Northeastern University
College of Engineering

Engineering for Society

Boldly innovating to better our world

2016 | 2017

SCHOLARSHIP REPORT

Mechanical and Industrial Engineering

WE ARE A LEADER IN EXPERIENTIAL EDUCATION AND INTERDISCIPLINARY RESEARCH, FOCUSED ON ENGINEERING FOR SOCIETY

Welcome to Northeastern's Department of Mechanical and Industrial Engineering

The Department of Mechanial and Industrial Engineering has been on the rise through strategic hiring. As the department rises, a conducive environment has provided a platform for people to work hard and work happily. The addition of 20 new tenured/tenure-track faculty members over four years, with no attrition to other universities, has propelled multiple research clusters in the department toward excellence.

Supporting the fast rise is the growing financial resource. The department has started large-scale collaborations with major industrial companies including General Electric, Raytheon, and Northrop, while continuing the strong working relationship with federal and state agencies. The annual research award has gone up by 35% over four years.

In parallel with the tenured/tenure-track faculty hires, the addition of nine teaching faculty members over four years has enabled educational excellence to advance even further. Undergraduate admissions has become ever more competitive, and the average SAT has reached 1450. The graduate student population has more than doubled over the same period. Some of our recent doctoral and post-doctoral graduates have started their tenure-track careers at Arizona State University, Mississippi State University, North Carolina State University, and University of Central Florida, to name a few.

People are the center of focus at this department. We work hard and work happily, and take ownership of the department. As an example, Emeritus Professor and former Department Chair John W. Cipolla has given the department $100K to establish the John and Katharine Cipolla Graduate Student Support Fund.

Strategic hiring, people focus, and preservation of a conducive environment have enabled people to work hard and work happily, and thereby work productively. Productive people naturally bring successes. Rising awareness of our successes is also a trend we note and appreciate. According to the *US News and World Report*, our mechanical engineering graduate program moved up 18 places to No. 39 in four years, while our industrial engineering graduate program has moved up four places to No. 32 during the same period.

This momentum will continue through strategic growth. I invite alums and other stakeholders to join us in propelling this department even further, and also invite all to consider this department for your education or for research and development projects. I look forward to hearing from you!

Sincerely,

Hanchen Huang
Donald W. Smith Professor and Department Chair
h.huang@northeastern.edu

QUICK FACTS — Mechanical and Industrial Engineering

2
FEDERALLY FUNDED RESEARCH CENTERS

NSF/DHHS Healthcare Systems Engineering Institute

NSF CENTER for High-rate Nanomanufacturing

1047
GRADUATE STUDENTS

INCLUDING MS AND PHD PROGRAMS IN:

Data Analytics Engineering
Engineering Management
Industrial Engineering
Mechanical Engineering
Operations Research

2
NATIONAL ACADEMY MEMBERS

NADINE AUBRY
University Distinguished Professor and Dean

VINOD SAHNEY
University Distinguished Professor

55
TENURED/ TENURE-TRACK FACULTY

17
YOUNG INVESTIGATOR AWARDS

Including **12 National Science Foundation CAREER Awards**

$145M
CONTRACT VEHICLE

$125M: five years from Veterans Health Administration

$20M: three years from Army Research Labs

QUICK FACTS — College of Engineering

13 MULTI-INSTITUTIONAL RESEARCH CENTERS funding by eight federal agencies

DOE, DHS, EPA, HHS, NIH, NSA, NIST, NSF

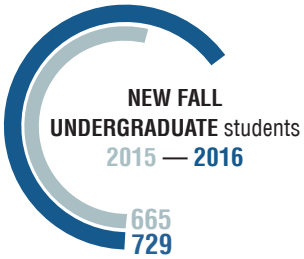
173
TENURED/ TENURE-TRACK Faculty

40
NSF CAREER Awards

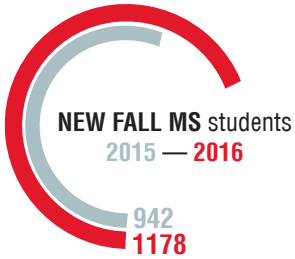
5 ENGINEERING DEPARTMENTS

Bioengineering
Chemical Engineering
Civil and Environmental Engineering
Electrical and Computer Engineering
Mechanical and Industrial Engineering

3566
UNDERGRADUATE students



3177
GRADUATE students



77
YOUNG INVESTIGATOR Awards

FACULTY HONORS AND AWARDS

Professor **Laura Lewis**, jointly appointed in chemical engineering, won a Fulbright U.S. Scholar Program grant for a research project in Spain to advance her research in magnetic materials. The Fulbright program is the flagship international educational exchange program sponsored by the U.S. government. Additionally, Lewis was selected as an American Physical Society fellow. The criterion for election is exceptional contributions to the physics enterprise.

John W. Cipolla, College of Engineering Distinguished Professor Emeritus, has been elected an honorary member of the American Society of Mechanical Engineers (ASME). He was one of only three people elected in 2017.

Professor **James Benneyan** was awarded a $257K National Science Foundation EAGER grant for "Development and Validation of Analytic Spatial-Temporal Models to Help Study and Mitigate the National Opioid-Heroin Co-Epidemic."

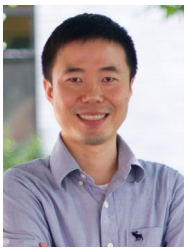
Professor **Sandra Shefelbine**, jointly appointed in bioengineering, was awarded a $650K National Science Foundation grant for her project, titled "Mechanobiology of Joint Morphogenesis: Manipulating Salamander Limbs." This project will examine the regenerating limbs of salamanders.

Assistant Professor **Jose Martinez-Lorenzo**, jointly appointed in electrical and computer engineering, was awarded a $500K National Science Foundation CAREER Award for "4D mm-Wave Compressive Sensing and Imaging at One Thousand Volumetric Frames per Second." One of the main applications of the system is finding security threats hidden under clothing, inside backpacks, or in public spaces, such as sports arenas.

Professor **Hameed Metghalchi's** Energy Systems master's students, Keyur Jigyasu and Emilda Totozani, were selected as one of only twelve finalists globally in the Go Green in the City competition by Schneider Electric for their original idea focusing on the innovative energy solutions for smart cities. In October 2017 the students will travel to Paris to compete for a job offer from Schneider Electric.

Donald W. Smith Professor and Chair **Hanchen Huang's** startup company, MesoGlue, founded with two PhD students, was selected by *Interesting Engineering* as one of the 20 Coolest Inventions of 2016. MesoGlue is a patented metallic glue that sets at room temperature with potential to replace welding and soldering.

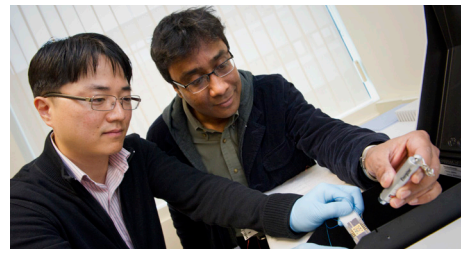
Associate Professor **Ashkan Vaziri's** research on "Lattice Materials with Reversible Foldability" was featured on the cover of *Advanced Engineering Materials*.



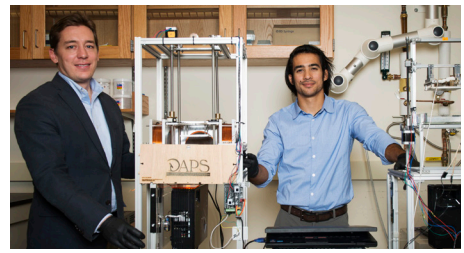
Assistant Professor **Yongmin Liu**, jointly appointed in electrical and computer engineering, was awarded a $500K National Science Foundation CAREER award for "Spin Plasmonics for Ultrafast All-Optical Manipulation of Magnetization in Hybrid Metal-Ferromagnet Structures." Liu received the award for his research developing new ways to control the magnetic properties of recording media such as hard disk drives in computers to dramatically increase the speed at which data can be stored. Liu was also selected to be part of the inaugural cohort of SPIE Defense and Commercial Sensing Rising Researchers by the International Society of Optics and Photonics.

An article, titled "Improving Security Screening: A Comparison of Multistatic Radar Configurations for Human Body Imaging," by College of Engineering Distinguished Professor **Carey Rappaport**, electrical and computer engineering (ECE), and Assistant Professor Jose Martinez Lorenzo, jointly appointed in ECE, was one of four featured articles on the cover of *IEEE Antennas & Propagation*.

Associate Professor **Rifat Sipahi** achieved the rank of senior member of the IEEE, an honor bestowed only to those who have made significant contributions to the profession. Only about 8% of over 400,000 members attain this membership grade.



Professor **Yung Joon Jung** and Associate Professor **Swastik Kar** of the College of Science, have been awarded a $200K grant from the National Science Foundation to translate a novel nanotechnology-based charged-particle (ion) detection method for a range of radioactivity and nuclear radiation sensing and monitoring applications, resulting in the development of prototype radiation detectors that will be ultrasensitive with significantly reduced size, weight, cost and power-consumption compared to current technologies. The professors' startup company, Guardion, has also been named a 2017 MassChallenge finalist.



3DFortify, founded by Assistant Professor **Randall Erb** and PhD student **Joshua Martin**, was selected as a $50K Gold prize winner in the 2016 MassChallenge. 3DFortify is a materials company that uses patented magnetic alignment technology to create the most complex composites

to date. 3DFortify was among 26 finalists in the MassChallenge Boston accelerator program, which began with 1,700 startups. Also, in 2017, Martin won the first prize in the Young Stress Analyst Competition after giving his invited lecture on Magnetic 3D Printing. He spoke in front of the British Society for Strain Measurement in Exeter, England.

PhD student **Jing Xu** won the "Volpe Best Presentation Award" at the 2017 New England Chapter Human Factors and Ergonomics Society student research conference.

PATENTS

Professor **Yiannis Levendis** was awarded a patent for "Method and Device for Fuel and Power Generation by Clean Combustion of Organic Waste Material."

Assistant Professor **Jose Martinez-Lorenzo**, jointly appointed in electrical and computer engineering (ECE), along with Carey Rappaport, College of Engineering Distinguished Professor, ECE, were awarded a patent for "Signal Processing Methods & Systems for Explosive Detection & Identification Using Electromagnetic Radiation."

Associate Professor **Carol Livermore** and doctoral student Chenye Yang were awarded a patent for a "Sealable Microvalve that can be Repeatedly Opened and Sealed" and can be used for miniature vacuum and analysis systems.

WL Smith Chair and University Distinguished Professor **Ahmed Busnaina** and Center for High Rate Nanomanufacturing researcher, **Siva Somu**, were awarded a patent for a "Nanoscale Interconnects Fabricated by Electrical Field Directed Assembly of Nanoelements."

FACULTY BY RESEARCH AREAS

11 Faculty

ENERGY

Ahmed Busnaina
Hanchen Huang
Yung Joon Jung
Gregory Kowalski
Yiannis Levendis
Yongmin Liu
Carol Livermore
Hameed Metghalchi
Reza Sheikhi
Mohammad Taslim
Hongli (Julie) Zhu

18 Faculty

MECHANICS

Nadine Aubry
Michael Allshouse
George Adams
Andrew Gouldstone
Carlos Hidrovo
Nader Jalili
Yang Liu
Carol Livermore
Craig Maloney
Jose Martinez Lorenzo
Sinan Müftü
Hamid Nayeb-Hashemi
Sandra Shefelbine
Rifat Sipahi
Ashkan Vaziri
Kai-Tak Wan
John Whitney
Ibrahim Zeid

8 Faculty

MECHATRONICS

Samuel Felton
Nader Jalili
Yingzi Lin
Carol Livermore
Jose Martinez Lorenzo
Nicol McGruer
Robert Platt
Rifat Sipahi

8 Faculty

BIOMECHANICS

Charles DiMarzio
Andrew Gouldstone
Sinan Muftu
Shashi Murthy
Hamid Nayeb-Hashemi
Sandra Shefelbine
Ashkan Vaziri
Kai-Tak Wan

10 Faculty

NANOMANUFACTURING

Ahmed Busnaina
Randall Erb
Jacqueline Isaacs
Nader Jalili
Yung Joon Jung
Yongmin Liu
Carol Livermore
Marilyn Minus
Moneesh Upmanyu
Hongli (Julie) Zhu

10 Faculty

THERMOFLUIDS

Ahmed Busnaina
Carlos Hidrovo
Safa Jamali
Alireza Karimi
Gregory Kowalski
Yiannis Levendis
Hameed Metghalchi
Uichiro Narusawa
Reza Sheikhi
Kai-tak Wan

14 Faculty

MATERIALS SCIENCE

Teiichi Ando
Ahmed Busnaina
Randall Erb
Andrew Gouldstone
Hanchen Huang
Jacqueline Isaacs
Yung Joon Jung
Laura H. Lewis
Yongmin Liu
Marilyn Minus
Sandra Shefelbine
Moneesh Upmanyu
Ashkan Vaziri
Hongli (Julie) Zhu

14 Faculty

INDUSTRIAL ENGINEERING/ OPERATIONS RESEARCH

MD Noor E Alam
James Bean
Mehdi Behroozi
James Benneyan
Thomas Cullinane
Ozlem Ergun
Nasser Fard
Jackie Griffin
Surendra Gupta
Xiaoning Jin
Sagar Kamarthi
Yingzi Lin
Emanuel Melachrinoudis
Vinod Sahney

6 Faculty

HEALTHCARE SYSTEMS

James Benneyan
Chun-An (Joe) Chou
Jackie Griffin
Sagar Kamarthi
Yingzi Lin
Vinod Sahney

GEORGE ADAMS

COE Distinguished Professor, Mechanical and Industrial Engineering; affiliated faculty appointment in: 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

F. Oweiss, G.G. Adams
Adhesion of an Axisymmetric Elastic Body: Ranges of Validity of Monomial Approximations and a Transition Model, Tribology International, 100, 2016, 287-292

G. Stan, G.G. Adams
Adhesive Contact Between a Rigid Spherical Indenter and an Elastic Multi-Layer Coated Substrate, International Journal of Solids and Structures, 87, 2016, 1-10

Hu, G.G. Adams
Adhesion of a Micro-/Nano- Beam/Plate to a Sinusoidal/Grooved Surface, International Journal of Solids and Structures, 99, 2016, 40-47

G.G. Adams
Frictional Slip of a Rigid Punch on an Elastic Half-Plane, Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences, A 472, 2016, 20160352

G.G. Adams
Critical Value of the Generalized Stress Intensity Factor for a Crack Perpendicular to an Interface, Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences, 471, 2015, 20150571

S. Berger, N.E. McGruer, G.G. Adams
Simulation of Dielectrophoretic Assembly of Carbon Nanotubes Using 3D Finite Element Analysis, Nanotechnology, 26, 2015, 155602

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

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, healthcare, supply chain, large scale optimization and data analytics

Honors and awards: Analytics Best Track Paper Award, 2016 IEOM Detroit Conference; Postdoctoral Fellowship, Natural Sciences and Engineering Research Council of Canada; Izaak Walton Killam Memorial Scholarship

SELECTED PUBLICATIONS

S. Shahinur, A.M.M. Sharif Ullah, M. Noor-E-Alam, H. Haniu, A. Kubo
A Decision Model for Making Decisions Under Epistemic Uncertainty and Its Application to Select Materials, Artificial Intelligence for Engineering Design, Analysis and Manufacturing, 2016

M. Noor-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

M. Noor-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

M. Noor-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

M. Noor-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

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

M. Noor-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, 1-10, 2012

M. Noor-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

MICHAEL ALLSHOUSE

Assistant Professor, Mechanical and Industrial Engineering

PhD, Massachusetts Institute of Technology, 2013
mie.neu.edu/people/allshouse-michael

Scholarship focus: nonlinear dynamics, geophysical fluid dynamics, computational fluid mechanics, disaster response, experimental fluids

SELECTED PUBLICATIONS

M.R. Allhouse, et. al.
Impact of Windage on Ocean Surface Lagrangian Coherent Structures, Environmental Fluid Mechanics, 17(3), 2017, 473-483

M.R. Allshouse, F.M. Lee, P.J. Morrison, H.L. Swinney
Internal Wave Pressure, Velocity, and Energy Flux from Density Perturbations, Physical Review Fluids, 1(1), 2016, 014301

M.R. Allshouse, T. Peacock
Lagrangian Based Methods for Coherent Structure Detection, Chaos, 25, 2015, 097617

M.R. Allshouse, T. Peacock
Refining Finite-Time Lyapunov Exponent Ridges and the Challenges of Classifying Them, Chaos, 25, 2015, 087410

M. Mercier, A. Ardekani, M.R. Allshoulse, B. Doyle, T. Peacock
Self-Propulsion of Immersed Objects via Natural Convection, Physical Review Letters, 112, 2014, 097617

D. Kelley, M.R. Allshouse, N. Ouellette
Lagrangian Coherent Structures Separate Dynamically Distinct Regions in Fluid Flows, Physical Review E, 88, 2013, 013017

M.R. Allshouse, J-L. Thieault,
Detecting Coherent Structures Using Braids, Physica D, 241, 2012, 95-105

M.R. Allshouse, M.F. Barad, T. Peacock
Propulsion Generated by Diffusion-Driven Flow, Nature Physics, 6, 2010, 516-519

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

Y. Li, Y. Hamada, K. Otobe, T. Ando
A Method to Predict the Thickness of Poor-Bonded Material along Spray and Spray-Layer Boundaries in Cold Spray Deposition, J. Thermal Spray Technology, 26(3), 2017, 350-359

S. Onell, T. Ando
Application of a Simple Sub-regular Solution Model to the Computation of Phase Boundaries and Free-dendritic Growth in the Ag-Cu System, Acta Mater, 113, 2016,109-115

Y. Shu, S. Gheybi Hashemabad, T. Ando, Zhiyong Gu
Ultrasonic Powder Consolidation of Sn/In Nanosolder Particles and Their Application for Low Temperature Cu-Cu Joining, Materials and Design, 111, 2016, 631-639

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

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-15 Mass Pct Cu Alloy, Metallurgical and Materials Transactions A, 39A, 2008, 2449-58

SELECTED RESEARCH PROJECTS

Production of Porous Aluminum and High Colbalt WC-Co Composites
Principal Investigator, Hitachi Metals, Ltd

Engineered Materials and Materials Design of Engineered Materials
Co-Principle Investigator, ARL

NADINE AUBRY

University Distinguished Professor, Mechanical and Industrial Engineering and Dean of the College of 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; Member, American Academy of Arts and Sciences; 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; President, International Union of Theoretical and Applied Mechanics; 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

W.-T. Wu, A. Gandini, N. Aubry, M. Massoudi, J.F. Antaki
Design of Microfluidic Channels for Magnetic Separation of Malaria-Infected Red Blood Cells, Microfluidics and Nanofluidics, 20(2), 2016, 1-11

W.T. Wu, N. Aubry, M. Massoudi, W.R. Wagner, J.F. Antaki
Multi-Constituent Simulation of Thrombus Deposition, Scientific Reports 7, 2016, 42720

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

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 Defectfree, Adjustable Monolayers, Proceedings of the National Academy of Sciences USA (PNAS), 105, 2008, 3711-3714

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

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

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; 2017 Outstanding Alumnus, Harvey Mudd College

SELECTED PUBLICATIONS

S. Xu, J. Bean
Scheduling Parallel-Machine Batch Operations to Maximize On-Time Delivery Performance, Journal of Scheduling, 2015, 1-18

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

MEHDI BEHROOZI

Assistant Professor, Mechanical and Industrial Engineering

PhD, University of Minnesota, Twin Cities, 2016
mie.neu.edu/people/behroozi-mehdi

Scholarship focus: geographic resource allocation, transportation and logistics, computational geometry; data analytics, robust optimization, mathematical programming; scheduling

SELECTED PUBLICATIONS

J.G. Carlsson, M. Behroozi, X. Meng, R. Devulapalli
Household-Level Economies of Scale in Transportation, Operation Research, 64(6), 2016, 1372-1387

J.G. Carlsson, M. Behroozi, X. Li
Geometric Partitioning and Robust Ad-Hoc Network Design, Annals of Operation Research, 238, 2016, 41-68

J. G. Carlsson, M. Behroozi
Worst-Case Demand Distributions in Vehicle Routing, European Journal of Operational Research, 2016

M. Behroozi
Plant Layout and Location, 6th Ed., Modaresane Sharif, Tehran, Iran, 2015

M. Behroozi, A.B. Jahromi, A.J. Dehkordi, S. Abbasi, F. Masafinia
Solution Mannual for the National Graduate Studies Entrance Exams: Industrial Engineering, 7th Ed., Modaresane Sharif, Tehran, Iran, 2015

H. Samarghandi, P. Taabayan, M. Behroozi
Metaheuristics for Fuzzy Dynamic Facility Layout Problem with Unequal Area Constraints and Closeness Ratings, International Journal of Advanced Manufacturing Technology, 67, 2013, 2701-2715

M. Behroozi, K. Eshghi
Modeling and Solving Job Shop Scheduling Problem with Sequence Dependent Setup Times, International Journal of Industrial Engineering and Production Management, 21(4), 2010

M. Behroozi, K. Eshghi
A New Hybrid Particle Swarm Optimization for Job Shop Scheduling Problem, International Journal of Industrial Engineering and Production Management, 20(2), 2009

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

AHMED BUSNAINA

William Lincoln Smith and University Distinguished Professor, Mechanical and Industrial Engineering; affiliated faculty appointment in: Bioengineering, Electrical and Computer Engineering

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

Scholarship focus: nanomanufacturing, nano and microscale printing of sensors and electronics, nano and micro control, particulate and chemical defects in semiconductor manufacturing, high rate nanomanufacturing, NEMS devices and nanomaterials based nanoelectronics

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

SELECTED PUBLICATIONS

C. Yilmaz, A. Sirman, A. Halder, A. Busnaina
High-Rate Assembly of Nanomaterials on Insulating Surfaces Using Electro-Fluidic Directed Assembly, ACS Nano, 11(8), 2017, 7679-7689

C. Yilmaz, C. Sarisozen, V. Torchilin, A. Busnaina
Novel Nanoprinting for Oral Delivery of Poorly Soluble Drugs, Methodist DeBakey Cardiovascular Journal, 12(3), 2016, 157-162

H. Cho, S. Somu, J.-Y. Lee, H. Jeong, A. Busnaina
High-Rate Nanoscale Offset Printing Process Using Directed Assembly and Transfer of Nanomaterials, Advanced Materials, 27, 2015, 1759-1766

C. Yilmaz, A.E. Cetin, G. Goutzamanidis, J. Huang, S. Somu, H. Altug, D. Wei, A. Busnaina
Three-Dimensional Crystalline and Homogeneous Metallic Nanostructures Using Directed-Assembly of Nanoparticles, ACS Nano, 8(5), 2014, 4547-4558

H.Y. Jung, Y.L. Kim, S. Park, A.A. Datar, H.–J. Lee, J. Huang, S. Somu, A. Busnaina, Y.J. Jung, Y.-K. Kwon
A High-Performance H2S Detection by Redox Reactions in Semiconducting Carbon Nanotube-Based Devices, Analyst, 138(23), 2013, 7206-7211

SELECTED RESEARCH PROJECTS

Advanced Manufacturing Cluster for Smart Sensors and Materials
Principal Investigator, Massachusetts Technology Collaborative

Novel Nanoprinting for Oral Delivery of Poorly Soluble Drugs
Principal Investigator, National Science Foundation

Fabrication of Mechanical Metamaterials
Principal Investigator, Draper Laboratories

Development work Regarding Biomarker Sensor Systems, Sensor Fabrication and Carbon Nanotube Material Optimization
Principal Investigator, Nano-Bio Manufacturing Consortium

CHUN-AN (JOE) CHOU

Assistant Professor, Mechanical and Industrial Engineering

PhD, Rutgers University, 2011
mie.neu.edu/people/chou-chun

Scholarship focus: applied large-scale optimization and data mining and analytics; interpretable decision-making models and predictive analytics for medical and healthcare intelligence

Honors and awards: Research Foundation for SUNY Collaboration Fund Award, 2013; Finalist of the INFORMS Data Mining Best Student Paper Award, 2011

SELECTED PUBLICATIONS

S. Khanmohammadi, C.-A. Chou
A New Gaussian Mixture Model Based Discretization Algorithm for Associative Classification of Medical Data, Expert Systems with Applications, 58, 2016, 119-129

S. Tutun, C.-A. Chou, E. Canıyılma
A New Forecasting Framework for Volatile Behavior in Net Electricity Consumption: A Case Study in Turkey, Energy, 93, 2015, 2406-2422

C.-A. Chou, T.O. Bonates, C. Lee, W. Art Chaovalitwongse
Multi-Pattern Generation Framework for Logical Analysis of Data, Annals of Operations Research, 2015

V. Miskovic, X. Ma, C.-A. Chou, M. Fan, M. Owens, H. Sayama, B.E. Gibb
Developmental Changes in Spontaneous Electrocortical Activity and Network Organization From Early to Late Childhood, Neuroimage, 118, 2015, 237-247

C.-A. Chou, T.O. Bonates, C. Lee, W. Art Chaovalitwongse
Multi-Pattern Generation Framework for Logical Analysis of Data, Annals of Operations Research, 2015

C.-A. Chou, K. Kampa, S.H. Mehta, R.F. Tungaraza, W. Art Chaovalitwongse, T.J. Grabowski
Voxel Selection Framework in Multi-Voxel Pattern Analysis of fMRI Signals for Prediction of Neural Response to Visual Stimuli, IEEE Transactions on Medical Imaging, 33(4), 925-934, 2014

C.-A. Chou, W. Art Chaovalitwongse et al.
Column Generation Framework of Nonlinear Similarity Model for Reconstructing Sibling Groups, INFORMS Journal on Computing, 27(1), 2014, 35-47

K. Kampa, S.H. Mehta, C.-A. Chou, W. Art Chaovalitwongse, T.J. Grabowski
Sparse Optimization in Feature Selection: Application in Neuroimaging, Journal of Global Optimization, 59(2-3), 2014, 439-457

THOMAS CULLINANE

Program Director, Engineering Management; Professor, Mechanical and Industrial Engineering; affiliated faculty appointment in: 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

MOHAMMAD DEHGHANI

Assistant Teaching Professor, Mechanical and Industrial Engineering

PhD, Western New England University, 2016
mie.neu.edu/people/dehghani-mohammad

Scholarship focus: simulation optimization; healthcare operation management; supply chain finance

SELECTED PUBLICATIONS

M. Dehghanimohammadabadi, T.K. Keyser, S.H. Cheraghi
A Novel Iterative Optimization-Based Simulation (IOS) Framework: An Effective Tool to Optimize System's Performance, Computers & Industrial Engineering, 111, 2017, 1-17

M. Dehghanimohammadabadi, M. Rezaeiahari, T. Keyser
Simheuristic of Patient Scheduling Using a Table-Experiment Approach - Simio and Matlab Integration Application, Winter Simulation Conference, Las Vegas, NV, 2017

M. Demirtas, N. Ahmadi, M. Dehghanimohammadabadi
Highlighting the Main Factors of Internet Banking via Multiple Criteria Decision Analysis, ISERC Conference, Anaheim CA, USA, 2016

M. Dehghanimohammadabadi, T. Keyser
Intelligent Simulation: Integration of SIMIO and MATLAB to Deploy Decision Support Systems to Simulation Environment, Simulation Modelling Practice and Theory, 2016

S.M. Hosseini, M. Dehghanimohammadabadi
A Weighted Monte Carlo Simulation Approach to Risk Assessment of Information Security Management System, International Journal of Enterprise Information Systems, 11(4), 2015, 63-79

M. Dehghanimohammadabadi, T. Keyser
Tradeoffs Between Objective Measures and Execution Speed in Iterative Optimization-Based Simulation (IOS), Winter Simulation Conference, Huntington Beach CA, USA, 2015

M. Dehghanimohammadabadi, T. Keyser
Smart Simulation: Integration of SIMIO and MATLAB, Winter Simulation Conference, Huntington Beach CA, USA, 2015

M. Mobin, M. Dehghanimohammadabadi, C. Salmon
Food Product Target Market Prioritization Using MCDM Approaches, ISERC Conference, Montreal QC, Canada, 2014 CA,

M. Dehghanimohammadabadi, T. Keyser
Does the Iranian National Productivity and Excellence Award Get Leadership Buy–in, ISERC Conference, Montreal QC, Canada, 2014

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

R.M. Erb, J.J. Martin, R. Soheilian, C. Pan, J.R. Barber
Actuating Soft Matter with Magnetic Torque, Advanced Functional Materials, 26(22), 2016, 3859-3880

J.S. Sander, R.M. Erb, L. Li, A. Gurijala, Y.-M. Chiang
High-Performance Battery Electrodes via Magnetic Templating, Nature Energy, 1, 2016, 16099

J.J. Martin, B.E. Fiore, R.M. Erb
Designing Bioinspired Composite Reinforcement Architectures via 3D Magnetic Printing, Nature Communications, 6, 2015, 8641

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

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.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

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

Incorporating Composite Design into Biopolymer Hydrogels for Strong Scaffolds in Bone Regeneration
Co-Principal Investigator, AO Foundation

Aligning Boron Nitride Patriciles within Dense Ceramics-Reinforced Polymer Films
Principal Investigator, Rogers Corporation

ÖZLEM ERGUN

Professor, Mechanical and Industrial Engineering; affiliated faculty appointment in: Electrical and Computer Engineering, Global Resilience Institute

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

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

Honors and awards: National Science Foundation CAREER Award; Winner, EURO/INFORMS 2007 Management Science Strategic Innovation Prize

SELECTED PUBLICATIONS

M. Celik, A. Lorca, Ö. Ergun. P. Keskinocak
A Decision-Support Tool for Post-Disaster Debris Operations, Production and Operations Mangaement, 26(6), 2017, 1076-1091

M. Jahre, J. Kembro, T. Rezvanian, Ö. Ergun, S. J. Håpnes, P. Berling
Integrating Supply Chains for Emergencies and Ongoing Operations in UNHCR , Journal of Operations Management, 45, 2016, 1-134

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

SELECTED RESEARCH PROJECTS

Multi-Agent Modeling Framework for Mitigating Distributed Disruptions in Critical Supply Chains
Co-Principal Investigator, National Science Foundation

Food Aid Quality Review Phase III Program
Principal Investigator, subcontract from Tufts University's USAID grant

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

Same Day Delivery Operations
Principal Investigator, Deliv

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

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

K. Sadeghzadeh, N. Fard
Analytical Clustering Procedures in Massive Failure Data, IEEE Xplore Annual Reliability and Maintainability Symposium (RAMS), 2017

M. Liu, N. Fard, K. Sadeghzadeh
Large-Scale Spectral Clustering for Managing Big Data in Healthcare Operations, International Journal of Big Data Intelligence, 4(3), 2017, 195-207

Y. Fang, H. Xu, N. Fard
Neural Network-WPCA Based Method for Multi-Objective Optimal Redundancy Allocation, International Journal of Reliability, Quality and Safety Engineering, 24(5), 2017 1750024, 1-22

Y. Fang, N. Fard, H. XU
Artificial Neural Network and Multi-Response Optimization in Reliability Measurement Approximation and Redundancy Allocation Problem, International Journal of Mathematics and Statistics Invention, 4(12), 2016, 29-34

N. Fard, K. Sadeghzadeh
Complex Data Classification in Weighted Accelerated Failure Time Model, IEEE Xplore Annual Reliability and Maintainability Symposium (RAMS), 2016

N. Fard, H. XU, Y. Fang
Coherent System Reliability Improvement Using PCA Based Multi-Response Optimization Method, IEEE Xplore Annual Reliability and Maintainability Symposium (RAMS), 2016

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

SAMUEL FELTON

Assistant Professor, Mechanical and Industrial Engineering

PhD, Harvard University, 2015
mie.neu.edu/people/felton-samuel

Scholarship focus: soft robots; transformable robots; self-folding machines; rapid prototyping; biomimetic design

Honors and awards: National Defense Science and Engineering Graduate Fellowship

SELECTED PUBLICATIONS

S. Felton, K. Becker, D. Aukes, R. Wood
Self-Folding with Shape Memory Composites at the Millimeter Scale, Journal of Micromechanics and Microengineering, 25(8), 2015, 085004

M. Tolley, S. Felton, S. Miyashita, D. Aukes, D. Rus, R. Wood
Self-Folding Origami: Shape Memory Composites Activated by Uniform Heating, Smart Materials and Structures, 23, 2014, 094006

S. Felton, M. Tolley, E. Demaine, R. Rus, R. Wood
A Method for Building Self-Folding Machines, Science, 345(6197), 2014, 644-646

S. Felton, D. Lee, K. Cho, R. Wood
A Passive, Origami-Inspired, Continuously Variable Transmission, IEEE International Conference on Robotics and Automation, 2014, 2913-2918

S. Felton, M. Tolley, B. Shin, C. Onal, E. Demaine, D. Rus, R. Wood
Self-Folding with Shape Memory Composites, Soft Matter, 9(32), 2013, 7688-7694

S. Felton, T. Gaige, T. Benner, R. Wang, T. Reese, V. Wedeen, R. Gilbert
Associating the Mesoscale Fiber Organization of the Tongue with Local Strain Rate During Swallowing, Journal of Biomechanics, 41, 2008, 1782-1789

ANDREW GOULDSTONE

Associate Professor, Mechanical and Industrial Engineering; affiliated faculty appointment in: 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

GARDE: An Interdisciplinary Approach to Accommodate Fine Motor Control Disorders
Co-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; modeling resiliency in complex systems; design and management of outpatient health care clinics; simulation: discrete event simulation and systems dynamics; deterministic and stochastic optimization

Honors and awards: ARCS (Achievement Rewards for College Scientists) Foundation; George Fellowship, Health Systems Institute, Georgia Institute of Technology

SELECTED PUBLICATIONS

J. Griffin, V. Vahdatzad, S. Burns
Design of New Integrated Healthcare Facitlities with Simulation, INFORMS International Meeting, Waikaloa Village, HI, 2016

N. Vailbeig, J. Griffin
Management of Scarce Blood Supplies Accounting for Cross-Matching Characteristics, INFORMS Annual Meeting, Nashville, TN, 2016

J. Griffin, V. Vahdatzad, S. Burns
Multi-Attribute Balances Scheduling in an Integrated Outpatient Clinic, INFORMS Annual Meeting, Nashville, TN, 2016

V. Vahdatzad, J. Griffin
Outpatient Clinic Layout Design Accounting for Flexible Policies, Proceedings of the Winter Simulation Conference, Washington, DC, 2016

R. Azghandi, J. Griffin, O. Ergun
Tackling Drug Shortages by Examing Resiliency and Robustness in Pharamaceutical Supply Chains, INFORMS Annual Meeting, Nashville, TN, 2016

SELECTED RESEARCH PROJECTS

Design of New Orthopedic Clinics Via Simulation
Principal Investigator, Boston Children's Hospital

Improving Patient Flow in New Musculoskeletal Floor of the 'Brigham Building for the Future'
Principal Investigator, Brigham and Women's Hospital

Patient Flow Simulation Projects in Dermatology and Cardiology Clinics
Principal Investigator, Brigham and Women's Hospital

CRISP Type 1: Multi-Agent Modeling Framework for Mitigating Distributed Disruptions in Critical Supply Chains
Principal Investigator, National Science Foundation

CRISP Type 2: Identification and Control of Uncertain, Highly Interdependent Processes Involving Humans with Applications to Resilient Emergency Health Response
Co-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; Outstanding IE Professor Award

SELECTED PUBLICATIONS

A. Ishigaki, T. Yamada, S.M. Gupta
Design of a Closed-Loop Supply Chain with Stochastic Product Returns, International Journal of Automation Technology, 11(4), 2017, 563-571

A.Y. Alqahtani, S.M. Gupta
Optimizing Two-Dimensional Renewable Warranty Policies for Sensor Embedded Remanufactured Products, Journal of Industrial Engineering and Management, 10(2), 2017, 145-187

C.B. Kalayci, O. Polat, S.M. Gupta
A Hybrid Genetic Algorithm for Sequence-Dependent Disassembly Line Balancing Problem, Annals of Operations Research, 242(2), 2016, 321-354

M.A. Ilgin, S.M. Gupta, O. Battaia
Use of MCDM Techniques in Environmentally Conscious Manufacturing and Product Recovery: State of the Art, Journal of Manufacturing Systems, 37(3), 2015, 746-758

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

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

CARLOS HIDROVO

Assistant Professor, Mechanical and Industrial Engineering

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

Scholarship focus: multiscale and multiphase flow and transport phenomena, surface tension interactions in micro/nanoengineered structures, and electrokinetic ion transport in porous media for applications in energy storage, portable biochemical diagnostics, thermal management, and water treatment systems

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

P. Tirandazi, C.H. Hidrovo
Liquid In-Gas Droplet Microfluids; Experimental Characterization of Droplet Morphology, Generation Frequency, and Monodispersity in a Flow-Focusing Microfluidic Device, Journal of Micromechanics and Microengineering, 27(7), 2017, 075020-9

A. Shahriari, M. Kim, S. Zamani, N. Phillip, B. Nasouri, C.H. Hidrovo
Flow Regime Mapping of High Inertial Gas-Liquid Droplet Microflows in Flow-Focusing Geometries, Microfluidics and Nanofluidics, 20(1), 2016, 1-13

S. Salamat, C.A. Rios Perez, C. Hidrovo
Performance Characterization of a Capacitive Deionization Water Desalination System With an Intermediate Solution and Low Salinity Water, Journal of Energy Resources Technology, 138(3), 2016, 032003-032005

T.J. Kim, M. Kim, S. Hann, J. Trejo, C.H. Hidrovo
Thermal Characterization of Microheated Microchannels with Spatially Resolved Two-Color Fluorescence Thermometry, Journal of Microelectromechanical Systems, 24(1), 2015, 115-125

R.S. Hale, R. Ranjan, C.H. Hidrovo
Capillary Flow through Rectangular Micropillar Arrays, International Journal of Heat and Mass Transfer, 75, 2014, 710-717

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

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

Donald W. Smith Professor and Department Chair, Department of Mechanical and Industrial Engineering

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

Scholarship focus: development of a theoretical framework for nanorod growth and innovation of metallic glue for ambient environments; and atomistic simulation methods

Honors and awards: Fellow, Society of Engineering Science; 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; Hsue Shen Tsien Engineering Science Professor in China; and Connecticut Clean Energy Fund Endowed Professor in US

SELECTED PUBLICATIONS

F. Du, P.R. Elliott, H. Huang
Generalized Theory of Smallest Diameter of Nanorods, Physical Review Materials, 1, 2017, 33401

S.P. Stagon, A. Knapp, P.R. Elliot, H. Huang
Metallic Glue for Ambient Environments Making Strides, Advanced Materials and Processes, 174, 2016, 22-25

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

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, Depment of Energy Office of Basic Energy Science Core Program

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

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

Novel Thermal Management Technologies
Co-Principal Investigator, Raytheon Company

JACQUELINE ISAACS

Professor, Mechanical and Industrial Engineering; affiliated faculty appointment in: the 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 materials processing towards sustainable design and manufacturing, ethical, societal and legal implications of nanomanufacturing, 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

S. Radhakrishnan, S. Erbis, J.A. Isaacs, S. Kamarthi
Analysis of Scientific Literature on Nano Environmental, Health, and Safety Risk Using Keyword Co-Occurrence Networks, PLOS ONE, 2017, 0172778

L. Pourzahedi, P. Zhai, J.A. Isaacs, M.J. Eckelman
Life Cycle Energy Benefits of Carbon Nanotubes for Electromagnetic Interference (EMI) Shielding Applications, Journal of Cleaner Production, 142(4), 2017, 1971-1978

P. Zhai, J.A. Isaacs, M.E. Eckelman
Net Energy Benefits of Carbon Nanotube Applications, Applied Energy, 173, 2016, 624-634

S. Ebris, S. Kamarthi, A. Namin, A. Hakimian, J.A. Isaacs
Stochastic Goal Programming Model for Sustainable CNT-Enabled Lithium-Ion Battery Manufacturing, Environmental Science: Nano, 3, 2016, 1447-1459

V.H. Grassian, A.J. Haes, I.A. Mudunkotuwa, P. Demokritou, A.B. Kane, C.J. Murphy, J.E. Hutchison, J.A. Isaacs, et. al.
NanoEHS – Defining Fundamental Science Needs: No Easy Feat When the Simple Itself is Complicated, Perspective in Environmental Science: Nano, 3, 2015, 15-27

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, Editorial, Environment Systems and Decisions, 35, 2015, 24-28

SELECTED RESEARCH PROJECTS

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 appointment in: 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
A Novel Sensor System Utilizing Piezoelectric Microcantilever Coupled with Resonating Circuit, US Patent, 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

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

SAFA JAMALI

Assistant Professor, Mechanical and Industrial Engineering

PhD, Case Western Reserve University, 2015
mie.neu.edu/people/jamali-safa

Scholarship focus: microstructure-macroscopic properties relationship in complex fluids, with emphasis on rheology and physics of soft matter and structured fluids; colloidal suspensions; mesoscale computational science; non-Newtonian fluid mechanics; physics of living systems; hemorheology and hemodynamics

SELECTED PUBLICATIONS

S. Jamali, G.H. McKinley, R.C. Armstrong
Rheology, Microstructure and Heterogeneity in Thixotropic Elasto-Visco-Plastic Fluids, Physical Review Letters, 118, 2017, 048003

A. Boromand, S. Jamali, J. Maia
Structural Fingerprints of Yielding in Short-Ranged Attractive Colloidal Gels, Soft Matter, 13(2), 2017, 458-473

S. Liu, S. Jamali, J.-B. Baek, J. Maria, L. Dai
Solvent Induced Conformational Switching of Polymer Brush Functionalized Graphene Transistors, Macromolecules, 49(19), 2016, 7434-7441

S. Jamali, et al.
A Gaussian-Inspired Auxiliary Thermostat for Non-Equilibrium Dissipative Particle Dynamics Simulations, Computer Physics Communications, 197, 2015, 27-34

S. Jamali, et al.
Generalized Mapping of the Many-Body Dissipative Particle Dynamics Simulation Parameters onto Fluid Compressibility and the Flory-Huggins Theory, Journal of Chemical Physics, 142(16), 2015, 1-11

S. Jamali, et al.
Microstructure and Rheology of Soft to Rigid Shear-Thickening Colloidal Suspensions, Journal of Rheology, 59(6), 2015, 1377-1395

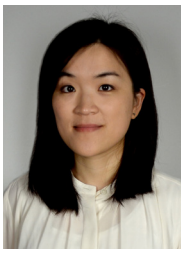
S. Khani, S. Jamali, A. Boromand, M. Hore, J. Maia
Polymer-Mediated Nanorod Self-Assembly Predicted by Dissipative Particle Dynamics Simulations, Soft Matter, 11(34), 2015, 6881-6892

S. Jamali, A. Boromand, J. Maia
Viscosity Measurement Techniques in Dissipative Particle Dynamics, Computer Physics Communications, 196, 2015, 149-160

S. Jamali, M. Yamanoi, J. Maia
Bridging the Gap Between Microstructure and Macroscopic Behavior of Monodisperse and Bimodal Colloidal Suspensions, Soft Matter, 9(5), 2013, 1506-1515

S. Jamali, M.C. Paiva, J. Covas
Dispersion and Re-agglomeration Phenomena During Melt Mixing of Polypropylene with Multi-Walled Carbon Nanotubes, Polymer Testing, 32(4), 2013, 701-707

XIAONING JIN



Assistant Professor, Mechanical and Industrial Engineering

PhD, University of Michigan, 2012
mie.neu.edu/people/jin-xiaoning

Scholarship focus: developing advanced models for prognostics and health management using physics-based models and data analytics; designing preventive strategies for manufacturing operations

SELECTED PUBLICATIONS

J. Ni, X. Gu, X. Jin
Preventive Maintenance Opportunities for Large Production Systems, CIRP Annals Manufacturing Technology, 64(1), 2015, 447-450

X. Gu, X. Jin, J. Ni
Prediction of Passive Maintenance Opportunity Windows on Bottleneck Machines in Complex Manufacturing Systems, ASME Transactions on Journal of Manufacturing Science and Engineering, 137(3), 2015, 031017

T. Xia, X. Jin, L. Xi
Operating Load Based Real-Time Rolling Grey Forecasting for Machine Health Prognostics in Dynamic Maintenance Schedule, Journal of Intelligent Manufacturing, 26(2), 2015, 269-280

X. Liang, X. Jin, J. Ni
Forecasting Product Returns for Remanufacturing Systems, Journal of Remanufacturing, 4(1), 2014, 1-18

H. Dong, X. Jin, J. Ni
Lithium-Ion Battery State of Health Monitoring and Remaining Useful Life Prediction based on Support Vector Regression-Particle Filter, Journal of Power Sources, 271, 2014, 114-123

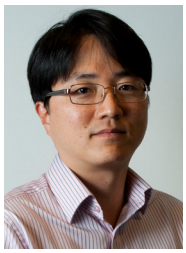
S.G.L. Peters, J. Ni, X. Jin, P. Yi, M. Colledani
Automotive Manufacturing Technologies- An International Viewpoint, Manufacturing Review, 1, 2014

X. Jin, S.J. Hu, J. Ni, G. Xiao
Assembly Strategies for Product Remanufacturing with Variable Quality Returns, IEEE Transactions on Automation Science and Engineering, 10(1), 2013, 76-85

X. Jin, J. Ni
Joint Production and Preventive Maintenance Strategy for Manufacturing Systems with Stochastic Demand, ASME Transactions on Manufacturing Science and Engineering, 135(3), 2013

J. Ni, X. Jin
Decision Support Systems for Effective Maintenance Operations, CIRP Annals-Manufacturing Technology, 61(1), 2012, 411-414

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, 2014, 4941

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, Ministry of Industry, Korea

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

Hierarchically Arranged 3D QDs Network-carbon Nanocone-polymer Hybrid Films for Flexible Multiband Photodetector
Co-Principal Investigator, Army Research Office

SAGAR KAMARTHI

Professor of Mechanical and Industrial Engineering, Founding Director of Data Analytics Engineering Program

PhD, Pennsylvania State University, 1994
mie.neu.edu/people/kamarthi-sagar

Scholarship focus: machine learning applications in smart and sustainable manufacturing; predictive analytics for smart and connected health; data driven approaches to mass customized instruction

SELECTED PUBLICATIONS

S. Radhakrishnan, S. Erbis, J.A. Isaacs, S. Kamarthi
Novel Keyword Co-Occurrence Networks Based Methods to Foster Systematic Reviews of Scientific Literature, PLOS ONE, 2017

M.G. Uddin, K.S. Ziemer, A. Zeid, Y.-T.T. Lee, S. Kamarthi
Process Control Model for Growth Rate of Molecular Beam Epitaxy of MgO (111) Nanoscale Thin Films on 6H-SiC (0001) Substrates, International Journal of Advanced Manufacturing Technology, 91(1-4), 2017, 907–916

S. Radhakrishnan, A. Duvvuru, S. Sultornsanee, S. Kamarthi
Phase Synchronization Based Minimum Spanning Trees for Analysis of Financial Time Series with Nonlinear Correlations, Physica A: Statistical Mechanics and its Applications, 444, 2016, 259-270

S. Kamarthi, S. Sultornsanee, A. Zeid
Recurrence Quantification Analysis to Estimating Surface Roughness in Finish Turning Processes, International Journal of Advanced Manufacturing Technology, 87(1-4), 2016, 451–460

S. Erbis, Z. Ok, J.A. Isaacs, J.C. Benneyan, S. Kamarthi
Review of Research Trends and Methods in Nano Environmental, Health and Safety Risk Analysis, Risk Analysis: An International Journal, 2016, 1-18

S. Erbis, S. Kamarthi, A. Abdollahi-Namin, A. Hakimian, J.A. Isaacs
Stochastic Goal Programming Model for Sustainable CNT-Enabled Lithium-Ion Battery Manufacturing, Environmental Science: Nano, 3, 2016, 1447-1459

SELECTED RESEARCH PROJECTS

Achieving Smart Factory Through Predictive Dynamic Scheduling
Co-Principle Investigator, Digital Manufacturing and Design Innovation Institute

Smart Manufacturing Performance Assurance (Mpass) Through Equipment Monitoring
Principle Investigator, National Institute of Standards of Technology

TRANSFORMing Liberal Arts Careers to Meet Demand for Advanced Manufacturing Workforce
Co-Principle Investigator, National Science Foundation

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

GREGORY KOWALSKI

Director, Professional Maters of Science in Energy Systems Program; 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

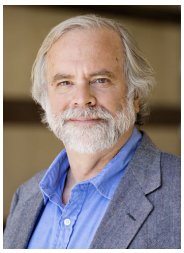
A. Emdadi, Y. Emami, M. Zenouzi, A. Lak, B. Panahirad, A. Lotfi, F. Lak, G.J. Kowalski
Potential Of Electricity Generation By The Salinity Gradient Energy Conversion Technologies in the System of Urmia Lake-Gadarchay River, Proceedings of the 8th International Conference on Energy Sustainability Co-located 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

SELECTED RESEARCH PROJECTS

Energy Storage Systems
Principal Investigator, 3 Phase Renewables

ARTHUR F. KRAMER



Senior Vice Provost for Research & Graduate Education, Office of the Provost; Professor, Department of Psychology; Professor, Mechanical and Industrial Engineering

PhD, University of Illinois, 1984
mie.neu.edu/people/kramer-arthur

Scholarship focus: Cognitive Psychology, Cognitive Neuroscience, Aging, and Human Factors

Honors and awards: NIH Ten Year MERIT Award; Fellow, American Psychological Association; Fellow, American Psychological Society

SELECTED PUBLICATIONS

L. Chaddock-Heyman, K.I. Erickson, M.A. Chappel, C.L. Johnson, C. Kienzler, A. Knecht, E.S. Drolette, L.B. Raine, M.R. Scudder, S.C. Kao, C.H. Hillman, A.F. Kramer
Aerobic Fitness is Associated with Greater Hippocampal Cerebral Blood Flow in Children, Developmental Cognitive Neuroscience, 20, 2016, 52-58

D.M. Pindus, E.S. Drollette, M.R. Scudder, N.A. Khan, L.B. Raine, L.B. Sherar, D.W. Esliger, A.F. Kramer, C.H. Hillman
Associations Among Moderate to Vigorous Physical Activity, Indices of Cognitive Control, and Academic Achievement in Preadolescents, The Journal of Pediatrics, 173, 2016, 136-142

M.W. Voss, T.B. Weng, A.Z. Burzynska, C.N. Wong, R. Clark, J. Fanning, R. Awick, E.O. Olson, E. McAuley, A.F. Kramer
Fitness, but not Physical Activity, is Related to Functional Integrity of Brain Networks Associated with Aging, Neuroimage, 131, 2016, 113-125

J.G. Gaspar, N. Ward, M.B. Neider, J. Crowell, R. Carbonari,
H. Kaczmarski, R.V. Ringer, A.P. Johnson, A.F. Kramer, L. Loschky
Measuring the Useful Field of View with Gaze-Contingent Displays, Human Factors, 58(4), 2016, 630-641

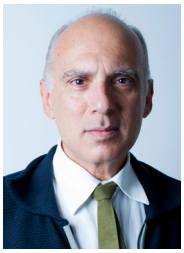
L.E. Oberlin, T.D. Verstynen, A.Z. Burzynska, M.W. Voss, R.S. Prakash, L. Chaddock-Heyman,C. Wong, J. Fanning, E., Awick, N. Gothe, S.M. Phillips, E. Maliey, D. Ehlers, E. Olson,T.Wojiciki, E. Mcauley, A.F. Kramer, K.I. Erickson
White Matter Microstructure Mediates the Relationship Between Cardiorespiratory Fitness and Spatial Working Memory in Older Adults, Neuroimage, 131, 2016, 91-101

SELECTED RESEARCH PROJECTS

Enhancing Children's Cognitive and Brain Health Through Physical Activity Training
Principal Investigator, National Institute of Child Health and Human Development

Reshaping the Path of Mild Cognitive Impairment by Refining Exercise Prescription: Understanding Training Type and Exploring Mechanisms
Principal Investigator, Canadian Institutes of Health

YIANNIS LEVENDIS



COE Distinguished Professor, Mechanical and Industrial Engineering

PhD, California Institute of Technology, 1987
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; Percy Nicholls Award, jointly awarded by the American Society of Mechanical Engineers and the Society of Manufacturing Engineers, 2015

SELECTED PUBLICATIONS

C.W. Martland, D.P. Marchessault, A. McGarey, D. Rivas, K.W. Stanley, Y.A. Levendis
Cryogen Capsules to Suppress Wildfires, Fire and Safety Magazine, 2016, 30-33

E. Rokni, A. Panahi, X. Ren, Y.A. Levendis
Curtailing the Generation of Sulfur Dioxide and Nitrogen Oxide Emissions by Blending and Oxy-Combustion of Coals, Fuel, 181, 2016, 772-784

A. Ruscio, F. Kazanc, Y.A. Levendis
Fine Ash Emissions Generated from Biomass and Coal Combustion and Valuation of Predictive Furnace Deposition Indices: A Review, Journal of Energy Engineering, 142(2), 2016, E4015007 1-12

R. Khatami, Y.A. Levendis
An Overview of Coal Rank Influence on Ignition and Combustion Phenomena at the Particle Level, Combustion and Flame, 164, 2016, 22-34

E. Rokni, A. Panahi, X. Ren, Y.A. Levendis
Reduction of Sulfur Dioxide Emissions by Burning Coal Blends, Journal of Energy Resources Technology, 138(3), 2016, 032204 1-8

R. Khamati, Y.A. Levendis, M.A. Delichatsios
Soot Loading, Temperature and Size of Single Coal Particle Envelope Flames in Conventional and Oxy-Combustion Conditions (O2/N2 and O2/CO2), Combustion and Flame, 162, 2015, 2508-2517

SELECTED RESEARCH PROJECTS

Co-firing Illinois Bituminous Coals with Highly-Fragmenting Lignite Coals for SO_x/HCl Control
Principal Investigator, Illinois Clean Coal Institute

LAURA H. LEWIS

Cabot Professor, Chemical Engineering; joint faculty appointment in: Mechanical and Industrial Engineering

PhD, University of Texas, 1993
che.neu.edu/people/lewis-laura

Scholarship focus: structure-property relationships in magnetofunctional materials for energy transformations including advanced permanent magnet materials and magnetocaloric materials; strategic materials for technological application

Honors and awards: Fulbright Scholar (2018, 2019); Fellow, American Physical Society; Northeastern University Excellence in Research and Creative Activity Award; Chair, Technical Committee of the IEEE Magnetics Society; Conference Editor, IEEE Transactions on Magnetics, 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

Promotion and Control of $L1_0$ FeNi Phase Formation for Permanent Magnet Applications
Principal Investigator, Rogers Corporation

Program in Engineered Mat'ls and Materials Design of Engineered Mat'ls
Co-Principal Investigator, Army Research Office

Sustainable Permanent Magnets For Advanced Applications
Principal Investigator, National Science Foundation

Rapid Assessment oF AlT_2X_2 (T = Fe, Co, Ni, X = B, C) Layered Materials for Sustainable Magnetocaloric Applications
Principal Investigator, Department of Energy

YINGZI LIN

Associate Professor, Mechanical and Industrial Engineering; affiliated faculty appointed in: 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, J. Breugelmans, X. Wang, G. Gao, X. Tang
A Spatial-Temporal Trajectory Clustering Algorithm for Eye Fixations Identification, International Journal of Intelligent Data Analysis, 20(2), 2016, 377-393

P. Wan, C. Wu, Y. Lin, X. Ma, Z. Huang
A Recognition Model of Driving Anger Based on Belief Rule Base, Transportation Systems Engineering and Information, 15(5), 2015, 1-8

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

YANG LIU

Assistant Professor, Mechanical and Industrial Engineering (joining January 2018)

PhD, Columbia University, 2015
mie.neu.edu/people/liu-yang

Scholarship focus: multiscale/multiphysics computational modeling of complex materials and structures; computational mechanics; large scale impact and blast simulation; high performance computing

SELECTED PUBLICATIONS

H. Zhang, Y. Liu, H. Sun, S. Wu
Transient Dynamic Behavior of Polypropylene Fiber Reinforced Mortar Under Compressive Impact Loading, Construction and Building Materials, 111(0), 2016, 30-42

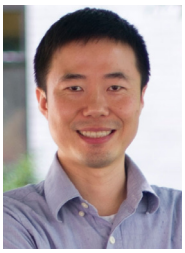
Y. Liu, W. C. Sun, Z. Yuan, J. Fish
A Nonlocal Multiscale Discrete-Continuum Model for Predicting Mechanical Behavior of Granular Materials, International Journal for Numerical Methods in Engineering, 106(2), 2016, 129-160

Y. Liu, W. C. Sun, J. Fish
Determining Material Parameters for Critical State Plasticity Models Based on Multilevel Extended Digital Database, ASME Journal of Applied Mechanics, 83(1), 2016

H. Sun, D. Feng, Y. Liu, M.Q. Feng
Statistical Regularization for Identification of Structural Parameters and External Loadings Using State Space Models, Computer-Aided Civil and Infrastructure Engineering, 30(11), 2015, 843-858

Y. Liu, V. Filonova, N. Hu, Z. Yuan, J. Fish, Z. Yuan, T. Belytschko
A Regularized Phenomenological Multiscale Damage Model, International Journal for Numerical Methods in Engineering, 99(12), 2014, 867-887

YONGMIN LIU



Assistant Professor, joint faculty appointment in: Mechanical and Industrial Engineering and 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: NSF CAREER Award, Office of Naval Research Young Investigator Award; SPIE Rising Researcher; 3M Non-Tenured Faculty Award

SELECTED PUBLICATIONS

Z.J. Wang, L.Q. Jing, K. Yao, Y.H. Yang, B. Zheng, C.M. Soukoulis, H.S. Chen, Y.M. Liu
Origami-Based Reconfigurable Metamaterials for Tunable Chirality, Advanced Materials, 2017

K. Yao, Y.M. Liu
Controlling Electric and Magnetic Resonances for Ultracompact Nanoantennas with Tunable Directionality, ACS Photonics, 3, 2016, 953-963

Z.J. Wang, K. Yao, M. Chen, H. Chen, Y.M. Liu
Manipulating Smith-Purcell Emission with Babinet Metasurfaces, Physical Review Letters, 117(15), 2016, 157401

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

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

T. Zentgraf, Y.M. Liu, M.H. Mikkelsen, J. Valentine, X. Zhang
Plasmonic Luneburg and Eaton Lenses, Nature Nanotechnology, 6, 2011, 151-155

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

SELECTED RESEARCH PROJECTS

CAREER: Spin Plasmonics for Ultrafast All-Optical Manipulation of Magnetization in Hybrid Metal-Ferromagnet Structures
Principal Investigator, National Science Foundation

Reconfigurable Metamaterials for Beam Steering, Imaging and Sensing at Infrared Frequencies
Principal Investigator, Office of Naval Research

CAROL LIVERMORE

Associate Professor, Mechanical and Industrial Engineering; affiliated faculty appointment in: 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 origami folding, carbon nanomaterials

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

SELECTED PUBLICATIONS

X. Xie, C. Livermore
Passively Self-Aligned Assembly of Compact Barrel Hinges for High-Performance, Out-of-Plane MEMS Actuators, IEEE 30th International Conference on Micro Electro Mechanical Systems, 2017, 813-816

C. Yang, X. Xie, S. Liu, C. Livermore
Resealable, Ultra-Low Leak Micro Valve Using Liquid Surface Tension Sealing for Vacuum Applications, Proceedings of Transducers 2017, 2071-2074

Yang, C., S. Liu, X. Xie, C. Livermore
Compact, Planar, Translational Piezoelectric Bimorph Actuator with Archimedes' Spiral Actuating Tethers, Journal of Micromechanics and Microengineering, 26(2), 2016,124005

S. Liu, C. Martin, D. Lashmore, M. Schauer, C. Livermore
Carbon Nanotube Torsional Springs for Regenerative Braking Systems, Journal of Micromechanics and Microengineering, 25(10), 2015, 104005

N.S. Shaar, G. Barbastathis, C. Livermore
Integrated Folding, Alignment, and Latching for Reconfigurable Origami MEMS, Journal of Microelectromechanical Systems, 24(4), 2015, 1043-1051

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

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

DAVID LUZZI

Vice Provost for Research, Innovation, and Development; Vice President for the Innovation Campus at Burlington, MA; Professor, Mechanical and Industrial Engineering

PhD, Northwestern University, 1986
mie.neu.edu/people/luzzi-david

Scholarship focus: security, intelligence and resilience; corporate partnerships; intellectual property policy; technology readiness and transition; engineered materials; additive manufacturing; expeditionary cyber; cybersecurity; UAS swarms; workforce training and development

Honors and awards: Ellis Island Medal of Honor; Air Force Meritorious Civilian Service Medal; George Heilmeier Award for Research Innovation

SELECTED PUBLICATIONS

E. Abou-Hamad, Y. Kim, M. Bouhrara, Y. Saih, T. Wågberg, D.E. Luzzi, C. Goze-Bac
NMR Strategies to Study the Local Magnetic Properties of Carbon Nanotubes, Physics B: Condensed Matter, 407(4), 2012, 740-742

Y. Kim, E. Abou-Hamad, A. Rubio, T. Wågberg, AV Talyzin, D.E. Boesch, S. Aloni, A. Zettl, D. Luzzi, C. Goze-Bac
Communications: Nanomagnetic Shielding: High-Resolution NMR in Carbon Allotropes, The Journal of Chemical Physics, 132(2), 2010, 21102

E. Abou-Hamad, Y. Kim, T. Wågberg, D. Boesch, S. Aloni, A. Zettl, A. Rubio, D.E. Luzzi, C. Goze-Bac
Molecular Dynamics and Phase Transition in One-Dimensional Crystal of C60 Encapsulated Inside Single Wall Carbon Nanotubes, ACS nano, 3(12), 2009, 3878-3883

E. Abou-Hamad, Y. Kim, A. Talyzin, C. Goze-Bac, D.E. Luzzi, C. Goze-Bac, A. Rubio, T. Wågberg
Hydrogenation of C60 in Peapods: Physical Chemistry in Nano Vessels, American Chemical Society, 113(2), 2009, 8583-8587

P. Jaroenapibal, Y. Jung, S.Evoy, D.E. Luzzi
Electromechanical Properties of Individual Single-Walled Carbon Nanotubes Grown on Focused-Ion-Beam Patterned Substrates Ultramicroscopy, 109(2), 2009, 167-171

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

JOSE MARTINEZ LORENZO

Assistant Professor, Mechanical and Industrial Engineering; joint faculty appointment in: 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 and 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 and Propagation, 248351, 2014, 1-8

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

EMANUEL MELACHRINOUDIS

Professor, Associate Department Chair and 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; wildfire prediction and mitigation

Honors and awards: Outstanding Faculty Service Award, College of Engineering

SELECTED PUBLICATIONS

R. Heydari, E. Melachrinoudis
A Path-Based Capacitated Network Flow Model for Empty Railcar Distribution, Annals of Operations Research, 253(2), 2017, 773-798

M. Hajian, E. Melachrinoudis, P. Kubat
Modeling Wildfire Propagation Using the Stochastic Shortest Path Problem: A Network Size Reduction Methodology, Environmental Modeling and Software, 82, 2016, 73-88

N. Zaarour, E. Melachrinoudis, M. Solomon
Phase-out of Obsolete Inventory Items in Retail Stores, European Journal of Operational Research, 255, 2016, 133-141

H. Min, E. Melachrinoudis
A Model-based Decision Support System for Solving Vehicle Routing and Driver Scheduling Problems under Hours of Service Regulations, International Journal of Logistics Research and Applications, 19, 2016, 256-277

E. Melachrinoudis, E. Yavuz, R. Heydari
An O(m2+mn2) Algorithm for the Bi-Objective Location Problem on a Network with Mixed Metrics, International Journal of Operational Research, 23, 2015, 427-450

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

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 (C2H2)/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 of GTL Fuel
Principal Investigator, Qatar Foundation

LSAMP Research Project
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 and 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

SİNAN MÜFTÜ

Professor, Mechanical and Industrial Engineering; affiliated faculty appointment in: 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

B. Yildirim, H. Yang, A. Gouldstone, S. Müftü
Rebound Mechanics of Micrometre-Scale, Spherical Particles in High Velocity Impacts, Proceedings of the Royal Society of London A, 473, 2017, 20160936

T. Kaşikci, M.-C. Weng, A. Nayak, T. Goker, S. Müftü
Contact Mechanics of a Thin, Tensioned, Translating Tape with a Grooved Roller, Journal of Tribology, 2017

W. Xie, A. Alizadeh-Dehkharghani, Q. Chen, V.K. Champagne, X. Wang, A. Nardi, S. Kooi, S. Müftü, J.-H. Lee
Dynamics and Extreme Plasticity of Metallic Microparticles in Supersonic Collisions, Nature Scientific Reports, 2017

Q. Sheng, A. J. White, S. Müftü
Indentation of Polytetrafluoroethylene (PTFE) Thin-Film: Simulations by Using Continuum Damage Mechanics, Tribology Transactions, 60(1), 2017, 114-120

H. Yang, J. B. C. Engelen, W.A. Haberle, M. Lantz, S. Müftü
Lateral Friction Behavior of a Thin, Tensioned Tape Wrapped over a Grooved-Roller: Experiments and Theory, Journal of Tribology, 139(2), 2017, 021605

Q. Chen, F.C. Meral, S. Müftü, M. Akcakaya, K. Tuncali
Model-based Optimal Planning of Hepatic Radiofrequency Ablation, Mathematical Medicine and Biology, 2016

SELECTED RESEARCH PROJECTS

Collaborative Research: Mechano-lipidomics and Mechano-cytosis of Drug Delivery Liposomes
Co-Principal Investigator, National Science Foundation

Improving Theoretical Models of Advanced Tape Transport Systems
Principal Investigator, Oracle Corporation

Multi-Scale Investigations of Particle Impact in Cold-Spray
Technical Point of Contact, Army Research Laboratory

UICHIRO NARUSAWA

Associate Professor, Mechanical and Industrial Engineering; affiliated faculty appointment in: 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 appointment in: 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

A. Orsi, S. Chakravarthy, P. Canavan, E, Pena, R. Goebel, A. Vaziri, H. Nayeb-Hashemi
The Effect of Knee Joint Kinematics on the Anterior Cruciate Ligament Injury and Articular Cartilage Damage, Computer Methods in Biomechanics and Biomedical Engineering, 19(5), 2015, 493-506

R. Oftadeh, V. Entezari, G. Sporri J. C. Villa-Camacho, H. Krigbaum, E. Strwich, L. Graham, C. Rey, H. Chiu, R. Muller, H. Nayeb-Hashemi, A.Vaziri, A. Nazarian
Hierarchical Analysis and Multi-Scale Modelling of Rat Cortical and Trabecular Bone, Journal of the Royal Society Interface, 2015

M. Ashrafi, C.J. Woodsum, J. Papadopoulos, A.S. Hamouda, H. Nayeb-Hashemi, A. Vaziri
In Situ Strengthening of Thin-Wall Structures Using Pressurized Foam, Construction and Building Materials, 100, 2015, 298-304

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

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

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

SANDRA SHEFELBINE

Associate Professor, Mechanical and Industrial Engineering; joint faculty appointment in: 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

B. Depalle, Z. Qin, S.J. Shefelbine, M.J. Buehler
Large Deformation Mechanisms, Plasticity, and Failure of an Individual Collagen Fibril With Different Mineral Content, Journal of Bone and Mineral Research, 31(2), 2016, 380-390

P. Yadav, S.J. Shefelbine, E.M. Gutierrez-Farewik
Effect of Growth Plate Geometry and Growth Direction on Prediction of Proximal Femoral Morphology, Journal of Biomechanics, 49(9), 2016, 1613-1619

M. Giorgi, A. Carriero, S.J. Shefelbine, N.C. Nowlan
Effects of Normal and Abnormal Loading Conditions on Morphogenesis of the Prenatal Hip Joint: Application to Hip Dysplasia, Journal of Biomechanics, 48(12), 2015, 3390-3397

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, 52, 2015, 1-13

B. Javaheri, A. Carriero, K.A. Staines, Y.-M. Chang, D.A. Houston, K.J. Oldknow, J.L. Millán, B.N. Kazeruni, P. Salmon, S.J. Shefelbine, C. Farquharson, A.A. Pitsillides
Phospho 1 Deficiency Transiently Modifies Bone Architecture yet Produces Consistent Modification in Osteocyte Differentiation and Vascular Porosity with Ageing, Bone, 81, 2015, 277-291

A.F. Pereira, B. Javaheri, A.A. Pitsillides, S.J. Shefelbine
Predicting Cortical Bone Adaptation to Axial Loading in the Mouse Tibia, Journal of the Royal Society, Interface, 12(110), 2015

O.G. Andriotis, S.W. Chang, M. Vanleene, P.H. Howarth, D.E. Davies, S.J. Shefelbine, M.J. Buehler, P.J. Thurner
Structure-Mechanics Relationships of Collagen Fibrils in the Osteogenesis Imperfecta Mouse Model, Journal of the Royal Society, Interface/the Royal Society, 12(111), 2015

SELECTED RESEARCH PROJECTS

Hetrogeneity and Anisotropy in Fracture Toughness
Principal Investigator, National Science Foundation

Keeping Hockey Hips Healthy
Principal Investigator, US Hockey Foundation

Multi-Scale Characteristics of Bone Toughness
Principal Investigator, National Science Foundation

RIFAT SIPAHI

Associate Professor, Mechanical and Industrial Engineering; affiliated faculty appointment in: 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: Outstanding Young Investigator, Dynamic Systems and Control Division/American Society of Mechanical Engineers; College of Engineering Faculty Fellow; Defense Advanced Research Projects Agency Young Faculty Award; Fellow, American Society of Mechanical Engineers; Senior Member, Institute of Electrical and Electronics Engineers

SELECTED PUBLICATIONS

A. Ramirez, S. Mondie, R. Garrido, R. Siphai
Design of Maximum Exponential Decay Rate for LTI-SISO Systems via Delay-Based Controllers, SIAM Control and Optimization, 55(1), 2017, 397-412

T. Yucelen, Y. Yildiz, R. Sipahi, E. Yousefi, N. Nguyen
Stability Limit of Human-in-the-Loop Model Reference Adaptive Control Architechtures, International Journal of Control, 2017, 1-18

S. Nourazari, D.B. Hoch, S. Capawanna, R. Sipahi, J.C. Benneyan
Can Improved Specialty Access Moderate Emergency Department Overuse? Effect of Neurology Appointment Delays on ED Visits, Neurology Clinical Practice, 6(6), 2016, 498-505

M.H. Koh, R. Sipahi
A Consensus Dynamics with Delay-Induced Instability Can Self-Regulate for Stability via Agent Regrouping, Chaos: An Interdisciplinary Journal of Nonlinear Science, 26(11), 2016, 116313

D. Tian, R. Sipahi
Creating Two Disjoint Stability Intervals Along the Delay Axis via Controller Design: Linear SISO Case, International Journal of Dynamics and Control, 2016

SELECTED RESEARCH PROJECTS

Graph-Based Control Design for Network Dynamics with Time Delays
Principal Investigator, National Science Foundation

A Three-Dimensional Model of Spinal Cord Growth and Repair in a Regeneration-Competent Organism
Co-Principal Investigator, National Science Foundation

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, F. Xue
Crossover Jet Impingement in a Rib-Roughened Trailing-Edge Cooling Channel, J. Turbomachinery, 139(7), 2017, 071007-1-12

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 Engineering for Gas Turbines and Power, 136(8), 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

SELECTED RESEARCH PROJECTS

Measurements of Heat Transfer and Pressure Drops Research in a Two-Legged Test Section with a 180-Turn, Rib-Roughened with Three Rib Geometries, Simulating Two Mid-Chord Cooling Cavities of a GE Turbine Airfoils
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

MONEESH UPMANYU

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

Microstructure-sensitive Modeling and Experimentation of Single Particle Impact During Cold Spray of Metallic Particles
Co-Principal Investigator, ARO

ASHKAN VAZIRI

Associate Professor, Mechanical and Industrial Engineering; affiliated faculty appointment in: 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

Functional Biomimetic Materials with Extreme Topology
Principal Investigator, National Science Foundation

Mechanics of Carbon Nanotube Surface Decontamination
Principal Investigator, FM Global

Multifunctional Cellular Structures for Energy Harvesting and Energy Management Applications
Principal Investigator, Qatar Foundation

KAI-TAK WAN

Professor, Mechanical and Industrial Engineering; affiliated faculty appointment in: 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

T. Zhu, G. Li, S. Müftü, Kai-Tak Wan
Revisiting the Constrained Blister Test to Measure Thin Film Adhesion, Journal of Applied Mechanics, 84, 2017, 071005

X. Wang, B. Li, J. Hao, Y.J. Jung, K.-T. Wan
Mechanical Characterization of Suspended Strips of Meshed Single-Walled Carbon Nanotubes, Journal of Applied Physics, 119, 2017, 045305

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

SELECTED RESEARCH PROJECTS

Mechanics of Fusion of Dissimilar Lipid BiLayers and Multi-Lamellar Vesicles
Principal Investigator, National Science Foundation

Mechanical Integrity and Long Term Reliability of Photovoltaic Panels
Principal Investigator, National Institute of Standards and Technology/Department of Energy

A Novel Biomechanical Model of Bacterial Adhesion and Aggregation
Principal Investigator, National Science Foundation

JOHN (PETER) WHITNEY

Assistant Professor, Mechanical and Industrial Engineering

PhD, Harvard University, 2012
mie.neu.edu/people/whitney-peter

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: Best paper award finalist, International Conference on Robotics and Automation (2016, 2017)

SELECTED PUBLICATIONS

N. Burkhard, S. Frishman, A. Gruebele, J.P. Whitney, R. Goldman, B.L. Daniel, M.R. Cutkosky
A Rolling-Diaphragm Hydrostatic Transmission for Remote MR-Guided Needle Insertion, IEEE International Conference on Robotics and Automation, 2017

J.P. Whitney, T. Chen, J. Mars, J.K. Hodgins
A Hybrid Hydrostatic Transmission and Human-Safe Haptic Telepresence Robot, IEEE International Conference on Robotics and Automation, 2016

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

SELECTED RESEARCH PROJECTS

Teleoperation with Passive, Transparent Force Feedback for MR-Guided Interventions
Principal Investigator, National Science Foundation

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

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 (JULIE) ZHU

Assistant Professor, Mechanical and Industrial Engineering

PhD, South China University of Technology, 2009
mie.neu.edu/people/zhu-hongli

Scholarship focus: advanced manufacturing, multifunctional bio-inspired material from nature; sustainable energy storage; nano/micro fabrication of devices and materials; bendable, implantable and biocompatible electronics; application of sustainable biomateria in life science

Honors and awards: Innovator of the year 2013, University of Maryland; Jakob Wallenberg Scholarship, Sweden

SELECTED PUBLICATIONS

X. Geng, Y. Zhang, Y. Han, J. Li, L. Yang, M. Benamara, H. Zhu
Two-Dimensional Water-Coupled Metallic MoS_2 with Nanochannels for Ultrafast Supercapacitor, Nano Letter, 17(3). 1825-1832, 2017

H. Zhu, P. Ciesielski, M. Himmel, J. Zhu, G. Henriksson, L. Hu
Wood-Derived Materials for Green Electronics, Sustainable Energy, and Biological Applications, Chemical Reviews, 2016

X. Geng, W. Sun, W. Wu, B. Chen, A. Al-Hilo, M. Benamara, H. Zhu, F. Watanabe, J. Cui, T. Chen
Pure and Stable Metallic Phase Molybdenum Disulfide Nanosheets for Hydrogen Evolution Reaction, Nature Communications, 7, 2016

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

SELECTED RESEARCH PROJECTS

Ultra-Stable and Conductive Metallic MoS_2 for Hydrogen Evolution Reaction
Principal Investigator, Northeastern University

SELECTED PhD THESES

Adebayo Adebiyi

PhD 2017, Mechanical Engineering;
Advisor, Mohammad E. Taslim

PSEUDO-POTENTIAL LATTICE BOLTZMANN MODEL FOR WETTABILITY GRADIENT-BASED MICRODROPLET MANIPULATION

The focus of this work is wedge-patterned wettability gradient passive on-chip droplet manipulation. Specifically, this work investigated the effect of different droplet parameters, namely: wedge-surface relative wettability, pattern wedge angle, initial droplet position and gravitational acceleration on the droplet dynamic behavior on a numerical basis. To this end, we used the lattice Boltzmann method (LBM)-an alternative powerful method for solving fluid dynamics problems.

See full dissertation at
coe.neu.edu/17/AdebayoAdeniranAdebiyi

Paul Asare Agyapong

PhD 2017, Mechanical Engineering; Advisor, Yung Joon Jung

X-RAY GAS IONIZATION STUDIES WITH A SINGLE-WALLED NANOTUBE (SWNT) SENSOR

In this dissertation we start with an explanation of the different types of radiation that can be detected, describe how a radiation transport model was used to model the x-ray source in the experiments, and show how to calculate energy spectra and deposition in different materials. We investigate the mechanisms by which x-rays generate an electrical response in a conventional silicon-based diode radiation detector and the SWNT sensor. We then present an experimental setup that can be used to calibrate the SWNT sensor relative to the diode based on simulation data. The experiment involves distance variation, air pressure variation, and fill-gas variation. After a thorough analysis of sensor performance future avenues for improved design and evaluation are presented.

See full dissertation at **coe.neu.edu/17/PaulAsareAgyapong**

Moaz Omar Allehaibi

PhD 2017, Mechanical Engineering; Advisor, Hameed Metghalchi

LAMINAR BURNING SPEED MEASURMENTS OF METHANE /AIR/CARBON DIOXIDE MIXTURES

The experiments were conducted in a constant volume cylindrical chamber with the aid of a Z-shaped Schlieren/shadowgraph system. Pressure rise data during the flame propagation were recorded through pressure transducer on the cylindrical chamber wall and were the main input into the thermodynamic model used to measure the laminar burning speed. A high-speed CMOS camera capable of taking pictures up to 40,000 frames per second was used to determine the cellularity of the flame.

See full dissertation at **coe.neu.edu/17/MoazOmarAllehaibi**

Benjamin P. Harris

PhD 2017, Industrial Engineering; Advisor, Sagar Kamarthi

COMPUTATIONAL MODELS OF COMPETITIVE BUSINESS DEVELOPMENT UNDER IMPERFECT INFORMATION

Governments and other large organizations are increasingly finding themselves contracting products and services to firms whose specialties align more closely than the original firm. To accomplish this, a number of resources are available for firms seeking to do business with large firms or governmental organizations. These customers solicit bids from prospective suppliers to meet their product or service needs, but often pay little attention to the interactions amongst the competitors during the competition. This can cause the products and services provided to be sub-optimal either in performance or cost. From the perspective of the competitor, I present a number of models by which a complex competition can be envisioned which lead to improved decision-making even when a competitor does not possess complete information.

See full dissertation at **coe.neu.edu/17/BenjaminPHarris**

James Earl Kopriva

PhD 2017, Mechanial Engineering; Advisor, Hameed Metghalchi

THE ROLE OF FREE-STREAM TURBULENCE ON HIGH PRESSURE TURBINE AERO-THERMAL STAGE INTERACTION

Turbulence plays an important role on the aero-thermal performance of modern aircraft engine High Pressure Turbines (HPT). The role of the vane wake and passage turbulence on the downstream blade flow field is an important consideration for both performance and durability. Obtaining measurements to fully characterize the flow field can be challenging and costly in an experimental facility. Advances in computational Fluid Dynamic (CFD) modeling and High Performance Computing (HPC) are providing opportunity to close these measurement gaps. In order for CFD to be adopted, methods need to be both accurate and efficient. Meshing approaches must also be able to resolve complex HPT geometry while maintaining quality adequate for scale-resolved simulations.

See full dissertation at **coe.neu.edu/ 17/JamesEarlKopriva**

Zhengdong Liu

PhD 2017, Industrial Engineering; Advisor, Sagar Kamarthi

ECONOMIC COMPARISON OF SELECTIVE LASER MELTING AND CONVENTIONAL SUBTRACTIVE MANUFACTURING PROCESSES

As one of the leading techniques in additive manufacturing processes, selective laser melting (SLM) has shown great potential for commercialization and scale-up in various applications in industry. The ability to build near net shape end-usable products shows advantages in some cases, with more freedom in product design and processing; greater part complexity; and increased ability to structurally optimize parts that are manufactured directly from powder metal materials. In this study, cost analyses of selective laser melting process is compared with conventional subtractive manufacturing (SM) processes. A generic cost models for SLM and SM processing were developed, and several case studies are used to illustrate the conditions and drivers that demonstrate cost advantages for SLM processing. Factors such as production volume and raw material price are analyzed to investigate the influence on fabrication cost.

See full dissertation at **coe.neu.edu/17/ZhengdongLiu**

Chenye Yang

PhD 2017, Mechanical Engineering; Advisor, Carol Livermore

RESEALABLE, ULTRA-LOW LEAK MICRO VALVE USING SOLDER SEALING

MEMS valves typically actuate a flow-obstructing element to cover or uncover a gas flow path. This approach is prone to leakage, causing incomplete isolation across the valve. As a result, an exceptional open-to-closed flow rate ratio would be on the order of 10 6. The limited open-to-closed flow rate ratios of conventional MEMS valves limit their utility for higher vacuum systems. One reason for the relatively high leakage in conventional MEMS valves is that the roughness of the valves contact surfaces prevents leak-free seals. Liquid-based sealing offers an opportunity for improved sealing.

See full dissertation at **coe.neu.edu/17/ChenyeYang**

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COVER IMAGE

Alolika Mukhopadhyay, PhD'19, conducts research in the Clean Energy Multifunctional Materials and Advanced Manufacturing Laboratory in the Mugar building.