 2014, 239-243

M.G. Hahm, H. Wang, H.Y. Jung, M. Upmanyu, Y.J. Jung, et al.
  Bundling Dynamics Regulates the Active Mechanics and Transport in Carbon Nanotube Networks and their Nanocomposites, Nanoscale, 4, 2012, 3584-3590, *This article was selected for Cover Page

H.Y. Jung, M.B. Karimi, M.G. Hahm, P.M. Ajayan, Y.J. Jung
  Transparent, Flexible Supercapacitors from Nano-engineered Carbon Films, Scientific Report, Nature Publishing Group, 2(773), 2012

B. Li, M. G. Hahm, Y.L. Kim, H.Y. Jung, S. Kar, Y.J. Jung
  Highly Organized Two and Three-dimensional Single-walled Carbon Nanotubes-polymer Hybrid Architectures, ACS Nano, 5, 2011, 4826-4834

SELECTED RESEARCH PROJECTS

Developing Strong, High thermal resistant, and Light Weight Materials and their Processing for the High Performance Automotive Lighting System
  Principal Investigator, KATECH

DMREF: Engineering Strong, Highly Conductive Nanotube Fibers Via Fusion
  Principal Investigator, National Science Foundation

High Performance Photoswitches Using Carbon Nanotube-Si Heterojunctions for Optoelectronic Logic devices
  Co-Principal Investigator, National Science Foundation

DAVID KAELI

COE Distinguished Professor, Electrical and Computer Engineering; affiliated faculty: Bioengineering, Computer and Information Science

PhD, Rutgers University, 1992
ece.neu.edu/people/kaeli-david

Scholarship focus: computer architecture; heterogeneous computing; performance analysis; embedded systems; security and information assurance; back-end compilers; profile-guided optimization; hardware reliability and recovery; image databases; software engineering; workload characterization; GPGPU

Honors and awards: Fellow, Institute of Electrical and Electronics Engineers; Distinguished Scientist, Associate of Computing Machinery; Distinguish Professor, Heterogeneous Systems Architecture Foundation; National Science Foundation CAREER Award

SELECTED PUBLICATIONS

A.K. Ziabari, J.L. Abellan, R. Ubal, C. Chen, A. Joshi, D. Kaeli
Leveraging Silicon-photonic NOC for Designing Scalable GPUs, Proceedings of the 29th ACM International Conference on Supercomputing, 2015, 273-282

D. Kaeli, P. Mistry, D. Schaa, D. Zhang
Heterogeneous Computing with OpenCL 2.0, Morgan Kaufmann Publishing, 2015

Y. Ukidave, F.N. Paravecino, L. Yu, C. Kalra, D. Kaeli, et al.
NUPAR: Benchmark Suite for Modern GPU Architectures, Proceedings of the 6th ACM/SPEC International Conference on Performance Engineering, 2015, 253-264

M. Wilkening, V. Sridharan, S. Li, F. Previlon, D. Kaeli, et al.
Calculating Architectural Vulnerability Factors for Spatial Multi-bit Transient Faults, Proceedings of the 47th Annual IEEE/ACM International Symposium on Microarchitecture, 2014, 293-305

B. Jang, D. Schaa, P. Mistry, D. Kaeli
Exploiting Memory Access Patterns to Improve Memory Performance in Data Parallel Architectures, IEEE Transactions on Parallel and Distributed Computing, 22(1), 2011, 105-118

SELECTED RESEARCH PROJECTS

Collaborative Research: Leveraging Intra-chip/Inter-chip Silicon Photonic Networks for Designing Next-generation Accelerators
Principal Investigator, National Science Foundation

BIGDATA: IA: Exploring Analysis of Environment and Health Through Multiple Alternative Clustering
Co-Principal Investigator, National Science Foundation

Engineering Strong, Highly Conductive Nanotube Fibers Via Fusion
Co-Principal Investigator, National Science Foundation

MRI: Development of a Testbed for Side-channel Analysis and Security Evaluation (TeSCASE)
Co-Principal Investigator, National Science Foundation

Multi-disciplinary Preparation of Next Generation Information Assurance Practitioners
Co-Principal Investigator, National Science Foundation

Puerto Rico Testsite for Exploring Environmental Contamination Threats (PROTECT)
Co-Principal Investigator, National Institutes of Health

SAGAR KAMARTHI

Associate Professor, Mechanical and Industrial Engineering

PhD, Pennsylvania State University, 1994
mie.neu.edu/people/kamarthi-sagar

Scholarship focus: industrial engineering; advanced manufacturing; personalized disease management; sensor based diagnostics and prognostics

SELECTED PUBLICATIONS

S. Onel, A. Zeid, S. Kamarthi
Agent-based Simulation and Analysis of a Complex Adaptive Supply Network, International Journal of Collaborative Enterprise, 4(3), 2014

I. Zeid, J. Chin, C. Duggan, S. Kamarthi
Engineering Based Learning: A Paradigm Shift for High School STEM Teaching, International Journal of Engineering Education, 30(4), 2014, 1-12

A. Zeid, S. Kamarthi, V. Sahney
Forward: Research Issues in Patient Centric Healthcare Delivery, International Journal of Collaborative Enterprise, 4(1-2), 2014, 1-2

G.M. Uddin, K.S. Ziemer, I. Zeid, S. Kamarthi
Monte Carlo Study of the Molecular Beam Epitaxy Process for Manufacturing Magnesium Oxide Nano Scale Films, IIE Transactions, 47, 2014, 1-16

S. Vadde, A. Zeid, S. Kamarthi
Optimal Pricing and Disposal Decisions for Product Recovery Facilities Under a Single Portfolio, International Journal of Collaborative Enterprise, 4(3), 2014, 160-187

E. Tuncel, I. Zeid, S. Kamarthi
Solving Large Scale Disassembly Line Balancing Problems with Uncertainty Using Reinforcement Learning, International Journal of Intelligent Manufacturing, 25(4), 2014, 647-659

SELECTED RESEARCH PROJECTS

Cost-effective Thermal Envelope Retrofits in Woodframed Residential Buildings
Co-Principal Investigator, Northeastern University

TRANSFORM: TRANSFORMing Liberal Arts Careers to Meet Demand for Advanced Manufacturing Workforce
Co-Principal Investigator, National Science Foundation

BARRY L. KARGER

Professor and James L. Waters Chair in Analytical Chemistry; affiliated faculty, Bioengineering, Chemical Engineering

PhD, Cornell University, 1963
bioe.neu.edu/people/karger-barry

Scholarship focus: analytical chemistry, bioanalysis, proteomics

Honors and awards: Arnold O. Beckman Medal; Csaba Horváth Memorial Award; Heyrovsky Medal (Czech Republic); Michael Widmer Award of the New Swiss Chemical Society; 3 American Chemical Society Awards

SELECTED PUBLICATIONS

Z. Liu, S. Dai, B.L. Karger, J.J. Li, et al.
A Quantitative Proteomic Analysis of Cellular Responses to High Glucose Media in Chinese Hamster Ovary Cells, Biotechnology Progress, 31(4), 2015, 1026-1038

S. Li, B.D. Plouffe, B.L. Karger, A.R. Ivanov, et al.
An Integrated Platform for Isolation, Processing and Mass Spectrometry-based Proteomic Profiling of Rare Cells in Whole Blood, Molecular and Cellular Proteomics, 14(6), 2015, 1672-1683

H. Arthanari, Y. Gao, S.-L. Wu, B.L. Karger, et al.
Constitutively Oxidized CXXC Motifs within the CD3 Heterodimeric Ectodomains of the T Cell Receptor Complex Enforce the Conformation of Juxtaposed Segments, Journal of Biological Chemistry, 290(1), 2015, 18880-18892

S. Li, T. Nakayama, A. Akinc, S.-L. Wu, B.L. Karger
Development of LC-MS Methods for Quantitation Of Hepcidin And Demonstration of siRNA-Mediated Hepcidin Suppression in Serum, Journal of Pharmacological and Toxicological Methods, 71, 2015, 110-119

S. Rodig, J.L. Kutok, E.K. Jackson, B.L. Karger, et al.
Immunological Mechanisms of the Antitumor Effects of Supplemental Oxygenation, Science Translational Medicine, 7(277), 2015, 277

SELECTED RESEARCH PROJECTS

Development of an Analytical Platform for Comprehensive Characterization of Biotherapeutic Proteins Top down, middle down and bottom up LC and CE-MS of Biopharmaceuticals
Principal Investigator, Biogen Idec

Proteomic Analysis of Cell Lines, Drug Target Identification and Host Cell Impurity
Principal Investigator, Industrial Collaborations

ALIREZA KARIMI

Assistant Professor, Mechanical and Industrial Engineering

PhD, Virginia Polytechnic Institute and State University, 2012
mie.neu.edu/people/karimi-alireza

Scholarship focus: collective behavior of swimming microorganisms, formation and development of biofilms, nonlinear dynamics and chaos, pattern formation and spatiotemporal chaos in fluidic systems, multiphase flow in porous media, computational fluid dynamics, high performance computing and parallel processing

Honors and awards: Liviu Librescu Memorial Scholarship Award

SELECTED PUBLICATIONS

A. Karimi, D. Karig, A. Kumar, A.M. Ardekani
Interplay of Physical Mechanisms and Biofilm Processes: Review of Microfluidic Methods, Lab on a Chip, 15(1), 2015, 23-42

G.-J. Li, A. Karimi, A.M. Ardekani
Effect of Solid Boundaries on Swimming Dynamics of Microorganisms in a Viscoelastic Fluid, Rheologica Acta, 53(12), 2014, 911-926

A. Karimi, M. R. Paul
Bioconvection in Spatially Extended Domains, Physical Review E, 87, 2013, 053016

A. Karimi, A.M. Ardekani
Gyrotactic Bioconvection at Pycnoclines, Journal of Fluid Mechanics, 733, 2013, 245-267

A. Karimi, S. Yazdi, A.M. Ardekani
Hydrodynamic Mechanisms of Cell and Particle Trapping in Microfluidics, Biomicrofluidics, 7, 2013, 021501

A. Karimi, M.R. Paul
Length Scale of a Chaotic Element in Rayleigh-Bénard Convection, Physical Review E, 86, 2012, 066212

A. Karimi, M.R. Paul
Quantifying Spatiotemporal Chaos in Rayleigh-Bénard Convection, Physical Review E, 85, 2012, 046201

YONG-BIN KIM

Associate Professor, Electrical and Computer Engineering

PhD, Colorado State University, 1996
ece.neu.edu/people/kim-yong-bin

Scholarship focus: integrated circuit design and for nanoelectronics and nano technology, high speed system integration for signal processing and communication applications, bio-chip and bio-sensor interface circuit design, electronic neuron circuit design, low power adaptive robot controller circuit design; high performance and low power vlsl design, system-on-chip (soc), and Physical VLSI CAD

SELECTED PUBLICATIONS

H. Zhu, R. Kapusta, Y.-B. Kim
Noise Reduction Technique Through Bandwidth Switching for Switched-capacitor Amplifier, IEEE Transactions on Circuits and Systems 1(TCAS1), 62(7), 2015, 1707-1715

I. Jung, Y.-B. Kim
A 12-bit 32MS/s SAR ADC Using Built-in Self Calibration Technique To Minimize Capacitor Mismatch, 2014 IEEE International Symposium on Defect and Fault Tolerance in VLSI and Nanotechnology Systems(DFT), August 3-6, Amsterdam, Netherlands, 2014, 275-279

Y. Choi, Y.-B. Kim
A Mixed-signal Self-calibration Technique for Baseband Filters in System-on-chip Mobile Transceivers, 2014 ACM GLSVLSI Conference(GLSVLSI 2014), Houston, 2014, 312-316

H. Chauhan, Y. Choi, M. Onabajo, I. Jung, Y.-B. Kim
Accurate and Efficient On-chip Spectral Analysis for Built-in Testing and Calibration Approaches, IEEE Transactions on VLSI Systems, 22(3), 2014, 497-506

T.M. Rookmmaker, M.S. Kim, Y.-B. Kim
Design and Analysis of the Quadfferential Amplifier, Elsevier Microelectronics, 43(10), 2012, 697-707

S. Lin, Y.-B. Kim, F. Lombardi
Design of Ternary Memory Cell Using CNTFETs, IEEE Transactions on Nanotechnology, 11(5), 2012, 1019-1025

SELECTED RESEARCH PROJECTS

Semi-self Calibration of High Speed Transceiver for DRAM Interface
Principal Investigator, Hynix Semiconductor

Compact and Power Efficient Integrated Voltage Tunable RF Multiferroic Inductors with Wide Tunable Inductance
Principal Investigator, Winchester Technology

ENGIN KIRDA

Professor, Electrical and Computer Engineering; jointly appointed, Computer and Information Science

PhD, Technical University of Vienna, 2002
ece.neu.edu/people/kirda-engin

Scholarship focus: malware analysis and detection; web security; social network security; reverse engineering; intrusion detection

SELECTED PUBLICATIONS

M. Weissbacher, W. Robertson, E. Kirda, C. Kruegel, G. Vigna
ZigZag: Automatically Hardening Web Applications Against Client-side Validation Vulnerabilities, In USENIX Security Symposium, Washington DC, 2015

C. Mulliner, W. Robertson, E. Kirda
Hidden GEMs: Automated Discovery of Access Control Vulnerabilities in Graphical User Interfaces, In IEEE Symposium on Security and Privacy (S&P), San Jose, CA, 2014

S. Le Blonde, A. Uritesc, C. Gilbert, Z. Leong Chua, P. Saxena, E. Kirda
Look at Targeted Attacks through the Lense of an NGO, In USENIX Security Symposium, San Diego, CA, 2014

K. Onarlioglu, C. Mulliner, W. Robertson, E. Kirda
PrivExec: Private Execution as an Operating System Service, In IEEE Symposium on Security and Privacy (S&P), San Francisco, CA, 2013

L. Bilge, E. Kirda, C. Kruegel, M. Balduzzi
EXPOSURE: Finding Malicious Domains Using Passive DNS Analysis, In Network and Distributed Systems Security Symposium (NDSS) San Diego, CA, 2011

SELECTED RESEARCH PROJECTS

Continuum: Finding Space and Time Vulnerabilities in Java Programs
Co-Principal Investigator, Defense Advanced Research Projects Agency

DarkDroid: Exposing the Dark Side of Android Marketplaces
Principal Investigator, Defense Advanced Research Projects Agency

Firmalice: Modeling and Identifying Malice in Firmware
Principal Investigator, Defense Advanced Research Projects Agency

TWC: Medium: Collaborative: Automated Reverse Engineering of Commodity Software
Co-Principal Investigator, National Science Foundation

ZIGZAG: Secure Execution of Client-Side Web Application Components
Principal Investigator, Office of Naval Research

MIECZYSLAW KOKAR

Professor, Electrical and Computer Engineering

PhD, Wroclaw University of Technology, 1973
ece.neu.edu/people/kokar-mieczyslaw

Scholarship focus: cognitive radio; software engineering-self-controlling software; information fusion

SELECTED PUBLICATIONS

Y. Chen, M.M. Kokar, J. Moskal, D. Suresh
Mapping Spectrum Consumption Models to Cognitive Radio Ontology for Automatic Inference, Wireless Innovation Forum Conference on Wireless Communications Technologies and Software Defined Radio, Wireless Innovation Forum, 2015, *Best paper award

D. Suresh, M.M. Kokar, J. Moskal, Y. Chen
Updating CRO to CRO2, In Wireless Innovation Forum Conference on Wireless Communications Technologies and Software Defined Radio, Wireless Innovation Forum, 2015

B.E. Ulicny, J.J. Moskal, M.M. Kokar, K. Abe, J. Smith
Inference and Ontologies, In A. Kott, C. Wang, and R. F. Erbacher, editors, Cyber Defense and Situational Awareness, Springer, 2014, 167-199

L. Grande, M. Sherman, H. Zhu, M. Kokar, J. Stine
IEEE DySPAN 1900.5 Efforts To Support Spectrum Access Standardization, 2013 IEEE Military Communications Conference (MILC OM 2013), San Diego, 2013

D. Suresh, M. Kokar, J. Moskal
Prototyping SCA Transceiver APIs Using a Generic Reasoner API, SDR Winn-Comm: Wireless Innovation Forum Conference on Wireless Communications Technologies and Software Defined Radio, Washington D.C., 2013

B. Ulicny, J. Moskal, M. Kokar
Situational Awareness from Social Media, Proceedings of the Eighth Conference on Semantic Technologies for Intelligence, Defense, and Security, Fairfax, VA, 2013, 87-92

L. Lechowicz, M. Kokar
Waveform Reconstruction from Ontological Description, Journal of Analog Integrated Circuits and Signal Processing, Published electronically, 2013

SELECTED RESEARCH PROJECTS

Detection and Learning of Unexpected Behaviors of Systems of Dynamical Systems by Using the Q2 Abstractions
Principal Investigator, Air Force Research Laboratory

YING-YEE KONG

Associate Professor, Speech Language Pathology and Audiology; affiliated faculty, Bioengineering

PhD, University of California, Irvine, 2004
bioe.neu.edu/people/kong-ying-yee

Scholarship focus: auditory perception in hearing-impaired and cochlear-implant listeners

SELECTED PUBLICATIONS

Y.-Y. Kong, A. Mullangi, K. Kokkinakis
Classification of Fricative Consonants for Speech Enhancement in Hearing Devices, PLOS One, 9(4), 2014, e95001

R.W. Schlosser, Howard C. Shane, Ying-Yee Kong, et al.
Effects of Environmental Sounds on the Guessability of Animated Graphic Symbols, Augmentative and Alternative Communication, 30(4), 2014, 298-313

T. Lee, S. Yu, M. Yuan, T. Wong, Y.-Y. Kong
The Effect of Enhancing Temporal Periodicity Cues on Cantonese Tone Recognition by Cochlear Implantees, International Journal of Audiology, 53(8), 2014, 546-557

Y.-Y. Kong, A. Mullangi
Using a Vocoder-based Frequency-lowering Method and Spectral Enhancement to Improve Place-of-Articulation Perception for Hearing-impaired Listeners, Ear and Hearing, 34, 2013, 300-312

Y.-Y. Kong, A. Mullangi
On the Development of a Frequency-Lowering System that Enhances Place-of-Articulation Perception, Speech Communication 54, 2012, 147-160

SELECTED RESEARCH PROJECTS

Hearing Acuity Cognitive Aging and Memory for Speech
Principal Investigator, National Institutes of Health

Speech Perception with Combined Electric and Acoustic Stimulation
Principal Investigator, National Institutes of Health

ABIGAIL KOPPES

Assistant Professor, Chemical Engineering

PhD, Rensselaer Polytechnic Institute, 2013
che.neu.edu/people/koppes-abigail

Scholarship focus: bioelectric medicine, development of novel interventions and tissue engineered platforms for nerve regeneration and repair

SELECTED PUBLICATIONS

D. Thompson, A. Koppes, J. Hardy, C. Schmidt
Electrical Stimuli in the Central Nervous System Microenvironment, Annual Review of Biomedical Engineering,16, 2014, 397-430

A. Koppes, N. Zaccor, C. Rivet, et al.
Neurite Outgrowth on Electrospun PLLA Fibers is Enhanced by Exogenous Electrical Stimulation, Journal of Neural Engineering, 11(4), 2014, 046002

A.N. Koppes, A.L. Nordberg, G. Paolillo, H. Darwish, et al.
Electrical Stimulation of Schwann Cells Promotes Sustained Increases in Neurite Outgrowth, Tissue Engineering A, 20(3-4), 2014, 494-506

B. Behan, D. DeWitt, D. Bogdanowicz, A.N. Koppes, et al.
Cytotoxicity of Single Walled Carbon Nanotubes on Schwann Cells in 2D and 3D Microenvironments towards the Development of an Electrically Conductive Hydrogel for Neural Engineering, Journal of Biomedical Materials Research Part A, 96(1), 2011, 46-57

A.N. Koppes, A.M. Seggio, D.M. Thompson
Neurite Outgrowth is Significantly Increased by the Simultaneous Presentation of Schwann Cells and Moderate Exogenous Electric Fields, Journal of Neural Engineering, 8(4), 2011, 046023

RYAN KOPPES

Assistant Professor, Chemical Engineering

PhD, Rensselaer Polytechnic Institute, 2013
che.neu.edu/people/koppes-ryan

Scholarship focus: neural interface technology; tissue engineering; and musculoskeletal biomechanics

SELECTED PUBLICATIONS

R. Koppes, D. Swank, et al.
A New Experimental Model to Study Force Depression: The Drosophila Jump Muscle, Journal of Applied Physiology, 166(12), 2014, 1543-1550

C. Lu, U.P. Froriep, R. Koppes, et al.
Polymer Fiber Probes Enable Optical Control of Spinal Cord and Muscle Function in Vivo, Advanced Functional Materials, 24(42), 2014, 6594-6600 *Cover Art

N. Schiele, R. Koppes, D. Chrisey, D.T. Corr
Engineering Cellular Fibers for Musculoskeletal Soft Tissues Using Directed Self-assembly, Tissue Engineering: Part A, 19(9-10), 2013, 1223-1232

S. Park, R.A. Koppes, U.P. Froriep, X. Jia, A. Harapanahalli, B. McLaughlin, P. Anikeeva
Optogenetic Control of Nerve Growth, Scientific Reports, 5(9669), 2015

A. Canales, X. Jia, U.P. Froriep, R.A. Koppes, C.M. Tringides, J. Selvidge, C. Lu, C. Hou, L. Wei, Y. Fink, P. Anikeeva
Multimodality Fibers for In-Vivo Simultaneous Optical, Electrical and Chemical Communications with Neural Circuits, Nature Biotechnology, 33(3), 2015, 277-284

HARIS KOUTSOPOULOS

Professor, Civil and Environmental Engineering

PhD, Massachusetts Institute of Technology, 1986
civ.neu.edu/people/koutsopoulos-haris

Scholarship focus: urban transportation networks and informatics, urban mobility, intelligent transportation systems, public transportation operations

SELECTED PUBLICATIONS

M. Rahmani, E. Jenelius, H.N. Koutsopoulos
 Non-parametric Estimation of Route Travel Time Distributions from Low-frequency Floating Car Data, Transportation Research Part C: Emerging Technologies, 58(part B), 2015, 343-362

A. Tympakianaki, E. Jenelius, H.N. Koutsopoulos
 c-SPSA: Cluster-wise Simultaneous Perturbation Stochastic Approximation Algorithm and its Application to Dynamic Origin–destination Matrix Estimation, Transportation Research Part C: Emerging Technologies, 55, 2015, 231-245

E. Jenelius, H.N. Koutsopoulos
 Probe Vehicle Data Sampled by Time or Space: Consistent Travel Time Allocation and Estimation, Transportation Research Part B: Methodological, 71, 2015, 120-137

E. Kazagli, H.N. Koutsopoulos
 Estimation of Arterial Travel Time from Automatic Number Plate Recognition Data, Journal of the Transportation Research Board, 2391, 2014, 22-31

H. Farah, H.N. Koutsopoulos
 Do Cooperative Systems Make Drivers' Car-following Behavior Safer?, Transportation Research Part C, 41, 2014, 61-72

X. Ma, Z. Huang, H.N. Koutsopoulos
 Integrated Traffic and Emissions Simulation: a Model Calibration Approach Using Aggregate Information, Environmental Modeling and Assessment, 19, 2014, 271-282

C. Antoniou H.N. Koutsopoulos, G. Yannis
 Dynamic Data-driven Local Traffic State Estimation and Prediction, Transportation Research Part C, 34, 2013, 89-107

SELECTED RESEARCH PROJECTS

Transport for London Research Partnership Extension
Principal Investigator, Transport for London

Automated Data Collection System Research in Chinese Transit Systems
 Co-Principal Investigator, Jinan Urban Transport Research Center

Near Capacity Operations
 Co-Principal Investigator, MTR, Hong Kong

GREGORY KOWALSKI

Energy Systems Program Director; Associate Professor, Mechanical and Industrial Engineering

PhD, University of Wisconsin, 1978
mie.neu.edu/people/kowalski-gregory

Scholarship focus: energy related and calorimeter studies related to pharmaceutical developments; simulation of thermal effects on laser beam propagation through heated materials; simulating microscale heat transfer phenomena and its effects on laser beam propagation; Simulation of laser welding processes

Honors and awards: Fellow, American Society of Mechanical Engineers

SELECTED PUBLICATIONS

A.J. Conway, W.M. Saadi, F.L. Sinatra, G.J. Kowalski, D. Larson, J. Fiering
 Dispersion of a Nanoliter Bolus in Microfluidic Co-Flow, Journal of Micromechanics and Microengineering: Structures, Devices, and Systems, 24(3), 2014, 034006

U. Piana, G.J. Kowalski, M. Zenouzi
 Incorporating Reliability and Failure Models into Energy System Analysis, Proceedings of the 8th International Conference on Energy Sustainability co-located with the 12th Fuel Cell Science, Engineering & Technology Conference, Boston, MA, 2014, 1-9

A. Emdadi, Y. Emami, M. Zenouzi, A. Lak, B. Panahirad, A. Lotfi, F. Lak, G.J. Kowalski
 Potential Of Electricity Generation By The Salinity Gradient Energy Conversion Technologies in the System of Urmia Lake- Gadarchay River, Proceedings of the 8th International Conference on Energy Sustainability co-located with the 12th Fuel Cell Science, Engineering & Technology Conference, Boston, MA, 2014, 1-8

G.J. Kowalski, M. Modaresifar, M. Zenouzi
 Significance of Transient Exergy Terms in a New Tray Design Solar Desalination Device, Journal of Energy Resources Technology, 137(1), 2014, 1-8

PHILIP LARESE-CASANOVA

Assistant Professor, Civil and Environmental Engineering

PhD, University of Iowa, 2006
civ.neu.edu/people/larese-casanova-philip

Scholarship focus: environmental chemistry and mineralogy; transformation and remediation of water pollutants; nanomaterial sorbents for water treatment

Honors and awards: National Science Foundation CAREER Award

SELECTED PUBLICATIONS

N. Cai, P. Larese-Casanova
Factors Influencing Natural Organic Matter Sorption onto Commercial Graphene Oxides, Chemical Engineering Journal, 273, 2015, 568-579

A.E.P. Schellenger, P. Larese-Casanova
Oxygen Isotope Indicators of Selenate Reaction with Fe(II) and Fe(III) Hydroxides, Environmental Science and Technology, 47(12), 2013, 6254-6262

P. Larese-Casanova, R.E. Blake
Measurement of §18O Values in Arsenic and Selenium Oxyanions, Rapid Communications in Mass Spectrometry, 27(1), 2013, 117-126

N. Cai, P. Larese-Casanova
Sorption of Carbamazepine by Commercial Graphene Oxides: A Comparative Study with Granular Activated Carbon and Multiwalled Carbon Nanotubes, Journal of Colloid and Interface Science, 426, 2014, 152-161

P. Larese-Casanova, S. Haderlein, A. Kappler
Biomineralization of Lepidocrocite and Goethite by Nitrate-Reducing Fe(II)-oxidizing Bacteria: Effect of pH, Bicarbonate, Phosphate, and Humic Acids, Geochimica et Cosmochimica Acta, 74(13), 2010, 3721-3734

SELECTED RESEARCH PROJECTS

CAREER: Quantum Dot Degradation in Aquatic Environments
Principal Investigator, National Science Foundation

Insights to Selenium Cycling and Remediation Revealed by Stable Oxygen Isotopes
Principal Investigator, National Science Foundation

Recrystallization of Stable Iron Oxides in Reducing Environments
Principal Investigator, National Science Foundation

CAROLYN LEE-PARSONS

Associate Professor, Chemical Engineering; jointly appointed, Chemistry; affiliated faculty, Bioengineering

PhD, Cornell University, 1995
che.neu.edu/people/lee-parsons-carolyn

Scholarship focus: production of valuable pharmaceutical compounds from plant cell cultures, specifically the production of important anti-cancer drug molecules from cell cultures of Catharanthus roseus

Honors and awards: National Science Foundation CAREER Award; College of Engineering Outstanding Teaching Award

SELECTED PUBLICATIONS

N. Rizvi, M. Cornejo, K. Stein, J. Weaver, E.J. Cram, C.W.T. Lee-Parsons
An Efficient Transformation Method for Estrogen-inducible Transgene Expression in Catharanthus roseus Hairy Roots, Plant Cell, Tissue and Organ Culture (PCTOC), 120(2), 2015, 475-487

J. Weaver, S. Goklany, N. Rizvi, E.J. Cram, C.W.T. Lee-Parsons
Optimizing the Transient Fast Agro-mediated Seedling Transformation (FAST) Method in Catharanthus roseus Seedlings, Plant Cell Reports, 33(1), 2014, 89-97

S. Goklany, N. Rizvi, R.H. Loring, E.J. Cram, C.W.T. Lee-Parsons
Jasmonate-dependent Alkaloid Biosynthesis in Catharanthus roseus is Correlated with the Relative Expression of Orca and Zct Transcription Factors, Biotechnology Progress, 29(6), 2013, 1367-1376

N. Rizvi, S. Goklany, E.J. Cram, C.W.T. Lee-Parsons
Rapid Increases of Key Regulators Precede the Increased Production of Pharmaceutically Valuable Compounds in Catharanthus roseus, Pharmaceutical Engineering, 33(6), 2013, 1-8

R.M. Gathungu, J.T. Oldham, S.S. Bird, C.W.T. Lee-Parsons, P. Vouros, R. Kautz
Application of an Integrated LC-UV-MS-NMR Platform to the Identification of Secondary Metabolites from Cell Cultures: Benzophenanthridine Alkaloids from Elicited Eschscholzia Californica (California poppy) Cell Cultures, Analytical Methods, 4, 2012, 1315-1325

M. Shulman, M. Cohen, A. Soto-Gutierrez, H. Yagi, H. Wang, J. Goldwasser, C.W.T. Lee-Parsons, O. Benny-Ratsaby, M.L. Yarmush, Y. Nahmias
Enhancement of Naringenin Bioavailability by Complexation with Hydroxypropyl-ß-cyclodextrin, PLoS ONE, 6(4), 2011, e18033

SELECTED RESEARCH PROJECTS

Transcriptional Control of Alkaloid Biosynthesis in Catharanthus roseus Cultures
Principal Investigator, National Science Foundation

Zinc Finger Transcription Factors: Regulators of Growth, Development, and Alkaloid Biosynthesis
Principal Investigator, National Science Foundation

MIRIAM LEESER

Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, Cambridge University, 1988
ece.neu.edu/people/leeser-miriam

Scholarship focus: accelerators for compute intensive applications: reconfigurable hardware and graphics processing units (GPUs); applications including biocomputing, machine learning, software-defined radio; uses and implementations of computer arithmetic

SELECTED PUBLICATIONS

N. Moore, M. Leeser, L. Smith King
  Kernel Specialization Provides Adaptable GPU Code for Particle Image Velocimetry, IEEE Transactions on Parallel and Distributed Systems, 26(4), 2015, 1049-1058

M. Leeser, S. Mukherjee, J. Brock
  Fast Reconstruction of 3D Volumes from 2D CT Projection Data with GPUs, Biomed Central Research Notes, 7(528), 2014

N. Moore, M. Leeser, L. Smith King
  Kernel Specialization for Improved Adaptability and Performance on Graphics Processing Units (GPUs), 27th IEEE International Parallel and Distributed Processing Symposium (IPDPS), May 2013

M. Leeser, D. Yablonski, D. Brooks, L. Smith King
  The Challenges of Writing Portable, Correct and High Performance Libraries for GPUs, ACM SIGARCH Computer Architecture News, 39(4), 2011, 2-7

X. Wang, M. Leeser
  VFloat: A Variable Precision Fixed and Floating-point Library for Reconfigurable Hardware, ACM Transactions on Reconfigurable Technology and Systems, 3(3), 2010, 1-34

X. Wang, M. Leeser
  K-means Clustering for Multispectral Images Using Floating-point Divide, IEEE Symposium on Field-programmable Custom Computing Machines (FCCM), 2007, 151-162

N. Moore, A. Conti, M. Leeser, L. Smith King
  Vforce: An Extensible Framework for Reconfigurable Supercomputing, Computer, Published by the IEEE, 2007, 39-49

SELECTED RESEARCH PROJECTS

MRI: Development of a Testbed for Side Channel Analysis and Security Evaluation
  Co-Principal Investigator, National Science Foundation

Ensuring Reliability and Portability of Scientific Software for Heterogeneous Architectures
  Co-Principal Investigator, National Science Foundation

BRAD LEHMAN

Professor, Electrical and Computer Engineering

PhD, Georgia Institute of Technology, 1992
ece.neu.edu/people/lehman-bradley

Scholarship focus: power electronics; dc-dc converters; pulse width modulation; motion control; electric motor drives; analog circuits; control theory; differential equations; time delays; nonlinear systems and control; industrial control

SELECTED PUBLICATIONS

J.-H. Huang, Y. Zhao, B.Lehman
  Fast Reconfigurable Photovoltaic Switching Cell Integrated within DC-DC Converters, Proceedings of the IEEE Applied Power Electronics Conference and Exposition (APEC), Fort Worth, TX, 2014, 629-636

S. Chen, P. Li, B. Lehman, R. Ball, J.F. de Palma
  A New Topology of Bridge-Type Non-Superconducting Fault Current Limiter, IEEE Applied Power Electronics Conference and Exposition (APEC), Long Beach, CA, 2013

S. Chen, P. Li, D. Brady, B. Lehman
  Determining the Optimum Grid-Connected Photovoltaic Inverter Size, Solar Energy, 87, 2013, 96-116

Y. Zhao, B. Lehman, R. Ball and J.-F. de Palma
  Graph-based Semi-supervised Learning for Fault Detection and Classification in Solar Photovoltaic Arrays, in Fifth IEEE Energy Conversion Congress & Exposition (ECCE), Denver, CO, 2013

Y. Zhao, J. de Palma, J. Mosesian, R. Lyons, B. Lehman
  Line-line Fault Analysis and Protection Challenges in Solar Photovoltaic Arrays, IEEE Transactions on Industrial Electronics, IEEE Transactions on Industrial Electronics, 60(9), 2013, 3784-3795

SELECTED RESEARCH PROJECTS

A Multi-Model Machine Learning-Solar Forecasting Technology
  Principal Investigator, United States Department of Energy

Advanced 100W Solar Blanket for Squad Power
  Principal Investigator, Department of Defense

HANOCH LEV-ARI

Professor, Electrical and Computer Engineering

PhD, Stanford University, 1984
ece.neu.edu/people/lev-ari-hanoch

Scholarship focus: adaptive filtering; statistical signal processing; spectrum analysis and estimation; networked dynamic state estimation

Honors and awards: Fellow, Institute of Electrical and Electronics Engineers

SELECTED PUBLICATIONS

P. Argyropoulos, H. Lev-Ari, A. Abur
  Subband Transmission Line Modeling for Robust Power System Transient Simulation, IEEE PES General Meeting, Denver, 2015

B. Yan, H. Lev-Ari, A.M. Stankovic
  Robust Continuous-discrete Kalman Filter for Time-stamped Delay Mitigation in Networked Estimation and Control Systems, 46th North American Power Symposium, Pullman, 2014

P. Argyropoulos, H. Lev-Ari
  Customized Wavelets for Improved Fault Location Quality in Power Systems, IEEE Power and Energy Conference at Illinois (PECI), Champaign, IL, 2013

L. Peng, H. Lev-Ari
  Estimating the Autocorrelation Function of an Arbitrarily Time-variant System Response, IEEE International Conference on Acoustics, Speech and Signal Processing, Vancouver, BC, May 2013, 6249-6253

P. Argyropoulos, H. Lev-Ari, A.M. Stankovic
  IIR Phasor-Banks: Causal, Delay-free, Numerically Robust, Customizable Uniform-DFT-Like Perfect Reconstruction Filter Banks, IEEE International Conference on Acoustics, Speech and Signal Processing, Vancouver, BC, 2013, 5613-5617

M. Korkali, H. Lev-Ari, A. Abur
  Traveling-Wave-Based Fault-location Technique for Transmission Grids via Wide-area Synchronized Voltage Measurements, IEEE Transactions on Power Systems, 27(2), 2012, 1003-1011

A.M. Stankovic, H. Lev-Ari, M.M. Perisic
  Analysis and Implementation of Model-based Linear Estimation of Dynamic Phasors, IEEE Transactions on Power Systems, 19, 2004, 1903-1910

SELECTED RESEARCH PROJECTS

Center for Ultra-Wide-Area Resilient Electric Energy Transmission Networks (CURENT)
  Co-Principal Investigator, National Science Foundation

Cyber-physical Models for Estimation, Control and Fault Management in Naval Energy Systems
  Principal Investigator, Office of Naval Research

YIANNIS LEVENDIS

COE Distinguished Professor, Mechanical and Industrial Engineering

PhD, California Institute of Technology, 1988
mie.neu.edu/people/levendis-yiannis

Scholarship focus: gasification and combustion of solid fuels, generation and containment of combustion-generated pollution, synthesis and characterization of combustion-generated materials, fire suppression – fire extinction, engine design and operation

Honors and awards: Fellow, American Society of Mechanical Engineers; Fellow, Society of Automotive Engineers; Søren Buus Outstanding Research Award, College of Engineering; George Westinghouse Gold Medal, American Society of Mechanical Engineers

SELECTED PUBLICATIONS

J. Chase, C. Zhuo, Y.A. Levendis
  A Feasibility Study on Power Generation from Waste Plastics with Partial Pre-Combustion Carbon Capture and Conversion, Journal of Energy Engineering (ASCE), 141(2), 2015

A. Ruscio, F. Kazanc, Y.A. Levendis
  Characterization of Particulate Matter Emitted from Combustion of Various Biomasses in O_2/N_2 and O_2/CO_2 Environments, Energy and Fuels, 28, 2014, 685-696

J. Riaza, R. Khatami, Y.A. Levendis, L. Álvarez, et al.
  Combustion of Single Particles of Waste Biomasses in Air and in Oxy-Fuel Conditions, Biomass & Bioenergy, 64, 2014, 162-174

C. Zhuo, W. Nowak, Y.A. Levendis
  Oxidative Heat Treatment of 316L Stainless Steel for Effective Catalytic Growth of Carbon Nanotubes, Applied Surface Science, 313, 2014, 227-236

A. Davies, R. Soheilian, C. Zhuo, Y.A. Levendis
  Pyrolytic Conversion of Biomass Residues to Gaseous Fuels for Electricity Generation, Journal of Energy Resources Technology, Transactions of ASME, 136(2), 2014, 021101-021106

J. Riaza, R. Khatami, Y.A. Levendis, L. Álvarez, et al.
  Single Particle Ignition and Combustion of Anthracite, Semi-Anthracite and Bituminous Coals in Air and Simulated Oxy-Fuel Conditions, Combustion and Flame, 161, 2014, 1096-1108

C. Zhuo, Y.A. Levendis
  Up-cycling Waste Plastics into Carbon Nanomaterials: A Review, Journal of Applied Polymer Science, 131, 2014, 39931-39944

SELECTED RESEARCH PROJECTS

Co-firing Illinois Bituminous Coals with Highly-fragmenting Lignite Coals for SO_x/HCl Control
  Principal Investigator, Illinois Clean Coal Institute

NU STEP-UP: Science, Technology, Engineering
  Co-Principal Investigator, National Science Foundation

KIM LEWIS

Distinguished Professor, Biology; affiliated faculty, Bioengineering

PhD, Moscow University,1980
bioe.neu.edu/people/lewis-kim

Scholarship focus: molecular microbiology; antimicrobial drug tolerance; drug discovery

SELECTED PUBLICATIONS

N. Balaban, K. Gerdes, K. Lewis, J. McKinney
  A Problem of Persistence: Still More Questions than Answers?, Nature Reviews Microbiology, 11(8), 2013, 587-591

B. Conlon, E. Nakayasu, L. Fleck, M. LaFleur, V. Isabella, K. Coleman, S. Leonard, R. Smith, J. Adkins, K. Lewis
  Activated ClpP Kills Persisters and Eradicates a Chronic Biofilm Infection, Nature, 503, 2013, 365-370

I. Keren, Y. Wu, J. Innocencio, L. Mulcahy, K. Lewis
  Killing By Bactericidal Antibiotics Does Not Depend on Reactive Oxygen Species, Science, 339, 2013, 1213-1216

K. Lewis
  Platforms for Antibiotic Discovery, National Reviews Drug Discovery, 12, 2013, 371-387

M. LaFleur, L. Sun, I. Liste,r J. Keating, A. Nantel, L. Long, M. Ghannoum, J. North, R. Lee, K. Coleman, T. Dahl, K. Lewis
  Potentiation of Azole Antifungals by 2-Adamantanamine, Antimicrob, Agents Chemother, 2013, 3585-3592

SELECTED RESEARCH PROJECTS

Developing Therapeutics to Treat Chronic Infections
  Co-Principal Investigator, National Institutes of Health

Formation of Persisters in B. Burgdorferi and their Elimination
  Principal Investigator, Lyme Research Alliance

LAURA H. LEWIS

Cabot Professor, Chemical Engineering; jointly appointed, Mechanical and Industrial Engineering

PhD, University of Texas, 1993
che.neu.edu/people/lewis-laura

Scholarship focus: structure-property relationships in magnetofunctional materials including advanced permanent magnetic magnetocaloric materials; strategic materials for technological application

Honors and awards: Northeastern University Excellence in Research and Creative Activity Award; Fulbright Specialist; NATO Technical Team Member of AVT-231 on "Scarcity of Rare Earth Materials for Electrical Power Systems", appointed by U.S. National Coordinator

SELECTED PUBLICATIONS

B.D. Plouffe, S.K. Murthy, L.H. Lewis
  Fundamentals and Application of Magnetic Particles in Cell Isolation and Enrichment: A Review, Reports on Progress in Physics, 78(1), 2015, 016601

L.H. Lewis, F.E. Pinkerton, et al.
  De Magnete et Meteorite: Cosmically-motivated Materials, IEEE Magnetics Letters, 5, 2014

R. McCallum, L.H. Lewis, R. Skomski, M.J. Kramer, I.E. Anderson
  Practical Aspects of Modern and Future Permanent Magnets, Annual Review of Materials Research, 44(1), 2014, 451-477

L.H. Lewis, F. Jiménez-Villacorta
  Perspectives on Permanent Magnetic Materials for Energy Conversion and Power Generation, Metallurgical and Materials Transactions A, 44(1), 2013, 2-20

G. Srajer, L.H. Lewis, S.D. Bader, et al.
  Advances in Nanomagnetism via X-ray Techniques, Review Article, Journal of Magnetism and Magnetic Materials, 307(1), 2006, 1-31

SELECTED RESEARCH PROJECTS

Multiscale Development of $L1_0$ Materials for Rare-Earth-Free Permanent Magnets
  Principal Investigator, Department of Energy

Nanomedicine Science and Technology
  Co-Principal Investigator, National Science Foundation

Rare-Earth-Free Permanent Magnets
  Principal Investigator, Office of Naval Research

YINGZI LIN

Associate Professor, Mechanical and Industrial Engineering; affiliated faculty, Bioengineering

PhD, University of Saskatchewan, 2004
mie.neu.edu/people/lin-yingzi

Scholarship focus: human-machine interactions, interface design and user experiences, system integration and evaluation; smart systems and nonintrusive sensors, human friendly mechatronics, human state detection and information fusion; human factors in transportation and healthcare

Honors and awards: National Science Foundation CAREER Award

SELECTED PUBLICATIONS

M. Yu, Y. Lin, X. Wang, D. Schmidt, Y. Wang
Human-robot Interaction Based on Gaze Gesture for the Drone Teleoperation, Journal of Eye Movement Research, 7(4), 2014, 1-14

S. Radhakrishnan, Y. Lin, A. Zeid, S. Kamarthi
Design, Evaluation and Implementation of Gesture Based Functions for CAD Modeling System Using the Multitouch Interface, International Journal of Human-computer Studies, 71(3), 2013, 261-275

H. Cai, Y. Lin
Coordinating Cognitive Assistances with Cognitive Engagement Control Approaches in Human-machine Interactions, IEEE Transactions on Systems, Man and Cybernetics Part A: Humans and Systems, 42(2), 2012, 286-294

Y. Lin
A Natural Contact Sensor Paradigm for Non-intrusive and Real-time Sensing of Bio-signals in Human-machine Interactions, IEEE Sensors Journal, Special Issue on Cognitive Sensor Networks, 11(3), 2011, 522-529

G. Yang, Y. Lin, P. Bhattacharya
A Driver Fatigue Recognition Model Based on Information Fusion and Dynamic Bayesian Network, Information Sciences, 180, 2010, 1942-1954

SELECTED RESEARCH PROJECTS

CAREER: Bridging Cognitive Science and Sensor Technology: Nonintrusive and Multimodality Sensing in Human Machine Interactions
Principal Investigator, National Science Foundation

Integrated Individualized Modeling towards Cognitive Control of Human-machine Systems
Principal Investigator, National Science Foundation

YONGMIN LIU

Assistant Professor, Mechanical and Industrial Engineering; jointly appointed, Electrical and Computer Engineering

PhD, University of California, Berkeley, 2009
mie.neu.edu/people/liu-yongmin

Scholarship focus: nano optics; nanoscale materials and engineering; nano devices; plasmonics; metamaterials; applied physics

Honors and awards: Air Force Summer Faculty Fellow

SELECTED PUBLICATIONS

W.L. Gao, F.Z. Fang, Y.M. Liu, S. Zhang
Chiral Surface Waves Supported by Biaxial Hyperbolic Metamaterials, Light: Science and Applications, 2015, e238

Z.B. Li, K. Yao, F.N. Xia, S. Shen, J.G. Tian, Y. M. Liu
Graphene Plasmonic Metasurfaces to Steer Infrared Light, Scientific Reports, 5, 2015, 12423

Q.H. Guo, W.L. Gao, J. Chen, Y.M. Liu, S. Zhang
Line Degeneracy and Strong Spin-orbit Coupling of Light with Bulk Bianisotropic Metamaterials, Physical Review Letters, 115, 2015, e067402

C. L. Zhao, Y. M. Liu, Y. H. Zhao, N. Fang, T. J. Huang
Reconfigurable Plasmofluidic Lens, Nature Communications, 4(2350), 2013, 1-8

Y.M. Liu, S. Palomba, Y. Park, T. Zentgraf, X.B. Yin, X. Zhang
Compact Magnetic Antennas for Directional Excitation of Surface Plasmons, Nano Letters, 12(9), 2012, 4853-4858

Y.M. Liu, X. Zhang
Metamaterials: A New Frontier of Science and Technology, Chemical Society Reviews, 40, 2011, 2494-2507

S.C. Kehr, Y.M. Liu, et al.
Near-field Examination of Perovskite-based Superlenses and Superlens-enhanced Probe-object Coupling, Nature Communications, 2(249), 2011, 1-9

T. Zentgraf, Y.M. Liu, M.H. Mikkelsen, J. Valentine, X. Zhang
Plasmonic Luneburg and Eaton Lenses, Nature Nanotechnology, 6, 2011, 151-155

M. Liu, T. Zentgraf, Y.M. Liu, G. Bartal, X. Zhang
Light-driven Nanoscale Plasmonic Motors, Nature Nanotechnology, 5, 2010, 570-573

Y. M. Liu, T. Zentgraf, G. Bartal, X. Zhang
Transformational Plasmon Optics, Nano Letters, 10(6), 2010, 1991-1997

J. Yao, Z. Liu, Y.M. Liu, Y. Wang, C. Sun, G. Bartal, et al.
Optical Negative Refraction in Bulk Metamaterials of Nanowires, Science, 321(5891), 2008, 930

Y.M. Liu, G. Bartal, D.A. Genov, X. Zhang
Subwavelength Discrete Solitons in Nonlinear Metamaterials, Physical Review Letters, 99, 2007, 153901

CAROL LIVERMORE

Associate Professor, Mechanical and Industrial Engineering; affiliated faculty: Bioengineering, Electrical and Computer Engineering

PhD, Harvard University, 1998
mie.neu.edu/people/livermore-clifford-carol

Scholarship focus: MEMS-enabled systems for assistive technologies, energy harvesting, and microscale vacuum systems, tissue engineering via MEMS-enabled cell assembly and origami folding, carbon nanotube-based energy storage

Honors and awards: National Science Foundation CAREER Award

SELECTED PUBLICATIONS

T. Liu, R. St. Pierre, C. Livermore
Passively-switched Energy Harvester for Increased Operational Range, Smart Materials and Structures, 23(9), 2014, e095045

X. Xie, Y. Zaitsev, L.F. Velásquez-García, S. Teller, C. Livermore
Scalable, MEMS-enabled, Vibrational Tactile Actuators for High Resolution Tactile Displays, Journal of Micromechanics and Microengineering, 24(12), 2014, 125014

A.S. Dighe, C. Livermore
Single-use MEMS Sealing Valve with Integrated Actuation for Ultra Low-leak Vacuum Applications, Journal of Micromechanics and Microengineering, 24(10), 2014, 105011

G. Agarwal, A. Servi, C. Livermore
Size-selective, Biocompatible, Manufacturable Platform for Structuring Deformable Microsystems, Lab on a Chip, 14(17), 2014, 3385-3393

F.A. Hill, T. Havel, D. Lashmore, M. Schauer, C. Livermore
Storing Energy and Powering Small Systems with Mechanical Springs Made of Carbon Nanotube Yarn, Energy, 76, 2014, 318-325

F.A. Hill, T. Havel, A. John Hart, C. Livermore
Enhancing the Tensile Properties of Continuous Millimeter-scale Carbon Nanotube Fibers by Densification, ACS Applied Materials and Interfaces, 5(15), 2013, 7198-7207

SELECTED RESEARCH PROJECTS

DMREF: Engineering Strong, Highly Conductive Nanotube Fibers Via Fusion
Co-Principal Investigator, National Science Foundation

EFRI-ODISSEI: Origami and Assembly Techniques for Human-Tissue-Engineering (OATH)
Principal Investigator, National Science Foundation

Tiny, Robust Tactile Elements for Scalable, High Resolution Tactile Displays (Phase I)
Principal Investigator, Samsung

FABRIZIO LOMBARDI

ITC Endowed Professor, Electrical and Computer Engineering

PhD, University of London, 1982
ece.neu.edu/people/lombardi-fabrizio

Scholarship focus: fault-tolerant computing; VLSI CAD; testing, configurable computing, distributed systems

Honors and awards: Fellow, Institute of Electrical and Electronics Engineers; Søren Buus Outstanding Research Award, College of Engineering

SELECTED PUBLICATIONS

J. Han, J. Liang, F. Lombardi
Analysis of Error Masking and Restoring Properties of Sequential Circuits, IEEE Transactions on Computers, 62(9), 2013, 1694-1704

K. Namba, W. Wei, F. Lombardi
Extending Non-Volatile Operation to DRAM Cells, IEEE Access, 1, 2013, 758-769

J. Han, J. Liang, F. Lombardi
New Metrics for the Reliability of Approximate and Probabilistic Adders, IEEE Transactions on Computers, 62(9), 2013, 1760-1771

G. Cho, F. Lombardi
On the Delay of a CNTFET with Undeposited CNTs by Gate Width Adjustment, Journal of Electronic Testing Theory and Applications, 29(3), 2013, 261-273

A.F. Almurib, T Nandha Kumar, F. Lombardi
Single-Configuration Fault Detection in Application-Dependent Testing of FPGA Interconnects, Proceedings of IET Computers and Digital Techniques, 7(3), 2013, 132-141

H. Feng, A.F. Almurib, T. Nandha Kumar, F. Lombardi
Testing a Nano Crossbar for Multiple Fault Detection, IEEE Transactions on Nanotechnology, 12(4), 2013, 477-485

LEE MAKOWSKI

Professor and Chair, Bioengineering; jointly appointed, Chemistry and Chemical Biology; affiliated faculty, Electrical and Computer Engineering

PhD, Massachusetts Institute of Technology, 1976
bioe.neu.edu/people/makowski-lee

Scholarship focus: image and signal processing as applied to biophysical data designed to answer fundamental questions about the molecular basis of living systems

SELECTED PUBLICATIONS

L. Makowski, et al.
Large-scale Inter-laboratory Study to Develop, Analytically Validate and Apply Highly Multiplexed, Quantitative Peptide Assays to Measure Cancer-relevant Proteins in Plasma, Molecular and Cellular Proteomics, 14(4), 2015, 2357-2374

Y. Wang, E. Onuk, L. Makowski
The Mechanism of Population Shifting Among Transition States of Adenylate Kinase, Biophysical Journal, 108(2), 2015, 59a

B. Donohoe, J. Matthews, M.E. Himmel, L. Makowski, et al.
Multiscale Deconstruction of Molecular Architecture in Corn Stover, Scientific Reports, 4(3756), 2014

L. Makowski, H.R. Kim, P. Ciesielski, J. Badger, et al.
The Structure of the Catalytic Domain of a Plant Cellulose Synthase and its Assembly into Dimers, The Plant Cell, 26(7), 2014, 2996-3009

R.E. Iacob, G.M. Bou-Assaf, L. Makowski, J.R. Engen, et al.
Investigating Monoclonal Antibody Aggregation Using a Combination of H/DX-MS and Other Biophysical Measurements, Journal of Pharmaceutical Sciences, 102(12), 2013, 4315-4329

SELECTED RESEARCH PROJECTS

Center for Direct Catalytic Conversion of Biomass to BioFuels (C3Bio)
Co-Investigator, Basic Energy Sciences

Identification of Small Molecules that Stabilize PARKIN in an Active Conformation
Principal Investigator, Zenobia Therapeutics, Inc.

Precise Characterization of Conformational Ensembles
Principal Investigator, National Science Foundation

Small Angle X-Ray Scattering (SAXS) as a Tool for Characterizing the Biophysical Properties of Biopharmaceutical Proteins in Solution
Principal Investigator, Biogen Idec

CRAIG MALONEY

Associate Professor, Mechanical and Industrial Engineering

PhD, University of California, Santa Barbara, 2005
mie.neu.edu/people/maloney-craig

Scholarship focus: modeling, simulation, and theory of nanoscale mechanics, soft matter, and glasses and amorphous materials

Honors and awards: National Science Foundation CAREER Award

SELECTED PUBLICATIONS

A. Garg, A. Acharya, C.E. Maloney
A Study of Conditions for Dislocation Nucleation in Coarser-than-atomistic Scale Models, Journal of the Mechanics and Physics of Solids, 75, 2015, 76–92

K.M. Salerno, C.E. Maloney, M.O. Robbins
Avalanches in Strained Amorphous Solids: Does Inertia Destroy Critical Behavior?, Physical Review Letters, 109, 2012, e105703

A. Hasan, C.E. Maloney
Inferring Elastic Properties of an fcc Crystal from Displacement Correlations: Sub-space Projection and Statistical Artifacts, Physical Review E 90, 87(5-1), 2012, e062309

A. Hasan, C.E. Malonewy
Saddle-node Scalings in Homogeneous Dislocation Nucleation, International Journal for Multiscale Computational Engineering 10, 2012, 101-108

D. Kaya, N. Green, C.E. Maloney, M.F. Islam
Density Invariant Vibrational Modes in Disordered Colloidal Crystals, Physical Review E, 83(5), 2011, e051404

K. Karimi, C.E. Maloney
Local Anisotropy in Globally Isotropic Granular Packings, Physical Review Letters, 107, 2011, e268001

SELECTED RESEARCH PROJECTS

CAREER: Plasticity and Jamming
Principal Investigator, National Science Foundation

CDSE: A Data-driven Statistical Approach to Aging and Elasticity in Colloidal Glasses
Principal Investigator, National Science Foundation

EDWIN MARENGO

Associate Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, Northeastern University, 1997
ece.neu.edu/people/marengo-fuentes-edwin

Scholarship focus: theoretical and applied electromagnetics, theoretical and applied optics, scattering theory, wave inverse problems, noniterative inverse scattering, physics-based signal processing and imaging, change detection theory and applications, compressive sensing, electromagnetic information theory, analysis and design of optical and quantum holographic detectors

Honors and awards: National Science Foundation CAREER Award

SELECTED PUBLICATIONS

E.A. Marengo
A New Theory of the Generalized Optical Theorem in Anisotropic Media, IEEE Transactions on Antennas and Propagation, 61, 2013, 2164-2179

E.A. Marengo, P. Berestesky
Cramer-rao Bound Study of Multiple Scattering Effects in Target Separation Estimation, International Journal of Antennas and Propagation, 572923, 2013, 1-10

E.A. Marengo
Inverse Diffraction Theory and Computation of Minimum Source Regions of far Fields, Mathematical Problems in Engineering, 513953, 2014, 1-18

E.A. Marengo, J. Tu
Optical Theorem for Transmission Lines, Progress in Electromagnetics Research B, 61, 2014, 253-268

E.A. Marengo
Multipole Theory and Algorithms for Target Support Estimation, International Journal of Antennas and Propagation, 515240, 2013, 1-15

E.A. Marengo, F.K. Gruber
Optical-theorem-based Coherent Scatterer Detection in Complex Environments, International Journal of Antennas and Propagation, 231729, 2013, 1-12

SELECTED RESEARCH PROJECTS

Wave-based Algorithms and Bounds for Target Support Estimation
Principal Investigator, Air Force Office of Scientific Research

JOSE MARTINEZ LORENZO

Assistant Professor, Mechanical and Industrial Engineering; jointly appointed, Electrical and Computer Engineering

PhD, University of Vigo, 2005
mie.neu.edu/people/martinez-lorenzo-jose-angel

Scholarship focus: devices, circuits and sensing; antenna analysis, modeling, design, and optimization; subsurface scattering analysis; computational methods of electromagnetics; novel radar system specification and design; explosives detection

SELECTED PUBLICATIONS

I.A. Osaretin, M.W. Shields, J.A. Martinez-Lorenzo, W.J. Blackwell
A Compact 118-GHz Radiometer Antenna for the Micro-Sized Microwave Atmospheric Satellite, IEEE Antennas & Wireless Propagation Letters, 13, 2014, 1533-1536

Y. Rodriguez-Vaqueiro, C. Rappaport, J.A. Martinez-Lorenzo, et al.
Fourier-based Imaging for Multistatic Radar Systems, IEEE Transactions on Microwave Theory and Techniques, 62(8), 2014, 1798-1810

Y. Alvarez, J.A. Martinez-Lorenzo, C. Rappaport, et al.
On the Combination of SAR and Model Based Techniques for High-Resolution Real-Time Two-Dimensional Reconstruction, IEEE Transactions on Antennas & Propagation, 62(10), 2014, 5180-5189

Y. Rodriguez-Vaqueiro, J.A. Martinez-Lorenzo
On the use of Passive Reflecting Surfaces and Compressive Sensing Techniques for Detecting Security Threats at Standoff Distances, International Journal on Antennas & Propagation, 248351, 2014, 1-8

J.A. Martinez-Lorenzo, F. Las-Heras, C. Rappaport, et al.
Sparse Array Optimization using Simulated Annealing and Compressed Sensing for Near-Field Millimeter Wave Imaging, IEEE Transactions on Antennas & Propagation, 62(4), 2014, 1716-1722

SELECTED RESEARCH PROJECTS

Advanced Algorithm Development for Multiband GPR Radar Detection of Buried Mines
Co-Principal Investigator, US Army Night Vision and Electronic Sensors Directorate

Advanced Imaging and Detection of Security Threats using Compressive Sensing
Principal Investigator, Department of Homeland Security

Advanced Mechanical-Electromagnetic Applications for next Generation Environmental Monitoring
Principal Investigator, National Oceanic and Atmospheric Administration

Multi-Modality Electromagnetic Detection and Localization of Implanted Explosives Using Ultra low Field MRI and Nuclear Quadrupole Resonance
Co-Principal Investigator, Defense Advanced Research Projects Agency

NICOL MCGRUER

Professor, Electrical and Computer Engineering; affiliated faculty: Mechanical and Industrial Engineering, Bioengineering

PhD, Michigan State University, 1983
ece.neu.edu/people/mcgruer-nicol

Scholarship focus: MEMS, NEMS, RF MEMS; nanotechnology; micro/nanofabrication; microsystems; microrelay; nanoswitch; microspectrometer; microfluidics; organic FETs, organic solar cells

Honors and awards: Søren Buus Outstanding Research Award, College of Engineering

SELECTED PUBLICATIONS

S.D. Berger, N.E. McGruer, G.G. Adams
Simulation of Dielectrophoretic Assembly of Carbon Nanotubes Using 3D Finite Element Analysis, Nanotechnology, 26(15), 2015, e155602

A. Basu, R.P. Hennessy, G.G. Adams, N.E. McGruer
Hot Switching Damage Mechanisms in MEMS Contacts - Evidence and Understanding, Journal of Micromechanics and Microengineering, 24, 2014, e105004

Y.-C. Wu, N. McGruer, G.G. Adams
Adhesive Slip Process Between a Carbon Nanotube and a Substrate, Journal of Physics D: Applied Physics, 46, 2013, e175305

R.P. Hennessy, A. Basu, G.G. Adams, N. McGruer
Hot-switched Lifetime and Damage Characteristics of MEMS Switch Contacts, Journal of Micromechanics and Microengineering, 23(5), 2013, e055003

H. Pan, Y.-C. Wu, G.G. Adams, G.P. Miller, N. McGruer
Interfacial Shear Stress Between Single-walled Carbon Nanotubes and Gold Surfaces With and without an Alkanethiol Monolayer, Journal of Colloid and Interface Science, 407, 2013, 133-139

C. Pramanik, Y. Li, A. Singh, W. Lin, J.L. Hodgson, J.B. Briggs, S. Ellis, P. Müller, N.E. McGruer, G.P. Miller
Water Soluble Pentacene, Journal of Materials Chemistry C, 1, 2013, 2193-2201

P. Ryan, Y.-C. Wu, S. Somu, G. Adams, N. McGruer
Single Walled Carbon Nanotube Electromechanical Switching Behavior with Shoulder Slip, Journal of Micromechanics and Microengineering, 21, 2011, e045028

SELECTED RESEARCH PROJECTS

PLASMID (Plasmonic Microelectromechanical Infrared Digitizer), Zero-Power Sensor
Co-Principal Investigator, Defense Advanced Research Projects Agency

Zero Power Sensors (ZePS), RF Wake-up
Co-Principal Investigator, Defense Advanced Research Projects Agency

STEPHEN MCKNIGHT

Professor, Electrical and Computer Engineering, Gordon Engineering Leadership Program

PhD, University of Maryland, 1976
ece.neu.edu/people/mcknight-stephen

Scholarship focus: submillimeter devices and materials; optical and infrared materials and systems; magnetic materials; engineering education

SELECTED PUBLICATIONS

S.W. McKnight, C. Zahopoulos
Scientific Foundations of Engineering, Cambridge University Press, 2015

S.W. McKnight, C. Zahopoulos
Scientific Foundations of Engineering: A New Curricular Model for Engineering Education, Proceeding of the 2105 ASEE Annual Conference and Exposition, Seattle, WA, 11316, 2015

S.W. McKnight, M.E. Pelletier, P. Leventman
A First-year 'Introduction to Engineering' Course at a Community College Using Hands-on MATLAB Experiment Control, Proceedings of the ASEE Annual Conference and Exposition, San Antonio, TX, 2012

C.N. Javdekar, S.W. McKnight, M.E. Pelletier
High-tech Tools for Freshman Engineers, Proceedings of the 2011 ASEE Annual Conference and Exposition, Vancouver, 2011

S.W. McKnight, M.B. Silevitch, P. Cheney, J. Beaty
A Graduate Curriculum for Engineering Leadership, Proc. Intern. Conf. on Engineering Leadership, Coimbra, Portugal, 2007

S.W. McKnight, E.B. Ekholm
Attenuation and Dispersion for High-Tc Superconducting Microstrip Lines, IEEE Transactions on Microwave Theory and Techniques, 38(4), 2002, 387-396

S.W. McKnight, G. Tadmor, M. Ruane, R. Rodriguez-Solis, G. Saulnier
Creating 'High-Tech Tools and Toys Lab' Leaning Environments at Four Universities, Proceeding of the Frontiers in Education Conference, Boston, MA, 2002, SE3-SE7

S.A. Oliver, P. Shi, W. Hu, H. How, S.W. McKnight, N.E. McGruer, P. Zavracky, C. Vittoria
Integrated Self-biased Hexaferrite Microstrip Circulators for Millimeter-wavelength Applications, IEEE Transactions on Microwave Theory and Techniques, 49(2), 2001, 385-387

M.B. Silevitch, S.W. McKnight, C. Rappaport
A Unified Discipline of Subsurface Sensing and Imaging Systems, Subsurface Sensing Technologies and Applications, 1, 2000, 1-21

EMANUEL MELACHRINOUDIS

Associate Professor, Associate Department Chair and Program Director of Industrial Engineering

PhD, University of Massachusetts, Amherst, 1980
mie.neu.edu/people/melachrinoudis-emanuel

Scholarship focus: deterministic operations research and multi-criteria optimization; facility location; supply chain, transportation and logistics; wireless sensor network lifetime maximization with sink mobility; network design for maximum survivability

Honors and awards: Outstanding Faculty Service Award, College of Engineering

SELECTED PUBLICATIONS

E. Melachrinoudis, E. Yavuz, R. Heydari
An O(m¬2+mn2) Algorithm for the Bi-objective Location Problem on a Network with Mixed Metrics, International Journal of Operational Research, 23, 2015, 427-450

E. Melachrinoudis, H. Min, C. Selneck
A Decision Support System for Developing the Managerial Policy of Urban Paratransit Services: A Case Study of the Massachusetts Bay Transit Authority, Journal of Transportation Management, 24, 2014, 37-62

N. Zaarour, E. Melachrinoudis, M. Solomon, H. Min
A Reverse Logistics Network Model for Handling Returned Products, International Journal of Engineering Business Management, 6, 2014, 1-10

N. Zaarour, E. Melachrinoudis, M. Solomon, H. Min
The Optimal Determination of the Collection Period for Returned Products in the Sustainable Supply Chain, International Journal of Logistics Research and Applications, 17, 2014, 35-45

R. Heydari, E. Melachrinoudis
Location of an Obnoxious Facility with Elliptic Maximin and Network Minisum Objectives, European Journal of Operational Research, 223(2), 2012, 452-460

M. Mekuria, P. Furth, E. Melachrinoudis
Optimization of Spacing of Transit Stops on a Realistic Street Network, Transportation Research Record, 4, 2012, 29-37

E. Melachrinoudis
The Location of Undesirable Facilities, Chapter 10, Foundations of Location Analysis, International Series in Operations Research and Management Science, Springer, New York, 2010, 207-239

J. Santivanez, E. Melachrinoudis, M. Helander
Network Location of a Reliable Center Using the Most Reliable Route Policy, Computers and Operations Research, 36, 2009, 1437-1460

S. Basagni, A. Carosi, E. Melachrinoudis, C. Petrioli, M.Z. Wang
Controlled Sink Mobility for Prolonging Wireless Sensor Networks Lifetime, Wireless Networks, 14, 2008, 831-858

WALEED MELEIS

Associate Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, University of Michigan, 1996
ece.neu.edu/people/meleis-waleed

Scholarship focus: combinatorial optimization; algorithm design and analysis; scheduling; machine learning; parallel computing

Honors and awards: Black Engineering Student Society Professor Appreciation Award; Invited to represent Northeastern at the National Academy of Engineering's Frontiers of Engineering Education Symposium; College of Engineering Outstanding Teacher Award; Martin W. Essigmann Outstanding Teaching Award, College of Engineering; Eta Kappa Nu Professor of the Year Award; Center for Innovative Course Design Teaching Award, EdTech

SELECTED PUBLICATIONS

D. Lazer, W. Meleis, B. Foucault Wells, C. Riedl, et al.
Performing Massively Open Online Social Experiments with Volunteer Science, Workshop on Crowdsourcing and Online Behavioral Experiments (COBE) at the ACM Conference on Economics and Computation, 2015

C. Wu, W. Li, W. Meleis
Rough Sets-based Prototype Optimization in Kanerva-based Function Approximation, IEEE/WIC/ACM International Conference on Intelligent Agent Technology, 2015

W. Meleis, et al.
Volunteer Science as a Platform for Studying Team Processes and Performance, Cooperative Team Networks Workshop at the International School and Conference on Network Science (NetSci), 2014

D. Brooks, S, Muftu, W. Meleis, R. Moore, K.-T. Wan, et al.
Detecting Solid Masses in Phantom Breast Using Mechanical Indentation, Experimental Mechanics, 54,(6), 2014, 935-942

C. Karbeyaz, B. Foucault Welles, J. Hoye, W. Meleis, D. Lazer, et al.
Information Navigation and Hidden Profile Experiments on the Volunteer Science Web Laboratory, International Sunbelt Social Network Conference (Sunbelt XXXIV), Florida, US, 2014

J. Tai, J. Zhang, J. Li, W. Meleis, N. Mi,
ArA: Adaptive Resource Allocation for Clouds under Burst Workloads, Proceedings of the IEEE International Performance Computing and Communications Conference (IPCCC), Orlando, Florida, 2011, 1-8

K. Chowdhury, R. Doost-Mohammady, W. Meleis, et al.
Cooperation and Communication in Cognitive Radio Networks based on TV Spectrum Experiments, Proceedings of IEEE International Symposium on a World of Wireless Mobile and Multimedia Networks (WoWMoM), Lucca, Italy, 2011, 1-9

TOMMASO MELODIA

Associate Professor, Electrical and Computer Engineering

PhD, Georgia Institute of Technology, 2007
ece.neu.edu/people/melodia-tommaso

Scholarship focus: modeling, optimization, and experimental evaluation of wireless networked systems; networked implantable medical systems; multimedia sensor networks; secure tactical cognitive radio networks; underwater networks; mobile cloud computing

Honors and awards: National Science Foundation CAREER Award

SELECTED PUBLICATIONS

N. Cen, Z. Guan, T. Melodia
Multi-view Wireless Video Streaming Based on Compressed Sensing: Architecture and Network Optimization, Proceedings of ACM International Symposium on Mobile Ad Hoc Networking and Computing, 2015, 1-10

G.E. Santagati, T. Melodia
U-Wear: Software-defined Ultrasonic Networking for Wearable Devices, Proceedings of ACM Conference on Mobile Systems, Services and Applications (MOBISYS), Florence, Italy, May 2015, 1-16

Z. Guan, G.E. Santagati, T. Melodia
Ultrasonic Intra-body Networking: Interference Modeling, Stochastic Channel Access and Rate Control, Proceedings of the IEEE Conference on Computer Communications, Hong Kong, 2015, 1-9

S. Pudlewski, N. Cen, Z. Guan, T. Melodia
Video Transmission Over Lossy Wireless Networks: A Cross-Layer Perspective, IEEE Journal of Selected Topics in Signal Processing, 9(1), 2015, 6-21

E. Demirors, G. Sklivanitis, G.E. Santagati, T. Melodia, et al.
Design of a Software-defined Underwater Acoustic Modem with Real-time Physical Layer Adaptation Capabilities, Proceedings of the International Conference on Underwater Networks and Systems, 2014, 1-8

SELECTED RESEARCH PROJECTS

CAREER: Towards Ultrasonic Networking for Implantable Biomedical Devices
Principal Investigator, National Science Foundation

Networking Medical Implants Through Ultrasounds
Principal Investigator, National Science Foundation

Small:Towards Real-Time Video Streaming in the Internet of Underwater Things
Principal Investigator, National Science Foundation

Toward Distributed Decision Making in Cognitive Radio Ad-hoc Networks Based on Bilevel Equilibrium Programming
Principal Investigator, National Science Foundation

Toward Maximal Spectral-efficiency Networking
Principal Investigator, Air Force Research Laboratory

HAMEED METGHALCHI

Professor, Mechanical and Industrial Engineering

ScD, Massachusetts Institute of Technology, 1980
mie.neu.edu/people/metghalchi-mohamad

Scholarship focus: fundamentals of combustion such as burning speed and onset of autoignition measurement and flame stability analysis; development of chemistry reduction such as rate-controlled constrained-equilibrium method; non-equilibrium thermodynamics

Honors and awards: American Society of Mechanical Engineers James H. Potter Gold Medal; American Society of Mechanical Engineers Edward Obert Award; American Society of Mechanical Engineers Dedicated Service Award; Editor in Chief, American Society of Mechanical Engineers Journal of Energy Resources Technology; Fellow, American Society of Mechanical Engineers

SELECTED PUBLICATIONS

E. Rokni, A. Mossadagh, O. Askari, H. Metghalchi
Measurement of Laminar Burning Speed and Investigation of Flame Stability of Acetylene (C_2H_2)/air Mixtures, ASME Journal of Energy Resources Technology, 137, 2015, e012204

O. Askari, M. Janbozorgi, R. Greig, A. Moghaddas, H. Metghalchi
Developing Alternative Approaches to Predicting the Laminar Burning Speed of Refrigerants Using the Minimum Ignition Energy, Science and Technology for the Built Environment, 21(2), 2015, 220-227

G. Nicolas, H. Metghalchi
Comparison Between RCCE and Shock Tube Ignition Delay Time at Low Temperatures, ASME Journal of Energy Resources Technology, 137, 2015, e062203

G. Nicolas, M. Janbozorgi, H. Metghalchi
Constrained-equilibrium Modeling of Methane Oxidation in Air, ASME Journal of Energy Resources Technology, 136(3), 2014, 1-7

A. Moghaddas, C. Bennett, E. Rokni, H. Metghalchi
Laminar Burning Speeds and Flame Structures of Mixtures of Difluoromethane (HFC-32) and 1,1-Difluoroethane (HCF-152a) with Air at Elevated Temperatures and Pressures, HVAC&R Research, 20, 2014, 42-50

O. Askari, H. Metghalchi, S.K. Hannani, H. Hemmati, R. Ebrahimi
Lean Partially Premixed Combustion Investigation of Methane Direct-injection under Different Characteristic Parameters, ASME Journal of Energy Resources Technology, 136, 2014, 1-7

SELECTED RESEARCH PROJECTS

Combustion Research
Principal Investigator, Novatio Engineering

LSAMP Educational Research Project: Retention of URM Engineering Students through Practice-oriented Experiential Education
Principal Investigator, National Science Foundation

NINGFANG MI

Assistant Professor, Electrical and Computer Engineering

PhD, College of William and Mary, 2009
ece.neu.edu/people/mi-ningfang

Scholarship focus: capacity planning; mapreduce/hadoop scheduling; cloud computing; resource management; performance evaluation; workload characterization; simulation; virtualization

Honors and awards: National Science Foundation CAREER Award; IBM Faculty Award; Air Force Office of Scientific Research Young Investigator Award

SELECTED PUBLICATIONS

J. Tai, D. Liu, Z. Yang, X. Zhu, J. Lo, N. Mi
  Improving Flash Resource Utilization at Minimal Management Cost in Virtualized Flash-based Storage Systems, IEEE Transactions on Cloud Computing (TCC), 1, 2015, 1-14

Y. Yao, J. Wang, B. Sheng, C.C. Tan, N. Mi
  Self-adjusting Slot Configurations for Homogeneous and Heterogeneous Hadoop Clusters, IEEE Transactions on Cloud Computing (TCC), 2015, 1-14

J. Tai, B. Sheng, Y. Yao, N. Mi
  SLA-Aware Data Migration in A Shared Hybrid Storage Cluster, Journal of Cluster Computing (CC), 2015, 1-13

Y. Yao, J. Wang, B. Sheng, J. Lin, N. Mi
  HaSTE: Hadoop YARN Scheduling Based on Task-Dependency and Resource-demand, IEEE International Conference on Cloud Computing (Cloud'14), Anchorage, AK, 2014, 184-191

Y. Yao, J. Tai, B. Sheng, N. Mi
  LsPS: A Job Size-based Scheduler for Efficient Assignments in Hadoop, IEEE Transactions on Cloud Computing (TCC), 99, 2014, 1-14

SELECTED RESEARCH PROJECTS

AFOSR YIP: Creating an Integrated Management Layer to Administer Heterogeneous Resources in Dynamic Workflow Clusters
  Principal Investigator, Air Force Office of Scientific Research

CAREER: Capacity Planning Methodologies for Large Clusters with Heterogeneous Architectures and Diverse Applications
  Principal Investigator, National Science Foundation

MARILYN MINUS

Associate Professor, Mechanical and Industrial Engineering

PhD, Georgia Institute of Technology, 2008
mie.neu.edu/people/minus-marilyn

Scholarship focus: process-structure-properties relationships in polymer-based nano-composites fibers; polymer/nano-carbon interfacial interactions and interphase formations; lightweight composite materials; carbon-carbon composites

Honors and awards: National Science Foundation CAREER Award

SELECTED PUBLICATIONS

Y. Zhang, N. Tajaddod, K. Song, M.L. Minus
  Low Temperature Graphitization of Interphase Polyacrylonitrile (PAN), Carbon, 91, 2015, 479-493

J. Meng, N. Tajaddod, S.W. Cranford, M.L. Minus
  Polyethylene Assisted Exfoliation of Hexagonal Boron Nitride in Composite Fibers: A Combined Experimental & Computational Study, Macromolecular Chemistry and Physics, 216(8), 2015, 847-855

Y. Zhang, M.L. Minus
  Characterization and Structural Analysis of Solution-Grown Polyacrylonitrile-co-Methacrylic Acid (PAN-co-MAA) Single Crystals, Macromolecules, 47(12), 2014, 3987-3996

E.C. Green, Y. Zhang, M.L. Minus
  Understanding the Effects of Nano-Carbons on Flexible Polymer Chain Orientation and Crystallization: Polyethylene/Carbon Nano-Chip Hybrid Fibrillar Crystal Growth, Journal of Applied Polymer Science, 131(18), 2014, 40763

SELECTED RESEARCH PROJECTS

CAREER: Understanding Directionally Templated Interphase Processing-structure Development and Relationships in Polymer Nano-composite Materials
  Principal Investigator, National Science Foundation

EAGER: Dispersion and Selective Positioning of Reinforcement in Polymer Matrix Composites
  Co-Principal Investigator, National Science Foundation

Evolution of Interphase-polyacrylonitrile (i-PAN) Structure during Carbon Fiber Processing
  Principal Investigator, Defense Advanced Research Projects Agency

Multi-scale Characteristics of Bone Toughness
  Co-Principal Investigator, National Science Foundation

Studying the Dependency of Interfacial Formation with Carbon Nanotube Length for Stress Transfer in Polymer Composite Fibers
  Principal Investigator, Air Force Office of Scientific Research

HOSSEIN MOSALLAEI

Associate Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, University of California, Los Angeles, 2001
ece.neu.edu/people/mosallaei-hossein

Scholarship focus: electromagnetics and optics, quantum systems, nanoscale materials and metamaterials, nanoantennas, THz-IR Devices, multiscale computation and mathematical-numerical models

SELECTED PUBLICATIONS

S. Valleau, S.K. Saikin, M. Rostami, H. Mosallaei, et al.
Electromagnetic Study of the Chlorosome Antenna Complex of Chlorobium-tepidum, ACS Nano, 8(4), 2014, 3884-3894

J. Cheng, H. Mosallaei
Optical Metasurfaces for Beam Scanning in Space, Optics Letters, 39(9), 2014, 2719-2722

M. Farmahini-Farahani, J. Cheng, H. Mosallaei
Metasurfaces Nanoantennas for Light Processing, Journal of the Optical Society of America B, 30(9), 2013, 2365-2370

B. Memarzadeh, H. Mosallaei
Multimaterial Loops as the Building Block for a Functional Metasurface, Journal of the Optical Society of America B, 30(7), 2013, 1827-1834

E. Chernobrovkina, S.K. Saikin, S. Valleau, H. Mosallaei, et al.
Parametric Hierarchical Matrix Approach for the Wideband Optical Response of Large-scale Molecular Aggregates, Journal of Applied Physics, 114, 2013, e164315

J. Cheng, W.L. Wang, H. Mosallaei, E. Kaxiras
Surface Plasmon Engineering in Graphene Functionalized with Organic Molecules: A multi-scale Theoretical Investigation, Nano Letters, 14(1), 2013, 50-56

SELECTED RESEARCH PROJECTS

Computationally-designed Materials for Wave Synthesis
Principal Investigator, Office of Naval Research

Designer Solids Nanoantennas and Material
Principal Investigator, Army Research Laboratory

Large-area, 3D Optical Metaminerals with Tunability and Low Loss
Co-Principal Investigator, Office of Naval Research

Multiscale Mathematical Modeling and Design Realization of Novel 2D Functional Materials
Co-Principal Investigator, Office of Naval Research

Nanoantennas for Engineering Waves on the Surface
Principal Investigator, Air Force Office of Scientific Research

SİNAN MÜFTÜ

Professor, Mechanical and Industrial Engineering; affiliated faculty, Bioengineering, Civil and Environmental Engineering

PhD, University of Rochester, 1994
mie.neu.edu/people/muftu-sinan

Scholarship focus: mechanics and tribology of axially moving materials, webs; numerical simulation of tissue healing and bone remodeling; high velocity impact of micron scale particles

Honors and awards: Fellow, American Society of Mechanical Engineers; Søren Buus Outstanding Research Award, College of Engineering; Martin W. Essigman Outstanding Teaching Award, College of Engineering

SELECTED PUBLICATIONS

H. Yang, J. B. C. Engelen, A. Pantazi, S. Müftü, et al.
Mechanics of Lateral Positioning of a Translating Tape due to Tilted Rollers: Theory and Experiments, International Journal of Solids and Structures, 66, 2015, 88–97

S. Müftü, W. Meleis, R.H. Moore, D. Kopans, K.T. Wan, et al.
Detecting Solid Masses in Phantom Breast Using Mechanical Indentation, Experimental Mechanics, 54(6), 2014, 935-942

T. Hu, S. Zhalehpour, A. Gouldstone, S. Müftü, T. Ando,
A Method for the Estimation of Interface Temperature in Ultrasonic Joining, Metallurgical and Materials Transactions A, 45(5), 2014, 2545-2552

K. Michalakis, P. Calvani, S. Müftü, A. Pissiotis, H. Hirayama
The Effect of Different Implant-abutment Connection on Screw Joint Stability, Journal of Oral Implantology, 40(2), 2014, 146-152

J. Aguirrebeitia, S. Müftü, M. Abasolo, J. Vallejo
Experimental Study of the Removal Force in Conical Implant-abutment Interfaces, Journal of Prosthetic Dentistry, 111(4), 2014, 293-300

J. Shi, S. Müftü, A.Z. Gu, K.T. Wan
Adhesion of a Cylindrical Shell in the Presence of DLVO Surface Potential, Journal of Applied Mechanics, 80(6), 2013, e061007

B. Yildirim, S. Müftü
Impact of High Velocity Particles onto a Rough Surface, International Journal of Solids and Structures, 49(11-12), 2012, 1375-1386

SELECTED RESEARCH PROJECTS

A Novel Biomechanical Model of Bacterial Adhesion and Aggregation
Co-Principal Investigator, National Science Foundation

Collaborative Research: Mechano-Lipidomics and Mechano-Cytosis of Drug Delivery Liposomes
Co-Principal Investigator, National Science Foundation

Fundamentals of Bonding and Kinetic Consolidation Processes,
Co-Principal Investigator, National Science Foundation

Improving Theoretical Models of Advanced Tape Transport Systems
Principal Investigator, Oracle Corporation

SHASHI MURTHY

Professor, Chemical Engineering; affiliated faculty; Bioengineering, Mechanical and Industrial Engineering

PhD, Massachusetts Institute of Technology, 2003
che.neu.edu/people/murthy-shashi

Scholarship focus: microfluidic isolation of stem and progenitor cells, point-of-care diagnostics, cell surface phenomena during microfluidic flow, nanoscale probes for cell stimulation, and biopassive/bioactive coatings for neurological implants

Honors and awards: College of Engineering Faculty Fellow; National Science Foundation CAREER Award; Søren Buus Outstanding Research Award, College of Engineering

SELECTED PUBLICATIONS

D.A.L. Vickers, E. Chory, S.K. Murthy
Separation of Two Phenotypically Similar Cell Types via a Single Common Marker in Microfluidic Channels, Lab on a Chip, 12, 2012, 3399-3407

D.A.L. Vickers, S.K. Murthy
Receptor Expression Changes as a Basis for Endothelial Cell Identification Using Microfluidic Channels, Lab on a Chip, 10, 2010, 2380-2386

B.D. Plouffe, T. Kniazeva, J.E. Mayer, S.K. Murthy, V.L. Sales
Development of Microfluidics as Endothelial Progenitor Cell Capture Technology for Cardiovascular Tissue Engineering and Diagnostic Medicine, FASEB Journal, 23, 2009, 3309-3314

J.V. Green, S.K. Murthy
Microfluidic Enrichment of a Target Cell Type from a Heterogeneous Suspension by Adhesion-Based Negative Selection, Lab on a Chip, 9, 2009, 2245-2248

B.D. Plouffe, D.N. Njoka, J. Harris, J. Liao, S.K. Murthy, et al.
Peptide-Mediated Selective Adhesion of Smooth Muscle and Endothelial Cells in Microfluidic Shear Flow, Langmuir, 23, 2007, 5050-5055

SELECTED RESEARCH PROJECTS

CAREER: Understanding the Role of Cell Surface Markers in Microfluidic Cell Separation- An Integrated Research and Education Program
Principal Investigator, National Science Foundation

Cleavable Surface Coatings for Microfluidic Devices
Principal Investigator, US-Israel Binational Science Foundation

Identification and Measurement of Biomarkers to Predict and Prevent Behavioral Mental Illness
Co-Principal Investigator, Northeastern University

Microfluidic Cell Separation for Tissue Engineering and Regenerative Medicine
Principal Investigator, National Institutes of Health

ANDREW MYERS

Assistant Professor, Civil and Environmental Engineering

PhD, Stanford University, 2009
cive.neu.edu/people/myers-andrew

Scholarship focus: offshore wind structures; multi-scale experimental testing of structures; computational simulation; fracture and damage mechanics of metals; probabilistic modeling

Honors and awards: Civil and Environmental Engineering Excellence in Teaching Award

SELECTED PUBLICATIONS

J. Johansson, F. Løvholt, S.R. Arwade, A.T. Myers, et al.
Foundation Damping and the Dynamics of Offshore Wind Turbine Monopiles, Renewable Energy, 80, 2015, 724-736

V. Valamanesh, A.T. Myers, S.R. Arwade
Multivariate Analysis of Extreme Metocean Conditions for Offshore Wind Turbines, Structural Safety, 55, 2015, 60-69

A.T. Myers, S. Arwade, V. Valamanesh, S. Hallowell, W. Carswell
Strength, Stiffness, Resonance and the Design of Offshore Wind Turbine Monopiles, Engineering Structures, 100, 2015, 332-341

S. Hallowell, A. T. Myers, S.R. Arwade
Variability of Breaking Wave Characteristics and Impact Loads on Offshore Wind Turbines Supported by Monopiles, Wind Energy, 2015, 1-12

V. Valamanesh, A.T. Myers
Aerodynamic Damping and Seismic Response of Horizontal Axis Wind Turbine Towers, Journal of Structural Engineering, 140(11), 2014, e04014090

K.Wei, S.R. Arwade, A.T. Myers
Incremental Wind-wave Analysis of the Structural Capacity of Offshore Wind Turbine Support Structures Under Extreme Loading, Engineering Structures, 79, 2014, 58-69

SELECTED RESEARCH PROJECTS

Collaborative Research: Reliability-based Hurricane Risk Assessment for Offshore Wind Farms
Principal Investigator, National Science Foundation

Reliability-based Hurricane Risk Assessment for Offshore Wind Farms
Principal Investigator, National Science Foundation

Coll. Research: GOALI: Enabling Advanced Wind Turbine Tower Manufacturing with Reliability-based Design
Principal Investigator, National Science Foundation

Risk and Decision-making for the Hurricane Threat to Offshore Wind Farms
Principal Investigator, Massachusetts Clean Energy Center

Keystone Tower Systems – Wind Tower Demonstration Project
Co-Principal Investigator, Massachusetts Clean Energy Center

UICHIRO NARUSAWA

Associate Professor, Mechanical and Industrial Engineering; affiliated faculty, Bioengineering

PhD, University of Michigan, 1972
mie.neu.edu/people/narusawa-uichiro

Scholarship focus: biomechanics on respiratory systems; turbine blade cooling

SELECTED PUBLICATIONS

F. Forghan, O. Askari, U. Narusawa, H. Metghalchi
Computational Design of Turbine Blade Film Cooling with Expanded Exit Holes, Proceedings of ASME Turbo Expo, 2015

M. Nabian, U. Narusawa
Ventilator Optimization from P-V (Pressure-Volume) Curve Analyses of Animal Models for Lung Injury, International Mechanical Engineering Congress & Exposition (IMECE), 2015, 52472

F. Forghan, O. Askari, U. Narusawa, H. Metghalchi
Film Cooling of Turbine Blade Surface with Extended Exit Holes, Proceedings of the ASME 2014 8th International Conference on Energy Sustainability and 12th Fuel Cell Sci. Eng. Tech. Conf., ES-FuelCell, 2014, 1-7

F. Forghan, U. Narusawa, H. Metghalchi
Discharge Coefficient of an Expanded Exit Hole for Film Cooling of Turbine Blades, American Institute of Aeronautics and Astronautics Journal of Propulsion Power, 26, 2010, 1322-1325

H. Liu, P.R. Patil, U. Narusawa
On Darcy-brinkman Equation: Viscous Flow Between Plates Packed with Regular Square Arrays of Cylinders, Entropy, 9, 2007, 118-131

R. Amini, K. Creeden, U. Narusawa
A Mechanistic Model for Quasi-static Pulmonary Pressure-Volume Curves for Inflation, Journal of Biomechanical Engineering, 127, 2005, 619-629

H. Liu, U. Narusawa
Flow-induced Endothelial Surface Reorganization and Minimization of Entropy Generation Rate, ASME Journal of Biomechanical Engineering, 126, 2004, 346-350

HAMID NAYEB-HASHEMI

Professor, Mechanical and Industrial Engineering; affiliated faculty, Bioengineering

PhD, Massachusetts Institute of Technology, 1982
mie.neu.edu/people/nayeb-hashemi-hamid

Scholarship focus: biomechanics and mechanics

Honors and awards: Fellow, American Society of Mechanical Engineers

SELECTED PUBLICATIONS

J. Papadopoulos, H. Nayeb-Hashemi, A. Vaziri, et al.
Buckling of Regular, Chiral and Hierarchical Honeycombs Under a General Macroscopic Stress State, Proceedings of The Royal Society A, 470(2167), 2014, 1-23

S. Banijamali, A. Vaziri, H. Nayeb-Hashemi, et al.
Effects of Different Loading Patterns on the Trabecular Bone Morphology of the Proximal Femur Using Adaptive Bone Remodeling, Journal of Biomechanical Engineering, ASME, 137(1), 2014, 1-10

A. Ajdari, A.Hamouda, H. Nayeb-Hashemi, A. Vaziri, et al.
Impact Resistance and Energy Absorption of Regular and Functionally Graded Hexagonal Honeycombs with Cell Wall Material Strain Hardening, International Journal of Mechanical Sciences, 89, 2014, 413-422

P. Bloori-Zadeh, S.C. Corbett, H. Nayeb-Hashemi
In-Vitro Calcification Study of Polyurethane Heart Valves, Material Science and Engineering C, 35, 2014, 335-340

J.Papadopoulos, A. Hamouda, H. Nayeb-Hashemi, A.Vaziri, et al.
Mechanics of Anisotropic Hierarchical Honeycombs, International Journal of Mechanical Sciences, 81, 2014, 126-136

H. Abdi, H. Nayeb-Hashemi, A. Hammuda, A. Vaziri, et al.
Torsional Dynamic Response of Shaft with Longitudinal and Circumferential Cracks, Journal of Vibration and Acoustics, ASME, 136(6), 2014, 1-8

SELECTED RESEARCH PROJECTS

High-Performance Biodegradable Composites from Qatari Date Palm Waste
Principal Investigator, National Priorities Research Program

Knee Injury Prevention and Osteoarthritis Risk in Obesity
Co-Principal Investigator, National Priorities Research Program

Novel Multi Functional Composite Sandwich Panel
Principal Investigator, National Priorities Research Program

MARK NIEDRE

Associate Professor, Electrical and Computer Engineering; jointly appointed, Bioengineering

PhD, University of Toronto, 2004
ece.neu.edu/people/niedre-mark

Scholarship focus: biomedical optics and non-invasive imaging, rare cell detection and tracking in the body, ultrafast time-domain diffuse optical imaging, image reconstruction and biomedical signal processing

Honors and awards: College of Engineering Faculty Fellow; Massachusetts Life Sciences Center New Investigator Award; Søren Buus Outstanding Research Award, College of Engineering

SELECTED PUBLICATIONS

S. Markovic, S. Li, M. Niedre
Performance of Computer Vision In Vivo Flow Cytometry with Low Fluorescence Contrast, Journal of Biomedical Optics, 20(3), 2015, 35005

V. Pera, D.H. Brooks, M. Niedre
On the use of Cramer-Rao Bounds in diffuse optical Tomography, Journal of Biomedical Optics, 19(2), 2014, 025002

S. Markovic, B. Li, V. Pera, M. Sznaier, O. Camps, M. Niedre
A Computer Vision Approach to RareCell In Vivo Flow Cytometry, Cytometry A, 83A, 2013, 1113-1123

N. Pestana, L. Mortensen, J. Runnels, M. Niedre, et al.
An Improved Prototype Diffuse Fluorescence Flow Cytometer for High Sensitivity Detection of Rare Circulating Cells In Vivo, Journal of Biomedical Optics, 18(7), 2013, 77002

Y. Mu, N. Valim, M. Niedre
Evaluation of a Fast Single-photon Avalanche Photodiode for Measurement of Early Transmitted Photons Through Diffusive Media, Optics Letters, 38(12), 2013, 2098-2100

N. Valim, J. Brock, M. Leeser, M. Niedre
The Effect of Temporal Impulse Response on Experimental Reduction of Photon Scatter in Time-resolved Diffuse Optical Tomography, Physics in Medicine and Biology, 58(2), 2013, 335-349

SELECTED RESEARCH PROJECTS

High Resolution Multiplexed Fluorescence Tomography
Principal Investigator, National Institutes of Health

Ultra-rare Cell In Vivo Flow Cytometry
Principal Investigator, National Institutes of Health

Detecting Blood Flow Changes in Bone
Principal Investigator, Northeastern University

Detecting, Counting and Tracking Rare Circulating Cells in Vivo
Principal Investigator, Northeastern University

DONALD O'MALLEY

Associate Professor, Biology; affiliated faculty, Bioengineering

PhD, Harvard, 1989
bioe.neu.edu/people/omalley-donald

Scholarship focus: cellular and systems neurobiology biological imaging, cognitive neurodynamics, neuroethology

SELECTED PUBLICATIONS

D. O'Malley, M. Orger, F. Engert
Neural Control and Modulation of Swimming Speed in the Larval Zebrafish, Neuron, 83(3), 2014, 692-707

L. Ricci, C.H. Summers, E.T. Larson, D.M. O'Malley, R.H. Melloni
Development of Aggressive Phenotypes: Interactions of Age, Experience, and Social Status, Animal Behaviour, 86(2), 2013, 245-252

R.E. Westphal, D.M. O'Malley
Fusion of Locomotor Maneuvers, and Improving Sensory Capabilities, Give Rise to the Flexible Homing Strikes Of Juvenile Zebrafish, Front, Neural Circuits, 7(108), 2013, 1-18

N. Sankrithi, D. O'Malley
Activation of a Multisensory, Multifunctional Nucleus in the Zebrafish Midbrain During Diverse Locomotor Behaviors, Neuroscience, 166(3), 2010, 970-993

M. Kamali, L. Day, D. Brooks, X. Zhou, D. O'Malley
Automated Identification of Neurons in 3D Confocal Datasets From Zebrafish Brainstem, Journal of Microscopy, 233(1), 2009, 114-131

MARVIN ONABAJO

Assistant Professor, Electrical and Computer Engineering

PhD, Texas A&M University, 2011
ece.neu.edu/people/onabajo-marvin

Scholarship focus: design of analog, radio frequency, and mixed-signal integrated circuits; built-in test and calibration techniques for systems-on-a-chip; on-chip temperature sensors for thermal monitoring and built-in testing

Honors and awards: National Science Foundation CAREER Award; Martin Essigman Outstanding Teaching Award, College of Engineering

SELECTED PUBLICATIONS

L. Xu, J. Feng, Y. Ni, M. Onabajo
Test Signal Generation for the Calibration of Analog Front-end Circuits in Biopotential Measurement Applications, Proceedings of IEEE 57th International Midwest Symposium on Circuits and Systems, 2014, 949-952

C.-H. Chang, M. Onabajo
IIP3 Enhancement of Subthreshold Active Mixers, IEEE Transactions on Circuits and Systems II: Express Briefs, 60(11), 2013, 731-735

M. Onabajo, J. Silva-Martinez
Analog Circuit Design for Process Variation-Resilient Systems-on-a-Chip, New York, NY, Springer, 2012

H. Chauhan, Y. Choi, M. Onabajo, I. Jung, Y.-B. Kim
Accurate and Efficient On-chip Spectral Analysis for Built-in Testing and Calibration Approaches, IEEE Transactions on Very Large Scale Integration (VLSI) Systems, 22(3), 2014, 497-506

C.-J. Park, M. Onabajo, J. Silva-Martinez
External Capacitor-less Low Drop-out Regulator with 25dB Superior Power Supply Rejection in the 0.4-4MHz Range, IEEE Journal of Solid-State Circuits, 27(2), 2014, 486-501

SELECTED RESEARCH PROJECTS

CAREER: Low-Power Transceiver Design Methods for Wireless Medical Monitoring
Principal Investigator, National Science Foundation

Integrated Self-calibrated Analog Front-end for Biopotential and Bioimpedance Measurements
Principal Investigator, National Science Foundation

RF Power Amplifier Linearization with Digital Predistortion
Principal Investigator, Analog Devices, Incorporated

MARY JO ONDRECHEN

Professor, Chemistry; affiliated faculty, Bioengineering

PhD, Northwestern University, 1978
bioe.neu.edu/people/ondrechen-mary-jo

Scholarship focus: enzyme catalysis; functional genomics; modeling of enzyme substrate interactions; drug discovery; bioinformatics; protein design

SELECTED PUBLICATIONS

C.L. Mills, P.J. Beuning, M.J. Ondrechen
Biochemical Functional Predictions for Protein Structures of Unknown or Uncertain Function, Computational and Structural Biotechnology Journal, 13, 2015, 182-191

H.R. Brodkin, N.A. DeLateur, S. Somarowthu, C.L. Mills, W.R. Novak, P.J. Beuning, D. Ringe, M.J. Ondrechen
Prediction of Distal Residue Participation in Enzyme Catalysis, Protein Science, 24(5), 2015, 762-778

R.N. Hanson, P. Tongcharoensirikul, K. Barnsley, M.J. Ondrechen, A. Hughes, E.R. DeSombre
Synthesis and Evaluation of 2-halogenated-1,1-bis(4-hydroxyphenyl)-2-(3-hydroxyphenyl)-ethylenes as Potential Estrogen Receptor-targeted Radiodiagnostic and Radiotherapeutic Agents, Steroids, 96, 2015, 50-62

R. Thomas, J. Lee, V. Chevalier, S. Sadler, K. Selesniemi, S. Hatfield, M. Sitkovsky, M.J. Ondrechen, G.B. Jones
Design and Evaluation of Xanthine Based Adenosine Receptor Antagonists: Potential Hypoxia Targeted Immunotherapies, Bioorganic and Medicinal Chemistry, 21, 2013, 7453-7464

Z. Wang, P. Yin, J.S. Lee, R. Parasuram, S. Somarowthu, M.J. Ondrechen
Protein Function Annotation with Structurally Aligned Local Sites of Activity (SALSAs), BMC Bioinformatics, 14(Suppl 3) 2013

SELECTED RESEARCH PROJECTS

Chemical Signatures for the Discovery of Protein Function
Principal Investigator, National Science Foundation

Distal Residues in Enzyme Catalysis and Protein Design
Principal Investigator, National Science Foundation

SARAH OSTADABBAS

ADVANCE Faculty Fellow, 2015/16; Assistant Professor, 2016, Electrical and Computer Engineering

PhD, University of Texas at Dallas, 2013

Scholarship focus: computer-aided decision making, human-machine interface, medical sensing and diagnostic systems, telemedicine, embedded software and hardware co-design

SELECTED PUBLICATIONS

S. Ostadabbas, M. Nourani, R. Yousefi, M. Pompeo
A Knowledge-based Modeling for Plantar Pressure Image Reconstruction, IEEE Transactions on Biomedical Engineering, 61(10), 2014, 2538-2549

R. Yousefi, M. Nourani, S. Ostadabbas, I, Panahi
A Motion-tolerant Adaptive Algorithm for Wearable Photoplethysmographic Biosensors, IEEE Transactions on Information Technology in BioMedicine, 18(2), 2014, 670-681

S. Ostadabbas, M. Nourani, M. Pompeo
Pressure Ulcer Studies: A Review from an Engineering Perspective, IEEE Reviews in Biomedical Engineering, 2014

H. Ghasemezadeh, S. Ostadabbas, E. Guenterberg, et al.
Wireless Medical Embedded Systems: A Review of Signal Processing Techniques for Classification, IEEE Sensors Journal, 13(2), 2013, 423-437 (Ranked Top 20 Accessed Articles in First Half of 2013)

S. Ostadabbas, R. Yousefi, M. Nourani, M. Faezipour, et al.
A Resource-Efficient Planning for Pressure Ulcer Prevention, IEEE Transactions on Information Technology in BioMedicine (TITB), 16(6), 2012, 1265-1273

TASKIN PADIR

Associate Professor, Electrical and Computer Engineering

PhD, Purdue University, 2004
ece.neu.edu/people/padir-taskin

Scholarship focus: modeling and control of robot systems; human-in-the-loop robot control; intelligent vehicles; and realization of medical cyber-physical systems

Scholarship focus: Kalenian Award for Entrepreneurial Spirit, HEART: Humans Empowered with Assistive Robot Technologies; Romeo L. Moruzzi Young Faculty Award for Innovation in Undergraduate Education

SELECTED PUBLICATIONS

M. DeDonato, V. Dimitrov, F. Polido, T. Padir, et. al.
Human-in-the-loop Control of a Humanoid Robot for Disaster Response: A Report from the DARPA Robotics Challenge Trials, Journal of Field Robotics, Special Issue on the DARPA Robotics Challenge Trials, 32(2), 2015, 275-292

D. Sinyukov, R. Desmond, M. Dickerman, T. Padir
Multi-modal Control Framework for a Semi-autonomous Wheelchair Using Modular Sensor Designs, Journal of Intelligent Service Robotics, 7(3), 2014, 145-155

T. Padir, C.S. Ritchie, T.K. Houston, et al.
Robot-assisted Home Hazard Assessment for Fall Prevention: A Feasibility Study, Journal of Telemedicine and Telecare, 22(1), 2014, 3-10

T. Padir, L. Lai, T.R. Eisenbarth, L. Venkatasubramanian, et al.
Security of Autonomous Systems Employing Embedded Computing and Sensors, Micro, IEEE, 33(1), 2013, 80-86

T. Padir, G.S. Fischer, S. Chernova, M.A. Gennert, et al.
A Unified and Integrated Approach to Teaching a Two-course Sequence in Robotics Engineering, Journal of Robotics and Mechatronics, Special Issue on Education of Robotics and Mechatronics, 23(5), 2011, 1-11

SELECTED RESEARCH PROJECTS

Enhancing Disabilities Engineering Research and Education Through Robotics Capstone Projects
Principal Investigator, National Science Foundation

Holistic Design Methodology for Automated Implementation of Human-in-the-loop Cyber-physical Systems
Co-Principal Investigator, National Science Foundation

Nested Control of Assistive Robots Through Human Intent Inference
Co-Principal Investigator, National Science Foundation

Realization of a Medical Cyber-physical System to Enhance Safety of Ebola Workers
Principal Investigator, National Science Foundation

Systems, Software, and Simulation: Meeting the DARPA Robotics Challenge
Co-Principal Investigator, Defense Advanced Research Projects Agency

RUPAL PATEL

Professor, Communication Science and Disorders; jointly appointed, College of Computer and Information Science; affiliated faculty: Bioengineering, Electrical and Computer Engineering

PhD, University of Toronto, 2000
ece.neu.edu/people/patel-rupal

Scholarship focus: speech sciences; speech motor control in neuromotor speech disorders; multimodal interfaces for assistive communication; personal health informatics

SELECTED PUBLICATIONS

R.I Patel, D. Erdogmus, et al.
RSVP IconMessenger: Icon-based Brain-interfaced Alternative and Augmentative Communication, Brain-Computer Interfaces, 1(3-4), 2014, 192-203

R. Patel, H. Kember, S. Natale
Feasibility of Augmenting Text With Visual Prosodic Cues to Enhance Oral Reading, Speech Communication, 65, 2014, 109-118

T. Mills, H.T.Bunnell, R. Patel
Towards Personalized Speech Synthesis for Augmentative and Alternative Communication, Augmentative and Alternative Communication, 30(3), 2014, 226-236

R. Patel, K. Connaghan, D. Franco, E. Edsall, D. Forgit, et al.
"The Caterpillar": A Novel Reading Passage for Assessment of Motor Speech Disorders, American Journal of Speech-Language Pathology, 22(1), 2013, 1-9

K. Wiegand, R. Patel
Non-syntactic Word Prediction for AAC, Proceedings of the Third Workshop on Speech and Language Processing for Assistive Technologies, 2012, 28-36

K. Wiegand, R. Patel
SymbolPath: A Continuous Motion Overlay Module for Icon-based Assistive Communication, Proceedings of the 14th International ACM SIGACCESS Conference on Computers and Accessibility, 2012, 209-210

SELECTED RESEARCH PROJECTS

EAGER: Wireless Sensing of Speech Kinematics and Acoustics for Remediation
Principal Investigator, National Science Foundation

Minimally Verbal ASD: From Basic Mechanisms to Innovative Interventions
Co-Principal Investigator, National Institutes of Health

Multimodal Speech Translation for Assistive Communication
Principal Investigator, National Institutes of Health

MARK PATTERSON

Professor, Marine and Environmental Sciences; jointly appointed, Civil and Environmental Engineering

PhD, Harvard University, 1985
civ.neu.edu/people/patterson-mark

Scholarship focus: development of autonomous underwater robots for civil infrastructure and marine sensing; decision support tools for gray/green infrastructure like tide gates; environmental fluid mechanics; biomechanics and mass transfer in living systems

Honors and awards: Member of the Year Award, Association of Unmanned Vehicle Systems International; Lockheed Martin Award for Excellence in Ocean Science and Engineering

SELECTED PUBLICATIONS

E.C. Edson, M.R. Patterson
MantaRay: A Novel Autonomous Sampling Instrument for In Situ Measurements of Environmental Microplastic Particle Concentrations, Proceedings of the IEEE/Marine Technology Society OCEANS 2015, 2015, 6

J. Elliott, M. Patterson, E. Vitry, N. Summers, C. Miternique
Morphological Plasticity allows Coral to Actively Overgrow the Aggressive Sponge Terpios hoshinota (Mauritius, Southwestern Indian Ocean), Marine Biodiversity, 2015, 1-5

S. Mukhopadhyay, C. Wang, M. Patterson, M. Malisoff, F. Zhang
Collaborative Autonomous Surveys in Marine Environments Affected by Oil Spills, Cooperative Robots and Sensor Networks 2014 (Second Edition), (Editors, A. Koubaa and A. Khelil), Special edition in the "Studies in Computational Intelligence" Springer Book Series, 554, 2014, 87-113

K.P. Sebens, G. Bernardi, M.R. Patterson, D. Burkepile
Saturation Diving and Underwater Laboratories: How Underwater Technology has Aided Research on Coral Biology and Reef Ecology, Research and Discoveries: The Revolution of Science through Scuba, Smithsonian Contributions to the Marine Sciences, 39, 2013, 39-52

SELECTED RESEARCH PROJECTS

How does the Gastrovascular System in Perforate and Imperforate Corals Affect Physiological Response to Environmental Stress?
Principal Investigator, National Science Foundation

Autonomous Sensors and Smart Analytics for Wetlands in Urban Areas
Co-Principal Investigator, Northeastern University

ROBERT PLATT

Assistant Professor, Computer and Information Science; affiliated faculty, Mechanical and Industrial Engineering

PhD, University of Massachusetts Amherst
mie.neu.edu/people/platt-robert

Scholarship focus: robotics and machine learning with a focus on perception, planning, and control in uncertain environments; applications to robot manipulation

SELECTED PUBLICATIONS

N.A. Radford, P. Strawser, K. Hambuchen, J.S. Mehling,...R. Platt, et al.
Valkyrie: NASA's First Bipedal Humanoid Robot, Journal of Field Robotics, 32(3), 2015, 397-419

A. ten Pas, R. Platt
Localizing Handle-like Grasp Affordances in 3D Point Clouds, International Symposium on Experimental Robotics, 2014

M. Abdallah, R. Platt, C. Wampler
Decoupled Torque Control of Tendon-Driven Fingers with Tension Management, The International Journal of Robotics Research, 32(2), 2013, 247-258

G. Goretkin, A. Perez, R. Platt, G. Konidaris
Optimal Sampling-based Planning for Linear-quadratic Kinodynamic Systems, 2013 IEEE International Conference on Robotics and Automation, 2013, 2429-2436

A. Perez, R. Platt, G. Konidaris, L. Kaelbling, T. Lozano-Perez
LQR-RRT*: Optimal Sampling-based Motion Planning with Automatically Derived Extension Heuristics, Proceedings of the 2012 IEEE International Conference on Robotics and Automation, 2012, 2537-2542

ELIZABETH PODLAHA-MURPHY

Professor, Chemical Engineering

PhD, Columbia University, 1992
che.neu.edu/people/podlaha-murphy-elizabeth

Scholarship focus: understanding, discovering, and developing novel electrodeposited nanomaterials

Honors and awards: National Science Foundation CAREER Award; Vice Chair of the Division of Electrodeposition, The Electrochemical Society

SELECTED PUBLICATIONS

H. Cesiulis, T. Maliar, N. Tsyntsaru, F. Wenger, P. Ponthiaux, E.J. Podlaha
Anodic Titanium Oxide Films: Photoelectrochemical and Tribocorrosion Behavior, Journal of Nanoelectronics and Optoelectronics, 9, 2014, 265-270

E.J. Podlaha-Murphy, A. Almansur, A. Kola, K. Duarte
Electrodeposition of Ni-Fe-Mo-W Alloys-Part 4, Products Finishing, 79(2), 2014, 1-14

S. Sun, E.J. Podlaha
Examination of Ni-W Induced Codeposition by Intensity Modulated Photocurrent Spectroscopy (IMPS), Journal of the Electrochemical Society, 161(6), 2014, D362-D366

D. Pinisetty, D. Davis, E.J. Podlaha-Murphy, M.C. Murphy, A.B. Karki, D.P. Young, R.V. Devireddy
Characterization of Electrodeposited Bismuth-Tellurium Nanowires and Nanotubes, Acta Materialia, 59(6), 2011, 2455-2461

D. Davis, M. Zamanpour, M. Moldovan, D. Young, E.J. Podlaha
Electrodeposited, GMR CoNiFeCu Nanowires and Nanotubes from Electrolytes Maintained at Different Temperatures, Journal of Electrochemical Society, 157, 2010, D317-D322

SELECTED RESEARCH PROJECTS

Electrodeposition of NiFeMoW Alloys
Principal Investigator, National Association for Surface Finishing

Gigabyte Biomolecular Processor for Comprehensive Diagnostics and Precision
Co-Principal Investigator, Cornell University

Induced Electrodeposition of Molybdenum and Tungsten Alloys
Principal Investigator, National Science Foundation

CAREY RAPPAPORT

COE Distinguished Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, Massachusetts Institute of Technology, 1987
ece.neu.edu/people/rappaport-carey

Scholarship focus: bioelectromagnetics, microwave tissue imaging, electromagnetic breast cancer detection and treatment, cardiac ablation therapy, microwave assisted balloon angioplasty, catheter-based sensing. Antennas, electromagnetic computation, subsurface sensing and imaging, explosives detection, security system conceptualization and design

Honors and awards: Fellow, Institute of Electrical and Electronics Engineers; Søren Buus Outstanding Research Award, College of Engineering

SELECTED PUBLICATIONS

Y. Álvarez, F. Las-Heras, B. Gonzalez-Valdes, J.A. Martínez-Lorenzo, C. Rappaport
Accurate Profile Reconstruction Using An Improved SAR Based Technique, Proceedings of the IEEE International Antennas and Propagation Symposium (IAPS), 2013, 818-819

B. Gonzalez-Valdes, J.A. Martinez-Lorenzo, C. Rappaport
Dual Band SAR Processing for Low Dielectric Contrast Buried IED Detection, Proceedings of the IEEE IAPS, 2013, 1080-1081

C. Rappaport, B. Gonzalez-Valdes, G. Allan, et al.
Optimizing Element Positioning in Sparse Arrays for Nearfield Mm-Wave Imaging, Proceedings of the IEEE Phased Array Conference, 13, 2013, 333-335

Y. Álvarez, F. Las-Heras, B. Gonzalez-Valdes, J.A. Martínez-Lorenzo, C. Rappaport
Material Characterization Using A Millimeter Wave Portal-Based Imaging System for Security Screening, Proceedings of the IEEE Homeland Security Technology Conference, 2013, 511-516

SELECTED RESEARCH PROJECTS

Awareness and Localization of Explosive-Related Threats (ALERT)
Co-Principal Investigator, Department of Homeland Security

Concept Development And Modeling For Communicating With Oil Drilling Heads Using Low Frequency Electromagnetic Waves
Principal Investigator, Draper Laboratory Incorporated

Multi-Modality Electromagnetic Detection and Localization of Implanted Explosives Using Ultra Low Field MRI and Nuclear Quadrupole Resonance
Principal Investigator, Defense Advanced Research Projects Agency

PURNIMA RATILAL-MAKRIS

Associate Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, Massachusetts Institute of Technology, 2002
ece.neu.edu/people/ratial-makris-purnima

Scholarship focus: remote sensing; underwater acoustics; acoustical oceanography; bioacoustics; ultrasound imaging; nonlinear scattering; wave propagation in random media; signal, image and array processing; statistical inference theory

Honors and awards: Presidential Early Career Award for Scientists and Engineers; Office of Naval Research Young Investigator Award

SELECTED PUBLICATIONS

Z. Gong, A.D. Jain, D. Tran, P. Ratilal, et al.
Ecosystem Scale Acoustic Sensing Reveals Humpback Whale Behavior Synchronous with Herring Spawning Processes and Re-evaluation Finds No Effect of Sonar on Humpback Song Occurrence in the Gulf of Maine in Fall 2006, PLoS ONE, 9(10), 2014, e104733

D. Tran, W. Huang, A. Bohn, D. Wang, N. Makris, P. Ratilal, et al.
Using a Coherent Hydrophone Array for Observing Sperm Whale Range, Classification, and Shallow-water Dive Profiles, The Journal of the Acoustical Society of America,135(6), 2014, 3352-3363

Z. Gong, D. Tran, P. Ratilal
Comparing Passive Source Localization and Tracking Approaches With a Towed Horizontal Receiver Array in an Ocean Waveguide, The Journal of the Acoustical Society of America, 134, 2013, 3705-3720

Z. Gong, T. Chen, P. Ratilal, N. Makris
Temporal Coherence of the Acoustic Field Forward Propagated Through a Continental Shelf with Random Internal Waves, The Journal of the Acoustical Society of America, 134, 2013, 3476-3485

D. Tran, M. Andrews, P. Ratilal
Probability Distribution for Energy of Saturated Broadband Ocean Acoustic Transmission: Results from Gulf of Maine 2006 Experiment, Journal of the Acoustical Society of America, 132, 2012, 3659-2672

M. Andrews, Z. Gong, P. Ratilal
Effects of Multiple Scattering, Attenuation and Dispersion in Waveguide Sensing of Fish, Journal of the Acoustical Society of America, 130, 2011, 1253-1271

MATTEO RINALDI

Assistant Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, University of Pennsylvania, 2010
ece.neu.edu/people/rinaldi-matteo

Scholarship focus: understanding and exploiting the fundamental properties of micro/nanomechanical structures and advanced nanomaterials to engineer new classes of micro and nanoelectromechanical systems (M/NEMS) with unique and enabling features applied to the areas of chemical, physical and biological sensing and low power reconfigurable radio communication systems

Honors and awards: National Science Foundation CAREER Award; Defense Advanced Research Projects Agency Young Faculty Award

SELECTED PUBLICATIONS

Z. Qian, F. Liu, Y. Hui, S. Kar and M. Rinaldi
Graphene as a Massless Electrode for Ultra-high-frequency Piezoelectric Nano Electro Mechanical Systems, Nano Letters, 15(7), 2015, 4599-4604

Y. Hui, T. Nan, N.X. Sun, M. Rinaldi
High Resolution Magnetometer based on a High Frequency Magnetoelectric MEMS-CMOS Oscillator, IEEE/ASME Journal of Microelectromechanical Systems, 24(1), 2015, 134-143

G. Hummel and M. Rinaldi
Switchable 2-Port Aluminum Nitride MEMS Resonator Using Monolithically Integrated 3.6THz Cut-Off Frequency Phase-Change Switches, Proceedings of the 2015 Joint Conference of the IEEE International Frequency Control Symposium & European Frequency and Time Forum, Denver, 2015, 706-708

Y. Hui, Z. Qian, G. Hummel and M. Rinaldi
Pico-watts Range Uncooled Infrared Detector Based on a Freestanding Piezoelectric Resonant Microplate with Nanoscale Metal Anchors, Proceedings of the 2014 Solid-state Sensors, Actuators and Microsystems Workshop, Hilton Head Island, 2014, 387-390

SELECTED RESEARCH PROJECTS

Plasmonic Microelectromechanical Infrared Digitizer (PLASMID)
Principal Investigator, DARPA MTO N-Zero program

Zero Power Sensors (ZePS)
Principal Investigator, DARPA MTO N-Zero program

Nano Electro Mechanical Resonant Sensing Platform for Chip Scale, High Resolution and Ultra-fast Terahertz Spectroscopy and Imaging
Principal Investigator, National Science Foundation

Intrinsically Switchable and Programmable MEMS Filter Array
Principal Investigator, Defense Advanced Research Projects Agency

Nanofabricated Neural Probes with Ultra-sensitive Integrated Compact RF NEMS Magnetoelectric Sensors for Electro-Magneto-Brain Activity Mapping
Co-Principal Investigator, Keck Foundation

WILLIAM ROBERTSON

Assistant Professor, Computer & Information Science; jointly appointed, Electrical and Computer Engineering

PhD, University of California, Santa Barbara, 2009
ece.neu.edu/people/robertson-wil

Scholarship focus: trustworthy computing architectures; web security; statistical machine learning for anomaly detection; malware analysis using adversarial program analysis; reverse engineering; intrusion detection

SELECTED PUBLICATIONS

A. Ozcan, C. Mulliner, W. Robertson, E. Kirda, et al.
BabelCrypt: The Universal Encryption Layer for Mobile Messaging Applications, Proceedings of the International Conference on Financial Cryptography and Data Security (FC), Isla Verde, PR, 2015, 1-15

M. Weissbacher, W. Robertson, E. Kirda, C. Kruegel, G. Vigna
ZigZag: Automatically Hardening Web Applications Against Client-side Validation Vulnerabilities, Proceedings of the USENIX Security Symposium, Washington DC, 2015, 737-752

C. Mulliner, W. Robertson, E. Kirda
Hidden GEMs: Automated Discovery of Access Control Vulnerabilities in Graphical User Interfaces, Proceedings of the IEEE Symposium on Security and Privacy (Oakland), San Jose, CA, 2014, 1-14

M. Weissbacher, T. Lauinger, W. Robertson
Why is CSP Failing? Trends and Challenges in CSP Adoption, Proceedings of the International Symposium on Research in Attacks, Intrusions, and Defenses (RAID), Gothenburg, 2014, 1-22

K. Onarlioglu, C. Mulliner, W. Robertson, E. Kirda
PrivExec: Private Execution as an Operating System Service, Proceedings of the IEEE Symposium on Security and Privacy (Oakland), San Francisco, CA, 2013, 1-16

SELECTED RESEARCH PROJECTS

Automated Inference of High-Level Program Structure
Principal Investigator, Office of Naval Research

Continuum: Finding Space and Time Vulnerabilities in Java Programs
Principal Investigator, Defense Advanced Research Projects Agency

DarkDroid: Exposing the Dark Side of Android Marketplaces
Co-Principal Investigator, Defense Advanced Research Projects Agency

Firmalice: Modeling and Identifying Malice in Firmware
Co-Principal Investigator, Defense Advanced Research Projects Agency

Multi-disciplinary Preparation of Next Generation Information Assurance Practitioners
Co-Principal Investigator, National Science Foundation

JEFFREY RUBERTI

Professor, Bioengineering

PhD, Tulane University, 1998
bioe.neu.edu/people/ruberti-jeffrey

Scholarship focus: tissue engineering of load-bearing matrix (bone,cornea); bioreactor design; multi-scale mechanobiochemistry; statistical mechanics; energetics microscopy; high-resolution imaging

Honors and awards: Søren Buus Outstanding Research Award, College of Engineering

SELECTED PUBLICATIONS

J. Ruberti, C. Watson, Q. Dang, et al.
  Assessing the Impact of Engineered Nanoparticles on Wound Healing Using a Novel in Vitro Bioassay, Nanomedicine, 9(18), 2014, 2803-2815

H.K. Kao, Q. Li, B. Flynn, X. Qiao, J.W. Ruberti, G. Murphy, L. Guo
  Collagen Synthesis Modulated in Wounds Treated by Pulsed Radiofrequency Energy, Plastic and Reconstructive Surgery, 131(4), 2013, 490e-498e

J. Paten, G. Tilburey, E. Molloy, R. Zareian, C. Trainor, J. Ruberti
  Utility of an Optically-based Micromechanical System for Printing and Testing Collagen Fibers, Biomaterials, April, 34(11), 2013, 2577-2587

B.P. Flynn, G. Tilburey, J.W. Ruberti
  Single Fibril Force/Enzyme Degradation Assay Reveals Highly-sensitive Mechanochemical Switch in Native Collagen, Biomechanics and Modeling in Mechanobiology, 12(2), 2013, 291-300

C.B. Rich, R. Zareian, A.E.K. Hutcheon, J.W. Ruberti, et al.
  TGF-ß3 Stimulates Stromal Matrix Assembly by Human Corneal Keratocyte-Like Cells, Investigative Ophthalmology and Visual Science, 54(10), 2013, 6612-6619

SELECTED RESEARCH PROJECTS

Multiscale Investigation of Collagen Mechanochemistry
  Principal Investigator, National Institutes of Health

MATTHIAS RUTH

Professor, Public Policy and Urban Affairs; jointly appointed, Civil and Environmental Engineering

PhD, University of Illinois, 1992
civ.neu.edu/people/ruth-matthias

Scholarship focus: dynamic modeling of social, economic and environmental systems, and their interactions; urban infrastructure systems analysis and modeling; urban climate impacts and adaptation; energy and resources economics and policy

SELECTED PUBLICATIONS

M. Ruth, O. Özgün, J. Wachsmuth, S. Gößling-Reisemann
  Dynamics of Energy Transitions Under Changing Socioeconomic, Technological and Climate Conditions in Northwest Germany, Ecological Economics, 111, 2015, 29-47

S. Qiu, M. Ruth, S. Ghosh
  Evacuated Tube Collectors: A Notable Driver Behind the Solar Water Heater Industry in China, Renewable and Sustainable Energy Reviews, 47, 2015, 580-588

M. Ruth, R.S. Franklin
  Livability for all? Conceptual Limits and Practical Implications, Applied Geography, 49, 2014, 18-23

J. Zhu, M. Ruth
  The Development of Regional Collaboration for Resource Efficiency: a Network Perspective on Industrial Symbiosis, Computers, Environment and Urban Systems, 44, 2014, 37-46

J. Wachsmuth, A. Blohm, S. Gössling-Reisemann, T. Eickemeier, M. Ruth, R. Gasper, S. Stürmann
  How Will Renewable Power Generation be Affected by Climate Change?, The Case of a Metropolitan Region in Northwest Germany, Energy, 58, 2013, 192-201

J. Zhu, M. Ruth
  Exploring the Resilience of Industrial Ecosystems, Journal of Environmental Management, 122, 2013, 65-75

E. Douglas, P. Kirshen, M. Paolisso, C. Watson, J.Wiggin, M. Ruth
  Coastal Flooding, Climate Change, and Environmental Justice: Identifying Obstacles and Incentives for Adaptation in Two Metropolitan Boston Massachusetts Communities, Mitigation & Adaptation Strategies for Global Change, 17(5), 2012, 537-562

SELECTED RESEARCH PROJECTS

The Effect of Energy-saving Regulations on the Location of Manufacturing
  Principal Investigator, National Science Foundation

VINOD SAHNEY

University Distinguished Professor, Mechanical and Industrial Engineering

PhD, University of Wisconsin, Madison, 1970
mie.neu.edu/people/sahney-vinod

Scholarship focus: health care initiatives; industrial engineering; operations research

Honors and awards: Member, Institute of Medicine, National Academy of Science; Member, National Academy of Engineering; Fellow, Health Care Information and Management Systems Society; Fellow, Institute of Industrial Engineers; Gilbreth Award for Lifetime Contribution to Industrial Engineering, Institute for Industrial and Systems Engineering; Atrius Health Care, Boston, MA Board of Directors; Syntel Inc., Board of Directors; SCL Health System, Denver, Board of Directors; Brigham and Women's Hospital, Boston, MA, Patient Safety Research Center, Advisory Board

SELECTED PUBLICATIONS

A. Zeid , S. Kamarthi, V.K. Sahney
Research Issues in Patient Centric Healthcare, International Journal of Collaborative Enterprise, 4(1/2), 2014, 1-135

V.K. Sahney
Managing Implementation: The Unanswered Question, Frontiers of Health Services Management, 20(3), 2004, 29-36

V.K. Sahney
Generating Management Research on Improving Quality, Health Care Management Review, 2(4), 2003, 335-347

J.R. Griffith, V. Sahney, R.A. Mohr
Re-engineering Health Care: Building on CQI, Health Administration Press, Ann Arbor, MI, 1995

MASOUD SALEHI

Associate Professor, Electrical and Computer Engineering

PhD, Stanford University, 1979
ece.neu.edu/people/salehi-masoud

Scholarship focus: error correcting codes; information theory; digital communications

SELECTED PUBLICATIONS

K.-L. Huang, V.C. Gaudet, M. Salehi
A Hybrid ARQ Scheme Using LDPC Codes with Stochastic Decoding, Proceedings of the 49th Annual Conference on Information Sciences and Systems, 2015, 1-4

N. Yang, M. Salehi
A Family of Orthogonal Full Rate Differential Space Time Block Code Systems, Proceedings of the IEEE Military Communications Conference (MILCOM), Baltimore, MD, October 6-8, 2014, 569-574

John G. Proakis and Masoud Salehi
Fundamentals of Communication Systems, Second Edition Pearson, 2014

K. Firouzbakht, G. Noubir, M. Salehi
On the Performance of Adaptive Packetized Wireless Communication Links Under Jamming, IEEE Transactions on Wireless Communications, 13(7), 2014, 3481-3495

K.-L. Huang, V. Gaudet, M. Salehi
Output Decisions for Stochastic LDPC Decoders, Proceedings of the 48th Annual Conference on Information Sciences and Systems, Princeton, New Jersey, 2014, 1-5

K. Firouzbakht, G. Noubir, M. Salehi
Packetized Wireless Communication Under Jamming, a Constrained Bimatrix Game, Proceedings of the IEEE Global Communications Conference (GLOBECOM), 2014, 740-745

K. Firouzbakht, G. Noubir, M. Salehi
Quadratic Program Solution of Communication Links Under Jamming, Proceedings of the 48th Asilomar Conference on Signals, Systems and Computers, 2014, 1011-1015

O. Vahabzadeh, M. Salehi
A Novel Two-user Cooperation Scheme for Cooperative Communications Based on Protograph-based Low-density Parity-check (LDPC) Codes, Proceedings of the 47th annual conference on Information Sciences and Systems, 2013, 1-4

J.G. Proakis, M. Salehi, G. Bauch
Contemporary Communication Systems Using Matlab, Third Edition Cengage Learning 2013

MEHRDAD SASANI

Associate Professor, Civil and Environmental Engineering

PhD, University of California at Berkeley, 2001
civ.neu.edu/people/sasani-mehrdad

Scholarship focus: progressive collapse of structures; earthquake engineering; structural resilience, integrity and reliability

Honors and awards: Fellow, American Society of Civil Engineers; Fellow, Structural Engineering Institute; National Science Foundation CAREER Award

SELECTED PUBLICATIONS

L. Keyvani, M. Sasani
Analytical and Experimental Evaluation of Progressive Collapse Resistance of a Flat-slab Posttensioned Parking Garage, Journal of Structural Engineering, ASCE, 2015, 04015030

E. Livingston, M. Sasani, M. Bazan, S. Sagiroglu
Progressive Collapse Resistance of RC Beams, Engineering Structures, 959, 2015, 61-70

S. Sagiroglu, M. Sasani
Progressive Collapse Resisting Mechanisms of Reinforced Concrete Structures and Effects of Initial Damage locations, Journal of Structural Engineering, ASCE, 140(3), 2014, 1-12

J.A. Murray, M. Sasani
Seismic Shear-axial Failure of Reinforced Concrete Columns Versus System Level Structural Collapse, Journal of Engineering Failure Analysis, 32, 2013, 382-401

M. Sasani, S. Sagiroglu
Gravity Load Redistribution and Progressive Collapse Resistance of a 20-story RC Structure Following Loss of an Interior Column, Structural Journal, ACI, 107(6), 2010, 636-644

M. Sasani, J. Kropelnicki
Progressive Collapse Analysis of an RC Structure, The Structural Design of Tall and Special Buildings, 17(4), 2008, 757-772

SELECTED RESEARCH PROJECTS

NEESR: Near Collapse Performance of Existing RC Concrete Frame Buildings
Principal Investigator, National Science Foundation

RSB: A Decision and Design Framework for Multi-hazard Resilient and Sustainable Buildings
Principal Investigator, National Science Foundation

CARMEN SCEPPA

Professor and Chair, Health Sciences; affiliated faculty, Bioengineering

PhD, Tufts University, 1994
MD, Francisco Marroquin University, 1987
bioe.neu.edu/people/sceppa-carmen

Scholarship focus: aging and gerontology, physical activity and exercise, healthy eating and nutrition science

SELECTED PUBLICATIONS

G. Cloutier, A. Morton, D. Arguello, C. Castaneda-Sceppa, et al.
Effects of a 12-week Health and Fitness Program on the Health Status of University Police Officers, FASEB Journal, 29(1), 2015

M.S. El-Nasr, S. Durga, M.P. Shiyko, C. Castaneda-Sceppa
Data-driven Retrospective Interviewing (DDRI): A Proposed Methodology for Formative Evaluation of Pervasive Games, Entertainment Computing, 11, 2015, 1-19

N. Brooks, S.M. Cadena, G. Cloutier, C. Castaneda-Sceppa, et al.
Influence of Exercise on the Metabolic Profile Caused by 28 days of Bed Rest with Energy Deficit and Amino Acid Supplementation in Healthy Men, International Journal of Medical Sciences, 11(12), 2014, 1248-1257

C. Castaneda-Sceppa, J.A. Hoffman, J. Thomas, M. DuBois, et al.
Family Gym: A Model to Promote Physical Activity for Families with Young Children, Journal of Health Care for the Poor and Underserved, 25(3), 2014, 1101-1107

G. Cloutier, K. Khrapko, C. Castaneda-Sceppa, et al.
Bedrest Increases Burden of Mitochondrial DNA Deletions in Human Muscle, FASEB Journal, 27, 2014, 956.1

C. Castaneda-Sceppa, K.O. O'Brien, S.A. Abrams SA, et al.
Calcium Kinetics During Bed Rest With Artificial Gravity and Exercise Countermeasures, Osteoporosis International, 25, 2014, 2237-2244

SELECTED RESEARCH PROJECTS

Boston Area Roybal Center
Co-Principal Investigator, National Institutes of Health

Modifying the Workplace to Decrease Sedentary Behavior
Co-Investigator, The National Institute for Occupational Safety and Health

Northeastern Center for Technology Supporting Self Management in Older Adults
Co-Principal Investigator, National Institutes of Health

Improving Outcomes in People with Dementia
Co-Principal Investigator, Senior Link

GUNAR SCHIRNER

Associate Professor, Electrical and Computer Engineering

PhD, University of California, Irvine, 2008
ece.neu.edu/people/schirner-gunar

Scholarship focus: embedded computer systems; novel architectures for embedded vision; cyber-physical systems; system-level design and methodologies; hardware/software co-design

SELECTED PUBLICATIONS

H. Tabkhi, G. Schirner
A Joint SW/HW Approach for Reducing Register File Vulnerability, ACM Transactions on Architecture and Code Optimization (ACM TACO), 2015

N. Teimouri, H. Tabkhi, G. Schirner
Revisiting Accelerator-rich CMPs: Challenges and Solutions, Proceedings of the 52nd Annual Design Automation Conference (DAC), San Francisco, CA, 84, 2015

H. Tabkhi G. Schirner
Application-guided Power Gating Reducing Register File Static Power, IEEE Transactions on Very Large Scale Integration (TVLSI), 22(12), 2014, 2513-2526

J. Zhang, G. Schirner
Automatic Specification Granularity Tuning for Design Space Exploration, Design Automation and Test in Europe (DATE), Dresden, Germany, 2014, 1-6

H. Tabkhi, R. Bushey, G. Schirner
Function-level Processor (FLP): A High Performance, Minimal Bandwidth, Low Power Architecture for Market-oriented MPSoCs, IEEE Embedded Systems Letters, 2014

H. Tabkhi, R. Bushey, G. Schirner
Function-level Processor (FLP): Raising Efficiency by Operating at Function Granularity for Market-oriented MPSoCs, IEEE International Conference on Application-specific Systems, Architectures and Processors (ASAP), Zurich, Switzerland, 2014

G. Schirner, M. Götz, A. Rettberg, M. Zanella, F. J. Rammig
Embedded Systems: Design, Analysis and Verification, 403, Springer, 2013

G. Schirner, D. Erdogmus, K. Chowdhury, T. Padir
The Future of Human-in-the-loop Cyber-physical Systems, IEEE Computer, 46(1), 2013, 36-45

SELECTED RESEARCH PROJECTS

Collaborative Research: Holistic Design Methodology for Automated Implementation of Human-in-the-loop Cyber-physical Systems
Principal Investigator, National Science Foundation

Power Efficient Emerging Heterogeneous Platforms
Principal Investigator, National Science Foundation

PHILIP SERAFIM

Professor, Electrical and Computer Engineering

ScD, Massachusetts Institute of Technology, 1963
ece.neu.edu/people/serafim-philip

Scholarship focus: electromagnetics; nonlinear optics; microwaves; remote sensing; electrodynamics of random media; plasma turbulence; ionospheric scintillations; gaseous lasers

SELECTED PUBLICATIONS

J. Peñano, P. Sprangle, B. Hafizi, D. Gordon, P. Serafim
Terahertz Generation in Plasmas Using Two-color Laser Pulses, Physical Review E, 81(2), 2010, 026407

BAHRAM SHAFAI

Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, George Washington University, 1985
ece.neu.edu/people/shafai-bahram

Scholarship focus: control Systems; digital signal processing; robust and optimal control

Honors and awards: Associate Editor, Editorial Board and Program Chair of ISIAC-WAC; Senior Member, Institute of Electrical and Electronics Engineers

SELECTED PUBLICATIONS

B. Shafai, M. Saif
Proportional-integral Observer in Robust Control, Fault Detection, and Decentralized Control of Dynamic Systems, Control and Systems Engineering, Springer International Publishing, 2015, 13-43

S.M.M. Alavi, M. Saif, B. Shafai
Accurate State Estimation in DC-DC Converters Using a Proportional Integral Observer (PIO), Proceedings of 23rd IEEE International Symposium on Industrial electronics (ISIE), 2014, 1304-1309

R. Ghadami, B. Shafai
Distributed Observer-based LQR Design for Multi-agent Systems, Proceeding of ISIAC, World Automation Congress, Kona, HI, 2014, 520-526

P. Brunet, B. Shafai
Identification of Loudspeakers Using Fractional Derivatives, Journal of the Audio Engineering Society, 62(7/8), 2014, 505-515

B. Shafai, A Oghbaee
Positive Observer Design for Fractional Order Systems, Proceeding of ISIAC, World Automation Congress, Kona, HI, 2014, 531-537

B. Shafai, A Oghbaee
Positive Quadratic Stabilization of Uncertain Linear System, Proceeding of IEEE Multi-conference on Systems and Control, CAA, Antibes, France, 2014, 1412-1417

B. Shafai, A. Oghbaee, T. Tanaka
Positive Stabilization with Maximum Stability Radius for Linear Time-delay Systems, 2014 IEEE 53rd Annual Conference on Decision and Control, 2014, 1948-1953

R. Ghadami, B. Shafai
Decomposition-based Distributed Control for Continuous-time Multi-agent Systems, IEEE Transactions on Automatic Control, 58(1), 2013, 258-264

THOMAS SHEAHAN

Professor, Civil and Environmental Engineering; Sr. Associate Dean for Academic Affairs

ScD, Massachusetts Institute of Technology, 1991
civ.neu.edu/people/sheahan-thomas

Scholarship focus: rate effects in soils; offshore geohazards; sampling disturbance effects; laboratory instrumentation

Honors and awards: Fellow, American Society of Civil Engineers

SELECTED PUBLICATIONS

S. Barbuto, T.C. Sheahan, J.P. Shine, A. Alshawabkeh, et al.
Benchscale Assessment of the Efficacy of a Reactive Core Mat to Isolate PAH-Spiked Aquatic Sediments, Soil and Sediment Contamination: An International Journal, 23(1), 2014

D. Meric, A.N. Alshawabkeh, J.P. Shine, T.C. Sheahan
Bioavailability of Hydrophobic Organic Compounds in Thin-layered Sediments, Chemosphere, 103, 2014, 281-289

D. Cheney, L. Rajicb, E. Sly, D.Meric, T.C. Sheahan
Uptake of PCBs Contained in Marine Sediments by the Green Macroalga *Ulva* Rigida, Marine Pollution Bulletin, 88(1-2), 2014, 207-214

K. Santora. E.J. Mason, T.C. Sheahan
A Model for Progressive Mentoring in Science and Engineering Education and Research, Innovative Higher Education, 38(5), 2013, 427-440

F. Hellweger, N. Rahbar, A.N. Alshawabkeh, T.C. Sheahan, et al.
Model Prediction of Long-term Reactive Core Mat Efficacy for Capping Contaminated Aquatic Sediments, ASCE Journal of Environmental Engineering, 139(4), 2013, 564–575

SELECTED RESEARCH PROJECTS

Sustainable Adaptive Gradients in the Coastal Environment: Reconceptualizing the Role of Infrastructure in Resilience
Co-Principal Investigator, National Science Foundation

Puerto Rico Testsite for Exploring Contamination Threats (PROTECT), a National Institute of Environmental Health Sciences Superfund Research Center. PROTECT investigates the relationship between environmental contamination and preterm birth
Training Core Leader, National Institutes of Health

SANDRA SHEFELBINE

Associate Professor, Mechanical and Industrial Engineering; jointly appointed, Bioengineering

PhD, Stanford University, 2002
mie.neu.edu/people/shefelbine-sandra

Scholarship focus: multi-scale bone biomechanics–how the structure and composition of bone influences its mechanical properties; mechano-adaptation of bone and joint– how tissue responds to mechanical signals

SELECTED PUBLICATIONS

A. Carriero, E.A. Zimmerann, S.J. Shefelbine, R.O. Ritchie
A Methodology for the Investigation of Toughness and Crack Propagation in a Mouse Bone, Journal of the Mechanical Behavior of Biomedical Materials, 39, 2014, 38-47

N. Rodriguez-Florez, M.L. Oyen, S.J. Shefelbine
Age Related Changes in Mouse Bone Permeability, Journal of Biomechanics, 47(5), 2014, 1110-1116

A. Levchuk, P. Schneider, R. Müller, S.J. Shefelbine, et al.
Altered Lacunar and Vascular Porosity in Osteogenesis Imperfecta Mouse Bone as Revealed by Synchrotron Tomography Contributes to Bone Fragility, Bone, 61, 2014, 116-124 (cover picture)

A. Carriero, L. Abela, A.A. Pitsillides, S.J. Shefelbine
Ex Vivo Determination of Bone Tissue Strains for an in Vivo Mouse Tibial Loading Model, Journal of Biomechanics, 47(10), 2014, 2490-2497

A. Carriero, E.A. Zimmermann, R.O. Ritchie, S.J. Shefelbine, et al.
How Tough is Brittle Bone? Investigating Osteogenesis Imperfecta in Mouse Bone, Journal of Bone and Mineral Research, 29(6), 2014, 1392-401 (cover picture)

B. Depalle, Z. Qin, S.J. Shefelbine, M.J. Buehler
Influence of Cross-link Structure, Density and Mechanical Properties in the Mesoscale Deformation Mechanisms of Collagen Fibrils, Journal of the Mechanical Behavior of Biomedical Materials, 2014

M. Giorgi, A. Carriero, S.J. Shefelbine, N. C. Nowlan
Mechanobiological Simulations of Prenatal Joint Morphogenesis, Journal of Biomechanics, 47(5), 2014, 989-995

S.J. Shefelbine, N. J. Horwood, M. Marenzana, P. De Coppi, et al.
Potential of Human Fetal Chorionic Stem Cell for the Treatment of Osteogenesis Imperfect, Stem Cells and Development, 23(3), 2014, 262-276

J. Bruse, K. Oldknow, C. Farquharson, S.J. Shefelbine, et al.
Reference Point Indentation is not Indicative of Whole Mouse Bone Measures of Stress Intensity Fracture Toughness, Bone, 69, 2014,174-179

SELECTED RESEARCH PROJECTS

Heterogeneity and Anisotropy in Tough Materials
Principal Investigator, National Science Foundation

Multi-scale Characteristics of Bone Toughness
Principal Investigator, National Science Foundation

REZA SHEIKHI

Assistant Professor, Mechanical and Industrial Engineering

PhD, University of Pittsburgh, 2005
mie.neu.edu/people/sheikhi-reza

Scholarship focus: turbulence; combustion and propulsion; computational fluid dynamics and high performance computing

Honors and awards: Fellow, American Society of Mechanical Engineers

SELECTED PUBLICATIONS

M. Safari, M.R.H. Sheikhi
Large Eddy Simulation-based Analysis of Entropy Generation in a Turbulent Nonpremixed Flame, Energy, 78, 2014, 451-457

M. Safari, M.R.H. Sheikhi
Large Eddy Simulation for Prediction of Entropy Generation in a Nonpremixed Turbulent Jet Flame, ASME Journal of Energy Resources Technology, 136(2), 2014, 1-6

M. Safari, F. Hadi, M.R.H. Sheikhi
Progress in the Prediction of Entropy Generation in Turbulent Flows Using Large Eddy Simulation, Entropy, 16(10), 2014, 5159-5177

M. Janbozorgi, M.R.H. Sheikhi, H. Metghalchi
Principle of Detailed Balance and the Second Law of Thermodynamics in Chemical Kinetics, ASME Journal of Energy Resources Technology, 135(4), 2013, 1-4

M.R.H. Sheikhi, M. Safari, H. Metghalchi
Large Eddy Simulation for Local Entropy Generation Analysis of Turbulent Flows, Journal of Energy Resources Technology - Transactions of the ASME, 134(4), 2012, e041603

SELECTED RESEARCH PROJECTS

Large-scale Simulation of Turbulent Flames with Detailed Chemistry
Principal Investigator, American Chemical Society

Investigation of Coal-biomass Catalytic Gasification Using Experiments, Reaction Kinetics and Computational Fluid Dynamics
Principal Investigator, Department of Energy

Advancing Coal Catalytic Gasification to Promote Optimum Syngas Production
Principal Investigator, Department of Energy

Experimental and Computational Investigations of the Ignition and Combustion of GTL and Jet Fuel Blends
Principal Investigator, Qatar National Research Fund

MICHAEL B. SILEVITCH

Robert D. Black Professor, COE Distinguished Professor, Electrical and Computer Engineering; affiliated faculty, Civil and Environmental Engineering

PhD, Northeastern University, 1971
ece.neu.edu/people/silevitch-michael

Scholarship focus: subsurface sensing and imaging systems, detection of explosives related anomalies, engineered system development and engineering leadership

Honors and awards: Life Fellow, Institute of Electrical and Electronics Engineers; 2015 National Academy of Engineering Gordon Prize, for developing an innovative method to provide graduate engineers with the necessary personal skills to become effective engineering leaders

SELECTED RESEARCH PROJECTS

ALERT: Awareness and Localization of Explosives Related Threats, A Department of Homeland Security Center of Excellence. ALERT seeks to conduct transformational research, technology and educational development for effective characterization, detection, mitigation and response to the explosives-related threats facing the country and the world
Director and Principal Investigator, Department of Homeland Security

CenSSIS: Center for Subsurface Sensing and Imaging Systems, Gordon-CenSSIS was created to develop new technologies to detect hidden objects, and to use those technologies to meet real-world subsurface challenges in areas as diverse as noninvasive breast cancer detection and underground pollution assessment
Director and Principal Investigator, National Science Foundation

Research and Development of Reconstruction Advances in CT Based Object Detection Systems
Principal Investigator, Department of Homeland Security

HANUMANT SINGH

Professor, Electrical and Computer Engineering; jointly appointed, Marine and Environmental Sciences

PhD, Massachusetts Institute of Technology, 1995

Scholarship focus: robotic sensors, systems, platforms, and algorithms including high resolution optical and acoustic sensing; underwater vehicles (AUV, ROV, towed and manned vehicles), unmanned surface vehicles, and unmanned aerial systems; system architectures for navigation, docking and power; and the interactions between these subsystems

SELECTED PUBLICATIONS

C. Murphy, J. Walls, T. Schneider, H. Singh, et al.
CAPTURE: A Communications Architecture for Progressive Transmission via Underwater Relays with Eavesdropping, IEEE Journal of Oceanic Engineering, 39(1), 2014, 1-13

H. Singh, W. Freeman, et al.
Camouflaging an Object from Many Viewpoints, Proceedings of the 2014 Computer Vision and Pattern Recognition Conference, 1-8

K.E. Smith, H. Singh, H., et al.
Discovery of a Recent, Natural Whale Fall on the Continental Slope Off Anvers Island, Western Antarctic Peninsula, Deep Sea Research Part I: Oceanographic Research Papers, 90, 2014, 76-80

G. Williams, J. Wilkinson, T. Maksym, H. Singh, C. Kunz, et al.
Mapping Ice Thickness and Extreme Deformation of Antarctic sea Ice from an Autonomous Underwater Vehicle, Nature Geoscience, 8, 2014, 61-67

M. Yi Cheung, J. Leighton, U. Mitra, H. Singh, F.S. Hover
Performance of Bandit Methods in Acoustic Relay Positioning, Proceedings of the 2014 Automatic Control Conference, 2014, 4708 - 4714

C. Kunz, H. Singh
Map Building Fusing Acoustic and Visual Information Using Autonomous Underwater Vehicles, Journal of Field Robotics, 30(5), 2013, 1556-4967

H. Singh, K. Nakamura, M. Jakobssen, T. Shank, et al.
Effusive and Explosive Volcanism on the Ultraslow-spreading Gakkel Ridge, 85°E, Geochemistry, Geophysics, Geosystems,13(10), 2012

RIFAT SIPAHI

Associate Professor, Mechanical and Industrial Engineering; affiliated faculty, Bioengineering

PhD, University of Connecticut, 2005
mie.neu.edu/people/sipahi-rifat

Scholarship focus: control systems and mechatronics; stability analysis and control synthesis of dynamical systems with delays; interplay between stability, delays, and graphs; control-systems-aided human-machine systems; engineering education research; disability research; systems biology

Honors and awards: College of Engineering Faculty Fellow; Defense Advanced Research Projects Agency Young Faculty Award; Fellow, American Society of Mechanical Engineers

SELECTED PUBLICATIONS

W. Qiao, R. Sipahi
Delay-dependent Coupling for a Multi-agent LTI Consensus System with Inter-agent Delays, Physica D: Nonlinear Phenomena, 267, 2014, 112-122

R. Sipahi
Delay-margin Design for the General Class of Single-delay Retarded-type LTI Systems, International Journal of Dynamics and Control, 2(2), 2014, 198-209

R. Sipahi, I.I. Delice
On Some Features of Core Hypersurfaces Related to Stability Switching of LTI Systems with Multiple Time Delays, IMA Mathematical Control and Information, 31(2), 2014, 257-272

W. Qiao, R. Sipahi
A Linear Time-invariant Consensus Dynamics with Homogeneous Delays: Analytical Study and Synthesis of Rightmost Eigenvalues, SIAM Journal on Control and Optimization, 51(5), 2013, 3971-3992

I.I. Delice, R. Sipahi
Delay-independent Stability Test for Systems with Multiple Time-Delays, IEEE Transactions on Automatic Control, 57(4), 2012, 963-972

R. Sipahi, S.-I. Niculescu, C.T. Abdallah, W. Michiels, K. Gu
Stability and Stabilization of Systems with Time Delay, Limitations and Opportunities, invited, IEEE Control Systems Magazine, 31(1), 2011, 38-65

SELECTED RESEARCH PROJECTS

GARDE: An Interdisciplinary Approach to Accommodate Fine Motor Control Disorders
Principal Investigator, National Science Foundation

Model-free Algorithms to Assist and Control Human-Task Missions against Dynamic Environments
Principal Investigator, Defense Advanced Research Projects Agency

NIKOLAI SLAVOV

Assistant Professor, Bioengineering

PhD, Princeton University, 2010
bioe.neu.edu/people/slavov-nikolai

Scholarship focus: Ribosome-mediated translational regulation, cell growth and differentiation, statistical inference, mass-spectrometry; quantitative systems biology; bioinformatics

Honors and awards: Broad Institute SPARC; IRCSET Postgraduate Research Fellowship; Eureka Fellowship for Academic Excellence

SELECTED PUBLICATIONS

N. Slavov, B. Budnik, D. Schwab, E. Airoldi, et al.
Constant Growth Rate Can Be Supported by Decreasing Energy Flux and Increasing Aerobic Glycolysis, Cell Reports, 7(3), 2014, 705-714

D. Malioutov, N. Slavov
Convex Total Least Squares, Journal of Machine Learning Research, W&CP, 32(1), 2014, 109-117

N. Slavov, J. Carey, S. Linse
Calmodulin Transduces Ca^{+2} Oscillations into Differential Regulation of its Target Proteins, ACS Chemical Neuroscience, 4(4), 2013, 601-612

N. Slavov, D. Botstein
Decoupling Nutrient Signaling from Growth Rate Causes Aerobic Glycolysis and Deregulation of Cell Size and Gene Expression, Molecular Biology of the Cell, 24(2), 2013, 157-168

N. Slavov, A. van Oudenaarden
How to Regulate a Gene: to Repress or to Activate?, Molecular Cell, 46(5), 2012, 551-552

N. Slavov, D. Botstein
Coupling Among Growth Rate Response, Metabolic Cycle, and Cell Division Cycle in Yeast, Molecular Biology of the Cell, 22(12), 2011, 1997-2009

N. Slavov, J. Macinskas, A. Caudy, D. Botstein
Metabolic Cycling Without Cell Division Cycling in Respiring Yeast, Proceedings of the National Academy of Sciences of the United States of America, 108(47), 2011, 19090-19095

N. Slavov
Inference of Sparse Networks with Unobserved Variables, Application to Gene Regulatory Networks, Journal of Machine Learning Research, W&CP, 9(1), 2010, 757-764

SELECTED RESEARCH PROJECTS

Broad Institute SPARC
Co-Principal Investigator, Broad Institute

SRINIVAS SRIDHAR

CAS Distinguished Professor, Physics; affiliated faculty, Bioengineering, Chemical Engineering

PhD, California Institute of Technology, 1984
che.neu.edu/people/sridhar-srinivas

Scholarship focus: nanomedicine; neurotechnology; nanophotonics

SELECTED PUBLICATIONS

S. Kumar, J. Belz, S. Markovic, T. Jadhav, S. Sridhar, et al.
Nanoparticle-based Brachytherapy Spacers for Delivery of Localized Combined Chemoradiation Therapy, International Journal of Radiation Oncology, 91(2), 2015, 393-400

R. Tangutoori, P. Baldwin, S. Sridhar
Parp Inhibitors: A New Era of Targeted Therapy, Maturitas, 81(1), 2015, 5-9

B.M. Geilich, A.L. van de Ven, G.L. Singleton, L.J. Sepúlveda, S. Sridhar, T.J. Webster
Silver Nanoparticle-embedded Polymersome Nanocarriers for the Treatment of Antibiotic-resistant Infections, Nanoscale, 7(8), 2015, 3511-3519

A. van de Ven, M. Shann, S. Sridhar
Essential Components of a Successful Doctoral Program in Nanomedicine, International Journal of Nanomedicine, 10, 2014, 23-30

C.A. Gharagouzloo, P.N. McMahon, S. Sridhar
Quantitative Contrast-enhanced MRI with Superparamagnetic Nanoparticles using Ultrashort Time-to-Echo Pulse Sequences, Magnetic Resonance in Medicine, 74(2), 2014, 431-441

Y. Petrov, J. Nador, C. Hughes, S. Tran, O.Yavuzcetin, S. Sridhar
Ultra-dense EEG Sampling Shows Two-fold Increase of Functional Brain Information, NeuroImage, 90, 2014, 140-145

SELECTED RESEARCH PROJECTS

CaNCURE: Cancer Nanomedicine Co-ops for Undergraduate Research Experiences
Principal Investigator, National Institutes of Health

Integrative Graduate Education and Research Training
Principal Investigator, National Science Foundation

Nanoscale Magnetism In Next Generation Magnetic Nanoparticles Sub-project II: Organically Modified Magnetic Nanoparticles
Principal Investigator, Asian Office of Aerospace Research and Development

PARP Inhibitor Nanotherapy for Ovarian Cancer
Principal Investigator, Department of Defense, Ovarian Cancer Research Program

DAGMAR STERNAD

Professor, Biology; jointly appointed: Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, University of Connecticut, 1995
ece.neu.edu/people/sternad-dagmar

Scholarship focus: motor control and learning, variability and stability, virtual rehabilitation, dynamic modeling, rhythmic and discrete movements as primitives for action

Honors and awards: Klein Lectureship Award; Distinguished Lecturer on Life and the Sciences of Complexity, Center for the Ecological Study of Perception and Action

SELECTED PUBLICATIONS

D. Sternad, K.P. Körding
Carrot or Stick in Motor Learning, Nature Neuroscience, 18(4), 2015, 480-481

M.E. Huber, D. Sternad
Implicit Guidance to Stable Performance in a Rhythmic Perceptual-motor Skill, Experimental Brain Research, 233(6), 2015, 1783-1799

M.E. Huber, A.E. Seitchik, A. Brown, D. Sternad, S.G. Harkins
The Effect of Stereotype Threat on Performance of a Rhythmic Motor Skill, American Psychological Association, 41(2), 2015, 525-541

S.-W. Park, D. Sternad
Robust Retention of Individual Sensorimotor Skill After Self-Guided Practice, Journal of Neurophysiology, 2015

D. Sternad, M.E. Huber, N. Kuznetsov
Acquisition of Novel and Complex Motor Skills: Stable Solutions Where Intrinsic Noise Matters Less, Advances in Experimental Medicine and Biology, 826, 2014, 101-124

B. Nasseroleslami, C.J. Hasson, D. Sternad
Rhythmic Manipulation of Objects with Complex Dynamics: Predictability Over Chaos, PLoS Computational Biology, 10(10), 2014, e1003900

M.O. Abe, D. Sternad
Directionality in Distribution and Temporal Structure of Variability in Skill Acquisition, Frontiers in Human Neuroscience, 7(225), 2013

SELECTED RESEARCH PROJECTS

EAGER: Challenging the Cognitive-control Divide
Co-Principal Investigator, National Science Foundation

Clinical Studies on the Control of Movements in Infants and Adults
Principal Investigator, National Institutes of Health

Multi-center Trial of Augmented Sensory Feedback in Children with Dyskinetic CP
Co-Principal Investigator, National Institutes of Health

Variability and Stability of Skill Acquisition
Principal Investigator, National Institutes of Health

MILICA STOJANOVIC

Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, Northeastern University, 1993
ece.neu.edu/people/stojanovic-milica

Scholarship focus: wireless communications and networks, underwater acoustic tranmission, statistical system characterization, adaptive signal processing

Honors and awards: Fellow, Institute of Electrical and Electronics Engineers

SELECTED PUBLICATIONS

Y. Aval, M. Stojanovic
  Differentially Coherent Multichannel Detection of Acoustic OFDM Signals, IEEE Journal of Oceanic Engineering, 40(2), 2015, 251-268

P. Qarabaqi, M. Stojanovic
  Statistical Characterization and Computationally Efficient Modeling of a Class of Underwater Acoustic Channels, IEEE Journal of Oceanic Engineering, Special Issue on Underwater Communications, 38(4), 2013, 701-717

S. Yerramalli, M. Stojanovic, U. Mitra
  Partial FFT Demodulation: A Detection Method for Doppler Distorted OFDM Systems, IEEE Transactions on Signal Processing, 60(11), 2012, 5906-5918

J. Heidemann, M. Stojanovic, M. Zorzi
  Underwater Sensor Networks: Applications, Advances, and Challenges, Philosophical Transactions of the Royal Society A, 2012, 158-175

A. Radosevic, D. Fertonani, T. Duman, J. Proakis, M. Stojanovic
  Bounds on the Information Rate for Sparse Channels with Large Memory and I.U.D. Inputs, IEEE Transactions on Communications, 59(12), 2011, 3343-3352

SELECTED RESEARCH PROJECTS

NeTS: Large: Collaborative Research: Exploration and Exploitation in Actuated Communication Networks
  Principal Investigator, National Science Foundation

Intelligent Coordination and Adaptive Classification for Naval Autonomous Systems
  Principal Investigator, Office of Naval Research

MRI: Development of the Northeastern University Marine Observatory NETwork (NU MONET)
  Co-Principal Investigator, National Science Foundation

MING SU

Associate Professor & Associate Chair of Graduate Studies, Chemical Engineering

PhD, Northwestern University, 2004
che.neu.edu/people/su-ming

Scholarship focus: phase change nanoparticles, nanomedicines, in vitro biomarker detections, nanoparticle-enhanced radiation therapy, biological heat transfer, covert thermal barcodes

Honors and awards: National Science Foundation CAREER Award; National Institutes of Health Director's New Innovator Award

SELECTED PUBLICATIONS

B. Duong, H. Liu, L. Ma, M. Su
  Covert Thermal Barcodes Based on Phase Change Nanoparticles, Scientific Reports, 4, 5170, 2014

Y. Qiao, P. Zhang, C. Wang, L. Ma, M. Su
  Reducing X-ray Induced Oxidative Damages in Fibroblasts with Graphene Oxide, Nanomaterials, 4(2), 2014, 522-534

Y. Luo, M. Hossain, C. Wang, Y. Qiao, J. An, L. Ma, M. Su
  Targeted Nanoparticles for Enhanced X-ray Radiation Killing of Multidrug Resistant Bacteria, Nanoscale, 5(2), 2013, 687-694

M. Hossain, M. Su
  Nanoparticle Location and Materials Dependent Enhancement of X-ray Radiation Therapy, Journal of Physical Chemistry C, 116(43), 2012, 23047-23052

C. Wang, Z. Sun, L. Ma, M. Su
  Simultaneous Detection of Multiple Biomarkers With Several Orders of Concentration Difference Using Phase Change Nanoparticles, Analytical Chemistry, 83(6), 2011, 2215-2219

M. Zhang, Y. Hong, S. Ding, J. Hu, Y. Fan, A. Voevodin, M. Su
  Encapsulated Nano-Heat-Sinks for Thermal Management of Heterogeneous Chemical Reactions, Nanoscale, 2(12), 2010, 2790-2797

Y. Hong, S. Ding, W. Wu, M. Su, et al.
  Enhancing Heat Capacity of Colloidal Suspension Using Nanoscale Encapsulated Phase Change Materials for Heat Transfers, Applied Materials and Interfaces, 2(6), 2010, 1685-1691

SELECTED RESEARCH PROJECTS

CAREER: Biosensing in Thermal Space
  Principal Investigator, National Science Foundation

Enhanced Radiation Therap with Nanoscale Frequency Modulator
  Principal Investigator, National Institutes of Health

HELEN SUH

Professor, Health Sciences; affiliated faculty, Civil and Environmental Engineering

ScD, Harvard University, 1993
civ.neu.edu/people/suh-macintosh-helen

Scholarship focus: air pollution; environmental epidemiology; exposure assessment

Honors and awards: Member, Charter Clean Air Scientific Advisory Committee, US EPA; Yaglou Award, International Academy of Indoor Air Sciences

SELECTED PUBLICATIONS

M.A. Kioumourtzoglou, D. Spiegelman, H.H. Suh, et al.
Exposure Measurement Error in PM2.5 Health Effects Studies: A Pooled Analysis of Eight Personal Exposure Validation Studies, Environmental Health, 13(2), 2014, 1-11

J.D. Yanosky, C. Paciorek, F. Laden, J. Hart, R. Puett, D. Liao, H.H. Suh
Spatio-temporal Modeling of Particulate Air Pollution in the Conterminous United States Using Geographic and Meteorological Predictors, Environmental Health, 13(63), 2014, 1-15

E.S. Baja, J.D. Schwartz, B.A. Coull, H.H. Suh, et al.
Structural Equation Modeling of Parasympathetic and Sympathetic Response to Traffic Air Pollution in a Repeated Measures Study, Environmental Health, 12(81), 2013, 1-13

H.H. Suh, A. Zanobetti, J. Schwartz, B. Coull
Chemical Properties of Air Pollutants and Cause-specific Hospital Admissions among the Elderly in Atlanta, GA, EHP, 119(10), 2011, 1421-1428

E.S. Baja, J.D. Schwartz, G.A. Wellenius, B. Coull, H.H. Suh, et al.
Traffic-related Air Pollution and QT Interval: Modification by Diabetes, Obesity, and Oxidative Stress Gene Polymorphisms in the Normative Aging Study, EHP, 118(6), 2010, 840-846

SELECTED RESEARCH PROJECTS

Impact of Air Pollution, Weather, and Lifestyle on Health in Older Americans
Principal Investigator, National Institute of Environmental Health Sciences

Development of a Medicare Cohort Dataset for use in Air Pollution
Principal Investigator, EPRI

Research Opportunities for Undergraduates: Training in Environmental Health Sciences (ROUTES)
Principal Investigator, National Institute of Environmental Health Sciences

Examination of Dose-response Curves for Low Chronic Ambient Fine Particulate Concentrations and Mortality using the Medicare Cohort Dataset
Principal Investigator, Electric Power Research Institute

Using Novel Big Data Approaches to Improve Public Health
Principal Investigator, Northeastern University

NIAN SUN

Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, Stanford University, 2002
ece.neu.edu/people/sun-nian-xiang

Scholarship focus: magnetic, ferroelectric and magnetoelectric materials; RF/microwave magnetic and magnetoelectric devices design, fabrication and testing; materials properties at RF/microwave frequency; range self-assembly of magnetic nanostructures

Honors and awards: Fellow, Institute of Physics; Fellow, Institute of Engineering and Technology; Office of Naval Research Young Investigator Award; National Science Foundation CAREER Award; Søren Buus Outstanding Research Award, College of Engineering

SELECTED PUBLICATIONS

Z. Zhou, M. Trassin, Y. Gao, Y. Gao, D. Chen,...N.X. Sun
Probing Electric Field Control of Magnetism Using Ferromagnetic Resonance, Nature Communications, 6, 2015, 6082

T. Nan, Y. Hui, M. Rinaldi, N.X. Sun
Self-biased 215MHz Magnetoelectric NEMS Resonator for Ultra-sensitive DC Magnetic Field Detection, Scientific Reports, 3, 2013, 1985

M. Liu, Z. Zhou, T. Nan, B.M. Howe, G.J. Brown, N.X. Sun
Voltage Tuning of Ferromagnetic Resonance with Bistable Magnetization Switching in Energy-efficient Magnetoelectric Composites, Advanced Materials, 25(10), 2013, 1435-1439

J. Lou, M. Liu, D. Reed, Y. Ren, N.X. Sun
Giant Electric Field Tuning of Magnetism in Novel Multiferroic FeGaB/Lead Zinc Niobate Lead Titanate Heterostructures, Advanced Materials, 21(46), 2009, 4711-4715

S.X. Wang, N.X. Sun, M. Yamaguchi, S. Yabukami
Sandwich Films: Properties of a New Soft Magnetic Material, Nature, 407, 2000, 150-151

SELECTED RESEARCH PROJECTS

Integrated Thermoelectric Materials and Devices
Principal Investigator, Analog Devices, Incorporated

Multiferroic Materials for RF Applications
Principal Investigator, Defense Advanced Research Projects Agency

Nanofabricated Neural Probes with Ultra-sensitive Integrated Compact RF NEMS Magnetoelectric Sensors for Electro-magneto-brain Activity Mapping
Principal Investigator, Keck Foundation

Novel Multiferroic Heterostructures for Translational Compact and Power Efficient Voltage Tunable Devices
Principal Investigator, National Science Foundation

Power Efficient Voltage Tunable Spin Hall Nano Oscillators with Multiferroic Heterostructures
Principal Investigator, Air Force Research Laboratory

Sensitive and Selective Chemical Sensor Using Molecularly-Imprinted Single Layer Graphene
Principal Investigator, Air Force

MARIO SZNAIER

Dennis Picard Trustee Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, University of Washington, 1989
ece.neu.edu/people/sznaier-mario

Scholarship focus: robust control; reduced order models; video-based control; applications to dynamics in imaging and video processing; information extraction from high volume data streams

Honors and awards: IEEE Control Systems Society Distinguished Member Award

SELECTED PUBLICATIONS

B. Yilmaz, C. Lagoa, M. Sznaier
An Efficient Atomic Norm Minimization Approach to Identification of Low Order Models, 2013 IEEE 52nd Annual Conference on Decision and Control, 2013, 5834-5839

M. Ayazoglu, B. Yilmaz, M. Sznaier, O. Camps
Finding Causal Interactions in Video Sequences, IEEE International Conference on Computer Vision, Sydney, 2013

C. Dicle, O. Camps, M. Sznaier
The Way They Move: Tracking Multiple Targets with Similar Appearance, IEEE International Conference on Computer Vision, Sydney, Australia, 2013

K. Bekiroglu, M. Sznaier, C. Lagoa, B. Shafai
Vision Based Control of an Autonomous Blimp with Actuator Saturation Using Pulse Width Modulation, Proceedings of the 2013 IEEE International Conference on Control Applications, 2013, 1036-1041

Y. Cheng, Y. Wang, M. Sznaier
Worst Case Optimal Estimators for Switched Linear Systems, Proceedings of the 52nd IEEE Conference on Decision and Control, 2013, 4036-4041

SELECTED RESEARCH PROJECTS

Robust Identification and Model (in) Validation of Switched Hammerstein/Wiener Systems and Applications
Principal Investigator, National Science Foundation

GILEAD TADMOR

Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, Weizmann Institute of Science, 1984
ece.neu.edu/people/tadmor-gilead

Scholarship focus: applications of dynamics in imaging, robust and nonlinear control, reduced order models, fluid flow control

SELECTED PUBLICATIONS

K. Aleksic-Roeßner, R. King, O. Lehmann, G. Tadmor, et al.
On the Need of Nonlinear Control for Efficient Model-based Wake Stabilization, Theoretical and Computational Fluid Dynamics, 28(1), 2014, 23-49

L. Mirkin, T. Shima, G. Tadmor
Sampled-Data H^2 Optimization of Systems with I/O Delays via Analog Loop Shifting, IEEE Transactions on Automatic Control, 59, 2014, 787-791

M. Schlegel, B.R. Noack, P. Jordan, A. Dillman, G. Tadmor, et al.
On Least-order Flow Representations of Aerodynamics and Aeroacoustics, Journal of Fluid Mechanics, 697, 2012, 367-398

S. Laxminarayan, G. Tadmor, et al.
Modeling Habituation in Rat EEG Evoked Responses via a Neural Mass Model with Feedback, Biological Cybernetics, 105, 2011, 371-397

A. Cavalieri, G. Daviller, P. Comte, P. Jordan, G. Tadmor, et al.
Using Large Eddy Simulation to Explore Sound-source Mechanisms in Jets, Journal of Sound and Vibration, 330, 2011, 4098-4113

MOHAMMAD E. TASLIM

Professor, Mechanical and Industrial Engineering

PhD, University of Arizona, 1981
mie.neu.edu/people/taslim-mohammad

Scholarship focus: experimental and numerical research in gas turbine cooling technology, solar and wind energy, non-newtonian liquid droplet interactions with hydrophobic surfaces, nano-sensors

Honors and awards: Fellow, American Society of Mechanical Engineers; Associate Fellow, American Institute of Aeronautics and Astronautics; Member, IGTI Heat Transfer Committee

SELECTED PUBLICATIONS

M.E. Taslim, J.S. Halabi
Experimental/Numerical Investigation on the Effects of Trailing-Edge Cooling Hole Blockage on Heat Transfer in a Trailing-edge Cooling Channel, International Journal of Rotating Machinery, 2014, 2014, 710450

M.E. Taslim, X. Huang
Experimental/Numerical Investigation on the Effects of Trailing-edge Cooling Hole Blockage on Heat Transfer in a Trailing-edge Cooling Channel, Journal of Gas Turbine Power, 136(5), 2014, 082603

M.E. Taslim, M.K.H. Fong
Experimental and Numerical Cross-over Jet Impingement in a Rib-roughened Airfoil Trailing-edge Cooling Channel, Journal of Turbomachinery, 135(5), 2013, 2-13

K. Elebiary, M.E. Taslim
Experimental/Numerical Cross-over Jet Impingement in an Airfoil Leading-edge Cooling Channel, Journal of Turbomachinery 135(1), 2013, 1-12

M.E. Taslim, A. Nongsaeng
Experimental and Numerical Cross-over Jet Impingement in an Airfoil Trailing-edge Cooling Channel, Journal of Turbomachinery, 133(4), 2011, 1-10

A.A. Adebiyi, M.E. Taslim, K.D. Crawford
The Use of Computational Fluid Dynamic Models for the Optimization of Cell Seeding Processes, Journal of Biomaterials, 32(34), 2011, 8753–8770

SELECTED RESEARCH PROJECTS

Experimental Heat Transfer Coefficients and Pressure Drops in Two Test Sections Simulating the Mid-chord Cooling Cavities of a GE Turbine Airfoil roughed with Two Rib Geometries
Principal Investigator, General Electric Company

Experimental Heat Transfer and Pressure Drops Research in a Two-legged Rib-roughened Rig with Three Rib Geometries
Principal Investigator, General Electric Company

Measurements of Heat Transfer Coefficients and Pressure Drops in Seven Test Sections Simulating the Mid-chord and Trailing-edge Cooling Cavities of a GE Turbine Airfoils
Principal Investigator, General Electric Company

VLADMIR TORCHILIN

University Distinguished Professor, Pharmaceutical Sciences; affiliated faculty, Bioengineering

PhD, Moscow State University, 1971
DSc, Moscow State University, 1980
bioe.neu.edu/people/torchilin-vladmir

Scholarship focus: chemistry; biochemistry; bioorganic chemistry; physiologically active compounds; experimental pharmacology

Honors and awards: Fellow of American Institute of Medical and Biological Engineering; Elected as a Member of European Academy of Sciences

SELECTED PUBLICATIONS

G. Salzano, G. Navarro, M.S. Trivedi, G. De Rosa, V.P. Torchilin
Multifunctional Polymeric Micelles Co-loaded with Anti-survivin siRNA and Paclitaxel Overcome Drug Resistance in an Animal Model of Ovarian Cancer, Molecular Cancer Therapeutics, 14(4), 2015, 1075-1084

S. Essex, G. Navarro, P. Sabhachandani, V.P. Torchilin, et al.
Phospholipid-modified PEI-based Nanocarriers for in Vivo siRNA Therapeutics Against Multidrug-resistant Tumors, Gene Therapy, 22, 2015, 41-50

A. Apte, E. Koren, A. Koshkaryev, V.P. Torchilin
Doxorubicin in TAT Peptide-modified Multifunctional Immunoliposomes Demonstrates Increased Activity Against both Drug-sensitive and Drug-resistant Ovarian Cancer Models, Cancer Biology and Therapy, 15, 2014, 69-80

F. Perche, S. Biswas, T. Wang, L. Zhu, V.P. Torchilin
Hypoxia-targeted siRNA Delivery, Angew Chemie, 53, 2014, 3363-3366

S. Biswas, V.P. Torchilin
Nanopreparations for Organelle-specific Delivery in Cancer, Advanced Drug Delivery Reviews, 66, 2014, 26-41

V.P. Torchilin
Multifunctional, Stimuli-sensitive Nanoparticulate Systems for Drug Delivery, Nature Reviews Drug Discovery, 13, 2014, 813-827

SELECTED RESEARCH PROJECTS

Center for Cancer Nanotechnology Excellence
Principal Investigator, National Institutes of Health

Immix-production of PEG-PE-based Polymeric Micelles co-Loaded with Curcumin and Doxorubicin
Principal Investigator, Immix Biopharma, Llc

Microbiotix - Pharmacokinetic and Biodistribution of Liposomal Phenoxyacetamide in Vivo Using Mouse Model
Principal Investigator, Microbiotix, Inc

Multifunctional Matrix Metalloprotease-2-Sensitive Anti-cancer Nanopreparations
Principal Investigator, National Institutes of Health

Pharmacokinetic and Biodistribution of SBC-105
Principal Investigator, Synageva BioPharma

ALI TOURAN

Professor, Civil and Environmental Engineering

PhD, Stanford University, 1980
civ.neu.edu/people/touran-ali

Scholarship focus: risk assessment; construction cost/schedule uncertainty; project delivery systems; simulation; construction productivity

Honors and awards: Fellow, American Society of Civil Engineers; President's Award, Boston Society of Civil Engineers

SELECTED PUBLICATIONS

A.P. Gurgun, A. Touran
  Public-private Partnership Experience in the International Arena: Case of Turkey, Journal of Management in Engineering, 30(6), 2014

A.P. Gurgun, Y. Zhang, A. Touran
  Schedule Contingency Analysis for Transit Projects Using a Simulation Approach, Journal of Civil Engineering & Management, 19(4), 2013, 465-475

P. Bakhshi, A. Touran
  A Method for Calculating Cost Correlation among Construction Projects in a Portfolio, International Journal of Architecture, Engineering and Construction, 1(3), 2012, 134-141

P. Bakhshi, A. Touran
  A New Approach for Contingency Determination in a Portfolio of Construction Projects, Journal of Risk Analysis and Crisis Response, 2(4), 2012, 223-232

SELECTED RESEARCH PROJECTS

Managing a portfolio of projects – Metrics for improvement
  Principal Investigator, Construction Industry Institute

GEOFFREY C. TRUSSELL

Professor and Chair, Marine and Environmental Sciences; Director, Marine Science Center; affiliated faculty, Civil and Environmental Engineering

PhD, College of William & Mary, 1998
civ.neu.edu/people/trussell-geoffrey

Scholarship focus: evolutionary and community ecology; coastal sustainability

Honors and awards: Ray Lankester Investigatorship; Sigma Delta Tau Outstanding Professor

SELECTED PUBLICATIONS

C.M. Matassa, G.C. Trussell
  Effects of Predation Risk Across a Latitudinal Temperature Gradient, Oecologia, 177, 2015, 775-784

S.M. Donelan, G.C. Trussell
  Parental Effects Enhance Risk Tolerance and Performance in Offspring, Ecology, 96(8), 2015, 2049–2055

C.M. Matassa, G.C. Trussell
  Prey State Affects the Ecological Consequences of Temporal Variation in Predation Risk, Proceedings of the Royal Society B, 281, 2015, 1796

E.S. Bryson, G.C. Trussell, P.J. Ewanchuk
  Broad-scale Geographic Variation in the Organization of Rocky Intertidal Communities in the Gulf of Maine, Ecological Monographs, 84, 2014, 579-597 (cover article)

L.P. Miller, C.M. Matassa, G.C. Trussell
  Climate Change Enhances the Negative Effects of Predation Risk on an Intermediate Consumer, Global Change Biology, 20, 2014, 3834-3844

N.D. Chu, S.T. Kaluziak, G.C. Trussell, S.V. Vollmer
  Phylogenomic Analyses Reveal Latitudinal Population Structure And Polymorphisms in Heat Stress Genes in the North Atlantic Snail Nucella Lapillus, Molecular Ecology, 23, 2014, 1863-1873

N.D. Chu, S.T. Kaluziak, G.C. Trussell, S.V. Vollmer
  Thermal Stress and Predation Risk Trigger Distinct Transcriptomic Response in the Intertidal Snail, Nucella lapillus, Molecular Ecology, 23, 2014, 6104-6113

J.L. Orrock, E.L. Preisser, J.H. Grabowski, G.C. Trussell
  The Cost of Safety: Refuges Increase the Impact of Predation Risk in Aquatic Systems, Ecology, 94(3), 2013, 573-579

SELECTED RESEARCH PROJECTS

Collaborative Research: Intertidal Community Assembly and Dynamics: Integrating Broad-scale Regional Variation in Environmental Forcing and Benthic-pelagic Coupling
  Principal Investigator, National Science Foundation

AYTEN TURKCAN

Assistant Professor, Mechanical and Industrial Engineering

PhD, Bilkent University, 2003
mie.neu.edu/people/turkcan-upasani-ayten

Scholarship focus: implementation of operations research techniques to solve planning and scheduling problems in healthcare systems; appointment scheduling, chemotherapy scheduling, nurse staffing, diabetes management, and planning of mental health services

SELECTED PUBLICATIONS

S. Mutlu, J. Benneyan, J. Terrell, V. Jordan, A. Turkcan
A Co-availability Scheduling Model for Coordinating Multi-disciplinary Care Teams, International Journal of Production Research, 2014, 1-13

B. Liang, A. Turkcan
Acuity-based Nurse Assignment and Patient Scheduling in Oncology Clinics, Health Care Management Science, 2014, 1-30

B. Liang, A. Turkcan, M.E. Ceyhan, K. Stuart
Improvement of Chemotherapy Patient Flow and Scheduling in an Outpatient Oncology Clinic, International Journal of Production Research, 2014, 1-24

A. Turkcan, T. Toscos, B. Doebbeling
Patient-centered Appointment Scheduling Using Agent-based Simulation, in Proceedings of the American Medical Informatics (AMIA) Conference, 2014, 1125-1133

A. Turkcan, L. Nuti, P.-C. DeLaurentis, Z. Tian, J. Daggy, L. Zhang, M. Lawley, L. Sands
No-show Modeling for Adult Ambulatory Clinic, in B. Denton (Ed.) Healthcare Operations Management: A Handbook of Methods and Applications, 2013, 251-288

A. Turkcan, A. Zeng, M.A. Lawley
Chemotherapy Operations Planning and Scheduling, IIE Transactions on Healthcare Systems Engineering, 2(1), 2012, 31-49

J. Daggy, M.A. Lawley, D.R. Willis, D. Thayer, C. Suelzer, P. DeLaurentis, A. Turkcan, S. Chakraborty, L. Sands
Using No-show Modeling to Improve Clinic Performance, Health Informatics Journal, 16(4), 2010, 246-259

SELECTED RESEARCH PROJECTS

Improving Health Care Systems for Access to Care by Under Served Patients
Co-Principal Investigator, Patient-Centered Outcomes Research Institute

MONEESH UPMANYU

Associate Professor, Mechanical and Industrial Engineering

PhD, University of Michigan, 2001
mie.neu.edu/people/upmanyu-moneesh

Scholarship focus: computational techniques that span multiple scales, atomic-to continuum, to quantify the structure property relations in established and emerging material systems, both in technology and nature

SELECTED PUBLICATIONS

P. Waduge, J. Larkin, M. Upmanyu, S. Kar, M. Wanunu
Programmed Synthesis of Freestanding Graphene Nanomembrane Arrays, Small, 11(5), 2015, 597-603

L. X. Lu, M. S. Bharathi, M. Upmanyu, Y. W. Zhang
Growing Ordered and Stable Nanostructures on Polyhedral Nanocrystals, Applies Physics Letters, 105, 2014, 1-6

A. Shahabi, H. Wang, M. Upmanyu
Shaping van der Waals Nanoribbons via Torsional Constraints: Scrolls, Folds and Supercoils, Scientific Reports 4, 2014, 7004

C. Wang, M. Upmanyu
Shear Accommodation in Dirty Grain Boundaries, Europhysics Letters, 106(2), 2014, 1-6

E. T. Nilsen, R, Arora, M. Upmanyu
Thermonastic Leaf Movements in Rhododendron During Freezethaw Events: Patterns, Functional Significances, and Causes, Environmental and Experimental Botany, 106, 2014, 34-43

Z. Ma, D. McDowell, E. Panaitescu, A.V. Davidov, M. Upmanyu, L. Menon
Vapor-Liquid-Solid Growth of Serrated GaN Nanowires: Shape Selection Driven by Kinetic Frustration, Journal of Materials Chemistry C, 1, 2013, 7294-7302

SELECTED RESEARCH PROJECTS

Computational Studies of Nanocrystal Growth
Principal Investigator, National Science Foundation

DMREF: Engineering Strong, Highly Conductive Nanotube Fibers Via Fusion
Co-Principal Investigator, National Science Foundation

Enhanced Stability and Mechanics of Ultra-Fine Grained Metals via Engineered Solute Segregation
Principal Investigator, US Army Research Office

ASHKAN VAZIRI

Associate Professor, Mechanical and Industrial Engineering; affiliated faculty, Bioengineering

PhD, Northeastern University, 2004
mie.neu.edu/people/vaziri-ashkan

Scholarship focus: solid mechanics, materials, computational methods, biomechanics, nanotechnology

Honors and awards: Air Force Office of Scientific Research Young Investigator Award; National Science Foundation CAREER Award; Søren Buus Outstanding Research Award, College of Engineering; College of Engineering Faculty Fellow

SELECTED PUBLICATIONS

J Xiong, R. Ghosh, L. Ma., H. Ebrahimi, A. Vaziri, L. Wu, et al.
Bending Behavior of Lightweight Sandwich-walled Shells with Pyramidal Truss Cores, Composite Structures, 116, 2014, 793-804

B. Haghpanah, H. Nayeb-Hashemi, A. Vaziri, et al.
Buckling of Regular, Chiral, and Hierarchical Honeycombs Under a General Macroscopic Stress State, Proceedings of the Royal Society A, 470(2167), 2014, 20130856

R. Ghosh, H. Ebrahimi, A. Vaziri
Contact Kinematics of Biomimetic Scales, Applied Physics Letters, 2014, 105.23, 233701

R. Ghosh, A. Ajdari, H. Nayeb-Hashemi, A. Vaziri, et al.
Impact Resistance and Energy Absorption of Regular and Functionally Graded Hexagonal Honeycombs with Cell Wall Material Strain Hardening, International Journal of Mechanical Sciences, 89, 2014, 413-422

R. Oftadeh, B. Haghpanah, D. Vella, A. Boudaoud, A. Vaziri
Optimal Fractal-like Hierarchical Honeycombs, Physical Review Letters, 113, 2014, 104301

H. Abdi, H. Nayeb-Hashemi, A. M. S. Hamouda, A. Vaziri
Torsional Dynamic Response of a Shaft with Longitudinal and Circumferential Cracks, Journal of Vibration and Acoustics, 136, 2014, 61011-61018

R. Ghosh, A. Kumar, A. Vaziri
Type-IV Pilus Deformation Can Explain Retraction Behavior, PLOS ONE, 2014, 9, 114613

SELECTED RESEARCH PROJECTS

Development of Novel High Friction, low Adhesion Materials
Co-Principal Investigator, Brooks Automation

Mechanics of Carbon Nanotube Surface Decontamination
Principal Investigator, FM Global

Multifunctional Cellular Structures for Energy Harvesting and Energy Management Applications
Principal Investigator, Qatar Foundation

CARMINE VITTORIA

COE Distinguished Professor, Electrical and Computer Engineering

PhD, Yale University, 1970
ece.neu.edu/people/vittoria-carmine

Scholarship focus: elemagnetic wave propagation in anisotropic media, physics of magnetism, high tc superconductors and weak link devices, and ferrites and composites magnetic metal alloys and magnetic superlattices miniature microwave circuits

Honors and awards: Fellow, Institute of Electrical and Electronics Engineers; Søren Buus Outstanding Research Award, College of Engineering

SELECTED PUBLICATIONS

K. Ebnabbasi, M. Mohebbi, C. Vittoria
Coaxial Line Technique to Measure Constitutive Parameters in Magnetoelectric Ferrite Materials, Microwave and Optical Components Letters, 23(9), 2013, 504-506

M. Mohebbi, K. Ebnabbasi, C. Vittoria
First Observation of Magnetoelectric Effect In M-Type Hexaferrite Thin Films, Journal of Applied Physics, 113, 2013, 1-5

M. Mohebbi, C. Vittoria
Growth of Y-Type Hexaferrite Thin Films by Alternating Target Laser Ablation Deposition, Journal of Magnetism and Magnetic Materials, 344, 2013, 158-161

M. Mohebbi, K. Ebnabbasi, C. Vittoria
In-Situ Deposition of C-Axis Oriented Barium Ferrite Films for Microwave Applications, IEEE Transactions on Magnetics, 49(7), 2013

K. Ebnabbasi, M. Mohebbi, C. Vittoria
Room Temperature Magneto-electric Effects in Bulk Poly-crystalline Materials of M-and Z-Type Hexaferrites, Journal of Applied Physics, 113, 2013

K. Ebnabbasi, M. Mohebbi, C. Vittoria
Strong Magnetoelectric Coupling in Hexaferrites at Room Temperature, Journal of Applied Physics, 113, 2013, 17C707

SELECTED RESEARCH PROJECTS

Novel Epitaxial Films of ME Hexaferrite Materials
Principal Investigator, Army Research Office

SARAH WADIA-FASCETTI

Professor, Civil and Environmental Engineering; Associate Dean, Graduate Studies

PhD, Stanford University, 1994
civ.neu.edu/people/wadia-fascetti-sara

Scholarship focus: condition assessment methodologies for infrastructure systems; life cycle and life span analysis; nondestructive testing and evaluation; structural and earthquake engineering uncertainty

Honors and awards: American Society of Engineering Education Sharon Keillor Award for Women in Engineering Education; Minorities in Engineering Award, American Society of Engineering Education; National Science Foundation CAREER Award; Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring, selected by President Bush and awarded at the White House

SELECTED PUBLICATIONS

A. Ganguli, C.M. Rappaport, D. Abramo, S. Wadia-Fascetti
Synthetic Aperture Imaging for Flaw Detection in a Concrete Medium, NDT & E International, 45(1), 2012, 79-90

K. Belli, S. Wadia-Fascetti, C. Rappaport
Integrated Sensor and Media Modeling Environment Developed and Applied to Ground-Penetrating Radar Investigation of Bridge Decks, Journal of Computing in Civil Engineering, 25(1), 2011, 10-20

K. Belli, C. Rappaport, S. Wadia-Fascetti
A Time Domain Equivalent Source Model of an Impulse GPR Antenna Based on Measured Radiation Field, Research in Nondestructive Evaluation, 22(4), 2011, 197-207

SELECTED RESEARCH PROJECTS

Northeastern ADVANCE
Principal Investigator, National Science Foundation

IGERT: Intelligent Diagnostics for Aging Civil Infrastructure
Principal Investigator, National Science Foundation

VOTERS: Versatile Onboard Traffic Embedded Roaming Sensors
Co-Principal Investigator/Deputy Director, National Institute of Standards and Technology

KAI-TAK WAN

Professor, Mechanical and Industrial Engineering; affiliated faculty: Bioengineering, Civil and Environmental Engineering

PhD, University of Maryland at College Park, 1993
mie.neu.edu/people/wan-kai-tak

Scholarship focus: cellular biomechanics; water filtration; thin film adhesion and characterization; subsurface mechano-sensing; shell adhesion; fundamental intersurface forces

Honors and awards: National Science Foundation CAREER Award; College of Engineering Faculty Fellow

SELECTED PUBLICATIONS

M. Robitaille, N. Belisle, S. Dang, E. Faigle, C. Morck, P. Uth, K.-T. Wan
An Optical Topographic Technique to Map the 3-D Deformed Profile of a Convex Lens under External Loading, Experimental Mechanics, 55, 2015, 641-646

L. Sallaway, S. Magee, J. Shi, F. Quivira, K. Tgavalekos, D.H. Brooks, S. Muftu, W. Meleis, R.H. Moore, D. Kopans, K.-T. Wan
Detecting Solid Masses in Phantom Breast Using Mechanical Indentation, Experimental Mechanics, 54, 2014, 935-942

Y. Li, X. Wang, A. Onnis-Hayden, K.-T. Wan, A.Z. Gu
Universal Quantifier Derived from AFM Analysis Links Cellular Mechanic Properties and Cell–surface Integration Forces with Microbial Deposition and Transport Behavior, Environmental Science and Technology, 48, 2014, 1769-1778

G. Li, K.-T. Wan
Adhesion Map for Thin Membranes, Journal of Applied Mechanics 81(12), 2013, 021018

G. Li, C. Yilmaz, X. An, S. Somu, S. Kar, Y. Jung, A. Busnaina, K.-T. Wan
Adhesion of Graphene Sheet on Nano-patterned Substrates with Nano-Pillar Array, Journal of Applied Physics, 113, 2013, 244303

M. Robitaille, J. Shi, S. McBride, K.-T. Wan
Mechanical Performance of Hydrogel Contact Lenses with a Range of Power Under Parallel Plate Compression and Central Load, Journal of the Mechanical Behavior of Biomedical Materials, 22, 2013, 59-64

SELECTED RESEARCH PROJECTS

A Novel Biomechanical Model of Bacterial Adhesion and Aggregation
Principal Investigator, National Science Foundation

Mechano-lipidomics and Mechano-cytosis of Drug Delivery Liposomes
Principal Investigator, National Science Foundation

Mechanical Integrity and Long Term Reliability of Photovoltaic Panels
Principal Investigator, National Institute of Standards and Technology

MING WANG

Professor, Civil and Environmental Engineering

PhD, University of New Mexico, 1983
civ.neu.edu/people/wang-ming

Scholarship focus: structural health monitoring; structural damage assessment; sensor technology for infrastructure; experimental mechanics; fiber reinforced composites; construction materials; recycled waste materials; structural dynamics; earthquake engineering

Honors and awards: Fellow, SPIE; Søren Buus Outstanding Research Award, College of Engineering

SELECTED PUBLICATIONS

S. Cho, J. Yim, S. Shin, H. Jung, C. Yun, M. Wang
Comparative Field Study of Cable Tension Measurement for a Cable-Stayed Bridge, Journal of Bridge Engineering, 18(8), 2013, 748-757

W. Zhang, Y. Liu, M. Wang
Highly Efficient DNA-functionalized Carbon Nanotube Sensor Array for Gas Monitoring, Journal of Smart Structures and Systems, 11(8), 2013, 89-93

V.V. Saykin, Y. Zhang, Y. Cao, M. Wang, J. McDaniel
Pavement Macrotexture Monitoring through Sound Generated by Tire-Pavement Interaction, Journal of Engineering Mechanics, 139(3), 2013, 264-271

Y. Liu, C.-L. Chen, Y. Zhang, S. Sonkusale, M. Wang, M. Dokmeci
SWNT-Based Nanosensors for Wireless Detection of Explosives and Chemical Warfare Agents by Remote Single Chips SWNT Sensors, IEEE Sensor, 13(1), 2013, 202-209

Q. Wang, G. McDaniel, M. Wang
Dynamic Tire Pressure Sensor for Measuring Ground Vibration, Sensors, 12, 2012, 15192-15205

SELECTED RESEARCH PROJECTS

VOTERS: Versatile Onboard Traffic Embedded Roaming Sensors
Principal Investigator, National Institute of Standards and Technology

Breath and Saliva Based Nano-bio Sensing System for Disease Diagnosis and Monitoring
Principal Investigator, Northeastern University

Salivary Glucose Sensors
Principal Investigator, NanoBio Systems

THOMAS WEBSTER

Professor and Department Chair, Chemical Engineering; Art Zafiropoulo Chair in Engineering; affiliated faculty, Bioengineering

PhD, Rensselaer Polytechnic Institute, 2000
che.neu.edu/people/webster-thomas

Scholarship focus: design, synthesis, and evaluation of nanomaterials for various medical applications, including self-assembled chemistries, nanoparticles, nanotubes, and nanostructured surfaces

Honors and awards: Fellow, Biomaterials Science and Engineering; Fellow, American Institute for Medical and Biological Engineers; Fellow, American Society for Nanomedicine; Fellow, Biomedical Engineering Society; Fellow, Ernst Strungmann Foundation; Wenzhou 580 Elite Scientist Award, China

SELECTED PUBLICATIONS

P. Tran, L. Sarin, R. Hurt, T.J. Webster
Titanium Surfaces with Adherent Selenium Nanoclusters as a Novel Anti-cancer Orthopedic Material, Journal of Biomedical Materials Research, 93(4), 2014, 1417-1428

P. Tran, L. Sarin, R. Hurt, T.J. Webster
Opportunities for Nanotechnology-enabled Bioactive Bone Implants, Journal of Materials Chemistry, 19, 2009, 2653-2659

E.M. Christenson, K. Anseth, T.J. Webster, A.G. Mikos, et al.
Nanobiomaterial applications in orthopaedics, Journal of Orthopaedic Research 25, 2007, 11-22

G. Balasundaram, T.J. Webster
A Perspective on Nanophase Materials for Orthopedic Implant Applications, Journal of Materials Chemistry, 16, 2006, 3737-3745

A. Chun, J. G. Moralez, H. Fenniri, T.J. Webster
Helical Rosette Nanotubes: A More Effective Orthopaedic Implant Material, Nanotechnology, 15, 2004, 234-239

T.J. Webster, J.U. Ejiofor
Increased Osteoblast Adhesion on Nanophase Metals, Biomaterials, 25, 2004, 4731-4739

SELECTED RESEARCH PROJECTS

Development and Commercialization of Nanostructured Resorbable Urogenital Grafts
Principal Investigator, National Institutes of Health

Developing Injectable Materials for Cartilage Applications: Part 1
Principal Investigator, Audax, Inc.

Long-term Prevention of Peri-implantitis via Nano-textured, TiO/Ag Surfaces
Co-Principal Investigator, National Institutes of Health

Nanomedicine Academy of Minority Serving Institutions
Co-Principal Investigator, National Science Foundation

Testing Orthopedic Materials for Ionic Fusion, Inc.
Principal Investigator, Ionic Fusion, Inc.

Testing RTI Materials for Orthopedic Applications
Principal Investigator, RTI, Inc.

RICHARD WEST

Assistant Professor, Chemical Engineering

PhD, University of Cambridge, 2009
che.neu.edu/people/west-richard

Scholarship focus: development of detailed microkinetic models for complex reacting systems; automating the discovery and calculation of reaction pathways

Honors and awards: American Chemical Society Doctoral New Investigator

SELECTED PUBLICATIONS

R. Van de Vijver, N.M. Vandewiele, G.B. Marin, R.H. West, et al.
Automatic Mechanism and Kinetic Model Generation for Gas- and Solution-Phase Processes: A Perspective on Best Practices, Recent Advances, and Future Challenges, International Journal of Chemical Kinetics, 47(4), 2015, 199-231

A. Jalan, R.W. Ashcraft, R.H. West, W.H. Green
Predicting Solvation Energies for Kinetic Modeling, Annual Reports Section "C", 106, 2010, 211-258

M. Sander, R.H. West, M.S. Celnik, M. Kraft
A Detailed Model for the Sintering of Polydispersed Nanoparticle Agglomerates, Aerosol Science and Technology, 43(10), 2009, 978-989

R. Shirley, Y. Liu, T.S. Totton, R.H. West, M. Kraft
First-principles Thermochemistry for the Combustion of a $TiCl_4$ and $AlCl_3$ Mixture, Journal of Physical Chemistry A, 113(49), 2009, 13790-13796

W. Phadungsukanan, M. Sander, R.H. West, M. Kraft, et al.
First-principles Thermochemistry for Silicon Species in the Decomposition of Tetraethoxysilane, Journal of Physical Chemistry A, 113(31), 2009, 9041-9049

R.H. West, R.A. Shirley, M. Kraft, C.F. Goldsmith, W.H. Green
A Detailed Kinetic Model for Combustion Synthesis of Titania from $TiCl_4$, Combustion and Flame, 156(9), 2009, 1764-1770

SELECTED RESEARCH PROJECTS

Identifying and Resolving Discrepancies in Kinetic Models of Hydrocarbon Combustion
Principal Investigator, National Science Foundation

Transition-State Prediction for High-throughput Calculation of Accurate Chemical Reaction Rates
Principal Investigator, American Chemical Society

JOHN (PETER) WHITNEY

Assistant Professor, Mechanical and Industrial Engineering

PhD, Harvard University, 2012

Scholarship focus: human-safe robots, medical robotics, soft robotics and soft-material manufacturing, MEMS, microrobotics, bio-inspired design, flapping aerodynamics and insect flight

Honors and awards: Boston Patent Law Association, "Invented Here! Featured Honoree"; Society of Manufacturing Engineers, "Innovation That Could Change the Way You Manufacture"

SELECTED PUBLICATIONS

N.O. Perez-Arancibia, J.P. Whitney, R.J. Wood,
Lift Force Control of Flapping-wing Microrobots Using Adaptive Feedforward Cancellation Schemes, IEEE Transactions of Mechatronics, 18, 2013, 1-14

P.S. Sreetharan, H. Tanaka, J.P. Whitney, et al.
Progress on "Pico" Air Vehicles, International Journal of Robotics Research, 31(11), 2012, 1292-1302

J.P. Whitney, R.J. Wood
Conceptual Design of Flapping-wing Micro Air Vehicles, Bioinspiration and Biomimetics, 7, 2012, 1-10

P.S. Sreetharan, J.P. Whitney, M.D. Strauss, R.J. Wood
Monolithic Fabrication of Millimeter-scale Machines, Journal of Micromechics and Microengineering, 22(5), 2012, 055027 *cover article

H. Tanaka, J.P. Whitney, R.J. Wood
Effect of Flexural and Torsional Wing Flexibility on Lift Generation in Hoverfly Flight, Integrative and Comparative Biology51(1), 2011, 142-150

J.P. Whitney, P.S. Sreetharan, K. Ma, R.J. Wood
Pop-up Book MEMS, Journal of Micromechics and Microengineering, 21(11), 2011, 1-7 *cover article

J.P. Whitney, R.J. Wood
Aeromechanics of Passive Rotation in Flapping Flight, Journal of Fluid Mechanics, 660, 2010, 197-220

RONALD WILLEY

Professor and Associate Chair, Chemical Engineering

PhD, University of Massachusetts, Amherst, 1984
che.neu.edu/people/willey-ronald

Scholarship focus: process safety and catalysis (industrial)

Honors and awards: Fellow, American Institute of Chemical Engineers; Norton H. Walton/Russell L. Miller Award in Safety/Loss Prevention, American Institute of Chemical Engineers

SELECTED PUBLICATIONS

J. Murphy, D. Hendershot, S. Berger, A.E. Summers, R.J. Willey
Bhopal Revisited, Process Safety Progress, 33(4), 2014, 310-313

R.J. Willey
Consider the Role of Safety Layers in the Bhopal Disaster, Chemical Engineering Progress, 110(12), 2014, 22-27

R. J. Willey
Layer of Protection Analysis, Procedia Engineering, 84, 2014, 12–22

R. J. Willey
Novel ways to Present Process Safety Concepts, Process Safety Progress, 33(3), 2014, 207-207

R. Willey, J. H.-C. Hsiao, R. E. Sanders, A. Kossoy, C.-M. Shu
A Focus on Fire Fundamentals Including Emergency Response Training at the National Fire Agency in Taiwan, Process Safety Progress, 32(1), 2013, 2-7

R. Willey, J. Murphy
Process Safety Progress, American Institute of Chemical Engineers, 32(3), 2013, 229-229

T.O. Spicer, R. J. Willey, D. A. Crowl, W. Smades
The Safety and Chemical Engineering Education Committee—Broadening the Reach of Chemical Engineering Process Safety Education, Process Safety Progress, 32(2), 2013, 113-118

MARK C. WILLIAMS

Professor, Physics; affiliated faculty, Bioengineering

PhD, University of Minnesota, 1998
bioe.neu.edu/people/williams-mark

Scholarship focus: biophysics of DNA-protein interactions

SELECTED PUBLICATIONS

K.R. Chaurasiya, M.J. McCauley, M.C. Williams, et al.
Oligomerization Transforms Human APOBEC3G from an Efficient Enzyme to a Slowly Dissociating Nucleic Acid-Binding Protein, Nature Chemistry, 6, 2014, 28-33

H. Wu, M. Mitra, K. Musier-Forsyth, M.C. Williams, et al.
Aromatic Residue Mutations Reveal Direct Correlation Between HIV-1 Nucleocapsid Protein's Nucleic Acid Chaperone Activity and Retroviral Replication, Virus Research, 171, 2013, 263-277

K.R. Chaurasiya, C. Ruslie, M.C. Williams, et al.
Polymerase Manager Protein UmuD Directly Regulates E. coli DNA Polymerase III a Binding to ssDNA, Nucleic Acids Research, 41, 2013, 8959-8968

M.J. McCauley, E. Rueter, I. Rouzina, L.J. Maher III, M.C. Williams
Single Molecule Kinetics Reveal Microscopic Mechanism by Which HMGB Proteins Alter DNA Flexibility, Nucleic Acids Research, 41, 2013, 167-181

SELECTED RESEARCH PROJECTS

Single Molecule HIV-1 Replication Interactions
Principal Investigator, National Institutes of Health

Quantifying Single Molecule DNA-Ligand Interactions
Principal Investigator, National Science Foundation

MISHAC YEGIAN

COE Distinguished Professor, Civil and Environmental Engineering

PhD, Massachusetts Institute of Technology, 1976
civ.neu.edu/people/yegian-mishac

Scholarship focus: geotechnical earthquake engineering; soil dynamics; geosynthetics; seismic response of landfills; base isolation; liquefaction; bridge engineering; use of shaking table in earthquake engineering

Honors and awards: Fellow, American Society of Civil Engineers

SELECTED PUBLICATIONS

E. Eseller-Bayat, S. Gokyer, M.K. Yegian
Earthquake Engineering Experimental Facility for Research and Public Outreach, Seismic Evaluation and Rehabilitation of Structures, 26, 2014, 379-387

E. Eseller-Bayat, S. Gokyer, M.K. Yegian, O. Deniz, A. Alshawabkeh
Bender Elements and Bending Disks for Measurement of Shear and Compression Wave Velocities in Large Fully and Partially Saturated Sand Specimens, ASTM Geotechnical Testing Journal, 36(2), 2013, 1-8

E. Eseller-Bayat, S. Gokyer, M.K. Yegian, E. Ortakci, A. Alshawabkeh
Design and Application of Simple Shear Liquefaction Box, ASTM Geotechnical Testing Journal, 36(3), 2013, 1-9

E. Eseller-Bayat, S. Gokyer, M.K. Yegian, A. Alshawabkeh
Liquefaction Response of Partially Saturated Sands: An Empirical Model, ASCE Journal of Geotechnical and Geoenvironmental Engineering, 139(6), 2013, 872-879

SELECTED RESEARCH PROJECTS

NEESR: Induced Partial Saturation (IPS) Through Transport and Reactivity for Liquefaction Mitigation
Principal Investigator, National Science Foundation

EDMUND YEH

Professor, Electrical and Computer Engineering

PhD, Massachusetts Institute of Technology, 2001
ece.neu.edu/people/yeh-edmund

Scholarship focus: future internet architecture, cross-layer design and optimization of wireless networks, wireless network science, network economics, wireless sensor networks, network information theory and coding, smart power grids

Honors and awards: Alexander von Humboldt Fellowship; Best Paper Award, IEEE International Conference on Communications; Army Research Office Young Investigator Program Award; Senior Member of the Institute of Electrical and Electronics Engineers; Secretary, IEEE Information Theory Society

SELECTED PUBLICATIONS

E. Yeh, R.A. Berry
Throughput Optimal Control of Cooperative Relay Networks, IEEE Transactions on Information Theory, 53(10), 2007, 3827-3833

R.A. Berry, E. Yeh
Cross-layer Wireless Resource Allocation, IEEE Signal Processing Magazine, 21(5), 2004, 59-68

E. Yeh, A.S. Cohen
Throughput and Delay Optimal Resource Allocation in Multiaccess Fading Channels, Proceedings of the International Symposium on Information Theory (ISIT), Yokohama, Japan, 2003, 245

L. Zhang, D. Estrin, J. Burke, V. Jacobson, E. Yeh, et al.
Named Data Networking (NDN) Project, Technical Report ndn-0001, PARC, 2010

A. Bedekar, S. Borst, K. Ramanan, P. Whiting, E.Yeh
Downlink Scheduling in CDMA Data Networks, Global Telecommunications Conference, Rio De Janeiro, Brazil, 1999, 2653-2657

SELECTED RESEARCH PROJECTS

Modeling, Analysis and Control for Robust Interdependent Networks
Co-Principal Investigator, Defense Threat Reduction Agency

NeTS: Small: Collaborative Research: Large Scale Networks and Information Flow: From Emergent Behavior to Algorithm Design
Principal Investigator, National Science Foundation

Scalable Distributed and Dynamic Forwarding and Caching Algorithms for named Data Networks
Principal Investigator, Cisco Systems, Incorporated

IBRAHIM ZEID

Professor, Mechanical and Industrial Engineering

PhD, University of Akron, 1981
mie.neu.edu/people/zeid-ibrahim

Scholarship focus: mechanics; personalized medicine; simulation techniques and complex networks analysis

Honors and awards: Fellow, American Society of Mechanical Engineers

SELECTED PUBLICATIONS

S. Onel, A. Zeid, S. Kamarthi
Agent-based simulation and Analysis of a Complex Adaptive Supply Network, International Journal of Collaborative Enterprise, 4(3), 2014, 188

I. Zeid, J. Chin, C. Duggan, S. Kamarthi
Engineering Based Learning: A Paradigm Shift for High School STEM Teaching, International Journal of Engineering Education, 30(4), 2014, 1-12

A. Zeid, S. Kamarthi, V. Sahney
Forward: Research Issues in Patient Centric Healthcare Delivery, International Journal of Collaborative Enterprise, 4(1-2), 2014, 1-2

G.M. Uddin, K.S. Ziemer, I. Zeid, S. Kamarthi
Monte Carlo Study of the Molecular Beam Epitaxy Process for Manufacturing Magnesium Oxide Nano Scale Films, IIE Transactions, 47, 2014, 1-16

S. Vadde, A. Zeid, S. Kamarthi
Optimal Pricing and Disposal Decisions for Product Recovery Facilities Under a Single Portfolio, International Journal of Collaborative Enterprise, 4(3), 2014, 160 -187

E. Tuncel, I. Zeid, S. Kamarthi
Solving Large Scale Disassembly Line Balancing Problems with Uncertainty Using Reinforcement Learning, International Journal of Intelligent Manufacturing, 25, 2014, 647-659

SELECTED RESEARCH PROJECTS

ITEL: Investing in Tomorrow's Engineering Leaders
Principal Investigator, National Science Foundation

TRANSFORMing Liberal Arts Careers to Meet Demand for Advanced mfg Workforce
Principal Investigator, National Science Foundation

HONGLI ZHU

Assistant Professor, Mechanical and Industrial Engineering

PhD, South China University of Technology, 2009
mie.neu.edu/people/zhu-hongli

Scholarship focus: advanced manufacturing, electrochemical energy storage; multifunctional bio-inspired materials; nano/micro fabrication of devices and materials

Honors and awards: Innovator of the year 2013, University of Maryland; Jakob Wallenberg Scholarship, Sweden

SELECTED PUBLICATIONS

H. Zhu, S. Zhu, Z. Jia, S. Parvinian, Y. Li, T. Li, L. Hu
Anomalous Scaling Law of Strength and Toughness of Cellulose Nanopaper, Proceeding of the National Academy of Sciences (PNAS), 112(29), 2015, 8971-8976

C. Sun, H. Zhu, M. Okada, K. Gaskell, Y. Inoue, L. Hu, Y. Wang
Interfacial Oxygen Stabilizes Composite Silicon Anodes, Nano Letters, 15(1), 2015, 703-708

Y. Li, H. Zhu, F. Shen, J. Wan, Z. Liu, S. Lacey, Z. Fang, H. Dai, L. Hu
Nanocellulose Fibers as Green Dispersant for Two Dimensional Materials, Nano Energy, 2015, 346-354

J. Zhong, H. Zhu, Q. Zhong, J. Dai, W. Li, L. Hu, J. Zhou
Self-powered Human Interactive Transparent Nanopaper Systems, ACS Nano, 9(7), 2015, 7399-7406

W. Bao, Z. Fang, J. Wan, J. Dai, H. Zhu, X. Yang, C. Preston, L. Hu
Aqueous Gating of Van der Waals Materials on Bilayer Nanopaper, ACS Nano, 2014, 10606-10612

Z. Fang, H. Zhu, W. Bao, C. Preston, Z. Liu, J. Dai, Y. Li, L. Hu
Highly Transparent Paper with Tunable Haze for Green Electronics, Energy and Environmental Science, 7, 2014, 3313-3319

Y. Li, H. Zhu, F. Shen, J. Wan, X. Han, J. Dai, H. Dai, L. Hu
High conductive microfiber of graphene oxide templated carbonized cellulose, Advanced Functional Materials, 35(7), 2014, 1471-1479

Y. Li, H. Zhu, S. Zhu, J. Wan, Z. Liu, O. Vaaland, S. Lacey, Z. Fang, H. Dai, T. Li, L. Hu
Hybridizing Wood Cellulose and Graphene Oxide Toward High-performance Fibers, Nature-NPG Asia Materials, 7, 2014, e150

H. Zhu, H. Wang, Y. Li, W. Bao, Z. Fang, C. Preston, Z. Barcikowski, O. Vaaland, Z. Ren, L. Hu
Lightweight, Conductive Hollow Fibers from Nature as Sustainable Electrode Materials for Microbial Energy Harvesting, Nano Energy, 10, 2014, 268-276

KATHERINE ZIEMER

Professor, Chemical Engineering; Vice Provost for Curriculum

PhD, West Virginia University, 2001
che.neu.edu/people/ziemer-katherine

Scholarship focus: engineering surfaces in order to integrate wide bandgap semiconductors with functional and multi-functional oxides, organic molecules, and/or biomaterials

Honors and awards: College of Engineering Faculty Fellow

SELECTED PUBLICATIONS

G.M. Uddin, K.S. Ziemer, B. Sun, I. Zeid, S. Kamarthi
Monte Carlo Study of the High Temperature Hydrogen Cleaning Process of 6H-Silicon Carbide for Subsequent Growth of Nano Scale Metal Oxide Films, International Journal of Nanomanufacturing, 9(5/6), 2013, 407-430

Z. Ji, M. Ismail, D.M. Callahan Jr., E. Pandowo, K.S. Ziemer, et al.
The Role of Silver Nanoparticles on Silver Modified Titanosilicate ETS-10 in Visible Light Photocatalysis, Applied Catalysis B: Environmental 102, 2011, 323–333

V. K. Lazarov, Z. Cai, K. Yoshida, P. J. Hasnip, K.S. Ziemer
Growth and Interface Phase Stability of Barium Hexaferrite Films on SiC(0001), Journal of Applied Physics, 109, 2011, 07E520

M. Liu, O. Obi, Z. Cai, J. Lou, G. Yang, K.S. Ziemer, N.X. Sun
Electrical Tuning of Magnetism in Fe3O4/PZN-PT Multiferroic Heterostructures Derived by Reactive Magnetron Sputtering, Journal of Applied Physics, 107(7), 2010, 073916

Z. Cai, T. L. Goodrich, B. Sun, Z. Chen, V. G. Harris, K.S. Ziemer
Epitaxial Growth of Barium Hexaferrite Film on Wide Bandgap Semiconductor 6H-SiC by Molecular Beam Epitaxy, Journal of Physics D: Applied Physics, 43(9), 2010, 095002

SELECTED RESEARCH PROJECTS

STTR Phase 2: The Use of Hydrogen for Defect Reduction in Large Format Infrared Detectors
Principal Investigator, Department of Defense

Abdulla K. Al-Ali

PhD 2014, Computer Engineering; Advisor, Kaushik Chowdhury

DATABASE-ASSISTED END-TO-END THEORETICAL AND SIMULATION FRAMEWORK FOR COGNITIVE RADIO NETWORKS

This thesis provides the following contributions: (a) An end-to-end transport layer called TFRC-CR is devised that uses equation based transmission rate control, and relies on database updates rather than intermediate node information. (b) A framework for vehicular cognitive radio is created that uses cross-correlation between 2G signals obtained from an Android device and signals from the TV white space to reduce the number of database queries. Moreover, this framework also involves a practical demonstration of interference alignment to optimally use the channel during the querying process. (c) An extension for the network simulator-3 that provides cognitive abilities, such as spectrum sensing, primary user detection, and spectrum hand-off to the research community which allows them to simulate these complex radios in a virtual environment.

See full dissertation at **coe.neu.edu/iris/AbdullaAlAli**

George Ejiofor Aninwene II

PhD 2014, Chemical Engineering; Advisor, Thomas Webster

LUBRICIN AND NANO-BASO4: NOVEL METHODS TO PREVENT SURFACE BIOFOULING

This dissertation addresses the issue of biofouling by proposing novel surface preparation methods using lubricin and/or nano-BaSO4 as non toxic agents to prevent biofouling by inhibiting initial cellular adhesion to surfaces. Preventing initial unwanted cellular attachment and accumulation will dramatically improve outcomes and reduce instances of life threatening infections and bio-adhesions.

Lubricin is a an anti-adhesive glycoprotein that is found in the synovial fluid, which acts as a natural barrier within the body, lubricating surfaces and preventing undesirable cellular adhesion on cartilage. BaSO4 is a common additive used to make medical plastics radio opaque. Nano-formulations would retain similar radiopaque properties while imbuing the medical plastic with nano surface features which would change surface interactions with biological agents.

See full dissertation at **coe.neu.edu/iris/GeorgeAninwene**

Mary K. Balaconis

PhD 2014, Mechanical Engineering; Advisor, Heather Clark

THE DEVELOPMENT AND DESIGN OF FLUORESCENT SENSORS FOR CONTINUOUS IN VIVO GLUCOSE MONITORING

This dissertation details the design of novel fluorescent glucose-sensitive sensors for monitoring glucose levels non-invasively and continuously after initial implantation. Sensing components were selected for appropriate response at physiological concentrations and were fully characterized for dynamic range, sensitivity, and lifetime in vitro. In preclinical testing, glucose-sensitive sensors tracked changes in glucose levels in mice, but sensor monitoring was limited to one hour. Sensor design was further improved after these studies to prolong in vivo lifetime, increase response at hypoglycemic levels, and enhance sensor biocompatibility. These efforts resulted in in vivo lifetimes greater than one hour, incorporation of more advance sensing moieties, and a biodegradable sensor platform. Future work with these sensors will involve Clark Error Grid Analysis and biodistribution studies to address clinical application requirements.

See full dissertation at **coe.neu.edu/iris/MaryBalaconis**

Radhika Barua

PhD 2014, Chemical Engineering; Advisor, Laura H. Lewis

PATHWAYS FOR TAILORING THE MAGNETOSTRUCTURAL RESPONSE OF FeRh-BASED SYSTEMS

In this work, the near-equiatomic phase of FeRh serves as a test bed for understanding the magnetostructural phenomena in intermetallic alloys due to its relatively simple crystal structure (cubic with B2 (CsCl)-type ordering) and its reported ability to undergo a first-order magnetic phase change from antiferromagnetic (AF) to ferromagnetic (FM) ordering, with an accompanying 1 % volume expansion in the unit cell near room temperature ($T_t \sim 350$ K). Overall, three interrelated but largely unexplored aspects concerning the FeRh system have been examined here: (1) influence of nanostructuring on the magnetostructural response; (2) influence of simultaneous application of pressure and magnetic field on the magnetostructural response; (3) correlations between chemical modification of the lattice and the magnetostructural response. Bulk FeRh-based samples in this study were synthesized using the arc-melting technique and nanostructuring of the system was achieved via rapid solidification processing (melt-spinning) of the arc-melted precursor.

See full dissertation at **coe.neu.edu/iris/RadhikaBarua**

Anirban Basu

PhD 2014, Computer Engineering; Advisors, Nicol McGruer, George Adams

AN EXPERIMENTAL INVESTIGATION OF HOT SWITCHING CONTACT DAMAGE IN RF MEMS SWITCHES

This dissertation presents work focused on contact damage in Ruthenium-on-Ruthenium microcontacts has been investigated under hot switching conditions. Using an AFM based test setup, developed at Northeastern University for the purpose of contact testing, a large number of experiments were performed to observe and understand the mechanisms that lead to microcontact damage and ultimately its failure. The structure used was a clamped-clamped beam structure with a contact bump at its center. A flat topped mating pillar formed the other end of the contact and this pillar was mounted on a piezoactuator whose expansion and contraction, leading to contacts closing and opening, replicated switching cycles.

See full dissertation at **coe.neu.edu/iris/AnirbanBasu**

Pascal Brunet

PhD 2014, Electrical Engineering; Advisor, Bahram Shafai

NONLINEAR SYSTEM MODELING AND IDENTIFICATION OF LOUDSPEAKERS

This dissertation considers modeling and identification of nonlinear systems pertinent to loudspeakers with nonlinear distortion effects. It is well known that when loudspeakers are driven at high playback levels the nonlinear characteristics of these speakers become a major source of sound degradations. Nonlinear distortion not only diminishes listening pleasure but more importantly impairs speech intelligibility. Consequently it is essential to find a good model that matches to the loudspeaker response for the purpose of predicting and preventing the nonlinear distortion. This becomes particularly important for the purpose of improving sound quality of mobile phones. This report analyzes the loudspeaker operation and provides nonlinear modeling techniques that can reliably be used for its identification process. Frequency domain and state-space modeling are considered and emphasis is given towards model that mix polynomial nonlinear state-space models and fractional order state-space models.

See full dissertation at **coe.neu.edu/iris/PascalBrunet**

Nan Cai

PhD 2015, Environmental Engineering; Advisor, Phillip Larese-Casanova

NOVEL GRAPHENE BASED MATERIALS FOR SORPTION PROCESSES IN WATER TREATMENT AND PURIFICATION APPLICATIONS

This study first examines some of the mechanistic interactions between commercial graphene oxides and endocrine disrupting compounds, pharmaceuticals, and natural organic matter in order to determine which physicochemical properties should be considered when choosing a graphene material. In addition, two more graphene based nano composites including ethylenediamine functionalized graphene (ED-G) and black carbon magnetite (BC-Mag) was synthesized in the lab and tested for their sorption performance on targeted contaminants. Graphene oxides of varied particle sizes, specific surface areas, and surface chemistries were evaluated within batch reactors. Specific surface area (SSA), surface charge, and phenolic content of graphene oxides was determined to have the greatest control on sorption extent of carbamazepine, an anticonvulsant used as a probe compound.

See full dissertation at **coe.neu.edu/iris/NanCai**

Adedayo E. Catlett

PhD 2015, Bioengineering; Advisor, Shashi Murthy

INDUCED DIFFERENTIATION OF ADULT MESENCHYMAL STEM CELLS VIA FLUID SHEAR STIMULATION

In this dissertation, the differentiation of hMSCs via shear stimulation through biocompatible plastic tubing in a suspended flow was examined.

The in vitro investigation of mechanically and chemically stimulated hMSCs in a suspension was performed by: (1) Determining the length of plastic tubing which induced a differentiation response of the hMSCs. (2) Examining intracellular receptors using fluorescent markers to resolve differentiation toward the adipogenic lineage. (3) Incubating the hMSCs with fluorescently tagged antibodies corresponding to differentiation along the adipogenic and chondrogenic lineages. (4) Analyzing the genetic fold changes related to the shear stimulation of hMSCs.

See full dissertation at **coe.neu.edu/iris/BioAdedayoCatlett**

Song Chen

PhD 2014, Electrical Engineering; Advisor, Bradley Lehman

A NON-SUPERCONDUCTING FAULT CURRENT LIMITER (NSFCL)

In this thesis, we study and review the various topologies of the emerging FCL technology, compare their advantages and limitations, and propose a Non-Superconducting Fault Current Limiter (NSFCL) topology. The NSFCL is optimized to protect against short transients and to work in conjunction with existing protection devices, hence it is simple, low-cost, and more compact than prior art. We analyze the operation of the proposed NSFCL topology under normal condition and different fault conditions, and validate the concept with simulations and experiments of a prototype on a 3-phase 600V system in a UL-certified high power lab. In the tests, the NSFCL successfully protects the system from 100kA potential fault current, by limiting the fault current to a pre-determined level of 50A.

See full dissertation at **coe.neu.edu/iris/SongChen**

Hanchul Cho

PhD 2014, Mechanical Engineering; Advisor, Ahmed Busnaina

DEVELOPMENT OF HIGH-RATE NANO-SCALE OFFSET PRINTING TECHNOLOGY FOR ELECTRIC AND BIO APPLICATIONS

In the dissertation, we have newly developed 'damascene template,' reusable and versatile template, for high-rate directed assembly and transfer of nanomaterials. In addition, a flexible damascene template based on a polymer substrate has been developed to apply to the roll to roll system for continuous assembly and transfer. The governing parameters for assembly and transfer were investigated to achieve the uniform assembly and high transfer yield. Our approaches demonstrate that the combination of reusable damascene template and directed assembly and transfer is significantly compatible with various nanomaterials such as polymer, silica, semiconductor nanoparticles and SWNTs by controlling the surface energy of the template, assembly and transfer parameters. This process and template will enable high-rate manufacturing of flexible devices such as a flexible transistor, display, bio and chemical sensors, energy harvesting.

See full dissertation at **coe.neu.edu/iris/HanchulCho**

Selena Di Maio

PhD 2014, Chemical Engineering; Advisor, Rebecca L. Carrier

MECHANISTIC STUDIES AND MODELING OF EFFECTS OF INGESTED LIPIDS ON ORAL DRUG ABSORPTION

The specific four aims of the proposed experimental approach were the followings. 1) Design and characterize biorelevant in vitro lipid digestion models able to simulate fundamental features of human intestinal contents in post-prandial conditions. Basic back-titration has been used to establish associated chemical composition characterizing products of the lipolysis process. 2) Investigate the ultra-structure and composition of colloidal species existing in the GI tract upon ingestion of lipids and their dynamic behavior. Dynamic light scattering (DLS), and small angle neutron scattering (SANS) have been employed to characterize the colloidal structures (emulsion droplets, vesicles, micelles) present throughout digestion. 3) Establish kinetics and thermodynamics of drug transport into and out of colloidal structures in the GI tract, based on a model drug that was selected to represent poorly water-soluble drug compounds.

See full dissertation at **coe.neu.edu/iris/SelenaDiMaio**

Rahman Doost-Mohammady

PhD 2014, Computer Engineering; Advisor, Kaushik Chowdhury

OPPORTUNISTIC WIRELESS SPECTRUM ACCESS: PROTOCOLS, ANALYSIS AND APPLICATIONS

This thesis proposes methods for achieving efficient spectrum access through devising protocols for identifying and sharing unused spectrum, analyzing the theoretical bounds of these protocols, and implementing these solutions in practical medical and vehicular environments.

A significant portion of the thesis is focused on opportunistic spectrum access within licensed frequency bands, where cognitive radios transmit on frequencies without interfering with the primary users in them. First, a cooperative sensing method based on reinforcement learning technique is designed to efficiently detect spectrum opportunities. After identifying portions of the available spectrum, a channel allocation technique is devised for the cognitive radios with quality of service provisioning.

See full dissertation at **coe.neu.edu/iris/RahmanDoost**

Amir Farjadian Bejestan

PhD 2014, Bioengineering; Advisor, Constantinos Mavroidis

MECHANICAL DESIGN AND CONTROL SYSTEM DEVELOPMENT OF NOVEL 2 DEGREE-OF-FREEDOM ANKLE AND BALANCE REHABILITATION ROBOTIC SYSTEM

In this work, we present the Virtually-Interfaced Robotic Ankle and Balance Trainer (vi-RABT), a low-cost platform-based robotic system that is designed to improve overall ankle/balance strength, mobility and control. The system is equipped with two degrees-of-freedom (DOF) controlled actuation along with complete means of accurate force and angular measurements. Effective control techniques and virtual reality games were developed and interfaced into the system hardware. Under IRB approved protocol, the system was used to assess ankle force, mobility and motor control in a pool of healthy human subjects, while playing interactive virtual reality games on a large screen. In the next phase, an anisotropic assistive/resistive control paradigm has been implemented into practice, with realistic functionality consistent with the expectations of a Physical Therapy expert. A pilot experiment was conducted to investigate the feasibility of assistive control using vi-RABT.

See full dissertation at **coe.neu.edu/iris/AmirFarjadian**

Mohsen Farmahini Farahani

PhD 2014, Electrical Engineering; Advisor, Hossein Mosallaei

PLASMONICS AND METASURFACES FOR INFRARED WAVE ENGINEERING

This dissertation investigates several novel passive components composed of plasmonic materials at infrared regime. As an example for a passive plasmonic component, we present a bandpass filter integrated into a metal-insulator-metal (MIM) waveguide at mid-infrared range. Design techniques already developed in microwave and circuit theory used to realize the filter. The insulator is air and metal parts are silver where their loss considered in our simulations. The filter passband is from 27 THz to 33 THz (9.1 μm to 11.1 μm) and the simulated insertion loss is 1.7 dB. The filter length is 16.9 μm, almost 1.7 times center wavelength (10 μm).

See full dissertation at **coe.neu.edu/iris/MohsenFarmahini**

Ankita Shah Faulkner

PhD 2014, Electrical Engineering; Advisor, Ahmed Busnaina

ELECTRODE ARCHITECTURES FOR EFFICIENT IONIC AND ELECTRONIC TRANSPORT PATHWAYS IN HIGH-POWER LITHIUM ION BATTERIES

The first aim of this dissertation was to develop electrode architectures that enhance electronic and ionic transport pathways in large and small area lithium ion electrodes. These architectures will utilize the unique electronic and mechanical properties of carbon nanotubes to create robust electrode scaffolding that improves electrochemical charge transfer. Using extensive physical and electrochemical characterization, the second aim is to investigate the effect of electrode parameters on electrochemical performance and evaluate the performance against standard commercial electrodes. These parameters include surface morphology, electrode composition, electrode density, and operating temperature. Finally, the third aim is to investigate commercial viability of the electrode architecture. This will be accomplished by developing pouch cell prototypes using a high-rate and low cost scale-up process. Through this work, we aim to realize a commercially viable high-power electrode technology.

See full dissertation at **coe.neu.edu/iris/AnkitaFaulkner**

Trifon Fitchorov

PhD 2014, Electrical and Computer Engineering; Advisor, Vincent Harris

ELECTRIC FIELD-DRIVEN TUNING OF MULTIFERROIC TRANSDUCERS AND ANTENNAS THROUGH CHANGES IN FIELD STRENGTH AND MATERIAL MORPHOLOGY

This dissertation demonstrates experimentally and theoretically that tuning of magnetic properties of the heterostructures can be controlled through applied electric field. Significant CME effect is found in all three heterostructures: FeCoV/PZN-PT (31 Oe cm kV-1), Metglas/PMN-PT (23 Oe cm kV-1), and FeGa/PMN-PT (12.5 Oe cm kV-1). The tunabilities of remanence (Mr), coercivity (Hc), and squareness (SQ = Mr / Ms) are demonstrated. A sensitive dependence of CME effect on the magnitude of the applied electric field is discovered in the time and frequency domains, especially near the electric coercive field, and an alternative path to magnetization reversal is identified.

See full dissertation at **coe.neu.edu/iris/TrifonFitchorov**

Nastaran Ghadar

PhD 2015, Electrical and Computer Engineering; Advisor, Deniz Erdogmus

AUTOMATIC RECOGNITION OF PRIMATE BEHAVIORS AND SOCIAL INTERACTIONS FROM VIDEOS

In this dissertation, we describe a framework that adopts current practices from computer vision and machine learning in creating the preliminary steps towards solving the problem of automatically recognizing behaviors of primates in a social group (in this case, a pen hosting a group of 3 or more primates). Several challenges need to be overcome in order to achieve primate activity recognition from videos, some of which are: the massive size of continuous video recordings from multiple cameras over days and weeks, illumination variations throughout the day, background changes due to moving objects in the pen and humans passing by (e.g. for feeding or observing), highly variable shapes and poses of primates, and the low visibility of color-coded primate collars causing difficulty in identifying the primates.

See full dissertation at **coe.neu.edu/iris/NastaranGhadar**

Sindhu Ghanta

PhD 2015, Electrical and Computer Engineering; Advisor, Jennifer Dy

BAYESIAN NONPARAMETRICS AND MARKED POISSON PROCESSES

This dissertation explores the use of marked Poisson point processes within a Bayesian nonparametric framework. The Poisson point process underlies a wide range of combinatorial stochastic processes and as such has been a key object driving research in Bayesian nonparametrics. We explore Poisson point processes in combination with probabilistic shape and appearance priors for detection/segmentation of objects/patterns in 1D, 2D and 3D frameworks. This probabilistic formulation encompasses uncertainty in number, location, shape, and appearance of the feature of interest, be it in images or time-series data.

The generative process of the model can be explained as sampling a random number of objects at random locations from a Poisson process. The shape of each object is sampled from a shape model. The appearance inside and outside the shape boundary is sampled from an appearance model with foreground and background parameters respectively.

See full dissertation at **coe.neu.edu/iris/SindhuGhanta**

Seda Gokyer

PhD 2015, Civil Engineering; Advisor, Mishac Yegian

NUMERICAL SIMULATION OF PARTIAL SATURATION IN SANDS INDUCED BY FLOW AND CHEMICAL REACTIVITY

This research develops the theoretical basis of IPS and implements a numerical solution for modeling partial saturation in sand induced by transport and reactivity of a chemical solution within the pores of the sand. The model is based on coupled differential equations describing three-dimensional, transient, hydraulic flow and non-linear, advective-dispersive transport of the reactive chemical; coupled with algebraic equations describing the kinetics of the chemical, formation of oxygen gas, and associated decrease in saturation. To simulate partial saturation in sands through transport and reactivity, the computer program SUTRA, developed by the US Geological Survey, was adopted and modified. The new model "SUTRA-Bubble" is a modified version that simulates transient partial saturation created by IPS below the water table. SUTRA-Bubble models partial saturation in soil as a function of chemical reactivity of a solution which is transported through the pores of soil. SUTRA-Bubble also accounts for decrease in permeability of soil as degree of saturation in soil decreases.

See full dissertation at **coe.neu.edu/iris/SedaGokyer**

Burcu Guldur

PhD 2014, Civil Engineering; Advisor, Jerome F. Hajjar

LASER-BASED STRUCTURAL SENSING AND SURFACE DAMAGE DETECTION

This dissertation investigates the use of high resolution three-dimensional terrestrial laser scanners with image capturing abilities as tools to capture geometric range data of complex scenes for structural engineering applications. Laser scanning technology is continuously improving, with commonly available scanners now capturing over 1,000,000 texture-mapped points per second with an accuracy of ~2 mm. However, automatically extracting meaningful information from point clouds remains a challenge, and the current state-of-the-art requires significant user interaction. The first objective of this research is to use widely accepted point cloud processing steps such as registration, feature extraction, segmentation, surface fitting and object detection to divide laser scanner data into meaningful object clusters and then apply several damage detection methods to these clusters. This requires establishing a process for extracting important information from raw laser-scanned data sets such as the location, orientation and size of objects in a scanned region, and location of damaged regions on a structure.

See full dissertation at **coe.neu.edu/iris/BurcuGuldur**

Adam Hatch

PhD 2014, Chemical Engineering; Advisor, Shashi K. Murthy

MICROFLUIDIC ISOLATION OF ENDOTHELIAL PROGENITOR CELLS FOR VASCULAR TISSUE ENGINEERING

The principal goal of this dissertation is to create microfluidic cell separations systems to isolate or enrich key cell types for tissue engineering applications. In tissue engineering functional cell types must be enriched prior to seeding onto scaffolds. In cell based approaches to tissue repair and regeneration stem and progenitor cells present in certain types must be isolated and characterized prior to use. The adhesion of cells to a functionalized surface is the basis for this type of separation. This work demonstrated the viability of using a PEG-alginate hydrogel for the purification of EPCs. Further it was shown that the coating is agnostic to substrate type. Cells isolated via this hydrogel behaved as expected both in vitro and in vivo. This demonstrates the ability to use this platform for tissue engineering applications, basic research, and cellular based therapies to isolate EPCs in a rapid, rigorous, and inexpensive fashion. This represents a step forward in cell purification methods.

See full dissertation at **coe.neu.edu/iris/AdamHatch**

Ryan Patrick Hennessy

PhD 2014, Mechanical Engineering; Advisor, George Adams

EXPLORATION OF HOT SWITCHING DAMAGE AND DAMAGE MECHANISMS IN MEMS SWITCH CONTACTS

This work explores the effect of multi-domain coupling on the behavior of an electrical contact, what makes hot switching damaging, the making of contact under bias as it compares to the breaking of contact under bias (leading versus trailing edge hot switching), and the specific mechanisms that could be responsible for hot switching damage.

Theoretically, it was found that for a contact operating under displacement control, such as an asperity on the surface of a contact bump, thermal-electrical-mechanical coupling has a significant effect. Generalized (non-dimensional) equations are presented to describe the behavior of the contact in this situation...This work makes significant progress toward defining the specific mechanisms responsible for the additional damage associated with hot switching, thereby helping to solve a problem that has plagued the microswitch and inhibited it from significant commercial market penetration.

See full dissertation at **coe.neu.edu/iris/RyanHennessy**

Margery Hines

PhD 2015, Electrical Engineering; Advisor, Carey Rappaport

AUTONOMOUS ROBOTIC DETECTION OF ANTI-PERSONNEL LANDMINES USING GROUND-PENETRATING RADAR AND ON-CONTACT ANTENNAS

This dissertation proposes the use of ground-contact antennas, which greatly improve signal penetration and are less affected by ground clutter, thereby simplifying data analysis. Achieving contact between the surface and the antennas is done by integrating the antennas onto the feet of the Walking Tri-Sphere, a non-articulated walking robotic platform designed by Square One Systems Design (Jackson, WY, USA). Rather than imaging the subsurface, localization of potential targets is achieved using a robust geometric analysis, minimizing the required number of GPR scans. Overall, by using fewer scans and simpler data processing techniques, this method is capable of increasing the surveying speed of traditional GPR methods.

See full dissertation at **coe.neu.edu/iris/MargeryHines**

Chung-Ti Hsu

PhD 2014, Electrical Engineering; Advisor, Bradley Lehman

INCREASED ENERGY DELIVERY FOR PARALLEL BATTERY PACKS WITH NO REGULATED BUS

In this dissertation, a new approach to paralleling different battery types is presented. A method for controlling charging/discharging of different battery packs by using low-cost bi-directional switches instead of DC-DC converters is proposed. The proposed system architecture, algorithms, and control techniques allow batteries with different chemistry, voltage, and SOC to be properly charged and discharged in parallel without causing safety problems. The physical design and cost for the energy management system is substantially reduced.

Additionally, specific types of failures in the maximum power point tracking (MPPT) in a photovoltaic (PV) system when tracking only the load current of a DC-DC converter are analyzed. The periodic nonlinear load current will lead MPPT realized by the conventional perturb and observe (P&O) algorithm to be problematic. A modified MPPT algorithm is proposed and it still only requires typically measured signals, yet is suitable for both linear and periodic nonlinear loads.

See full dissertation at **coe.neu.edu/iris/ChungHsu**

Bolin Hu

PhD 2015, Electrical Engineering; Advisor, Vincent Harris

CRYSTAL GROWTH OF HEXAFERRITE ARCHITECTURE FOR MAGNETOELECTRICALLY TUNABLE MICROWAVE SEMICONDUCTOR INTEGRATED DEVICES

A nanoscale-driven crystal growth of magnetic hexaferrites was successfully demonstrated at low growth temperatures (25-40% lower than the temperatures required often for crystal growth). This outcome exhibits thermodynamic processes of crystal growth, allowing ease in fabrication of advanced multifunctional materials. Most importantly, the crystal growth technique is considered theoretically and experimentally to be universal and suitable for the growth of a wide range of diverse crystals. In the present experiment, the conical spin structure of Co_2Y ferrite crystals were a found to give rise to an intrinsic magnetoelectric effect. Our experiment reveals a remarkable increase in the conical phase transition temperature by ~150 K for Co_2Y ferrite, compared to 5-10 K of Zn_2Y ferrites recently reported. The high quality Co_2Y ferrite crystals, having low microwave loss and magnetoelectricity, were successfully grown on wide bandgap semiconductor GaN.

See full dissertation at **coe.neu.edu/iris/BolinHu**

Yu Hui

PhD 2015, Electrical Engineering; Advisor, Matteo Rinaldi

ALUMINUM NITRIDE PIEZOELECTRIC MICROELECTROMECHANICAL RESONANT PHYSICAL SENSORS

In this dissertation, a stepping stone towards the development of compact, power efficient and high resolution physical sensors: infrared (IR) detectors and magnetic field sensors, is set by taking the unique advantage of the AIN MEMS/NEMS resonant technology, which is the combination of extremely high sensitivity to external perturbations (due to their very reduced dimensions) and ultra-low noise performance (due to the intrinsically high quality factor, Q, of such resonant devices). For the first time, a spectrally selective uncooled NEMS resonant IR detector based on a plasmonic piezoelectric material is demonstrated, showing high resolution (noise equivalent power of 2.1 nW/Hz1/2) and ultra-fast response (thermal time constant of 440 μs), marking a milestone towards the implementation of a new class of high performance, miniaturized and low power IR spectroscopy and multi-spectral imaging systems.

See full dissertation at **coe.neu.edu/iris/EEYuHui**

Babak Haghpanah Jahromi

PhD 2014, Mechanical Engineering; Advisor, Ashkan Vaziri

MECHANICS OF REGULAR, CHIRAL AND HIERARCHICAL HONEYCOMBS

In this dissertation approaches to obtain analytical closed-form expressions for the macroscopic elastic, plastic collapse, and buckling response of various two-dimensional cellular structures are presented. First, analytical models to estimate the effective elastic modulus and Poisson's ratio of hierarchical honeycombs using the concepts of mechanics of materials and compare the analytical results with finite element simulations and experiments are provided. For plastic collapse, we present a numerical minimization procedure to determine the macroscopic 'plastic collapse strength' of a tessellated cellular structure under a general stress state. The method is illustrated with sample cellular structures of regular and hierarchical honeycombs. Based on the deformation modes found by minimization of plastic dissipation, closed-form expressions for strength are derived. The work generalizes previous studies on plastic collapse analysis of lattice structures, which are limited to very simple loading conditions.

See full dissertation at **coe.neu.edu/iris/BabakJahromi**

Inseok Jung

PhD 2014, Electrical Engineering; Advisor, Yong-Bin Kim

SELF-CALIBRATION APPROACH FOR MIXED SIGNAL CIRCUITS IN SYSTEMS-ON-CHIP

In this dissertation, several novel self-calibration design techniques in mixed-signal mode circuits are proposed for an analog to digital converter (ADC) to reduce mismatch error and improve performance. These are essential components in SOCs and the proposed self-calibration approach also compensates the process variations.

The proposed novel self-calibration approach targets the successive approximation (SA) ADC. First of all, the offset error of the comparator in the SA-ADC is reduced using the proposed approach by enabling the capacitor array in the input nodes for better matching. In addition, the auxiliary capacitors for each capacitor of DAC in the SA-ADC are controlled by using synthesized digital controller to minimize the mismatch error of the DAC. Since the proposed technique is applied during foreground operation, the power overhead in SA-ADC case is minimal because the calibration circuit is deactivated during normal operation time.

See full dissertation at **coe.neu.edu/iris/InseokJung**

Sean Henry Kevlahan

PhD 2014, Chemical Engineering; Advisors, Shashi K. Murthy, Rebecca L. Carrier

A MICROFLUIDIC CAPTURE AND RELEASE METHOD FOR ISOLATION INTESTINAL PROGENITOR AND STEM CELLS FROM NATIVE RAT TISSUE ENABLING ADVANCES IN VASCULOGENIC CO-CULTURES

This dissertation describes a novel microfluidic cell capture and release platform to enrich for rare tissue specific stem and progenitor cells within native conditions without the need of a FACS instrument. The platform incorporates the use of a microfluidic post array coupled with an alginate-PEG moiety containing a bound capture protein which allows for selective capture and release of target cells with a simple chelation step. Illustrated in chapter 3, incorporates anti-CD133 into the hydrogel for selective intestinal progenitor cell enrichment where as chapter 4 demonstrates stem cell isolation implementing anti-GPR49 as the capture protein. This approach has lead to a novel cell separation prototype to isolate intestinal stem cells from native tissue digestate without the need for conventional genetic hybridization techniques. In addition, the approach provides a greater throughput (35,000 cells/min) and higher viability (93%) in comparison to the state of the art.

See full dissertation at **coe.neu.edu/iris/SeanKevlahan**

Leila Keyvani

PhD 2015, Civil Engineering; Advisor, Mehrdad Sasani

PROGRESSIVE COLLAPSE RESISTANCE OF REINFORCED AND POST-TENSIONED CONCRETE FLAT PLATE STRUCTURES

In the first part of this dissertation a wireless data acquisition system capable of peer-to-peer and multi-hop communication is developed that would replace and overcome the constraints and drawbacks of wired systems.

Using field data, the progressive collapse resistance of an actual post-tensioned flat plate parking garage is analytically evaluated after an interior column is dynamically removed. The tendons and the interaction of the tendons and floor are modeled explicitly. The slab had no bottom bars yet successfully redistributed the gravity load to the adjacent columns without failure. Compressive membrane forces developed as a result of growth tendency contributed to an increase of the gravity load carrying capacity of slab. Use of total moments developed in post-tensioned slab sections were found to be misleading in identifying the contribution of different portions of the post-tensioned slab to collapse resistance.

See full dissertation at **coe.neu.edu/iris/LeilaKeyvani**

Masoud Khabiry

PhD 2015, Bioengineering; Advisor, Nader Jalili

AN INTEGRATED MICROFLUIDIC PLATFORM FOR CHEMICAL AND BIOLOGICAL SENSING EMPLOYING POLYMER-COATED PIEZOELECTRIC MICROCANTILEVERS

In this work, an integrated microfluidic system with shear-protective regions that enables cell and particle immobilization, sensor integration, and nanoparticle synthesis is presented. Thus, a novel and simple microfluidic device for capturing small volume of cells by using sidewall microgroove containing channels and microposts is developed. The developed microfluidic system enabled the control of fluid flow and shear stress profiles. Furthermore, the shear stress variation and cell positioning in the sidewall microgrooves were investigated. Moreover, the histograms of cell locations in the microgrooves were provided and the most probable destination of the cells was presented. In the microfluidic device, further investigation on extracting cell information from image data was carried out. Hence, a cell segmentation technique was developed for cell counting and extracting the cell information from the microfluidic device.

See full dissertation at **coe.neu.edu/iris/MasoudKhabiry**

Reza Khatami

PhD 2014, Mechanical Engineering; Advisor, Yiannis A.Levendis

IGNITION AND COMBUSTION OF PULVERIZED COAL AND BIOMASS UNDER DIFFERENT OXY-FUEL O_2/N_2 AND O_2/CO_2 ENVIRONMENTS

This dissertation studied the ignition and combustion of burning pulverized coals and biomasses particles under either conventional combustion in air or oxy-fuel combustion conditions. Oxy-fuel combustion is a 'clean-coal' process that takes place in O_2/CO_2 environments, which are achieved by removing nitrogen from the intake gases and recirculating large amounts of flue gases to the boiler. Removal of nitrogen from the combustion gases generates a high CO_2-content, sequestration-ready gas at the boiler effluent. Flue gas recirculation moderates the high temperatures caused by the elevated oxygen partial pressure in the boiler. In this study, combustion of the fuels took place in a laboratory laminar-flow drop-tube furnace (DTF), electrically-heated to 1400 K, in environments containing various mole fractions of oxygen in either nitrogen or carbon-dioxide background gases.

See full dissertation at **coe.neu.edu/iris/RezaKhatami**

SELECTED PhD THESES

Kholoud Khateeb

PhD 2015, Industrial Engineering; Advisors: Peter O'Reilly, Sagar Kamarthi

ECONOMIC ANALYSIS OF REMOTE PATIENT MONITORING: THE CASE (SIC) OF HEART FAILURE

This research evaluated the economic impact of integrating a Remote Patient Monitoring (RPM) system into the conventional heart failure disease care process. The first part of the work used a Markov chain model to represent patients' discrete health states in the disease management process and the transition probabilities between the states over time. The model presented 8 health states of a heart failure patient in the disease management process. These states are home/Post-Acute Care (PAC), doctor visit, Urgent Care (UC) visit, transfer from other health facility, Emergency Room (ER) visit, hospitalization, 30-day readmission, and death...This research indicates that RPM is a promising enabler of a new model of care with better outcomes for the heart failure disease management; however, further research is required to find an optimal RPM design with economic feasibility.

See full dissertation at **coe.neu.edu/iris/KholoudKhateeb**

Mert Korkali

PhD 2014, Electrical Engineering; Advisor, Ali Abur

ROBUST AND SYSTEMWIDE FAULT LOCATION IN LARGE-SCALE POWER NETWORKS VIA OPTIMAL DEPLOYMENT OF SYNCHRONIZED MEASUREMENTS

This dissertation addresses a novel method for fault location in power systems, while providing a new vision for the deployment of wide-area measurement systems and the application of robust estimation techniques in an effort to achieve systemwide, cost-effective, and resilient fault-location capability in large-scale power systems.

The first part of this dissertation introduces a novel methodology for synchronized-measurement-based fault location in large-scale power grids. The method is built on the notion of traveling waves that propagate throughout the power network. The approach is based upon capturing the arrival times of the fault-initiated traveling waves using a few synchronized sensors and triangulating the location of the fault with the aid of the recorded arrival times of these waves. In order to pinpoint (locate) the faults, these sparsely distributed sensors are exploited to capture point-on-wave samples of transient voltages after the occurrence of a fault.

See full dissertation at **coe.neu.edu/iris/MertKorkali**

Kang Li

PhD 2015, Computer Engineering; Advisor, Yun Fu

VIDEO EVENT RECOGNITION AND PREDICTION BASED ON TEMPORAL STRUCTURE ANALYSIS

In this thesis, several studies of high-level video content understanding were presented, which address these difficulties and narrow the semantic gap effectively. In particular, we have focused on two types of videos, namely human activity video and unconstrained consumer video. The proposed temporal structure analysis frameworks significantly extend the domains of video that can be understood by machine vision systems.

In aspect of human activity recognition, we notice that in case a time-critical decision is needed, there is no work that utilizes the temporal structure of videos for early prediction of ongoing human activity. Thus we present a general activity prediction framework in which human activities can be characterized by a complex temporal composition of constituent simple actions and interacting objects. Then we extend our work to the 3D cases of action prediction motivated by recent advent of the cost-effective sensors, such as depth camera Kinect.

See full dissertation at **coe.neu.edu/iris/KangLi**

Melissa Germaine Loving

PhD 2014, Chemical Engineering; Advisor, Laura H. Lewis

UNDERSTANDING THE MAGNETOSTRUCTURAL TRANSFORMATION IN FERH THIN FILMS

In this dissertation, sputter deposited FeRh thin films have been grown to study the role of intrinsic (chemical modification by thermally driven Au-capping layer diffusion) and extrinsic (strain/film lattice distortion and nanostructuring) factors on the FOPT character. Further, magnetic studies coupled with kinetic analysis have been employed to develop an understanding of the phase transformation kinetics (energy barriers and nucleation and growth mechanism associated with the AF-FM FOPT) in FeRh thin films. Results exposed in this dissertation have been obtained with laboratory and synchrotron-based magnetic and structural probes to advance the understanding of the spin-lattice coupling in the FeRh system with information that allows FOPT tailoring. Specifically, results obtained in this dissertation reveal that thermally-driven Au diffusion, out-of-plane lattice distortion, and nanostructuring lead to a stabilized FM phase in the (bulk) AF regime.

See full dissertation at **coe.neu.edu/iris/MelissaLoving**

Jennifer Mankin

PhD 2014, Electrical and Computer Engineering; Advisor, David Kaeli

CLASSIFICATION OF MALWARE PERSISTENCE MECHANISMS USING LOW-ARTIFACT DISK INSTRUMENTATION

In this thesis, we present DIONE, a flexible rule-based disk I/O monitoring and analysis infrastructure. DIONE interposes between a system-under-analysis and its hard disk, intercepting disk accesses and reconstructing high-level file system and registry changes as they occur. We evaluate the accuracy and performance of DIONE, and show that it can achieve 100% accuracy in reconstructing file system operations, with a performance penalty less than 2% in many cases.

Given the trustworthy behavioral traces obtained by DIONE, we convert file system-level events to high-level capabilities. For this, we use model checking, a formal verification approach that compares a model extracted from a behavioral trace to a given specification.

See full dissertation at **coe.neu.edu/iris/JenniferMankin**

Nicole Martino

PhD 2014, Structural Engineering; Advisor, Ming Wang

QUANTIFYING REINFORCED CONCRETE BRIDGE DECK DETERIORATION USING GROUND PENETRATING RADAR

The beginning of this research determines that not only is the relationship between GPR and rebar corrosion stronger than the relationship between GPR and delaminations, but that the two are exceptionally correlated (90.2% and 86.6%). Next, multiple bridge decks were assessed with GPR and half-cell potential (HCP). Statistical parameters like the mean and skewness were computed for the GPR amplitudes of each deck, and coupled with actual corrosion quantities based on the HCP measurements to form a future bridge deck model that can be used to assess any deck with GPR alone. Finally, in order to understand exactly which component of rebar corrosion (rust, cracking or chloride) attenuates the GPR data, computational modeling was carried out to isolate each variable. The results indicate that chloride is the major contributor to the rebar reflection attenuation, and that computational modeling can be used to accurately simulate GPR attenuation due to chloride.

See full dissertation at **coe.neu.edu/iris/NicoleMartino**

Babak Memarzadeh Isfahani

PhD 2014, Electrical Engineering; Advisor, Hossein Mosallaei

PLASMONIC METASURFACES WITH TAILORED LINEAR AND NONLINEAR BUILDING BLOCKS

In the first chapter there is brief review of metamaterials and plasmonic metasurfaces. In the second chapter we present the concept of transmit array concentrator implemented in optics. Planar concentric loop antennas are used as the elements for a 21×21 array to concentrate the incident plane wave at a desired distance. Finite difference time domain is used to obtain the performance of the periodic array of each element on the transmit array and then free space dyadic Green's function is employed to find the field distribution at each point, to show the focusing behavior of the metasurface. The third chapter investigates the concept of multi-layered tripod frequency selective surfaces in infrared. A full wave analysis based on finite difference time domain technique is applied to comprehensively characterize the structure and obtain the performance for both normal and oblique waves (for TE and TM polarizations).

See full dissertation at **coe.neu.edu/iris/BabakMemarzadeh**

Alexandre Consul Mendes

PhD 2014, Industrial Engineering; Advisor, Nasser Fard

PROPORTIONAL HAZARD MODEL APPLICATIONS IN RELIABILITY

This dissertation proposes two main methods as a modification of the semi-parametric Proportional Hazard Model (PHM) with innovative application for reliability testing. The first method developed uses a median of lifetime survival history for subjects with multiple occurrences to be modeled using the non-recurrent PHM method. The second method developed proposes censoring of influential observations, applying recurrent PHM theory. Both methods are validated using small electromechanical appliances with covariates identifying typical user performance as part of accelerated reliability testing.

See full dissertation at **coe.neu.edu/iris/AlexandreMendes**

Perhaad Mistry

PhD 2014, Computer Engineering; Advisor, David Kaeli

ARCHITECTURAL SUPPORT FOR IRREGULAR PROGRAMS AND PERFORMANCE MONITORING FOR HETEROGENEOUS SYSTEMS

This thesis proposes architectural enhancements to the profiling and workgroup scheduling subsystems of heterogeneous devices. The profiling and workgroup scheduling subsystems have been augmented with a resource known as the Offload Control Unit. The OCU enables performance monitoring of compute units with throughput counters. Throughput counters provide utilization information of compute units and the performance knowledge generated is utilized to improve execution performance for priority and data-driven workloads. Throughput counters and the software profiling subsystems result in a runtime that allows performance monitoring, profiling and specializations of applications built using heterogeneous computational pipelines. The scheduling capabilities proposed enable utilization of heterogeneous systems for workloads with QOS and non-homogeneous workgroup distributions.

See full dissertation at **coe.neu.edu/iris/PerhaadMistry**

Farid Moghim

PhD 2014, Civil Engineering; Advisor, Luca Caracoglia

WIND-BORNE DEBRIS TRAJECTORY IN HIGH WINDS: APPLICATION TO THE PROTECTION OF TALL BUILDING FAÇADES

This dissertation describes the development of a probability-based framework for the analysis of debris trajectory in simulated boundary layer winds and for the prediction of the probability of impact against the vertical façade of these buildings. The work focuses on compact debris, i.e., objects of small dimensions and negligible mass moment of inertia (e.g., roof ballast elements, gravel, "bluff" shingles, etc.) The trajectories were computed for three different wind fields: (i) uniform wind field with constant horizontal velocity and no turbulence, (ii) "sudden" vertical gust superimposed to the uniform wind field and (iii) fully turbulent wind field.

See full dissertation at **coe.neu.edu/iris/FaridMoghim**

Pegah Mohammad Hosseinpour

PhD 2014, Chemical Engineering; Advisor, Laura H. Lewis

STRUCTURE-MAGNETIC PROPERTY CORRELATIONS IN TiO_2 NANOTUBE ARRAYS

This Dissertation aims at investigating the correlations of the morphology, crystallinity, crystal structure, electronic structure and magnetic properties of TiO_2 nanotubes, with potential relevance to their functionality. Self-ordered arrays of amorphous TiO_2 nanotubes (pure and Fe-doped with cationic concentration of ~2.1 at%) were synthesized by the electrochemical anodization technique, followed by subjecting them to thermal treatments up to 450 °C to crystallize these nanostructures. A variety of probes—morphological, structural, magnetic and spectroscopic—were used to characterize the properties of these nanostructures as functions of their processing conditions and the dopant content. Structure-functionality relationships in these nanostructures were verified by examining the photodegradation rate of methyl orange (a model water pollutant) in presence of TiO_2 nanotubes under UV-Visible light irradiation.

See full dissertation at **coe.neu.edu/iris/PegahMohammad**

Marjan Mohebbi

PhD 2014, Electrical Engineering; Advisor, Carmine Vittoria

MAGNETOELECTRIC HEXAFERRITE THIN FILMS GROWTH FOR NEXT GENERATION DEVICE APPLICATIONS

In this dissertation, alternating target laser ablation deposition (ATLAD) is used for in-situ deposition of M-type and Y-type hexaferrites. There have been considerable reports on epitaxial growth of M-type hexaferrite but not on Y-types, since it is very difficult and challenging to produce them. One of the main problems is the need of substrate temperatures in excess of 1150°C which requires additional expensive high temperature equipment. Our developed process can be done at lower temperatures by PLD equipment and can form unique crystal structures which cannot be achieved by other techniques.

See full dissertation at **coe.neu.edu/iris/MarjanMohebbi**

Hande Musdal

PhD 2014, Industrial Engineering; Advisor, James Benneyan

SYSTEMS ENGINEERING MODELS FOR SIGNATURE INJURIES OF MODERN MILITARY CONFLICTS

This dissertation presents several systems engineering models to optimize the overall design, effectiveness, and capacity of healthcare systems for detecting and treating silent injuries, such as TBI and PTSD, as well as a general health problem that is common among veterans, sleep apnea, by addressing the following needs: (1) sequential screening processes, (2) categorical diagnostic methods, and (3) care services location-allocation (network optimization) models.

The first focus of this dissertation is analyzing and optimizing the design of disease screening processes. Several probability and Monte Carlo simulation models are developed to investigate the current and proposed PTSD screening processes within the Veterans Health Administration (VHA). Results indicate that a more systematically designed system, which consists of a series of annual screenings along with a standardized confirmatory testing, results in lower false diagnosis rates, predictable performance, and reduced costs.

See full dissertation at **coe.neu.edu/iris/HandeMusdal**

Payam Mahmoodi Nia

PhD 2014, Mechanical Engineering; Advisor, Rifat Sipahi

CONTROL-PARAMETER-SPACE CLASSIFICATION FOR DELAY-IDEPENDENT-STABILITY OF LINEAR TIME-INVARIANT TIME-DELAY SYSTEMS; [SIC] THEORY AND EXPERIMENTS

Within this dissertation, a purely algebraic approach is developed for designing controllers for regulation purposes of the general class of linear time-invariant (LTI) systems with uncertain delays. The results are new and address the major issue of extending the DIS control design to increased number of discrete delays. This is achieved mainly by procedures based on algebraic tools which allow designing controllers that can stabilize such systems regardless of how large/small the delays are.

See full dissertation at **coe.neu.edu/iris/PayamNia**

Sidi Niu

PhD 2014, Electrical Engineering; Advisor, Vinay Ingle

QUANTIFICATION OF CHEMICAL GASEOUS PLUMES ON HYPERSPECTRAL IMAGERY

In this dissertation, we evaluate and investigate the advantages and limitations of a number of quantification algorithms that span a variety of assumptions. With these in-depth insights we gain, a new quantification algorithm is proposed for single gas quantification which is superior to all state-of-the-art algorithms in almost every aspects including applicability, accuracy, and efficiency. The new method, called selected-band algorithm, achieves its superior performance through an accurate estimation of the unobservable off-plume radiance. The reason why off-plume radiance is recoverable relies on a common observation that most chemical gases only exhibit strong absorptive behavior in certain spectral bands. Those spectral bands where the gas absorption is almost zero or small are ideal to carry out background estimation. In this thesis, the new selected-band algorithm is first derived from its favorable narrow-band sharp-featured gas and then extended to an iterative algorithm that suits all kinds of gases. The performance improvement is verified by simulated data for a variety of experimental settings.

See full dissertation at **coe.neu.edu/iris/SidiNiu**

Umut Orhan

PhD 2014, Electrical Engineering; Advisor, Deniz Erdogmus

RSVP KEYBOARD: AN EEG BASED BCI TYPING SYSTEM WITH CONTEXT INFORMATION FUSION

In this dissertation RSVP aims to be accessible to the population with limited eye gaze control by presenting sequences of symbols on a screen over time at a fixed focal area and in rapid succession. As a response to the infrequent novel target stimulus (oddball paradigm), brain generates P300, an event related potential which is a positive deflection in the scalp voltage mainly in the centro-parietal areas with an average latency just over 300 ms. This natural novelty response allows us to design interfaces by detecting the intent using EEG.

See full dissertation at **coe.neu.edu/iris/UmutOrhan**

Jeffrey Paten

PhD 2014, Mechanical Engineering; Advisors: Jeffrey Ruberti, Christopher Trainor

INVESTIGATION INTO THE MECHANO-CHEMISTRY OF DE NOVO COLLAGEN ASSEMBLY

The proposed research in this dissertation is motivated by basic science to determine the essentiality of the cells in creating tissue in vitro. The results of this investigation strengthen the concept that upon completion of the initial anlage, cells are potentially relegated to mechanical stimulators/molecular production houses, and the mechanosensitive, physiochemical properties of the molecules drive tissue growth and maintenance. Successful demonstration will provide a significant opportunity for a generation of new engineering methods capable of acellularly recapitulating the development of load-bearing tissue.

See full dissertation at **coe.neu.edu/iris/JeffreyPaten**

Lang Peng

PhD 2014, Electrical Engineering; Advisor, Hanoch Lev-Ari

EFFICIENT ESTIMATION AND TRACKING OF RESPONSE STATISTICS FOR (RANDOMLY) TIME-VARIANT SYSTEMS

In this dissertation we develop efficient time -recursive alternatives to the existing non-recursive procedure for estimating the system's response autocorrelation. In addition, we exploit the structure and sparsity of the covariance matrix associated with our WIP interpretation to develop lag-recursive solutions that achieve a further reduction of the overall computational cost. In particular, we explore the possibility of using the maximum entropy method (MEM) to obtain a computationally efficient direct estimate of the system's (multi-channel) Doppler-spread spectrum.

See full dissertation at **coe.neu.edu/iris/LangPeng**

Parastoo Qarabaqi

PhD 2014, Electrical Engineering; Advisor, Milica Stojanovic

STATISTICAL CHARACTERIZATION OF A CLASS OF UNDERWATER ACOUSTIC COMMUNICATION CHANNELS

In this dissertation, we offer a statistical channel model, which incorporates physical laws of acoustic propagation (frequency-dependent attenuation, bottom-surface reflections) as well as the effects of inevitable random local displacements.

We focus on random displacements on two scales: small-scale effects, that involve distances on the order of a few wavelengths, and large-scale effects, that involve many wavelengths. Small-scale effects include scattering and motion-induced Doppler shifting, and are responsible for fast variations of the instantaneous channel response; while large-scale effects describe the location uncertainty and changing environmental conditions, and affect the locally-averaged received power.

See full dissertation at **coe.neu.edu/iris/ParastooQarabaqi**

Wei Qiao

PhD 2014, Mechanical Engineering; Advisor, Rifat Sipahi

INTERPLAY BETWEEN STABILITY, DELAYS, AND GRAPHS OF A CLASS OF MULTI-AGENT LTI SYSTEM WITH APPLICATIONS

This dissertation shows how networked dynamical systems with delays studied can be tolerant to delays by utilizing the Responsible Eigenvalue concept, which simply requires checking finite number of eigenvalues in order to conclude on the infinitely dimensional stability problem. Then the author reveals that the networked system can be made more tolerant to destabilizing effects of delays even by increasing delay. In particular, the author shows that by increasing delay, the settling time of the network system consensus reach can be reduced. Note the author develops two topology construction methods to build large scale systems while assuring improved tolerance to delay. Followed by this, delay dependent coupling design is introduced where agent couplings are designed as an explicit parameter of delay which insures the design of delay dependent or delay independent stability properties. Finally, an experimental setup of a three-robot system is used to validate the theoretical results, which show good agreement with simulations.

See full dissertation at **coe.neu.edu/iris/WeiQiao**

Michael Conrad Robitaille

PhD 2014, Mechanical Engineering; Advisor, Kai-Tak Wan

MULTI-SCALED ADHESION MECHANICS OF HYDROGEL CONTACT LENSES

This thesis establishes novel experimental protocols and methods to accurately characterize hydrogel contact lens adhesion and mechanical properties in a variety of contexts and length scales. Throughout all aims/experiments, two commercially available hydrogel lenses are characterized for comparison, Narafilcon A/Acuvue TruEye and Etafilcon A/Acuvue2.

The first aim of this thesis focuses on macroscopic hydrogel lens adhesion characterization achieved via the Planar Adhesion Test (PAT). The PAT is a novel experimental technique that utilizes the lens native geometry to characterize both mechanical and adhesion properties. The lens is compressed and subsequently removed from a planar substrate, during which the applied load P, the maximum tensile force or "pull-off" force P*, approach distance w0, and contact radius a are measured.

See full dissertation at **coe.neu.edu/iris/MichaelRobitaille**

Xiaodan Ruan

PhD 2015, Civil Engineering; Advisor, Ferdi L. Hellweger

EFFECT OF LAKE N FIXATION ON WATERSHED EXPORT UNDER N LOADING REDUCTION SCENARIOS

The hypothesis of this research is that lake and watershed N export is not reduced proportionally when N loading is reduced, because N fixation will counteract the reduction. The objective is to evaluate and quantify this effect. The hypothesis is tested by analysis of data from three approaches: microcosm lab experiments, lake field observations/budgets and lake ecosystem model applications. A simple model (Fixation and Export of Nitrogen from Lakes, FENL) is developed based on a steady-state mass balance with loading, output, loss/retention, and N fixation, where the amount fixed is a function of the N/P ratio of the loading. The FENL model is then implemented into a Chesapeake Bay watershed model and applied to predict watershed N export under three scenarios (baseline, 60% N reduction and balanced N+P reduction). The results suggest that lake and watershed N export will not be reduced proportionally with N loading.

See full dissertation at **coe.neu.edu/iris/XiaodanRuan**

Mehdi Safari-Qariq

PhD 2014, Mechanical Engineering; Advisor, Reza Sheikhi

ENTROPY FILTERED DENSITY FUNCTION FOR LARGE EDDY SIMULATION OF TURBULENT REACTING FLOWS

The objective of this work is to predict entropy and entropy generation in turbulent reacting flows using large eddy simulation (LES). Entropy generation is not only an essential part of entropy dynamics, but also a significant quantity in its own right with many applications in diverse fields. In fluid systems, production of entropy is a manifest of irreversible dissipation inherent in the underlying transport processes such as fluid flow, heat transfer and mass diffusion. The entropy transport equation in LES contains several unclosed terms. These are the subgrid scale (SGS) entropy flux and entropy generation caused by irreversible processes: heat conduction, mass diffusion, chemical reaction and viscous dis- sipation. The SGS effects are taken into account using a novel methodology based on the filtered density function (FDF). This methodology, entitled entropy FDF (En-FDF), is developed and utilized in the form of joint entropy-velocity-scalar-turbulent frequency FDF and the marginal scalar-entropy FDF, both of which contain the chemical reaction effects in a closed form.

See full dissertation at **coe.neu.edu/iris/MehdiSafari**

Vitaliy Victorovich Saykin

PhD 2014, Civil Engineering; Advisor, Jerome F. Hajjar

A VALIDATED APPROACH FOR MODELING COLLAPSE OF STEEL STRUCTURES

This dissertation discusses the goal of the creation of an element deletion strategy based on fracture models for use in validated prediction of collapse of steel structures. The current work reviews the state-of-the-art of finite element deletion strategies for use in collapse modeling of structures. It is shown that current approaches to element deletion in collapse modeling do not take into account stress triaxiality in vulnerable areas of the structure, which is important for proper fracture and element deletion modeling. The report then reviews triaxiality and its role in fracture prediction. It is shown that fracture in ductile materials is a function of triaxiality. It is also shown that, depending on the triaxiality range, different fracture mechanisms are active and should be accounted for. An approach using semi-empirical fracture models as a function of triaxiality are employed.

See full dissertation at **coe.neu.edu/iris/VitaliySaykin**

Jungho Seo

PhD 2014, Mechanical Engineering; Advisor, Ahmed Busnaina

DEVELOPMENT OF HIGH-RATE SWNTS ASSEMBLY FOR LARGE-SCALE SWNTS-BASED FUNCTIONAL DEVICE APPLICATIONS

In this thesis, I have focused on CNTs assembly techniques and nanotemplate manufacturing for single-walled carbon nanotubes (SWNTs)-based functional device applications. A template-guided fluidic assembly method has been utilized because it is directed, robust, and precisely controllable over other assembly methods. Since the fluidic assembly uses capillary force at the interface of the surface, however, it is a diffusion-limited process; the SWNTs are slowly attached on the surface while the solution is evaporated. Hence, a significantly progressive assembly technique is destined to meet all the integration requirements of precise control of the desired location, density, large area and alignment simultaneously. Therefore, I developed an electric-assisted template-guided fluidic assembly technique for high-rate SWNTs assembly accurately to assemble highly aligned SWNTs arrays with high density.

See full dissertation at **coe.neu.edu/iris/JunghoSeo**

Anup Kumar Singh

PhD 2014, Electrical Engineering; Advisor, Nicol McGruer

ORGANIC PHOTOVOLTAICS USING NOVEL PENTACENE DERIVATIVES

In this thesis, present the OPV cell designs (bilayer or planar and bulk heterojunction type), fabrication steps, electrical results and discuss them to correlate the experimental findings with simulation data.

One of the most promising organic semiconductors is pentacene, which acts mainly as a donor molecule. It is observed that PCE does not improve above this optimum mobility value of about 10-4 cm2/V-s. Donor and acceptor thicknesses are also optimized using the simulation program to get the best efficiency. We also investigate the effect of exciton diffusion length of organic semiconductor on power conversion efficiency, and simulations suggest that PCE almost saturates above certain value of exciton diffusion length.

See full dissertation at **coe.neu.edu/iris/AnupSingh**

Asli Sirman

PhD 2014, Mechanical Engineering; Advisor, Ahmed Busnaina

DEVELOPMENT OF HIGH-RATE ELECTRO-FLUIDIC DIRECTED ASSEMBLY OF NANOELEMENTS ON INSULATING SURFACES

In this study, governing parameters and important process kinetics, such as applied voltage and pH of the solution, were studied to establish a repeatable and robust assembly technique. A generalized assembly efficiency graph was obtained for different pulling speeds. We were also able to examine monolayer and multilayer assemblies with different geometries down to 100 nm scale. We have demonstrated assembly of polystyrene latex (PSL) nanoparticles, copper nanoparticles, silica nanoparticles, quantum dots and single walled carbon nanotubes (CNT). Finally, a single wall carbon nanotube based NO_2 gas sensor was fabricated. The overall significance of our results is twofold: first, the electro-fluidic assembly process is two orders of magnitude faster than the conventional fluidic assembly technique, and second, nanoelements are directly placed on the insulating layer unlike the electric field assembly technique. Our findings indicate that knowledge gained from this study could possibly aid in the understanding of high yield and repeatable assembly—leading to various nanoscale device applications.

See full dissertation at **coe.neu.edu/iris/AsliSirman**

Kenan Song

PhD 2015, Mechanical Engineering; Advisor, Marilyn Minus

CUSTOMIZING FIBER SPINNING APPROACHES FOR POLYMER/NANO-CARBON COMPOSITES

This thesis focuses on customizing a new spinning approach for fabricating polymer/nC high-performance composite fibers. In particular, the nCs used in this work include stacked graphitic platelets (carbon nanochips (CNC)), carbon nanotubes (CNT), and layered carbon nano-spheres (CNS). Mechanical properties are characterized using both static tensile tests and dynamic mechanical analysis (DMA). Thermal properties are examined using differential scanning calorimetry (DSC) and thermo-gravimetric analysis (TGA). Finally the microstructures of the materials are experimentally probed using wide-angle X-ray diffraction (WAXD) and small-angle X-ray (SAXS). Detailed exploration regarding the fabricated fiber microstructure is conducted to fundamentally understand the processing-microstructure-performance relationship in these polymer-based composite fiber systems.

See full dissertation at **coe.neu.edu/iris/KenanSong**

Linlin Sun

PhD 2014, Chemical Engineering; Advisor, Thomas Webster

SELF-ASSEMBLED ROSETTE NANOTUBES FOR BONE TISSUE ENGINEERING AND DRUG DELIVERY APPLICATIONS

This thesis will first cover recent advances in fabricating and using nanostructured metals, ceramics, and polymers for numerous orthopedic applications and discuss future research that is needed for the field to progress. Then, this thesis elucidates several promising tissue engineering applications of rosette nanotubes (RNTs), a biomimetic self-assembled nanomaterial composed of DNA base-pairs. Rosette nanotubes have unique properties, including self-assembling into stable nanotubes in physiological environments, forming a viscous gel at body temperatures, and having a great affinity and enhanced bioactivity with many types of tissues (e.g., bone, cartilage, skin, heart, blood vessels, etc.). With a similarity to collagen molecules in bone and extracellular matrices in other organs, rosette nanotubes were used in this thesis for orthopedic applications in terms of enhancing bone cell functions, promoting in-vivo bone growth, delivery of bone morphogenetic protein (BMP) 7 derived short peptides, and anti-cancer drug delivery for bone cancer treatment.

See full dissertation at **coe.neu.edu/iris/LinlinSun**

Shaopeng Sun

PhD 2014, Chemical Engineering; Advisor, Elizabeth J. Podlaha

INDUCED CODEPOSITION OF Mo AND W FROM AQUEOUS ELECTROLYTES

In the work presented here, Mo induced codeposition with Ni was explored when the concentration of nickel ions in the electrolyte was much lower than molybdate. Their composition and deposit thickness were characterized by X-ray fluorescence. Mo-rich alloys were obtained, setting a new record, with > 80 wt. % Mo content. Catalytic properties were investigated and exhibited Tafel behavior consistent with their hallmark feature as a catalyst for electrolytic hydrogen evolution. NiMoW alloys were also electrodeposited, where the nickel preferentially induced the deposition of molybdenum over that of tungsten. The tungsten partial current density, hence reaction rate, was inhibited when deposition was compared to a molybdenum free electrolyte. A mechanism to describe this observation was raised for both Mo and W induced codeposition...In this work, the composition range of electrodeposited NiMo from aqueous solution was expanded to a new limit, 80 wt.%. Also, a new mechanism of Mo and W induced codeposition was suggested, where adsorbed intermediates was identified as the key species that induces molybdate and tungstate ion reduction.

See full dissertation at **coe.neu.edu/iris/ShaopengSun**

Jianzhe Tai

PhD 2014, Electrical and Computer Engineering; Advisor, Ningfang Mi

RESOURCE MANAGEMENT IN ENTERPRISE CLUSTER AND STORAGE SYSTEMS

In this thesis, we present our works on resource management in large scale systems, especially for enterprise cluster and storage systems. Large-scale cluster systems have become quite popular among a community of users by offering a variety of resources. Such systems require complex resource management schemes for multi-objective optimizations and should be specific to different system requirements. In addition, burstiness has often been found in enterprise workloads, being a key factor in performance degradation. Therefore, it is an extremely challenging problem of managing heterogeneous resources (e.g., computing, networking and storage) for such a large scale system under bursty conditions while providing performance guarantee and cost efficiency.

See full dissertation at **coe.neu.edu/iris/JianzheTai**

Osso Vahabzadeh

PhD 2014, Electrical Engineering; Advisor, Masoud Salehi

EFFICIENT LOW-DENSITY PARITY-CHECK CODES FOR COOPERATIVE COMMUNICATION

In this dissertation, we address code design problem for cooperative communication over different channel models with emphasis on low complexity designs and structured codes that are attractive for practical implementation. We start with the problem of designing efficient codes for the relay node in Gaussian relay channels. For a class of capacity approaching codes for this channel model, called bilayer lengthened LDPC (BL-LDPC) codes, we calculate a measure of decoding complexity as a function of the number of decoding iterations and propose a technique to design complexity-optimized BL-LDPC codes by minimizing the complexity measure of these codes. This is made possible by generalizing the EXIT charts to the case of BL-LDPC codes. Motivated by the fact that there are usually stricter hardware restrictions at the relay node, our technique targets minimizing the decoding complexity of the relay code. Furthermore, excessive delay due to decoding high rate codes at the relay results in additional delay at the destination. Using our technique, we design bilayer codes with noticeable reduction in decoding complexity and delay compared to the rate-optimized codes reported in the literature.

See full dissertation at **coe.neu.edu/iris/OssoVahabzadeh**

Niksa Valim

PhD 2014, Electrical Engineering; Advisor, Mark Niedre

INSTRUMENTATION AND METHODS FOR TIME-RESOLVED DIFFUSE FLUORESCENCE IMAGING

We studied the impact of instrumentation on early-arriving photon measurements and showed that this had a significant effect on instrument performance compared to theoretical models. Specifically the effects of i) instrument temporal impulse response function, ii) detector sensitivity and iii) detected signal levels were studied. Based on this work, an improved early-photon tomography prototype was developed and validated in our lab.

Complimentary to this work, we studied time-resolved and multispectral analysis of FMT data sets with multiple fluorescent targets. In general, the narrow (~200 nm) "diagnostic window" in biological tissue in the red and NIR wavelength range, combined with the broad emission spectra of organic fluorophores limits the number concurrent fluorescent targets in an imaging system to one or two.

See full dissertation at **coe.neu.edu/iris/NiksaValim**

Alexandru Vasile

PhD 2015, Electrical Engineering; Advisor, Octavia Camps

HIERARCHICAL IMAGE GEO-LOCATION ON A WORLD-WIDE SCALE

In this thesis, we leverage multiple large geo-spatial databases to create a 3D world model and develop a hierarchical image geo-location framework using a coarse-to-fine localization approach. Starting at the coarsest level, a query image is geo-located to regions of the world though a probabilistic terrain classification approach using a 6.5 million image Flickr database. Next, a novel medium-scale localization method is developed to rule out most of the regions and establish candidate geo-locations with geo-positioning accuracy at a city level. Results from the combined hierarchical classifier demonstrate a 10% improvement over current state-of-the-art. A fine-scale geo-location stage was also developed to determine the pose of a query image to street-level geo-positioning accuracy.

See full dissertation at **coe.neu.edu/iris/AlexandruVasile**

Curtis Watson

PhD 2014, Computer Engineering; Advisor, Waleed Meleis

SIGNAL DETECTION AND DIGITAL MODULATION CLASSIFICATION-BASED SPECTRUM SENSING FOR COGNITIVE RADIO

In this dissertation, we describe a spectrum sensing architecture that characterizes the carrier frequency and bandwidth of all narrowband signals present in the spectrum, along with the modulation type of those signals that are located within a licensed portion of the spectrum. From this radio identification, a cognitive radio can better determine an opportunity to access the spectrum while avoiding primary users.

We describe a narrowband signal detection algorithm that takes an iterative approach to jointly estimate the carrier frequency and bandwidth of individual narrowband signals contained within a received wideband signal. Our algorithm has a number of tunable parameters, and the algorithm gives consistent performance as we varied these parameter values. Our algorithm outperforms the expected performance of an energy detection algorithm, in particular at lower signal-to-noise ratio (SNR) values. These behavioral features make our algorithm a good choice for use in our spectrum sensing architecture.

See full dissertation at **coe.neu.edu/iris/CurtisWatson**

Thaddaeus Webster

PhD 2015, Chemical Engineering; Advisor, Edgar Goluch

MONITORING OF PSEUDOMONAS AERUGINOSA TOXINS VIA MINIATURIZED ELECTROCHEMICAL ASSEMBLIES

In this dissertation the production of pyocyanin from the opportunistic pathogen Pseudomonas aeruginosa was probed using a variety of miniaturized electrochemical systems. Goal 1 used disposable screen printed carbon electrodes to measure pyocyanin in medically relevant samples showing for the first time that pyocyanin can be detected at medically relevant concentrations (1-100 μM) without sample processing. Goal 2 coupled these same electrodes with Polydimethylsiloxane growth chambers to expose P. aeruginosa biofilms to varying concentrations of colistin sulphate...Goal 3 addresses the question of detecting P. aeruginosa in patient samples if the concentration of pyocyanin is initially low/non-existent in patient samples...Goal 4 looks at the miniaturization of the reference electrode using palladium as a novel pseudo reference material. The reference electrode was fabricated in a nanofluidic chamber housing a gold working electrode.

See full dissertation at **coe.neu.edu/iris/ThaddaeusWebster**

Wei Wei

PhD 2015, Electrical and Computer Engineering;
Advisor, Fabrizio Lombardi

NOVEL PARADIGMS AND DESIGNS OF NANOMETRIC MEMORIES

This dissertation of study has investigated low power design techniques and methods to accomplish the tolerance improvement to the soft error, especially in the SEU. It achieves research and design concentrated on the memory circuit at nano scaled CMOS from various perspectives, including SRAM, DRAM, hybrid memory and multiple level memory. Moreover, by implementing the novel technology like Single-Electron transfer and Resistive RAM (RRAM), the designs are capable of replacing conventional MOSFET-based memory circuit and compatible with the MOSFET fabrication process. The proposed memory circuits have been evaluated with extensive HSPICE simulations. Finally, novel design of memory circuits have been demonstrated from architecture level with SPEC benchmark simulation and characterized the performance improvement of the implemented cache. In sum, this manuscript presents the adequate investigations on the nanometric memory designs, verification and characterization, facilitating novel design techniques with the emerging technology implementation.

See full dissertation at **coe.neu.edu/iris/WeiWei**

Fei Xiong

PhD 2014, Electrical Engineering; Advisor, Octavia Camps

MANIFOLD EMBEDDING WITH DYNAMIC AND/OR CLASSIFICATION SUPERVISION

In this dissertation, we propose a set of nonlinear manifold embedding tools that exploit supervised learning information to find low dimensional data embeddings that preserve spatial and/or temporal correlations characteristics hidden in high dimensional data such as videos and images.

The proposed methods extend the maximum variance embedding objective used in the existing Semi-Definite Embedding (SDE) algorithm by incorporating large margin, low dynamic order and large margin dynamic classification objectives, respectively. These three different supervision objectives benefit the embeddings with linear separation between classes, simple dynamics and separation between different dynamics.

See full dissertation at **coe.neu.edu/iris/FeiXiong**

Hasan Mahmut Yildiz

PhD 2014, Chemical Engineering; Advisor, Rebecca Carrier

FOOD-ASSOCIATED STIMULI ENHANCE BARRIER PROPERTIES OF MUCUS

The main objective of this project was to examine the impact of physicochemical changes occurring upon food ingestion on gastrointestinal (GI) mucus barrier properties. The motivation for studying these phenomena includes understanding how drug delivery and microbe transport through mucus may change upon food exposure, and how these effects may be exploited to enable more efficient drug delivery or block pathogen transport. Lipid content associated with fed state intestinal contents significantly enhanced mucus barrier properties, as indicated by 10 - 140-fold reduction in the transport rate of 200 nm microspheres through mucus, depending on surface chemistry. Physiologically relevant increases in [Ca2+] resulted in 3-fold, 4-fold and 2-fold reduction of amine-, carboxylate- and sulfate modified particle transport rates, respectively, likely due to binding of [Ca2+] to mucin glycoproteins and thus enhanced cross-linking of the mucus gel network. Reduction of pH from 6.5 to 3.5 also affected mucus viscoelasticity, reducing particle transport rates approximately 5-fold for amine-modified particles and 10-fold for carboxylate- and sulfate modified microspheres.

See full dissertation at **coe.neu.edu/iris/HasanMahmut**

Ayse Yilmazer

PhD 2014, Electrical and Computer Engineering; Advisor, David Kaeli

MICRO-ARCHITECTURAL SUPPORT FOR IMPROVING SYNCHRONIZATION AND EFFICIENCY OF SIMD EXECUTION ON GPUS

This dissertation presents a new approach to enhance the efficiency and scalability of GPU synchronization. The proposed scheme can enable applications that work on shared data to effectively communicate at finer levels of granularity.

To achieve this ambitious goal, we propose a new synchronization approach called Hierarchical Queuing Locks (HQL). HQL is a novel hardware-based synchronization mechanism which provides efficient use of resources through execution blocking and hierarchical queuing. To provide a queue-based locking mechanism, HQL extends current GPU L1 and L2 cache management protocols by adding a synchronization protocol. Integration of HQL's synchronization protocol simplies the synchronization, but adds a level of complexity to the cache management protocol. Given this added complexity to the cache management scheme, as part of this dissertation we provide a formal verication of the proposed HQL synchronization protocol.

See full dissertation at **coe.neu.edu/iris/AyseYilmazer**

Esra Negris Yolacan

PhD 2014, Computer Engineering; Advisor, David Kaeli

LEARNING FROM SEQUENTIAL DATA FOR ANOMALY DETECTION

In this thesis, we address context-aware multi-class anomaly detection as applied to discrete sequences and develop a context learning approach using an unsupervised learning paradigm. We begin the anomaly detection process by applying our approach to differentiate normal behavior classes (contexts) before attempting to model abnormal behavior. This approach leads to stronger learning on each class by taking advantage of the power of advanced models to identify normal behavior of the sequence classes. We evaluate our discrete sequence-based anomaly detection framework using two illustrative applications: 1) System call intrusion detection and 2) Crowd anomaly detection. We also evaluate how clustering can guide our context-aware methodology to positively impact the anomaly detection rate. In this thesis, we utilize a Hidden Markov Model (HMM) to perform anomaly detection. A HMM is the simplest dynamic Bayesian network. A HMM is a Markov model which can be used when the states are not observable, but observed data is dependent on these hidden states.

See full dissertation at **coe.neu.edu/iris/EsraYolacan**

Sheng You

PhD 2014, Electrical Engineering; Advisor, Deniz Erdogmus

AUTOMATIC SUBLINGUAL MICROCIRCULATION IMAGE ANALYSIS AND QUANTITATIVE ASSESSMENT OF THE MICROCIRCULATION

In this dissertation, our objective is to develop a fully functional, automatic computer assisted diagnosis tool providing quantitative microvascular measurements for the characterization of sublingual microcirculation in healthy subjects and infected patients and assist doctors in determining pathological conditions of patients.

See full dissertation at **coe.neu.edu/iris/ShengYou**

Jiaxing Zhang

PhD 2014, Computer Engineering; Advisor, Gunar Schirner

INTEGRATING ALGORITHM-LEVEL DESIGN AND SYSTEM-LEVEL DESIGN THROUGH SPECIFICATION SYNTHESIS

This thesis introduces a specification synthesis approach that joins two design methodologies, Algorithm-Level Design (ALD) and System-Level Design (SLD), to establish a new Algorithm-Architecture Co-design flow. We designed and implemented an algorithm-to-specification synthesizer: Algo2Spec, which out of an algorithm model captured in ALD, such as Simulink, synthesizes into an SLD languages (SLDL) specification (e.g. SpecC/SystemC) enabling SLD exploration. Expanding the rich sets of SLD facilities into higher abstraction levels in ALD forms a new joint co-design methodology. The new flow seamlessly spans from the Simulink environment down to heterogeneous implementations crossing multiple abstractions. Our tools empower designers to construct, simulate, validate, explore, and deploy models in rapid feedback cycles. Our results illustrated the opportunities and benefits of our approach on a set of real-world applications and showed a significantly shortened design time.

See full dissertation at **coe.neu.edu/iris/JiaxingZhang**

Yiying Zhang

PhD 2014, Civil Engineering; Advisor, Ming Wang

USE OF VEHICLE NOISE FOR ROADWAY DISTRESS DETECTION AND ASSESSMENT

This work evaluates the pavement surface condition and detects the pavement subsurface delamination through vehicle noise collected by microphones mounted underneath a moving vehicle. Such measurements will include tire-generated sound, which carries much information about the road condition, as well as noise generated by the environment and vehicle. A careful frequency analysis of the vehicle noise is carried out to localize the frequency range for surface characteristics and subsurface delamination respectively. The Principal Component Analysis (PCA) method is applied to differentiate important information about the road condition from noisy data contributions collected while the vehicle is moving. The analysis begins with acoustic pressure measurements made over constant and known road conditions. Fourier transforms are taken over various time windows and a PCA is performed over the resulting vectors, yielding a set of principal component vectors for the road condition.

See full dissertation at **coe.neu.edu/iris/YiyingZhang**

Yiying Zhang

PhD 2014, Mechanical Engineering; Advisor, Marilyn Minus

A SYSTEMATIC STUDY OF THE PROCESS-STRUCTURE RELATIONSHIP FOR BUILDING POLYMER INTERPHASE REGIONS IN CARBON NANOTUBE COMPOSITES

This dissertation work focuses on understanding the development of interfacial zones in polymer/CNT composites, which is necessary for producing mechanically outstanding composite materials. Highly crystalline and confined interphase structure plays a significant role for (i) interfacial stress transfer (affecting the overall composite properties), and (ii) structural evolution during heat treatment (enabling low-temperature graphitization of polyacrylonitrile (PAN)). For this reason, control of the structural development in the interphase regions during composite processing is a key to success.

See full dissertation at **coe.neu.edu/iris/MEYiyingZhang**

Chuanwei Zhuo

PhD 2014, Mechanical Engineering; Advisor, Yiannis Levendis

ON THE SYNTHESIS OF CARBON NANOTUBES FROM WASTE SOLID HYDROCARBONS

In this doctoral dissertation, the feasibility of utilizing municipal /industrial/agriculture wastes as carbon sources for CNTs has been examined and proven. It was also found that the effluents of the CNT synthesis process can also serve as gaseous fuels for "clean" power production, which can then be used for energy self-sustaining CNT synthesis. Besides, a facile catalyst pre-treatment has been developed to activate stainless steel based substrate/catalyst for efficient CNT growth. Finally, the efforts of CO_2 on the pyrolyzate gases and on the CNT co-generation were also investigated.

See full dissertation at **coe.neu.edu/iris/ChuanweiZhuo**

Ziyao Zhou

PhD 2014, Electrical Engineering; Advisor, Nian Sun

VOLTAGE CONTROL OF MAGNETISM

In our work, different mechanism-based magnetoelectric (ME) coupling in multiferroics heterostructure was investigated for the development of novel generation, voltage-controllable, high-speed, compact RF/microwave devices with greater energy efficiency.

Firstly, ME coupling was realized in different magnetic thin film/ferroelectric slab heterostructures. By decreasing the saturation magnetization of Cr doping Ni magnetic thin film, large ME coupling in NiCr/PbZr0.52Ti0.48O3 (PZT) and NiCr/PbZn1/3Nb2/3O2.4(PbTiO3)0.6 (PZNPT) was obtained. Furthermore, non-volatile voltage impulse tunability was discovered through electric field-induced phase transition in FeGaB/PZNPT multiferroics heterostructure.

See full dissertation at **coe.neu.edu/iris/ZiyaoZhou**