Welcome to Northeastern University’s Department of Mechanical and Industrial Engineering (MIE), where our star is rising!

Rising quality and quantity of faculty hires have been a departmental priority. Our department welcomed 15 tenured/tenure-track and 6 teaching faculty members in the recent three academic years, 2014-2016. In addition to junior faculty at the assistant level, these new members include two associate professors that moved here from Georgia Institute of Technology (Ozlem Ergun) and Carnegie Mellon University (Craig Maloney). Further, the new faculty represent a fairly diverse group, more than 30% of whom are women. We are absolutely delighted to witness the ways in which they are already contributing to our department!

Rising research effort and new discoveries have been unprecedented. The NSF Nanoscale Science and Engineering Center for High-rate Nanomanufacturing is translating its discoveries into industry innovation — most recently through the launch of a nanoscale offset printing system that promises to revolutionize nanomanufacturing with societal impact on the scale of the PC or 3-D printer. Two major research contract vehicles, received by our department in 2015, will have lasting impact; the five-year research contract vehicle from the Veterans Health Administration for $125M and three-year contract vehicle from the Army Research Office for $20M are bellwethers of both current success and future potential. Financially equipped, they will turbo charge the already strong and vital Health Systems Engineering Institute, currently under the leadership of Professor James Benneyan, and jumpstart the research efforts in the areas of solid mechanics and materials. Major research contracts, experienced faculty and students, state-of-the-art laboratories—we have a recipe for research success!

Rising student quality continues apace. The average SAT score of the entering undergraduate engineering class in 2015-2016 has reached 1447 out of a possible 1600. As the graduate student population has increased from 500 to 1200 over the past three years, the quality of our graduate students has also increased. Several recent PhD graduates and post-docs will start their tenure-track career at research universities, such as Mississippi State University (mechanical engineering), University of Central Florida (mechanical engineering), and North Carolina State University (industrial engineering).

Rising awareness of our accomplishments is also a trend we note and appreciate. According to the US News and World Report, our Mechanical Engineering graduate program moved up 9 places to #48 in three years, while our Industrial Engineering graduate program remained at #36 during the same period. Hard work, vision and sustained investment pay off.

Rising impact in the Department of Mechanical and Industrial Engineering will undeniably continue with this momentum. Please reach out to me to share your valuable opinions and explore opportunities to collaborate in the near future. I look forward to hearing from you!

Sincerely,

Hanchen Huang
Professor and Department Chair
h.huang@northeastern.edu
“Jimmy” is a robot puppet—a research platform for technology innovation in human-safe and interactive robotics, designed and built by MIE assistant professor Peter Whitney and colleagues at Disney Research Pittsburgh. Research in lightweight and ultra-low friction hydraulic transmissions that began with Jimmy continue at Northeastern, with applications in surgical and MRI-compatible robotics, and advanced autonomous manipulation.
YOUNG INVESTIGATOR AWARDS
Including 11 National Science Foundation CAREER Awards

$145M CONTRACT VEHICLE
$125M: five years from Veterans Health Administration
$20M: three years from Army Research Labs

QUICK FACTS — Mechanical and Industrial Engineering

QUICK FACTS — College of Engineering

MULTI-INSTITUTIONAL RESEARCH CENTERS funded by six federal agencies

ENGINEERING DEPARTMENTS
• Bio
• Chemical
• Civil and Environmental
• Electrical and Computer
• Mechanical and Industrial

YOUNG INVESTIGATOR Awards

NEW FALL UNDERGRADUATE students
665 2015 — 729 2016

3550 UNDERGRADUATE students

NEW FALL MS students
939 2015 — 1177 2016

3210 GRADUATE students

TENURED/ TENURE-TRACK Faculty

TENURED/ TENURE-TRACK Faculty

169

64

36

12

5

2

2

NSF/DHHS Healthcare Systems Engineering Institute
NSF CENTER for High-rate Nanomanufacturing

NATIONAL ACADEMY MEMBERS

NADINE AUBRY
University Distinguished Professor and Dean

VINOD SAHNEY
University Distinguished Professor

870 GRADUATE STUDENTS

INCLUDING MS AND PHD PROGRAMS IN:
Data Analytics Engineering Management
Industrial Engineering
Mechanical Engineering
Operations Research

2 FEDERALLY FUNDED RESEARCH CENTERS

FEDERALLY FUNDED RESEARCH CENTERS

15 YOUNG INVESTIGATOR AWARDS

INCLUDES MS AND PHD PROGRAMS IN:

NSF/DHHS
NIH
DHS
NSA
NIST
NSF

ENGINEERING DEPARTMENTS

DOE

NEW FALL UNDERGRADUATE students
665 2015 — 729 2016

3550 UNDERGRADUATE students

NEW FALL MS students
939 2015 — 1177 2016

3210 GRADUATE students
Faculty Honors and Awards

Professor and Chair Hanchen Huang, created the start-up company Meso Glue with two PhD students. The team designed a metallic glue that sets at room temperatures — which has the potential to replace welding and soldering. Learn more at coe.neu.edu/mesoglue

Associate Professor Ashkan Vaziri was awarded a NSF grant for the “Computational Design of Programmable Lattice Material Systems.”

Assistant Professor Randall Erb was featured in Nature Communications for his article on “Designing Bioinspired Composite Reinforcement Architectures via 3D Magnetic Printing.”

Associate Professor Craig Maloney had his research featured on the back cover of Soft Matter for his article on “Gelation and Mechanical Response of Patchy Rods.”

Assistant Professor Hongli Zhu was published in the Chemical Reviews Journal for her research on “Wood-derived Materials for Green Electronics, Biological Devices, and Energy Applications.”

Associate Professor Rifat Sipahi was selected to receive the 2015 ASME DSCD Outstanding Young Investigator Award.

Professor Laura Lewis was awarded a NSF grant for “Sustainable Permanent Magnets For Advanced Applications.”

Professor James Benneyan and the Healthcare Systems Engineering Institute were featured on the cover of ASEE’s PRISM journal for “Industrial R_s for Healthcare.”

Assistant Professor Jacqueline Griffin and Professor Ozlem Ergun, along with Electrical and computer engineering professor David Kaeli, College of Arts, Media and Design assistant professor Casper Hartvedt, and College of Computer and Information Science professor Stacy Marsella were awarded a $500K NSF CRISP grant to develop a “Multi-agent Modeling Framework for Mitigating Distributed Disruptions in Critical Supply Chains.”

Assistant Professor Jacqueline Griffin, along with Electrical and computer engineering professors Mario Sznaier, Octavia Camps, Ali Abur, and Edmund Yeh, Civil and Environmental engineering professor Jerome Hajjar, College of Science professor Lisa Feldman Barrett, College of Computer and Information Science professor Stacy Marsella, and Kostas director Peter Boynton were awarded a $2.5M NSF grant for the “Identification and Control of Uncertain, Highly Interdependent Processes Involving Humans with Applications to Resilient Emergency Health Response.”

Assistant Professor Yongmin Liu was awarded an Office of Naval Research 2016 Young Investigator Award for “Reconfigurable Metamaterials for Beam Steering, Imaging and Sensing at Infrared Frequencies.”

Professor Surendra Gupta published a new book “Reliability Analysis with Minitab” by CRC Press.

Associate Professor Gregory Kowalski was awarded a patent for his designs for a microfluidic calorimeter system and its method of use.

Professor Mohammad Taslim, was awarded a patent for creating a “Non-rotating Wind Energy Generator.”

Students

Mehul Patel, MS in industrial engineering, and Assistant Professor MD Noor E Alam won the Best Track Paper Award at the 2016 IIEOM Detroit Conference for their paper on, “Data Analytics and Visualization in Analyzing Mortality Records.”

Mechanical engineering PhD student Pooyan Tirandazi won the best poster award at the 90th ACS Colloid and Surface Science Symposium for his poster on, “An Integrated Microfluidic Device for Controlled Gas-liquid Generation and Manipulation of Monodisperse Droplets.”

Alumni Aja Atwood, ME’02, is the co-founder of everblume, LLC, which has developed a device to monitor the way we grow plants and allows the user to monitor humidity, pH, and light directly from an app.

Operations research MS student Kyle Cunningham won the 2015 INFORMS Undergraduate Operations Research Paper competition for his undergraduate work at SUNY Buffalo on “Alleviating Competitive Imbalances in NFL Schedules: an Integer-programming Approach.”

Tyler Hall COE’17 has been named a recipient of the 2016 Udall Scholarship, making him the first Northeastern student to receive the honor.
### FACULTY BY RESEARCH AREAS

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<tr>
<th>Faculty Area</th>
<th>Number of Faculty</th>
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<td><strong>ENERGY</strong></td>
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<td>Ahmed Busnaina</td>
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<td><strong>BIOMECHANICS</strong></td>
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<td>Charles DiMarzio</td>
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<td><strong>MATERIALS SCIENCE</strong></td>
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<td>Teiichi Ando</td>
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<td>Nadine Aubry</td>
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GEORGE ADAMS

COE Distinguished Professor, Mechanical and Industrial Engineering; affiliated faculty: Civil and Environmental Engineering, Electrical and Computer Engineering
PhD, University of California at Berkeley, 1975
mie.neu.edu/people/adams-george

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

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

SELECTED PUBLICATIONS

G. 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

G.G. Adams

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

G.G. Adams

G.G. Adams, D.A. Hills

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

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

Y.-C. Wu, N.E. McGruer, G.G. Adams

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

SELECTED PUBLICATIONS

M. Noor-E-Alam, B. Todd, J. Doucette

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

M. Noor-E-Alam, A. Ma, J. Doucette

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


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

M. Noor-E-Alam, Md. A. A. Hasin, A.M.M. Sharif Ullah, T.F. Lipi
MICHAEL ALLSHHOUSE

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. 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. Allshouse, B. Doyle, T. Peacock
D. Kelley, M.R. Allshouse, N. Ouellette
M.R. Allshouse, J-L. Thieault,
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
S. Onell, T. Ando
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
D. Erdeniz, T. Ando
T. Ando
S. Onel, T. Ando

SELECTED RESEARCH PROJECTS
Production of Porous Aluminum and High Colbalt WC-Co Composites
Principal Investigator, Hitachi Metals, Ltd
Metallographic Characterization of Cold Sprayed Materials
Principal Investigator, Fukuda Metal Foil
Engineered Materials and Materials Design of Engineered Materials
Co-Principal 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; Fellow, National Academy of Inventors; Fellow, American Association for the Advancement of Science; Fellow, American Institute of Aeronautics and Astronautics; Fellow, American Physical Society; Fellow, American Society of Mechanical Engineers; National Science Foundation Presidential Young Investigator Award; Former Chair, National Academies’ U.S. National Committee for Theoretical and Applied Mechanics (USNC/TAM); Former Chair, Division of Fluid Dynamics of the American Physical Society (APS)

SELECTED PUBLICATIONS

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

P. Singh, D.D. Joseph, N. Aubry

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

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

N. Aubry, P. Singh

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

S. Pillapakkam, P. Singh, D. Blackmore, N. Aubry

F. Li, O. Ozen, N. Aubry, D. Papageorgiou, P. Petropoulos

JAYDEEP BARDHAN

Assistant Professor, Mechanical and Industrial Engineering

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

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

SELECTED PUBLICATIONS

A. Molavi Tabrizi, M.G. Knepley, J.P. Bardhan
Generalising the Mean Spherical Approximation as a Multiscale, Nonlinear Boundary Condition at the Solute–solvent Interface, Molecular Physics, 2016

J.P. Bardhan, M.G. Knepley

J.P. Bardhan, P. Jungwirth, L. Makowski

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

J.P. Bardhan

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

SELECTED RESEARCH PROJECTS

Hybrid Mixed-resolution Solvation Models for Chemical Processing in Ionic Liquids Dynamics
Principal Investigator, National Science Foundation

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

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

Z.-Z. Lin, J. Bean, C. White III

J. Ohlmann, J. Bean, S. Henderson

C. Kim, G. Keoleian, D. Grande, J. Bean

Z.-Z. Lin, J. Bean, C. White III

R. Hughes, J. Bean, D. Chaffin

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, 2016

J.G. Carlsson, M. Behroozi, X. Li

J. G. Carlsson, M. Behroozi

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

H. Samarghandi, P . Taabayan, M. Behroozi

R. Hughes, J. Bean, D. Chaffin

B. Norman, J. Bean
Scheduling Operations on Parallel Machine Tools, IIE Transactions, 32, 2000, 449-459
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: nano engineering, nano and micro-contamination control, particulate and chemical contamination and defects, high rate nanomanufacturing, MEMS and NEMS devices with micro and nano-scale channels, nanomaterials

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

SELECTED PUBLICATIONS

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


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

J.C. Benneyan

SELECTED RESEARCH PROJECTS

Collaborative Research in Nanomanufacturing
Principal Investigator, Massachusetts Technology Collaborative

Novel Nanoprinting for Oral Delivery of Poorly Soluble Drugs
Co-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

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

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/UERC
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
SRINATH CHAKRAVARTHY
Assistant Professor, Mechanical and Industrial Engineering
PhD, University of Connecticut, 2007
mie.neu.edu/people/chakravarthy-srinath

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

SELECTED PUBLICATIONS
The Effects of Knee Joint Kinematics on Anterior Cruciate Ligament Injury and Articular Cartilage Damage, Computer Methods in Biomechanics and Biomedical Engineering, 2015, 1-14
S. Chakravarthy, W.A. Curtin
S. Olarnrithinun, S. Chakravarthy, W.A. Curtin
B.A. Szajewski, S. Chakravarthy, W.A. Curtin
Operation of a 3D Frank-read Source in a Stress Gradient and Implications for Size-dependent Plasticity, Acta Materialia, 61(5), 2012, 1469-1477
S. Chakravarthy, W.A. Curtin
S. Chakravarthy, W.A. Curtin
S. Chakravarthy, W.A. Curtin
Stress Gradient Plasticity, Proceedings of the National Academy of Sciences, 108(38), 2011, 15716-15720

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. Caniyilma
A New Forecasting Framework for Volatile Behavior in Net Electricity Consumption: A Case Study in Turkey, Energy, 93, 2015, 2406-2422
Developmental Changes In Spontaneous Electro cortical Activity And Network Organization From Early To Late Childhood, Neuroimage, 118, 2015, 237-247
C.-A. Chou, K. Kampa, S.H. Mehta, R.F. Tungaraza, W. Art Chaovalitwongse, T.J. Grabowski
C.-A. Chou, W. Art Chaovalitwongse et al.
K. Kampa, S.H. Mehta, C.-A. Chou, W. Art Chaovalitwongse, T.J. Grabowski
JOHN W. CIPOLLA

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

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

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

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

SELECTED PUBLICATIONS

G. Jia, Y. Yener, J.W. Cipolla

G. Jia, Y. Yener, J.W. Cipolla

D. DiGiovanni, T.F. Morse, J.W. Cipolla

J.W. Cipolla, T.F. Morse

J.W. Cipolla, M.B. Silevitch

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

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

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

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

S.M. Hosseini, M. Dehghanimohammadabadi

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

RANDELL 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

R.M. Erb, H.S. Son, B. Samanta, V.M. Rotello, B.B. Yellen

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

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

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

SELECTED PUBLICATIONS
M. Jahre, J. Kembro, T. Rezvanian, Ö. Ergun, S. J. Håpnes, P. Berling

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

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

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


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

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

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

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

SELECTED PUBLICATIONS
N. Fard, 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

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

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

K. Sadeghzadeh, N. Fard

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

A. Mendes, N. Fard
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
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
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

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

SELECTED PUBLICATIONS
J. Griffin, J. Swann, P. Keskinocak
J. Griffin, P. Keskinocak
Patient-bed Assignment Policies in Hospital Systems, INFORMS 2013 Annual Meeting, Chicago, IL, 2013
J. Griffin, P. Keskinocak, C. Stokes, N. O’Hara, A. Vats
Development of Patient-bed Assignment Algorithms to Support Bed Management Processes for Improvements in the Rate of Overflow Assignments and Average Request to Assign Metrics, Critical Care Medicine, 40(12), 2012, 48
J.A. Griffin, S. Xia, S. Peng, P. Keskinocak
Improving Patient Flow in an Obstetric Unit, Health Care Management Science, 15(1), 2012, 1-14
D.V. Laborde, J.A. Griffin, H.K. Smalley, P. Keskinocak, G. Mathew

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
C.B. Kalayci, O. Polat, S.M. Gupta
A. ElSayed, E. Kongar, S.M. Gupta
M.A. Ilgin, S.M. Gupta, O. Battaia
S.M. McGovern, S.M. Gupta
O. Ondemir, S.M. Gupta
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
M.A. Ilgin, O. Ondemir, S.M. Gupta
An Approach to Quantify the Financial Benefit of Embedding Sensors into Products for End-of-life Management: A Case Study, Production Planning and Control, 25(1), 2014, 26-43
O. Ondemir, S.M. Gupta
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
A. Shahriari, M. Kim, S. Zamani, N. Phillip, B. Nasouri, C.H. Hidrovo
S. Salamat, C.A. Rios Perez, C. Hidrovo
T.J. Kim, M. Kim, S. Hann, J. Trejo, C.H. Hidrovo
R.S. Hale, R. Ranjan, C.H. Hidrovo
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
Professor and Chair, Department of Mechanical and Industrial Engineering
PhD, University of California at Los Angeles, 1995
mie.neu.edu/people/huang-hanchen

Scholarship focus: 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 Endowed Professor in US

SELECTED PUBLICATIONS
Stephen P. Stagon, Hanchen Huang
Low Temperature Bonding and Sealing with Spaced Nanorods, US, 2016, 0172327-A1
S.P. Stagon, Alex 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
H. Huang
Insight: Multiscale Modeling and Simulation, Sandia Technology, 2007, 8-9
J. Wang, H. Huang, S.V. Kesapragada, D. Gall

SELECTED RESEARCH PROJECTS
A New Characteristic Length Scale on Surfaces
Principal Investigator, National Science Foundation
Characteristic Length Scales of Growing Nanorods
Principal Investigator, Department of Energy Office of Basic Energy Science Core Program
Characteristic Length Scales of Growing Nanorods
Principal Investigator, Defense Threat Reduction Agency
Collaborative Nuclear Fellowship Program Applied Research in Radiation Damage and Mitigation
Principal Investigator, Nuclear Regulatory Commission
Collaborative Research: Atomistic Mechanisms of Stabilizing Oxide Nanoparticles in Oxide-dispersion Strengthened Structural Materials
Principal Investigator, National Science Foundation
From Nanofabrication to Commercial Production of Solar Cells
Principal Investigator, National Science Foundation
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
P. Zhai, J.A. Isaacs, M.E. Eckelman
S. Erbis, Z.D. Ok, S. Kamarthi, J.C. Benneyan, J.A. Isaacs
W.C. Walker, L. Pourzahedi, J.A. Isaacs, M. Eckelman, C.J. Bosso
Integrating Life Cycle Assessment Into Managing Potential EHS Risks of Engineered Nanomaterials: Reviewing Progress to Date, Journal of Nanoparticle Research, 17, 2015, 344
Economic Analysis of CNT Lithium-ion Battery Manufacturing, Environmental Science: Nano, 2, 2015, 463-476
NanoEHS – Defining Fundamental Science Needs: No EasyFeat when the Simple itself is Complicated, Perspective in Environmental Science: Nano, 3, 2015, 15-27

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
S. Faegh, N. Jalili, S. Sridhar
S. Faegh, N. Jalili, S. Sridhar
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

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
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
Y. Kim, H. Jung, S. Park, B. Li, F. Liu, J. Hao, 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
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
J. Ni, X. Jin

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
Associate Professor, Mechanical and Industrial Engineering
PhD, Pennsylvania State University, 1994
mie.neu.edu/people/kamarthi-sagar

Scholarship focus: industrial engineering; smart and sustainable manufacturing; personalized disease management; sensor based diagnostics and prognostics

Honors and awards: Society of Manufacturing Engineers, Dell K. Allen Outstanding Young Manufacturing Engineer Award

SELECTED PUBLICATIONS
S. Radhakrishnan, A. Duvvuru, S. Sultornsanee, S. Kamarthi

S. Kamarthi, Sultornsanee, A. Zeid

S. Erbis, Z. Ok, J.A. Isaacs, J.C. Benneyan, S. Kamarthi

A. Hakimian, S. Kamarthi, S. Erbis, K.M. Abraham, T.P. Cullinane, J.A. Isaacs
Economic Analysis of CNT Lithium-ion Battery Manufacturing, Environmental Science: Nano, 2(9), 2015, 463-476

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(2), 2015, 125-140

S. Erbis, S. Kamarthi, T. Cullinane, J. Isaacs

SELECTED RESEARCH PROJECTS
Smart Manufacturing Performance Assurance (Mpass) Through Equipment Monitoring
Principal Investigator, National Institute of Standards and 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

G.-J. Li, A. Karimi, A.M. Ardekani

A. Karimi, M. R. Paul
Bioconvection in Spatially Extended Domains, Physical Review E, 87, 2013, 053016

A. Karimi, A.M. Ardekani

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

A. Karimi, M.R. Paul
GREGORY KOWALSKI
Director, Professional Mates 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
U. Piana, G.J. Kowalski, M. Zenouzi
A. Emdadi, Y. Emami, M. Zenouzi, A. Lak, B. Panahirad, A. Lotfi, F. Lak, G.J. Kowalski
G.J. Kowalski, M. Modaresifar, M. Zenouzi

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
Aerobic Fitness is Associated with Greater Hippocampal Cerebral Blood Flow in Children, Developmental Cognitive Neuroscience, 20, 2016, 52-58
Associations Among Moderate to Vigorous Physical Activity, Indices of Cognitive Control, and Academic Achievement in Preadolescents, The Journal of Pediatrics, 173, 2016, 136-142
Fitness, but not Physical Activity, is Related to Functional Integrity of Brain Networks Associated with Aging, Neuroimage, 131, 2016, 113-125
Measuring the Useful Field of View with Gaze-contingent Displays, Human Factors, 58(4), 2016, 630-641
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

**SELECTED PUBLICATIONS**

J. Chase, C. Zhuo, Y.A. Levendis  

A. Ruscio, F. Kazanc, Y.A. Levendis  
Characterization of Particulate Matter Emitted from Combustion of Various Biomasses in O\textsubscript{2}/N\textsubscript{2} and O\textsubscript{2}/CO\textsubscript{2} Environments, Energy and Fuels, 28, 2014, 685-696

Combustion of Single Particles of Waste Biomasses in Air and in Oxy-Fuel Conditions, Biomass & Bioenergy, 64, 2016, 162-174

C. Zhuo, W. Nowak, Y.A. Levendis  

A. Davies, R. Soheilian, C. Zhuo, Y.A. Levendis  


C. Zhuo, Y.A. Levendis  

**SELECTED RESEARCH PROJECTS**

Co-firing Illinois Bituminous Coals with Highly-fragmenting Lignite Coals for SO\textsubscript{2}/HCl Control  
Principal Investigator, Illinois Clean Coal Institute

**LAURA H. LEWIS**

**Cabot Professor, Chemical Engineering; jointly appointed, Mechanical and Industrial Engineering**

PhD, University of Texas, 1993

che.neu.edu/people/lewis-laura

**Scholarship focus:** structure-property relationships in magnetofunctional materials including advanced permanent magnetic magnetocaloric materials; strategic materials for technological application

**Honors and awards:** Northeastern University Excellence in Research and Creative Activity Award; Fulbright Specialist; NATO Technical Team Member of AVT-231 on “Scarcity of Rare Earth Materials for Electrical Power Systems,” appointed by U.S. National Coordinator

**SELECTED PUBLICATIONS**

B.D. Plouffe, S.K. Murthy, L.H. Lewis  
Fundamentals and Application of Magnetic Particles in Cell Isolation and Enrichment: A Review, Reports on Progress in Physics, 78(1), 2015, 016601

L.H. Lewis, F.E. Pinkerton, et al.  

R. McCallum, L.H. Lewis, R. Skomski, M.J. Kramer, I.E. Anderson  

L.H. Lewis, F. Jiménez-Villacorta  


**SELECTED RESEARCH PROJECTS**

New Exchange-couple Manganese-based Magnetic Materials  
Co-Principal Investigator, Spanish Research Council

Promotion and Control of L\textsubscript{1}\textsubscript{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 AIT\textsubscript{X} (T = Fe, Co, Ni, X = B, C) Layered Materials for Sustainable Magnetocaloric Applications  
Principal Investigator, Department of Energy
Associate Professor, Mechanical and Industrial Engineering; affiliated faculty appointment 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

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

S. Radhakrishnan, Y. Lin, A. Zeid, S. Kamarthi

H. Cai, Y. Lin

Y. Lin

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

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: Office of Naval Research Young Investigator Award; 3M Non-Tenured Faculty Award; Air Force Summer Faculty Fellow

SELECTED PUBLICATIONS

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

W.L. Gao, F.Z. Fang, Y.M. Liu, S. Zhang
Chiral Surface Waves Supported by Biaxial Hyperbolic Metamaterials, Light: Science and Applications, 2015, e238

Z.B. Li, K. Yao, F.N. Xia, S. Shen, J.G. Tian, Y.M. Liu
Graphene Plasmonic Metasurfaces to Steer Infrared Light, Scientific Reports, 5, 2015, 12423

C.L. Zhao, Y.M. Liu, Y.H. Zhao, N. Fang, T.J. Huang
Reconfigurable Plasmofluidic Lens, Nature Communications, 4(2350), 2013, 1-8

Y.M. Liu, S. Palomba, Y. Park, T. Zentgraf, X.B. Yin, X. Zhang
Compact Magnetic Antennas for Directional Excitation of Surface Plasmons, Nano Letters, 12(9), 2012, 4853-4858

Y.M. Liu, X. Zhang
Metamaterials: A New Frontier of Science and Technology, Chemical Society Reviews, 40, 2011, 2494-2507

S.C. Kehr, Y.M. Liu, et al.
Near-field Examination of Perovskite-based Superlenses and Superlens-enhanced Probe-object Coupling, Nature Communications, 2(249), 2011, 1-9

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

Y. M. Liu, T. Zentgraf, G. Bartal, X. Zhang

Optical Negative Refraction in Bulk Metamaterials of Nanowires, Science, 321(5891), 2008, 930

SELECTED RESEARCH PROJECTS

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 MEMS-enabled cell assembly and origami folding, carbon nanotube-based energy storage

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

SELECTED PUBLICATIONS

S. Liu, C. Martin, D. Lashmore, M. Schauer, C. Livermore

N.S. Shaar, G. Barbastathis, C. Livermore

T. Liu, R. St. Pierre, C. Livermore
Passively-switched Energy Harvester for Increased Operational Range, Smart Materials and Structures, 23(9), 2014, e095045

Xie, Y. Zaitsev, L.F. Velásquez-Garcia, S. Teller, C. Livermore
Scalable, MEMS-enabled, Vibrational Tactile Actuators for High Resolution Tactile Displays, Journal of Micromechanics and Microengineering, 24(12), 2014, 125014

A.S. Dighe, C. Livermore

G. Agarwal, A. Servi, C. Livermore
Size-selective, Biocompatible, Manufacturable Platform for Structuring Deformable Microsystems, Lab on a Chip, 14(17), 2014, 3385-3393


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

Communications: Nanomagnetic shielding: High-resolution NMR in carbon allotropes, The Journal of Chemical Physics, 132(2), 2010, 21102

Molecular Dynamics and Phase Transition in One-dimensional Crystal of C60 Encapsulated Inside Single Wall Carbon Nanotubes, ACS nano, 3(12), 2009, 3878-3883

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
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

K.M. Salerno, C.E. Maloney, M.O. Robbins

A. Hasan, C.E. Maloney

A. Hasan, C.E. Maloney

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

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, joint faculty appointment in Mechanical and Industrial Engineering and 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

Fourier-based Imaging for Multistatic Radar Systems, IEEE Transactions on Microwave Theory and Techniques, 62(8), 2014, 1798-1810

On the Combination of SAR and Model Based Techniques for High-resolution Real-time Two-dimensional Reconstruction, IEEE Transactions on Antennas & Propagation, 62(10), 2014, 5180-5189

Y. Rodriguez-Vaqueiro, J.A. Martinez-Lorenzo


SELECTED RESEARCH PROJECTS
Processing of Physiologic Optical Images and Signals for Development of an Intra-operative Burn Surgery Diagnostic Device
Principal Investigator, Spectral MD/BARDA

Hardware Design for “Stand-off” and “On-the-Move” Detection of Security Threats
Principal Investigator, Department of Homeland Security Center of Excellence-ALERT

Advanced Imaging and Detection of Security Threats using Compressive Sensing
Principal Investigator, Department of Homeland Security Center of Excellence-ALERT
EMANUEL MELACHRINOU DIS
Associate Professor, Associate Department Chair and Program Director of Industrial Engineering
PhD, University of Massachusetts, Amherst, 1980
mie.neu.edu/people/melachrinoudis-emanuel

Scholarship focus: deterministic operations research and multi-criteria optimization; facility location; supply chain, transportation and logistics; wireless sensor network lifetime maximization with sink mobility; network design for maximum survivability

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

SELECTED PUBLICATIONS
M. Hajian, E. Melachrinoudis, P. Kubat

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

E. Melachrinoudis, E. Yavuz, R. Heydari
An O(m-2+mn2) Algorithm for the Bi-objective Location Problem on a Network with Mixed Metrics, International Journal of Operational Research, 23, 2015, 427-450

N. Zaarour, E. Melachrinoudis, M. Solomon, H. Min

R. Heydari, E. Melachrinoudis
Location of an Obnoxious Facility with Elliptic Maximin and Network Minicum 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

S. Basagni, A. Carosi, E. Melachrinoudis, C. Petrioli, M.Z. Wang
Controlled Sink Mobility for Prolonging Wireless Sensor Networks Lifetime, Wireless Networks, 14, 2008, 831-858

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

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

G. Nicolas, M. Janbozorgi, H. Metghalchi

R. Heydari, E. Melachrinoudis
Location of an Obnoxious Facility with Elliptic Maximin and Network Minicum 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

S. Basagni, A. Carosi, E. Melachrinoudis, C. Petrioli, M.Z. Wang
Controlled Sink Mobility for Prolonging Wireless Sensor Networks Lifetime, Wireless Networks, 14, 2008, 831-858
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-composite fibers; polymer/nano-carbon interfacial interactions and interphase formations; lightweight composite materials; carbon-carbon composites
Honors and awards: National Science Foundation CAREER Award

SELECTED PUBLICATIONS
Y. Zhang, N. Tajaddod, K. Song, M.L. Minus
Low Temperature Graphitization of Interphase Polyacrylonitrile (PAN), Carbon, 91, 2015, 479-493
J. Meng, N. Tajaddod, S.W. Cranford, M.L. Minus
Polyethylene Assisted Exfoliation of Hexagonal Boron Nitride in Composite Fibers: A Combined Experimental & Computational Study, Macromolecular Chemistry and Physics, 216(8), 2015, 847-855
Y. Zhang, M.L. Minus
E.C. Green, Y. Zhang, M.L. Minus

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, 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
Q. Sheng, A.J. White, S. Müftü
An Experimental Study of Friction and Durability of a Thin PTFE-film on Rough Aluminum Substrates, Tribology Transactions, 2016
H. Yang, J.B.C. Engelen, A. Pantazi, W. Häberle, M.A. Lantz, S. Müftü
H.Y. Chou, D. Satpute, A. Müftü, S. Mukundan, S. Müftü
Influence of Mastication and Edentulism on Mandibular Bone Density, Computer Methods in Biomechanics and Biomedical Engineering, 18(3), 2015, 269-281

SELECTED RESEARCH PROJECTS
A Novel Biomechanical Model of Bacterial Adhesion and Aggregation
Co-Principal Investigator, National Science Foundation

ARL Cold Spray Modeling Program
Technical Point of Contact, Army Research Laboratory

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
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
F. Forghan, O. Askari, U. Narusawa, H. Metghalchi
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
R. Amini, K. Creeden, U. Narusawa
H. Liu, U. Narusawa

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
In Situ Strengthening of Thin-wall Structures Using Pressurized Foam, Construction and Building Materials, 100, 2015, 298-304
Buckling of Regular, Chiral and Hierarchical Honeycombs Under a General Macroscopic Stress State, Proceedings of The Royal Society A, 470(2167), 2014, 1-23

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

V.K. Sahney

V.K. Sahney

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

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

B. Depalle, Z. Qin, S.J. Shefelbine, M.J. Buehler

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


P.L. Salmon, C. Ohlsson, S.J. Shefelbine, M. Doube
Structure Model Index Does Not Measure Rods and Plates in Trabecular Bone, Frontiers in Endocrinology, 6, 2015, 162

SELECTED RESEARCH PROJECTS

Heterogeneity 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: Young Investigator Award, American Society of Mechanical Engineers; College of Engineering Faculty Fellow; Defense Advanced Research Projects Agency Young Faculty Award; Fellow, American Society of Mechanical Engineers

SELECTED PUBLICATIONS
W. Qiao, R. Sipahi
A. Ramirez, S. Mondie, R. Garrido, R. Sipahi
Design of Proportional Integral Retarded Controllers, IEEE Transactions on Automatic Control, 61(6), 2016, 1688-1693
M. Ulusoy, R. Sipahi
N. Zhi, A. Gouldstone, B.K. Jaeger, R. Sipahi, S. Frank
R. Sipahi

SELECTED RESEARCH PROJECTS
A Three-dimensional Model of Spinal Cord Growth and Repair in a Regeneration-competent Organism
Co-Principal Investigator, National Science Foundation
Graph-based Control Design for Network Dynamics with Time Delays
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, J.S. Halabi
M.E. Taslim, X. Huang
M.E. Taslim, M.K.H. Fong
K. Elebiary, M.E. Taslim
M.E. Taslim, A. Nongsaeng
Experimental and Numerical Cross-over Jet Impingement in an Airfoil Trailing-edge Cooling Channel, Journal of Turbomachinery, 133(4), 2011, 1-10
A.A. Adebiyi, M.E. Taslim, K.D. Crawford

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
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 Freeze-thaw 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

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
Bending Behavior of Lightweight Sandwich-walled Shells with Pyramidal Truss Cores, Composite Structures, 116, 2014, 793-804
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
R. Oftadeh, B. Haghpanah, D. Vella, A. Boudaoud, A. Vaziri
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
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


Y. Li, X. Wang, A. Onnis-Hayden, K.-T. Wan, A.Z. Gu
Universal Quantifier Derived from AFM Analysis Links Cellular Mechanic Properties and Cell-surface Integration Forces with Microbial Deposition and Transport Behavior, Environmental Science and Technology, 48, 2014, 1769-1778

G. Li, K.-T. Wan

G. Li, C. Yilmaz, X. An, S. Somu, S. Kar, Y. Jung, A. Busnaina, K.-T. Wan

M. Robitaille, J. Shi, S. McBride, K.-T. Wan
Mechanical Performance of Hydrogel Contact Lenses with a Range of Power Under Parallel Plate Compression and Central Load, Journal of the Mechanical Behavior of Biomedical Materials, 22, 2013, 59-64

SELECTED RESEARCH PROJECTS
A Novel Biomechanical Model of Bacterial Adhesion and Aggregation
Principal Investigator, National Science Foundation
Mechano-lipidomics and Mechano-cytosis of Drug Delivery Liposomes
Principal Investigator, National Science Foundation
Mechanical Integrity and Long Term Reliability of Photovoltaic Panels
Principal Investigator, National Institute of Standards and Technology

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

SELECTED PUBLICATIONS
J.P. Whitney, T. Chen, J. Mars, J.K. Hodgins
A Hybrid Hydrostatic Transmission and Human-safe Haptic Telepresence Robot, Disney Research, 2016


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 Micromechanics 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 Micromechanics and Microengineering, 21(11), 2011, 1-7 *cover article

J.P. Whitney, R.J. Wood
**IBRAHIM ZEID**

Faculty, 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  

I. Zeid, J. Chin, C. Duggan, S. Kamarthi  

A. Zeid, S. Kamarthi, V. Sahney  

G.M. Uddin, K.S. Ziemer, I. Zeid, S. Kamarthi  

S. Vadde, A. Zeid, S. Kamarthi  

E. Tuncel, I. Zeid, S. Kamarthi  

**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 biomaterials in life science

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

**SELECTED PUBLICATIONS**

H. Zhu, P. Ciesielski, M. Himmel, J. Zhu, G. Henriksson, L. Hu  


H. Zhu, Z. Zhu, Z. Jia, S. Parvinian, Y. Li, T. Li, L. Hu  


Highly Transparent Paper with Tunable Haze for Green Electronics, Energy and Environmental Science, 7, 2014, 3313-3319


Hamid Ebrahimi
PhD 2016, Mechanical Engineering; Advisor, Ashkan Vaziri

GEOMETRICALLY INDUCED NONLINEARITY IN MATERIALS AND STRUCTURAL SYSTEMS

In our work we focused on nonlinear behavior of structural systems that arises from geometry and specifically tackled three problems: nonlinearity in shell structures, nonlinearity in scale-substrate systems and nonlinearity in cellular solids. Firstly, we present a new instability that is observed in the indentation of a highly ellipsoidal shell by a horizontal plate. For the second problem, we investigate the nonlinear mechanical effects of biomimetic scale like attachments on the behavior of an elastic substrate brought about by the contact interaction of scales in pure bending using qualitative experiments, analytical models and detailed finite element analysis. And lastly, we develop a new class of two dimensional (2D) metamaterials with negative Poisson’s ratio.

See full dissertation at coe.neu.edu/HamidEbrahimi

Emily Catherine Green
PhD 2015, Mechanical Engineering; Advisor, Marilyn L. Minus

COLLAGEN FIBRIL ASSEMBLY IN THE PRESENCE OF CARBON NANO-FILLERS

The work outlined for this dissertation will utilize a flow-based gel-spinning protocol to assemble collagen fibrils with and without the presence of nano-carbons. This novel synthetic method is aimed at achieving continuous collagen fibers, which exhibit highly aligned fibrillar and organized molecular structures as toward mimicking the native material. This type of collagen fiber fabrication remains a challenge to date. Collagen and collagen/nano-carbon composites were fabricated and characterized in order to determine the effects of the nano-carbon, in terms of geometry, size-scale, and distribution in the matrix, on collagen self-assembly and molecular packing. Nano-carbon dispersions, collagen sonication, fiber incubation, fiber strain and cross-linking were also studied to determine their effects on the overall assembly process. Fundamental studies to determine the structure-property relationship were also conducted using electron microscopy, X-ray scattering/diffraction techniques, and mechanical testing. These characterization methods allow better understanding of the nano-carbons ability to template highly aligned collagen fibrillar organization as well as the capability for these fillers to influence the collagen fiber structure.

See full dissertation at coe.neu.edu/EmilyGreen

Mimmo Elia
PhD 2016, Mechanical Engineering; Advisor, Hameed Metghalchi

MEASUREMENT APPARATUS AND MODELLING OF LAMINAR BURNING SPEED AND MASS BURNING RATE OF SYNGAS AND ONSET AUTO-IGNITION OF N-HEPTANE AND GAS TO LIQUID FUEL

This thesis will describe in detail the experimental apparatus and report the laminar burning speed and mass burning rate for Syngas-Air and Syngas-O2-He at high temperature and pressure as well as auto-ignition characteristics of n-Heptane and GTL (S8), which is a synthetic surrogate for aviation fuel. The first core component of the facility includes a spherical combustion vessel that enables the measurement of the pressure rise from a combustion process, at high initial temperature and pressure. The second core component of the facility, which includes a lower pressure cylindrical combustion vessel, with optically clear sides, enables the direct measurement of laminar flame speed as well as the visualization of expanding spherical flames for the study of flame structures.

See full dissertation at coe.neu.edu/MimmoElia

Omid Askari
PhD 2016, Mechanical Engineering; Advisor, Hameed Metghalchi

ON THE EXPERIMENTAL AND THEORETICAL INVESTIGATIONS OF LEAN PARTIALLY PREMIXED COMBUSTION, BURNING SPEED, FLAME INSTABILITY AND PLASMA FORMATION OF ALTERNATIVE FUELS AT HIGH TEMPERATURES AND PRESSURES

This dissertation investigates the combustion and injection fundamental characteristics of different alternative fuels both experimentally and theoretically. The subjects such as lean partially premixed combustion of methane/hydrogen/air/diluent, methane high pressure direct-injection, thermal plasma formation, thermodynamic properties of hydrocarbon/air mixtures at high temperatures, laminar flames and flame morphology of synthetic gas (syngas) and Gas-to-Liquid (GTL) fuels were extensively studied in this work. The effect of different characteristics parameters such as spark delay time, stratification ratio, turbulence intensity, fuel injection pressure, chamber pressure, chamber temperature, Exhaust Gas recirculation (EGR) addition, hydrogen addition and equivalence ratio on flame propagation and emission concentrations were analyzed.

See full dissertation at coe.neu.edu/OmidAskari
Ruhollah Heydari
PhD 2016, Industrial Engineering; Advisor, Emanuel Melachrinoudis

OPTIMIZATION MODELS FOR EMPTY RAILCAR DISTRIBUTION PLANNING IN CAPACITATED NETWORKS

In this dissertation we develop two formulations for the Empty Railcar Distribution problem, both aiming to minimize the total setup costs, total transportation costs, and total shortage penalties under supply limitation, demand satisfaction, customer preferences and priorities, and network capacity constraints. We first formulate the problem as a path-based capacitated network flow model. Contrary to the traditional path-based formulations, the path connecting each supply-demand pair is given by an external application called Trip Planner which is defined on top of a time-space network. Then we formulate the problem as an arc-based capacitated multi-commodity network flow model where contrary to the path-based model, the car routing and car distribution decisions are integrated in a single model.

See full dissertation at coe.neu.edu/RuhollahHeydari

Jiangsha Meng
PhD 2015, Mechanical Engineering; Advisor, Marilyn L. Minus

A STUDY OF THE POLYMER-CNT INTERACTIONS IN POLYMER/CNT COMPOSITES USING EXPERIMENTAL AND COMPUTATIONAL METHODS

This dissertation work focuses on research related to understanding and controlling the polymer-carbon nanotube (CNT) interactions during composite fiber processing using both experimental and computational means, in order to achieve consistent formation of the interphase regions for various polymers in the vicinity of CNT. The development of the polymer crystalline interphase is important, since it has been shown to have a significant and positive impact on the mechanical performance of polymer/CNT composites. This is achieved by the improvement of stress transfer mechanisms between the polymer matrix and CNT. The preliminary results (i.e., both experimental and computational) provide insight toward understanding the fundamental mechanisms of polymer-CNT interactions under various processing conditions, as well as the resultant polymer or CNT behaviors and composite fibers performance governed by them.

See full dissertation at coe.neu.edu/JiangshaMeng

Sharon Loeffler Kotz
PhD 2016, Mechanical Engineering; Advisor, Ahmed Busnaina

ELECTRODE ARCHITECTURES FOR ENHANCED LITHIUM ION BATTERY PERFORMANCE

This research in this dissertation focuses on the development of an electrode architecture using nanomaterials which will decrease lithium ion transport distance while enhancing electrical conductivity within the cell. The proposed architecture consists of a stacked, 2D structure composed of layers of carbon nanotubes and active material particles, and can be applied to both the anode and the cathode. The process also has the advantage of low cost because it can be performed under normal laboratory conditions (e.g. temperature and pressure) and easily adapted to a commercial scale.

See full dissertation at coe.neu.edu/SharonKotz

Ali Moghaddas
PhD 2016, Mechanical Engineering; Advisor, Hameed Metghalchi

LAMINAR BURNING SPEED MEASUREMENT, AUTOIGNITION AND FLAME STRUCTURE STUDY OF SPHERICALLY EXPANDING FLAMES

In this thesis flame structure, laminar burning speed and onset of autoignition are studied for different premixed combustible mixtures including n-decane, jet-fuels, and Hydrofluorocarbon (HFC) refrigerants in air at high temperatures and pressures over a wide range of fuel-air equivalence ratios. The experimental facilities consist of two spherical and cylindrical vessels. The spherical vessel is used to collect pressure data to measure the burning speed and cylindrical vessel is used to take pictures of flame propagation with a high speed CMOS camera located in a shadowgraph system. A thermodynamic model is employed that assumes unburned gases compress isentropically and that burned gases are in local thermodynamic equilibrium. Burning speed is derived from the time rate change of mass fraction of burned gases. The major advantages of this method are that it circumvents the need for any extrapolation due to having low stretch rates and that many data points can be collected along an isentrope in a single experiment.

See full dissertation at coe.neu.edu/AliMoghaddas
Davood Mousanezhad Viyand
PhD 2016, Mechanical Engineering; Advisor, Ashkan Vaziri

MECHANICS OF CHIRAL, ANTI-CHIRAL, AND HIERARCHICAL HONEYCOMBS

This dissertation studies the effects of two geometric refinement strategies widespread in natural structures, chirality and self-similar hierarchy, on mechanical response of two-dimensional honeycombs. First, by employing the concepts of mechanics of materials, simple closed-form expressions were derived for the elastic moduli of several chiral, anti-chiral, and hierarchical honeycombs with hexagon and square based networks. A new class of hierarchical fractal-like honeycombs inspired by the topology of the "spiderweb" was introduced and investigated for its small and large deformation response through analytical modeling, detailed numerical simulations, and mechanical testing.

See full dissertation at coe.neu.edu/DavoodMousanezhadViyand

Fatomeh PourMohamadHadiFarshami
PhD 2016, Mechanical Engineering; Advisor, Hameed Metghalchi

RATE-CONTROLLED CONSTRAINED-EQUILIBRIUM MODELING OF CHEMICAL KINETICS AND MIXING

The objective of this study is to assess the computational efficiency and accuracy of the Rate-Controlled Constrained-Equilibrium (RCCE) method to represent systems involving chemical reaction and mixing. The RCCE is a dimension reduction technique for chemical kinetics based on thermodynamics laws. It describes the time evolution of reacting systems using a series of constrained-equilibrium states determined by RCCE constraints. The full chemical composition at each state is obtained by maximizing the entropy subject to instantaneous values of the constraints. The RCCE rate equations can be formulated in terms of constraints or constraint potentials. Although these two forms are mathematically equivalent, they involve different numerical procedures and thus show different computational performances.

See full dissertation at coe.neu.edu/FatemehPourMohamadHadiFarshami

Keivan Sadeghzadeh
PhD 2016, Industrial Engineering; Advisor, Nasser Fard

ANALYTIC FOR DATA-DRIVEN DECISION-MAKING IN COMPLEX HIGH-DIMENSIONAL TIME-TO-EVENT DATA

This research in this dissertation is motivated by the importance of the applied variable reduction in complex high-dimensional time-to-event data to avoid aforementioned difficulties in decision-making and facilitate time-to-event data analysis. Quantitative statistical and computational methodologies using combinatorial heuristic algorithms for variable selection and classification are proposed. The purpose of these methodologies is to reduce the volume of the explanatory variables and identify a set of most influential variables in such datasets.

See full dissertation at coe.neu.edu/KeivanSadeghzadeh

Melda Ulusoy
PhD 2015, Mechanical Engineering; Advisor, Rifat Sipahi

A TOUCH BASED FINGER-MOTION-ADAPTIVE CONTROL DESIGN FOR BRAILLE READING

In this dissertation, we focus on developing engineering design rules by which Braille reading devices can be created at low costs and with enhanced user experience. With this aim, a touch based finger-motion-adaptive control design algorithm is proposed for use on a rotating-wheel type Braille reading machine. By taking into account the inherent complexity of Braille reading process, the proposed algorithm estimates user’s hand gestures in real-time without any sensors attached to the hand, and based on this estimation, it can adjust the speed of the wheel bi-directionally in real-time. The finger-motion-adaptive algorithm is tested and its efficacy is evaluated through human subject experiments with sighted and blind people. Results indicate that subjects’ performance metrics improved in the presence of the finger-motion-adaptive algorithm, demonstrating the potentials of utilizing the algorithm in next-generation Braille reading devices.

See full dissertation at coe.neu.edu/MeldaUlusoy
Hankang Yang
PhD 2016, Mechanics and Design; Advisor, Sinan Muftu

LATERAL DYNAMICS OF AN AXIALLY TRANSLATING MEDIUM: A THEORETICAL AND EXPERIMENTAL STUDY ON THE EFFECTS OF GUIDING COMPONENTS

The research presented in this thesis is motivated by the need to understand the causes of LTM, in order to help increase the volumetric storage density of magnetic tape storage systems. To this end tape is modeled as tensioned, axially moving beam with viscoelasticity. Two major studies were undertaken to investigate the effects of imperfections in roller geometry, and dynamic friction between the tape and a grooved roller. In addition, the effects of periodic impulses, such as those that could develop due to flange contacts, on tape dynamics were investigated. A new model for the coupling between lateral and longitudinal tape vibrations was also presented. In this work we also introduce a way to carry out eigenvalue analysis of gyroscopic systems by using the finite element discretization. It was shown that the results match the classical work. This method was used to find the natural frequencies of the system with internal damping.

See full dissertation at coe.neu.edu/HankangYang