DEPARTMENT OF MECHANICAL AND INDUSTRIAL ENGINEERING

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

QUICK FACTS

2
FEDERALLY FUNDED RESEARCH CENTERS

2
NATIONAL ACADEMY MEMBERS

15
YOUNG INVESTIGATOR AWARDS

DEPARTMENT OF MECHANICAL AND INDUSTRIAL ENGINEERING

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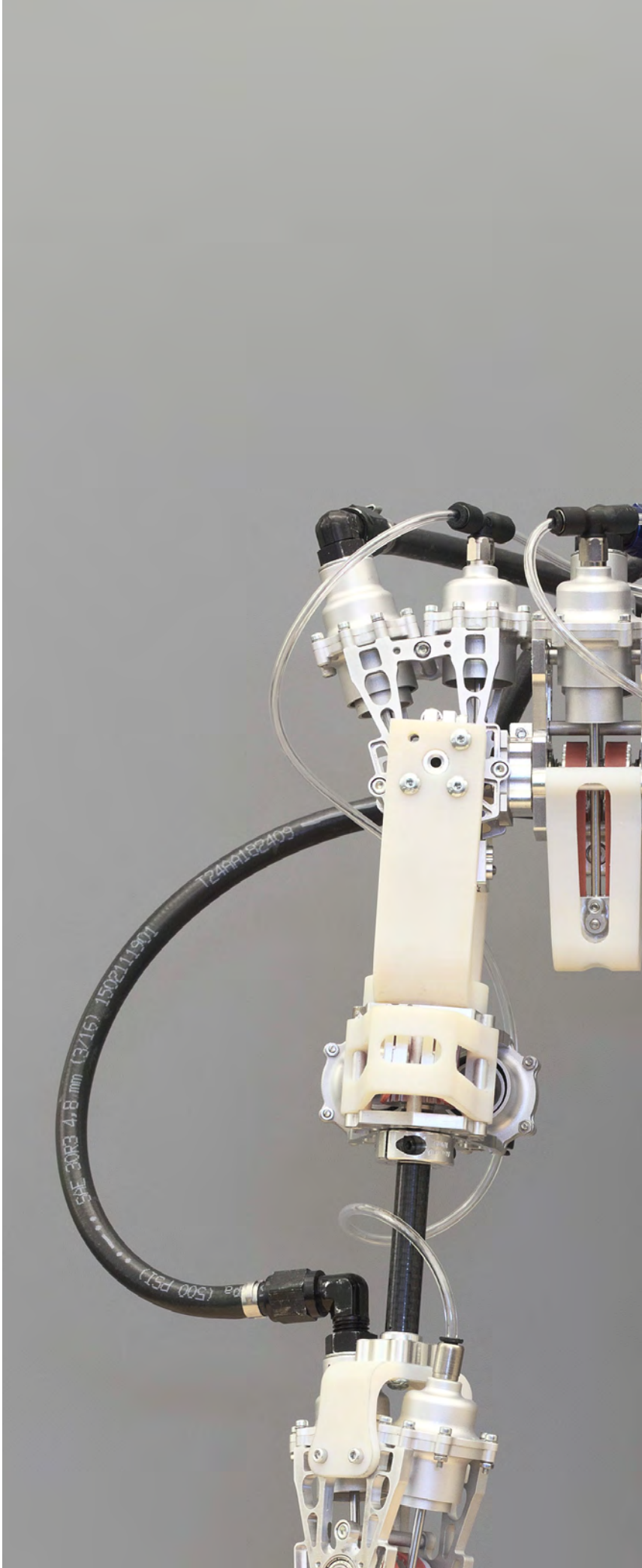
COVER IMAGE

"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.



Northeastern University
College of Engineering

MECHANICAL AND INDUSTRIAL ENGINEERING

2015 | 2016

SCHOLARSHIP REPORT

QUICK FACTS — Mechanical and Industrial Engineering

2
FEDERALLY FUNDED RESEARCH CENTERS

NSF/DHHS Healthcare Systems Engineering Institute

NSF CENTER for High-rate Nanomanufacturing

870
GRADUATE STUDENTS

INCLUDING MS AND PHD PROGRAMS IN:

Data Analytics Engineering
Engineering Management
Industrial Engineering
Mechanical Engineering
Operations Research

2
NATIONAL ACADEMY MEMBERS

NADINE AUBRY
University Distinguished Professor and Dean

VINOD SAHNEY
University Distinguished Professor

56
TENURED/ TENURE-TRACK FACULTY

15
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 — College of Engineering

12 MULTI-INSTITUTIONAL RESEARCH CENTERS funded by six federal agencies

DOE, DHS, NIH, NSA, NIST, NSF

169
TENURED/ TENURE-TRACK Faculty

NEW FALL UNDERGRADUATE students
2015 — 2016
665
729

3550
UNDERGRADUATE students

5 ENGINEERING DEPARTMENTS
- Bio
- Chemical
- Civil and Environmental
- Electrical and Computer
- Mechanical and Industrial

64
YOUNG INVESTIGATOR Awards

36
NSF CAREER Awards

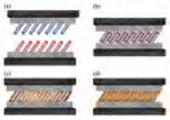
NEW FALL MS students
2015 — 2016
939
1177

3210
GRADUATE students

HONORS

ACHIEVEMENTS

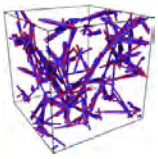
FACULTY HONORS AND AWARDS



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 **Surendra Gupta** published a new book "Reliability Analysis with Minitab" by CRC Press.

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_x 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 Harteveld, 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."

PATENTS

WL Smith Chair and University Distinguished Professor **Ahmed Busnaina**, and Director of the Kostas Nanoscale Research Center **Siva Somu** were awarded a patent for "Damascene Template for Directed Assembly and Transfer of Nanoelements."

WL Smith Chair and University Distinguished Professor **Ahmed Busnaina**, and electrical and computer engineering Professor Nicol McGruer were awarded a patent for "Directed Assembly of Carbon Nanotubes and Nanoparticles using Nanotemplates."

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 IEOM 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

12 Faculty
ENERGY

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

18 Faculty
MECHANICS

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

8 Faculty
BIOMECHANICS

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

6 Faculty
HEALTHCARE SYSTEMS

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

9 Faculty
MECHATRONICS

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

14 Faculty
MATERIALS SCIENCE

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

10 Faculty
NANOMANUFACTURING

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

14 Faculty
INDUSTRIAL ENGINEERING/ OPERATIONS RESEARCH

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

10 Faculty
THERMOFLUIDS

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

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

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

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

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

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
Adhesive Slip Process Between a Carbon Nanotube and a Substrate, Journal of Physics D: Applied Physics, 46, 2013, 175305

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
Integer Linear Programming Model for Grid-based Wireless Transmitter Location Problems, International Journal of Operational Research, 22(1), 2015, 48-64

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

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

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

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

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

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

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
Supplier Evaluation with GD based Multi Criteria Decision Making, International Journal of Industrial & Systems Engineering, 3(3), 2008, 368-381

MICHAEL ALLSHOUSE

Assistant Professor, Mechanical and Industrial Engineering

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

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

SELECTED PUBLICATIONS

M.R. 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
Self-Propulsion of Immersed Objects via Natural Convection, Physical Review Letters, 112, 2014, 097617

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

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

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

TEIICHI ANDO

Professor, Mechanical and Industrial Engineering

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

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

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

SELECTED PUBLICATIONS

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

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

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

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

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

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

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

SELECTED RESEARCH PROJECTS

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-Principle Investigator, ARL

NADINE AUBRY

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

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

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

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

SELECTED PUBLICATIONS

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

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

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

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

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

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

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

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

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

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
Modeling Charge-sign Asymmetric Solvation Free Energies using Nonlinear Boundary Conditions, Journal of Chemical Physics (Communication), 141, 2014, 131103

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

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

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

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

SELECTED RESEARCH PROJECTS

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

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

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

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

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

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

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

MEHDI BEHROOZI

Assistant Professor, Mechanical and Industrial Engineering

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

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

SELECTED PUBLICATIONS

J.G. Carlsson, M. Behroozi, X. Meng, R. Devulapalli
Household-level Economies of Scale in Transportation, Operation Research, 2016

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

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

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

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

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

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

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

JAMES BENNEYAN

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

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

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

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

SELECTED PUBLICATIONS

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

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

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

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

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

SELECTED RESEARCH PROJECTS

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

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

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

Reducing Preventable Hospital Readmissions
Principal Investigator, Purdue University

AHMED BUSNAINA

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

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

Scholarship focus: 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

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

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

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

A. Malima, S. Siavoshi, T. Musacchio, J. Upponi, C. Yilmaz, S. Somu, W. Hartner, V. Torchilin, A. Busnaina
Highly Sensitive Microscale in Vivo Sensor Enabled by Electrophoretic Assembly of Nanoparticles for Multiple Biomarker Detection, Lab on a Chip, 12, 2012, 4748-4754

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

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

SRINATH CHAKRAVARTHY

Assistant Professor, Mechanical and Industrial Engineering

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

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

SELECTED PUBLICATIONS

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

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

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

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

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

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

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

CHUN-AN (JOE) CHOU

Assistant Professor, Mechanical and Industrial Engineering

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

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

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

SELECTED PUBLICATIONS

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

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

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

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

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

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

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

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

JOHN W. CIPOLLA

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

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

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

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

SELECTED PUBLICATIONS

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

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

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

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

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

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

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

THOMAS CULLINANE

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

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

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

Honors and awards: Fellow, Institute of Industrial Engineers

SELECTED PUBLICATIONS

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

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

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

MOHAMMAD DEHGHANI

Assistant Teaching Professor, Mechanical and Industrial Engineering

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

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

SELECTED PUBLICATIONS

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

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

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

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

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

RANDALL ERB

Assistant Professor, Mechanical and Industrial Engineering

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

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

SELECTED PUBLICATIONS

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

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

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

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

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

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

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

SELECTED RESEARCH PROJECTS

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

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

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

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

ÖZLEM ERGUN

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

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
Integrating Supply Chains for Emergencies and Ongoing Operations in UNHCR , Journal of Operations Management, 45, 2016, 1-134

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

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

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

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

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

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

SELECTED PUBLICATIONS

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

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

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

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

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

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

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

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

SAMUEL FELTON

Assistant Professor, Mechanical and Industrial Engineering

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

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

Honors and awards: National Defense Science and Engineering Graduate Fellowship

SELECTED PUBLICATIONS

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

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

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

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

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

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

ANDREW GOULDSTONE

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

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

Scholarship focus: biomechanics; material science; engineering mechanics

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

SELECTED PUBLICATIONS

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

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

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

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

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

SELECTED RESEARCH PROJECTS

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

JACKIE GRIFFIN

Assistant Professor, Mechanical and Industrial Engineering

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

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

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

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

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

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

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

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 Hybrid Genetic Algorithm for Sequence-dependent Disassembly Line Balancing Problem, Annals of Operations Research, 242(2), 2016, 321-354

A. ElSayed, E. Kongar, S.M. Gupta
Fuzzy Linear Physical Programming for Multiple Criteria Decision-making Under Uncertainty, International Journal of Computers, Communications, and Control, 11(1), 2016, 25-37

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

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

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

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

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

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

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

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
Flow Regime Mapping of High Inertial Gas-liquid Droplet Microflows in Flow-focusing Geometries, Microfluidics and Nanofluidics, 20(1), 2016, 1-13

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

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

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

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

SELECTED RESEARCH PROJECTS

Advanced Thermo-adsorptive Battery Climate Control System
Co-Principal Investigator, Advanced Research Projects Agency-energy

CAREER: Inertial Two-phase Gas-liquid Droplet Microflows
Principal Investigator, National Science Foundation

HANCHEN HUANG

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
A Characteristic Length Scale of Nanorods Diameter during Growth, Physical Review Letters, 101(26), 2008, 266102

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

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

SELECTED RESEARCH PROJECTS

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

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

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

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

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

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

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
Net Energy Benefits of Carbon Nanotube Applications, Applied Energy, 173, 2016, 624-634

S. Erbis, Z.D. Ok, S. Kamarthi, J.C. Benneyan, J.A. Isaacs
Review of Research Trends and Methods in Nano Environmental, Health, and Safety Risk Analysis, Risk Analysis, 2016

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

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

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

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

SELECTED RESEARCH PROJECTS

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

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

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

NADER JALILI

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

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

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

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

SELECTED PUBLICATIONS

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

S. Faegh, N. Jalili, S. Sridhar
A Novel Sensor System Utilizing Piezoelectric Microcantilever Coupled with Resonating Circuit, US Patent, 2015

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

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

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

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

SELECTED RESEARCH PROJECTS

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

Robotic Leg Advancement Device
Principal Investigator, National Science Foundation

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

XIAONING JIN

Assistant Professor, Mechanical and Industrial Engineering

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

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

SELECTED PUBLICATIONS

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

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

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

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

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

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

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

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

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

YUNG JOON JUNG

Associate Professor, Mechanical and Industrial Engineering

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

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

SELECTED PUBLICATIONS

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

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

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

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

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

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

SELECTED RESEARCH PROJECTS

Developing Strong, High Thermal Resistant, and Light Weight Materials and their Processing for the High Performance Automotive Lighting System
Principal Investigator, 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
Phase Synchronization Based Minimum Spanning Trees for Analysis of Financial Time Series with Nonlinear Correlations, Physica A: Statistical Mechanics and its Applications, 444, 2016, 259-270

S. Kamarthi, Sultornsanee, A. Zeid
Recurrence Quantification Analysis to Estimating Surface Roughness in Finish Turning Processes, International Journal of Advanced Manufacturing Technology, 2016, 1-10

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

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(5), 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
Multi-stage Stochastic Programming (MSP) Model for Carbon Nanotube Production Capacity Expansion Planning, ACS Sustainable Chemistry and Engineering, 2(7), 2014, 1633-1641

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
Interplay of Physical Mechanisms and Biofilm Processes: Review of Microfluidic Methods, Lab on a Chip, 15(1), 2015, 23-42

G.-J. Li, A. Karimi, A.M. Ardekani
Effect of Solid Boundaries on Swimming Dynamics of Microorganisms in a Viscoelastic Fluid, Rheologica Acta, 53(12), 2014, 911-926

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

A. Karimi, A.M. Ardekani
Gyrotactic Bioconvection at Pycnoclines, Journal of Fluid Mechanics, 733, 2013, 245-267

A. Karimi, S. Yazdi, A.M. Ardekani
Hydrodynamic Mechanisms of Cell and Particle Trapping in Microfluidics, Biomicrofluidics, 7, 2013, 021501

A. Karimi, M.R. Paul
Length Scale of a Chaotic Element in Rayleigh-Bénard Convection, Physical Review E, 86, 2012, 066212

A. Karimi, M.R. Paul
Quantifying Spatiotemporal Chaos in Rayleigh-Bénard Convection, Physical Review E, 85, 2012, 046201

GREGORY KOWALSKI

Director, Professional Maters of Science in Energy Systems Program; Associate Professor, Mechanical and Industrial Engineering

PhD, University of Wisconsin, 1978
mie.neu.edu/people/kowalski-gregory

Scholarship focus: energy related and calorimeter studies related to pharmaceutical developments; simulation of thermal effects on laser beam propagation through heated materials; simulating microscale heat transfer phenomena and its effects on laser beam propagation; Simulation of laser welding processes

Honors and awards: Fellow, American Society of Mechanical Engineers

SELECTED PUBLICATIONS

A.J. Conway, W.M. Saadi, F.L. Sinatra, G.J. Kowalski, D. Larson, J. Fiering
Dispersion of a Nanoliter Bolus in Microfluidic Co-flow, Journal of Micromechanics and Microengineering: Structures, Devices, and Systems, 24(3), 2014, 034006

U. Piana, G.J. Kowalski, M. Zenouzi
Incorporating Reliability and Failure Models into Energy System Analysis, Proceedings of the 8th International Conference on Energy Sustainability co-located with the 12th Fuel Cell Science, Engineering & Technology Conference, Boston, MA, 2014, 1-9

A. Emdadi, Y. Emami, M. Zenouzi, A. Lak, B. Panahirad, A. Lotfi, F. Lak, G.J. Kowalski
Potential Of Electricity Generation By The Salinity Gradient Energy Conversion Technologies in the System of Urmia Lake-Gadarchay River, Proceedings of the 8th International Conference on Energy Sustainability Co-located with the 12th Fuel Cell Science, Engineering & Technology Conference, Boston, MA, 2014, 1-8

G.J. Kowalski, M. Modaresifar, M. Zenouzi
Significance of Transient Exergy Terms in a New Tray Design Solar Desalination Device, Journal of Energy Resources Technology, 137(1), 2014, 1-8

SELECTED RESEARCH PROJECTS

Energy Storage Systems
Principal Investigator, 3 Phase Renewables

ARTHUR F. KRAMER

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

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

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

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

SELECTED PUBLICATIONS

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

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

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

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

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

SELECTED RESEARCH PROJECTS

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

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

YIANNIS LEVENDIS

COE Distinguished Professor, Mechanical and Industrial Engineering

PhD, California Institute of Technology, 1987
mie.neu.edu/people/levendis-yiannis

Scholarship focus: gasification and combustion of solid fuels, generation and containment of combustion-generated pollution, synthesis and characterization of combustion-generated materials, fire suppression – fire extinction, engine design and operation

Honors and awards: Fellow, American Society of Mechanical Engineers; Fellow, Society of Automotive Engineers; Søren Buus Outstanding Research Award, College of Engineering; George Westinghouse Gold Medal, American Society of Mechanical Engineers

SELECTED PUBLICATIONS

J. Chase, C. Zhuo, Y.A. Levendis
A Feasibility Study on Power Generation from Waste Plastics with Partial Pre-Combustion Carbon Capture and Conversion, Journal of Energy Engineering (ASCE), 141(2), 2015

A. Ruscio, F. Kazanc, Y.A. Levendis
Characterization of Particulate Matter Emitted from Combustion of Various Biomasses in O_2/N_2 and O_2/CO_2 Environments, Energy and Fuels, 28, 2014, 685-696

J. Riaza, R. Khatami, Y.A. Levendis, L. Álvarez, et al.
Combustion of Single Particles of Waste Biomasses in Air and in Oxy-Fuel Conditions, Biomass & Bioenergy, 64, 2014, 162-174

C. Zhuo, W. Nowak, Y.A. Levendis
Oxidative Heat Treatment of 316L Stainless Steel for Effective Catalytic Growth of Carbon Nanotubes, Applied Surface Science, 313, 2014, 227-236

A. Davies, R. Soheilian, C. Zhuo, Y.A. Levendis
Pyrolytic Conversion of Biomass Residues to Gaseous Fuels for Electricity Generation, Journal of Energy Resources Technology, Transactions of ASME, 136(2), 2014, 021101-021106

J. Riaza, R. Khatami, Y.A. Levendis, L. Álvarez, et al.
Single Particle Ignition and Combustion of Anthracite, Semi-anthracite and Bituminous Coals in Air and Simulated Oxy-fuel Conditions, Combustion and Flame, 161, 2014, 1096-1108

C. Zhuo, Y.A. Levendis
Up-cycling Waste Plastics into Carbon Nanomaterials: A Review, Journal of Applied Polymer Science, 131, 2014, 39931-39944

SELECTED RESEARCH PROJECTS

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

LAURA H. LEWIS

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

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

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

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

SELECTED PUBLICATIONS

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

L.H. Lewis, F.E. Pinkerton, et al.
De Magnete et Meteorite: Cosmically-motivated Materials, IEEE Magnetics Letters, 5, 2014

R. McCallum, L.H. Lewis, R. Skomski, M.J. Kramer, I.E. Anderson
Practical Aspects of Modern and Future Permanent Magnets, Annual Review of Materials Research, 44(1), 2014, 451-477

L.H. Lewis, F. Jiménez-Villacorta
Perspectives on Permanent Magnetic Materials for Energy Conversion and Power Generation, Metallurgical and Materials Transactions A, 44(1), 2013, 2-20

G. Srajer, L.H. Lewis, S.D. Bader, et al.
Advances in Nanomagnetism via X-ray Techniques, Review Article, Journal of Magnetism and Magnetic Materials, 307(1), 2006, 1-31

SELECTED RESEARCH PROJECTS

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

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

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

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

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

YINGZI LIN

Associate Professor, Mechanical and Industrial Engineering; affiliated faculty 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
A Spatial-temporal Trajectory Clustering Algorithm for Eye Fixations Identification, International Journal of Intelligent Data Analysis, 20(2), 2016, 377-393

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

M. Yu, Y. Lin, X. Wang, D. Schmidt, Y. Wang
Human-robot Interaction Based on Gaze Gesture for the Drone Teleoperation, Journal of Eye Movement Research, 7(4), 2014, 1-14

S. Radhakrishnan, Y. Lin, A. Zeid, S. Kamarthi
Design, Evaluation and Implementation of Gesture Based Functions for CAD Modeling System Using the Multitouch Interface, International Journal of Human-computer Studies, 71(3), 2013, 261-275

H. Cai, Y. Lin
Coordinating Cognitive Assistances with Cognitive Engagement Control Approaches in Human-machine Interactions, IEEE Transactions on Systems, Man and Cybernetics Part A: Humans and Systems, 42(2), 2012, 286-294

Y. Lin
A Natural Contact Sensor Paradigm for Non-intrusive and Real-time Sensing of Bio-signals in Human-machine Interactions, IEEE Sensors Journal, Special Issue on Cognitive Sensor Networks, 11(3), 2011, 522-529

G. Yang, Y. Lin, P. Bhattacharya
A Driver Fatigue Recognition Model Based on Information Fusion and Dynamic Bayesian Network, Information Sciences, 180, 2010, 1942-1954

SELECTED RESEARCH PROJECTS

CAREER: Bridging Cognitive Science and Sensor Technology: Nonintrusive and Multimodality Sensing in Human Machine Interactions
Principal Investigator, National Science Foundation

Integrated Individualized Modeling towards Cognitive Control of Human-machine Systems
Principal Investigator, National Science Foundation

YONGMIN LIU

Assistant Professor, joint faculty appointment in Mechanical and Industrial Engineering and Electrical and Computer Engineering

PhD, University of California, Berkeley, 2009
mie.neu.edu/people/liu-yongmin

Scholarship focus: nano optics; nanoscale materials and engineering; nano devices; plasmonics; metamaterials; applied physics

Honors and awards: 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 Luneburg and Eaton Lenses, Nature Nanotechnology, 6, 2011, 151-155

Y. M. Liu, T. Zentgraf, G. Bartal, X. Zhang
Transformational Plasmon Optics, Nano Letters, 10(6), 2010, 1991-1997

J. Yao, Z. Liu, Y.M. Liu, Y. Wang, C. Sun, G. Bartal, et al.
Optical Negative Refraction in Bulk Metamaterials of Nanowires, Science, 321(5891), 2008, 930

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
Carbon Nanotube Torsional Springs for Regenerative Braking Systems, Journal of Micromechanics and Microengineering, 25(10), 2015, 104005

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

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

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

A.S. Dighe, C. Livermore
Single-use MEMS Sealing Valve with Integrated Actuation for Ultra Low-leak Vacuum Applications, Journal of Micromechanics and Microengineering, 24(10), 2014, 105011

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

F.A. Hill, T. Havel, D. Lashmore, M. Schauer, C. Livermore
Storing Energy and Powering Small Systems with Mechanical Springs Made of Carbon Nanotube Yarn, Energy, 76, 2014, 318-325

SELECTED RESEARCH PROJECTS

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

EFRI-ODISSEI: Origami and Assembly Techniques for Human-Tissue-Engineering (OATH)
Principal Investigator, National Science Foundation

DAVID LUZZI

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

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

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

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

SELECTED PUBLICATIONS

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

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

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

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

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

CRAIG MALONEY

Associate Professor, Mechanical and Industrial Engineering

PhD, University of California, Santa Barbara, 2005
mie.neu.edu/people/maloney-craig

Scholarship focus: modeling, simulation, and theory of nanoscale mechanics, soft matter, and glasses and amorphous materials

Honors and awards: National Science Foundation CAREER Award

SELECTED PUBLICATIONS

A. Garg, A. Acharya, C.E. Maloney
A Study of Conditions for Dislocation Nucleation in Coarser-than-atomistic Scale Models, Journal of the Mechanics and Physics of Solids, 75, 2015, 76–92

K.M. Salerno, C.E. Maloney, M.O. Robbins
Avalanches in Strained Amorphous Solids: Does Inertia Destroy Critical Behavior?, Physical Review Letters, 109, 2012, e105703

A. Hasan, C.E. Maloney
Inferring Elastic Properties of an fcc Crystal from Displacement Correlations: Sub-space Projection and Statistical Artifacts, Physical Review E 90, 87(5-1), 2012, e062309

A. Hasan, C.E. Malonewy
Saddle-node Scalings in Homogeneous Dislocation Nucleation, International Journal for Multiscale Computational Engineering 10, 2012, 101-108

D. Kaya, N. Green, C.E. Maloney, M.F. Islam
Density Invariant Vibrational Modes in Disordered Colloidal Crystals, Physical Review E, 83(5), 2011, e051404

K. Karimi, C.E. Maloney
Local Anisotropy in Globally Isotropic Granular Packings, Physical Review Letters, 107, 2011, e268001

SELECTED RESEARCH PROJECTS

CAREER: Plasticity and Jamming
Principal Investigator, National Science Foundation

CDSE: A Data-driven Statistical Approach to Aging and Elasticity in Colloidal Glasses
Principal Investigator, National Science Foundation

JOSE MARTINEZ LORENZO

Assistant Professor, 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
A Compact 118-GHz Radiometer Antenna for the Micro-sized Microwave Atmospheric Satellite, IEEE Antennas & Wireless Propagation Letters, 13, 2014, 1533-1536

Y. Rodriguez-Vaqueiro, C. Rappaport, J.A. Martinez-Lorenzo, et al.
Fourier-based Imaging for Multistatic Radar Systems, IEEE Transactions on Microwave Theory and Techniques, 62(8), 2014, 1798-1810

Y. Alvarez, J.A. Martinez-Lorenzo, C. Rappaport, et al.
On the Combination of SAR and Model Based Techniques for High-resolution Real-time Two-dimensional Reconstruction, IEEE Transactions on Antennas & Propagation, 62(10), 2014, 5180-5189

Y. Rodriguez-Vaqueiro, J.A. Martinez-Lorenzo
On the use of Passive Reflecting Surfaces and Compressive Sensing Techniques for Detecting Security Threats at Standoff Distances, International Journal on Antennas & Propagation, 248351, 2014, 1-8

J.A. Martinez-Lorenzo, F. Las-Heras, C. Rappaport, et al.
Sparse Array Optimization using Simulated Annealing and Compressed Sensing for Near-field Millimeter Wave Imaging, IEEE Transactions on Antennas & Propagation, 62(4), 2014, 1716-1722

SELECTED RESEARCH PROJECTS

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 MELACHRINOUDIS

Associate Professor, Associate Department Chair and Program Director of Industrial Engineering

PhD, University of Massachusetts, Amherst, 1980
mie.neu.edu/people/melachrinoudis-emanuel

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

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

SELECTED PUBLICATIONS

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

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

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

E. Melachrinoudis, E. Yavuz, R. Heydari
An O(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
The Optimal Determination of the Collection Period for Returned Products in the Sustainable Supply Chain, International Journal of Logistics Research and Applications, 17, 2014, 35-45

R. Heydari, E. Melachrinoudis
Location of an Obnoxious Facility with Elliptic Maximin and Network Minisum Objectives, European Journal of Operational Research, 223(2), 2012, 452-460

M. Mekuria, P. Furth, E. Melachrinoudis
Optimization of Spacing of Transit Stops on a Realistic Street Network, Transportation Research Record, 4, 2012, 29-37

E. Melachrinoudis
The Location of Undesirable Facilities, Chapter 10, Foundations of Location Analysis, International Series in Operations Research and Management Science, Springer, New York, 2010, 207-239

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
Measurement of Laminar Burning Speed and Investigation of Flame Stability of Acetylene (C2H2)/air Mixtures, ASME Journal of Energy Resources Technology, 137, 2015, e012204

O. Askari, M. Janbozorgi, R. Greig, A. Moghaddas, H. Metghalchi
Developing Alternative Approaches to Predicting the Laminar Burning Speed of Refrigerants Using the Minimum Ignition Energy, Science and Technology for the Built Environment, 21(2), 2015, 220-227

G. Nicolas, H. Metghalchi
Comparison Between RCCE and Shock Tube Ignition Delay Time at Low Temperatures, ASME Journal of Energy Resources Technology, 137, 2015, e062203

G. Nicolas, M. Janbozorgi, H. Metghalchi
Constrained-equilibrium Modeling of Methane Oxidation in Air, ASME Journal of Energy Resources Technology, 136(3), 2014, 1-7

A. Moghaddas, C. Bennett, E. Rokni, H. Metghalchi
Laminar Burning Speeds and Flame Structures of Mixtures of Difluoromethane (HFC-32) and 1,1-Difluoroethane (HCF-152a) with Air at Elevated Temperatures and Pressures, HVAC&R Research, 20, 2014, 42-50

O. Askari, H. Metghalchi, S.K. Hannani, H. Hemmati, R. Ebrahimi
Lean Partially Premixed Combustion Investigation of Methane Direct-injection under Different Characteristic Parameters, ASME Journal of Energy Resources Technology, 136, 2014, 1-7

SELECTED RESEARCH PROJECTS

Combustion of GTL Fuel
Principal Investigator, Qatar Foundation

LSAMP Research Project
Principal Investigator, National Science Foundation

MARILYN MINUS

Associate Professor, Mechanical and Industrial Engineering

PhD, Georgia Institute of Technology, 2008
mie.neu.edu/people/minus-marilyn

Scholarship focus: process-structure-properties relationships in polymer-based nano-composites fibers; polymer/nano-carbon interfacial interactions and interphase formations; lightweight composite materials; carbon-carbon composites

Honors and awards: National Science Foundation CAREER Award

SELECTED PUBLICATIONS

Y. Zhang, N. Tajaddod, K. Song, M.L. Minus
Low Temperature Graphitization of Interphase Polyacrylonitrile (PAN), Carbon, 91, 2015, 479-493

J. Meng, N. Tajaddod, S.W. Cranford, M.L. Minus
Polyethylene Assisted Exfoliation of Hexagonal Boron Nitride in Composite Fibers: A Combined Experimental & Computational Study, Macromolecular Chemistry and Physics, 216(8), 2015, 847-855

Y. Zhang, M.L. Minus
Characterization and Structural Analysis of Solution-grown Polyacrylonitrile-co-methacrylic Acid (PAN-co-MAA) Single Crystals, Macromolecules, 47(12), 2014, 3987-3996

E.C. Green, Y. Zhang, M.L. Minus
Understanding the Effects of Nano-Carbons on Flexible Polymer Chain Orientation and Crystallization: Polyethylene/Carbon Nano-chip Hybrid Fibrillar Crystal Growth, Journal of Applied Polymer Science, 131(18), 2014, 40763

SELECTED RESEARCH PROJECTS

CAREER: Understanding Directionally Templated Interphase Processing-structure Development and Relationships in Polymer Nano-composite Materials
Principal Investigator, National Science Foundation

EAGER: Dispersion and Selective Positioning of Reinforcement in Polymer Matrix Composites
Co-Principal Investigator, National Science Foundation

Evolution of Interphase-polyacrylonitrile (*i*-PAN) Structure during Carbon Fiber Processing
Principal Investigator, Defense Advanced Research Projects Agency

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

Studying the Dependency of Interfacial Formation with Carbon Nanotube Length for Stress Transfer in Polymer Composite Fibers
Principal Investigator, Air Force Office of Scientific Research

SİNAN MÜFTÜ

Professor, Mechanical and Industrial Engineering; affiliated faculty, 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

Q. Sheng, A.J. White, S. Müftü
Interfacial Delamination of Thin-film PTFE (Polytetrafluoroethylene) Coatings, The Journal of Adhesion, 2016

H. Yang, J.B.C. Engelen, A. Pantazi, W. Häberle, M.A. Lantz, S. Müftü
Mechanics of Lateral Positioning of a Translating Tape due to Tilted Rollers: Theory and Experiments, International Journal of Solids and Structures, 66, 2015, 88-97

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

Yildirim, H. Fukanuma, T. Ando, A. Gouldstone, S. Müftü
A Numerical Investigation into Cold Spray Bonding Processes, Journal of Tribology, 137(1), 2015, 935-942

H. Yang, J. B. C. Engelen, A. Pantazi, S. Müftü, et al.
Mechanics of Lateral Positioning of a Translating Tape due to Tilted Rollers: Theory and Experiments, International Journal of Solids and Structures, 66, 2015, 88–97

T. Kasikci, S. Müftü
Wrap Pressure between a Flexible Web and a Circumferentially Grooved Cylindrical Guide, Journal of Tribology, Trans ASME, 138(3), 2015

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
Ventilator Optimization from P-V (Pressure-Volume) Curve Analyses of Animal Models for Lung Injury, International Mechanical Engineering Congress & Exposition (IMECE), 2015, 52472

F. Forghan, O. Askari, U. Narusawa, H. Metghalchi
Film Cooling of Turbine Blade Surface with Extended Exit Holes, Proceedings of the ASME 2014 8th International Conference on Energy Sustainability and 12th Fuel Cell Sci. Eng. Tech. Conf., ES-FuelCell, 2014, 1-7

F. Forghan, U. Narusawa, H. Metghalchi
Discharge Coefficient of an Expanded Exit Hole for Film Cooling of Turbine Blades, American Institute of Aeronautics and Astronautics Journal of Propulsion Power, 26, 2010, 1322-1325

H. Liu, P.R. Patil, U. Narusawa
On Darcy-brinkman Equation: Viscous Flow Between Plates Packed with Regular Square Arrays of Cylinders, Entropy, 9, 2007,118-131

R. Amini, K. Creeden, U. Narusawa
A Mechanistic Model for Quasi-static Pulmonary Pressure-Volume Curves for Inflation, Journal of Biomechanical Engineering, 127, 2005, 619-629

H. Liu, U. Narusawa
Flow-induced Endothelial Surface Reorganization and Minimization of Entropy Generation Rate, ASME Journal of Biomechanical Engineering, 126, 2004, 346-350

HAMID NAYEB-HASHEMI

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

PhD, Massachusetts Institute of Technology, 1982
mie.neu.edu/people/nayeb-hashemi-hamid

Scholarship focus: biomechanics and mechanics

Honors and awards: Fellow, American Society of Mechanical Engineers

SELECTED PUBLICATIONS

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

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

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

J. Papadopoulos, H. Nayeb-Hashemi, A. Vaziri, et al.
Buckling of Regular, Chiral and Hierarchical Honeycombs Under a General Macroscopic Stress State, Proceedings of The Royal Society A, 470(2167), 2014, 1-23

S. Banijamali, A. Vaziri, H. Nayeb-Hashemi, et al.
Effects of Different Loading Patterns on the Trabecular Bone Morphology of the Proximal Femur Using Adaptive Bone Remodeling, Journal of Biomechanical Engineering, ASME, 137(1), 2014, 1-10

A. Ajdari, A.Hamouda, H. Nayeb-Hashemi, A. Vaziri, et al.
Impact Resistance and Energy Absorption of Regular and Functionally Graded Hexagonal Honeycombs with Cell Wall Material Strain Hardening, International Journal of Mechanical Sciences, 89, 2014, 413-422

SELECTED RESEARCH PROJECTS

High-performance Biodegradable Composites from Qatari Date Palm Waste
Principal Investigator, National Priorities Research Program

Knee Injury Prevention and Osteoarthritis Risk in Obesity
Co-Principal Investigator, National Priorities Research Program

Novel Multi Functional Composite Sandwich Panel
Principal Investigator, National Priorities Research Program

VINOD SAHNEY

University Distinguished Professor, Mechanical and Industrial Engineering

PhD, University of Wisconsin, Madison, 1970
mie.neu.edu/people/sahney-vinod

Scholarship focus: health care initiatives; industrial engineering; operations research

Honors and awards: Member, Institute of Medicine, National Academy of Science; Member, National Academy of Engineering; Fellow, Health Care Information and Management Systems Society; Fellow, Institute of Industrial Engineers; Gilbreth Award for Lifetime Contribution to Industrial Engineering; Institute for Industrial and Systems Engineering; Atrius Health Care, Boston, MA Board of Directors; Syntel Inc., Board of Directors; SCL Health System, Denver, Board of Directors; Brigham and Women's Hospital, Boston, MA, Patient Safety Research Center, Advisory Board

SELECTED PUBLICATIONS

A. Zeid , S. Kamarthi, V.K. Sahney
Research Issues in Patient Centric Healthcare, International Journal of Collaborative Enterprise, 4(1/2), 2014, 1-135

V.K. Sahney
Managing Implementation: The Unanswered Question, Frontiers of Health Services Management, 20(3), 2004, 29-36

V.K. Sahney
Generating Management Research on Improving Quality, Health Care Management Review, 2(4), 2003, 335-347

J.R. Griffith, V. Sahney, R.A. Mohr
Re-engineering Health Care: Building on CQI, Health Administration Press, Ann Arbor, MI, 1995

SANDRA SHEFELBINE

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

PhD, Stanford University, 2002
mie.neu.edu/people/shefelbine-sandra

Scholarship focus: multi-scale bone biomechanics–how the structure and composition of bone influences its mechanical properties; mechano-adaptation of bone and joint–how tissue responds to mechanical signals

SELECTED PUBLICATIONS

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

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

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

B. Depalle, Z. Qin, S.J. Shefelbine, M.J. Buehler
Influence of Cross-link Structure, Density and Mechanical Properties in the Mesoscale Deformation Mechanisms of Collagen Fibrils, Journal of the Mechanical Behavior of Biomedical Materials, 52, 2015, 1-13

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

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

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

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

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

Keeping Hockey Hips Healthy
Principal Investigator, US Hockey Foundation

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

RIFAT SIPAHI

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

PhD, University of Connecticut, 2005
mie.neu.edu/people/sipahi-rifat

Scholarship focus: control systems and mechatronics; stability analysis and control synthesis of dynamical systems with delays; interplay between stability, delays, and graphs; control-systems-aided human-machine systems; engineering education research; disability research; systems biology

Honors and awards: 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
Consensus Control under Communication Delay: Experiments on a Three-robot System, IEEE Control Systems Technology, 24(2), 2016, 687-694

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
Experimental Evaluation of a Braille-reading-inspired Finger Motion Adaptive Algorithm, PLoS One, 0148356, 2016, 1-23

N. Zhi, A. Gouldstone, B.K. Jaeger, R. Sipahi, S. Frank
Toward Monitoring Parkinson's through Analysis of Static Handwriting Samples: A Quantitative Analytical Framework, available online, IEEE Journal of Biomedical and Health Informatics, 2016

R. Sipahi
Delay-margin Design for the General Class of Single-delay Retarded-type LTI Systems, International Journal of Dynamics and Control, 2(2), 2014, 198-209

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
Experimental/Numerical Investigation on the Effects of Trailing-edge Cooling Hole Blockage on Heat Transfer in a Trailing-edge Cooling Channel, International Journal of Rotating Machinery, 2014, 710450

M.E. Taslim, X. Huang
Experimental/Numerical Investigation on the Effects of Trailing-edge Cooling Hole Blockage on Heat Transfer in a Trailing-edge Cooling Channel, Journal of Gas Turbine Power, 136(5), 2014, 082603

M.E. Taslim, M.K.H. Fong
Experimental and Numerical Cross-over Jet Impingement in a Rib-roughened Airfoil Trailing-edge Cooling Channel, Journal of Turbomachinery, 135(5), 2013, 2-13

K. Elebiary, M.E. Taslim
Experimental/Numerical Cross-over Jet Impingement in an Airfoil Leading-edge Cooling Channel, Journal of Turbomachinery 135(1), 2013, 1-12

M.E. Taslim, A. Nongsaeng
Experimental and Numerical Cross-over Jet Impingement in an Airfoil Trailing-edge Cooling Channel, Journal of Turbomachinery, 133(4), 2011, 1-10

A.A. Adebiyi, M.E. Taslim, K.D. Crawford
The Use of Computational Fluid Dynamic Models for the Optimization of Cell Seeding Processes, Journal of Biomaterials, 32(34), 2011, 8753–8770

SELECTED RESEARCH PROJECTS

Measurements of Heat Transfer and Pressure Drops Research in a Two-legged Test Section with a 180-turn, Rib-roughened with Three Rib Geometries, Simulating Two Mid-chord Cooling Cavities of a GE Turbine Airfoils
Principal Investigator, General Electric Company

Measurements of Heat Transfer Coefficients and Pressure Drops in Seven Test Sections Simulating the Mid-chord and Trailing-edge Cooling Cavities of a GE Turbine Airfoils
Principal Investigator, General Electric Company

MONEESH UPMANYU

Professor, Mechanical and Industrial Engineering

PhD, University of Michigan, 2001
mie.neu.edu/people/upmanyu-moneesh

Scholarship focus: computational techniques that span multiple scales, atomic-to continuum, to quantify the structure property relations in established and emerging material systems, both in technology and nature

SELECTED PUBLICATIONS

P. Waduge, J. Larkin, M. Upmanyu, S. Kar, M. Wanunu
Programmed Synthesis of Freestanding Graphene Nanomembrane Arrays, Small, 11(5), 2015, 597-603

L. X. Lu, M. S. Bharathi, M. Upmanyu, Y. W. Zhang
Growing Ordered and Stable Nanostructures on Polyhedral Nanocrystals, Applies Physics Letters, 105, 2014, 1-6

A. Shahabi, H. Wang, M. Upmanyu
Shaping van der Waals Nanoribbons via Torsional Constraints: Scrolls, Folds and Supercoils, Scientific Reports 4, 2014, 7004

C. Wang, M. Upmanyu
Shear Accommodation in Dirty Grain Boundaries, Europhysics Letters, 106(2), 2014, 1-6

E. T. Nilsen, R, Arora, M. Upmanyu
Thermonastic Leaf Movements in Rhododendron During Freezethaw Events: Patterns, Functional Significances, and Causes, Environmental and Experimental Botany, 106, 2014, 34-43

Z. Ma, D. McDowell, E. Panaitescu, A.V. Davidov, M. Upmanyu, L. Menon
Vapor-Liquid-Solid Growth of Serrated GaN Nanowires: Shape Selection Driven by Kinetic Frustration, Journal of Materials Chemistry C, 1, 2013, 7294-7302

SELECTED RESEARCH PROJECTS

Computational Studies of Nanocrystal Growth
Principal Investigator, National Science Foundation

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

Enhanced Stability and Mechanics of Ultra-fine Grained Metals via Engineered Solute Segregation
Principal Investigator, US Army Research Office

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

ASHKAN VAZIRI

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

PhD, Northeastern University, 2004
mie.neu.edu/people/vaziri-ashkan

Scholarship focus: solid mechanics, materials, computational methods, biomechanics, nanotechnology

Honors and awards: Air Force Office of Scientific Research Young Investigator Award; National Science Foundation CAREER Award; Søren Buus Outstanding Research Award, College of Engineering; College of Engineering Faculty Fellow

SELECTED PUBLICATIONS

J Xiong, R. Ghosh, L. Ma., H. Ebrahimi,A. Vaziri, L. Wu, et al.
Bending Behavior of Lightweight Sandwich-walled Shells with Pyramidal Truss Cores, Composite Structures, 116, 2014, 793-804

B. Haghpanah, H. Nayeb-Hashemi, A. Vaziri, et al.
Buckling of Regular, Chiral, and Hierarchical Honeycombs Under a General Macroscopic Stress State, Proceedings of the Royal Society A, 470(2167), 2014, 20130856

R. Ghosh, H. Ebrahimi, A. Vaziri
Contact Kinematics of Biomimetic Scales, Applied Physics Letters, 2014, 105.23, 233701

R. Ghosh, A. Ajdari, H. Nayeb-Hashemi, A. Vaziri, et al.
Impact Resistance and Energy Absorption of Regular and Functionally Graded Hexagonal Honeycombs with Cell Wall Material Strain Hardening, International Journal of Mechanical Sciences, 89, 2014, 413-422

R. Oftadeh, B. Haghpanah, D. Vella, A. Boudaoud, A. Vaziri
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H. Abdi, H. Nayeb-Hashemi, A. M. S. Hamouda, A. Vaziri
Torsional Dynamic Response of a Shaft with Longitudinal and Circumferential Cracks, Journal of Vibration and Acoustics, 136, 2014, 61011-61018

R. Ghosh, A. Kumar, A. Vaziri
Type-IV Pilus Deformation Can Explain Retraction Behavior, PLOS ONE, 2014, 9, 114613

SELECTED RESEARCH PROJECTS

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

Mechanics of Carbon Nanotube Surface Decontamination
Principal Investigator, FM Global

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

KAI-TAK WAN

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

PhD, University of Maryland at College Park, 1993
mie.neu.edu/people/wan-kai-tak

Scholarship focus: cellular biomechanics; water filtration; thin film adhesion and characterization; subsurface mechano-sensing; shell adhesion; fundamental intersurface forces

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

SELECTED PUBLICATIONS

M. Robitaille, N. Belisle, S. Dang, E. Faigle, C. Morck, P. Uth, K.-T. Wan
An Optical Topographic Technique to Map the 3-D Deformed Profile of a Convex Lens under External Loading, Experimental Mechanics, 55, 2015, 641-646

L. Sallaway, S. Magee, J. Shi, F. Quivira, K. Tgavalekos, D.H. Brooks, S. Muftu, W. Meleis, R.H. Moore, D. Kopans, K.-T. Wan
Detecting Solid Masses in Phantom Breast Using Mechanical Indentation, Experimental Mechanics, 54, 2014, 935-942

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

G. Li, K.-T. Wan
Adhesion Map for Thin Membranes, Journal of Applied Mechanics 81(12), 2013, 021018

G. Li, C. Yilmaz, X. An, S. Somu, S. Kar, Y. Jung, A. Busnaina, K.-T. Wan
Adhesion of Graphene Sheet on Nano-patterned Substrates with Nano-pillar Array, Journal of Applied Physics, 113, 2013, 244303

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

SELECTED RESEARCH PROJECTS

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

Mechano-lipidomics and Mechano-cytosis of Drug Delivery Liposomes
Principal Investigator, National Science Foundation

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

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

N.O. Perez-Arancibia, J.P. Whitney, R.J. Wood,
Lift Force Control of Flapping-wing Microrobots Using Adaptive Feedforward Cancellation Schemes, IEEE Transactions of Mechatronics, 18, 2013, 1-14

P.S. Sreetharan, H. Tanaka, J.P. Whitney, et al.
Progress on "Pico" Air Vehicles, International Journal of Robotics Research, 31(11), 2012, 1292-1302

J.P. Whitney, R.J. Wood
Conceptual Design of Flapping-wing Micro Air Vehicles, Bioinspiration and Biomimetics, 7, 2012, 1-10

P.S. Sreetharan, J.P. Whitney, M.D. Strauss, R.J. Wood
Monolithic Fabrication of Millimeter-scale Machines, Journal of Micromechics and Microengineering, 22(5), 2012, 055027 *cover article

H. Tanaka, J.P. Whitney, R.J. Wood
Effect of Flexural and Torsional Wing Flexibility on Lift Generation in Hoverfly Flight, Integrative and Comparative Biology51(1), 2011, 142-150

J.P. Whitney, P.S. Sreetharan, K. Ma, R.J. Wood
Pop-up Book MEMS, Journal of Micromechics and Microengineering, 21(11), 2011, 1-7 *cover article

J.P. Whitney, R.J. Wood
Aeromechanics of Passive Rotation in Flapping Flight, Journal of Fluid Mechanics, 660, 2010, 197-220

IBRAHIM ZEID

Professor, Mechanical and Industrial Engineering

PhD, University of Akron, 1981
mie.neu.edu/people/zeid-ibrahim

Scholarship focus: mechanics; personalized medicine; simulation techniques and complex networks analysis

Honors and awards: Fellow, American Society of Mechanical Engineers

SELECTED PUBLICATIONS

S. Onel, A. Zeid, S. Kamarthi
Agent-based simulation and Analysis of a Complex Adaptive Supply Network, International Journal of Collaborative Enterprise, 4(3), 2014, 188

I. Zeid, J. Chin, C. Duggan, S. Kamarthi
Engineering Based Learning: A Paradigm Shift for High School STEM Teaching, International Journal of Engineering Education, 30(4), 2014, 1-12

A. Zeid, S. Kamarthi, V. Sahney
Forward: Research Issues in Patient Centric Healthcare Delivery, International Journal of Collaborative Enterprise, 4(1-2), 2014, 1-2

G.M. Uddin, K.S. Ziemer, I. Zeid, S. Kamarthi
Monte Carlo Study of the Molecular Beam Epitaxy Process for Manufacturing Magnesium Oxide Nano Scale Films, IIE Transactions, 47, 2014, 1-16

S. Vadde, A. Zeid, S. Kamarthi
Optimal Pricing and Disposal Decisions for Product Recovery Facilities Under a Single Portfolio, International Journal of Collaborative Enterprise, 4(3), 2014

E. Tuncel, I. Zeid, S. Kamarthi
Solving Large Scale Disassembly Line Balancing Problems with Uncertainty Using Reinforcement Learning, International Journal of Intelligent Manufacturing, 25, 2014, 647-659

SELECTED RESEARCH PROJECTS

ITEL: Investing in Tomorrow's Engineering Leaders
Principal Investigator, National Science Foundation

TRANSFORMing Liberal Arts Careers to Meet Demand for Advanced mfg Workforce
Principal Investigator, National Science Foundation

HONGLI (JULIE) ZHU

Assistant Professor, Mechanical and Industrial Engineering

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

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

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

SELECTED PUBLICATIONS

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

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

H. Zhu, S. Zhu, Z. Jia, S. Parvinian, Y. Li, T. Li, L. Hu
Anomalous Scaling Law of Strength and Toughness of Cellulose Nanopaper, Proceeding of the National Academy of Sciences (PNAS), 112(29), 2015, 8971-8976

C. Sun, H. Zhu, M. Okada, K. Gaskell, Y. Inoue, L. Hu, Y. Wang
Interfacial Oxygen Stabilizes Composite Silicon Anodes, Nano Letters, 15(1), 2015, 703-708

Y. Li, H. Zhu, F. Shen, J. Wan, Z. Liu, S. Lacey, Z. Fang, H. Dai, L. Hu
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J. Zhong, H. Zhu, Q. Zhong, J. Dai, W. Li, L. Hu, J. Zhou
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W. Bao, Z. Fang, J. Wan, J. Dai, H. Zhu, X. Yang, C. Preston, L. Hu
Aqueous Gating of Van der Waals Materials on Bilayer Nanopaper, ACS Nano, 2014, 10606-10612

Z. Fang, H. Zhu, W. Bao, C. Preston, Z. Liu, J. Dai, Y. Li, L. Hu
Highly Transparent Paper with Tunable Haze for Green Electronics, Energy and Environmental Science, 7, 2014, 3313-3319

Y. Li, H. Zhu, F. Shen, J. Wan, X. Han, J. Dai, H. Dai, L. Hu
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Y. Li, H. Zhu, S. Zhu, J. Wan, Z. Liu, O. Vaaland, S. Lacey, Z. Fang, H. Dai, T. Li, L. Hu
Hybridizing Wood Cellulose and Graphene Oxide Toward High-performance Fibers, Nature-NPG Asia Materials, 7, 2014, e150

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**

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 is 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**

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**

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**

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**

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**

Fatemeh 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**

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 motived 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 carryout 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**

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