DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

Dear Friends,

This third annual scholarship report reflects the exceptional academic and professional accomplishments of the civil and environmental engineering faculty and PhD candidates for the 2015-2016 year. Our department has more than doubled in size of the faculty over the last five years, with 39 faculty in civil and environmental engineering, and has more than doubled in size of the graduate program over the last five years, with over 230 graduate students. The college looks forward to new infrastructure during this academic year, including adding a 220,000 square foot interdisciplinary science and engineering complex that will provide state-of-the art laboratories.

This year the department launches two new graduate degrees, including an MS in Environmental Engineering (MSEE) and an MS in Engineering and Public Policy (MSEPP) with two concentrations, including Energy and Environment, and Infrastructure Resilience. These degrees focus on topics of significant national need, with the MSEE integrating environmental engineering and science with public health, water sustainability, and water-energy-nexus, and the MSEPP degree providing students with the core skills needed to address engineering solutions while recognizing the impact of public policy and societal constraints on these solutions.

The department continues to expand its research presence across all fields, and is currently leading the PROTECT Center, funded by the National Institute of Environmental Health Sciences (NIEHS) of the National Institutes of Health, and the CRECE Center, funded by NIEHS and the Environmental Protection Agency, to study the relationship between environmental contamination and preterm birth.

Our scholars strive to use today's discovery and research to make tomorrow happen. You can see some highlights of our civil and environmental engineering faculty members at northeastern.edu/tomorrow. We hope you enjoy this report, and we look forward to sharing our future accomplishments in our annual scholarship reports.

Sincerely,

Jerome F. Hajjar, Ph.D., P.E.
CDM Smith Professor
Chair of Civil and Environmental Engineering
jf.hajjar@northeastern.edu

QUICK FACTS

2
FEDERALLY FUNDED RESEARCH CENTERS

8
NATIONAL SCIENCE FOUNDATION CAREER Awards

39
TENURED/ TENURE-TRACK Plus Affiliated Faculty

DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

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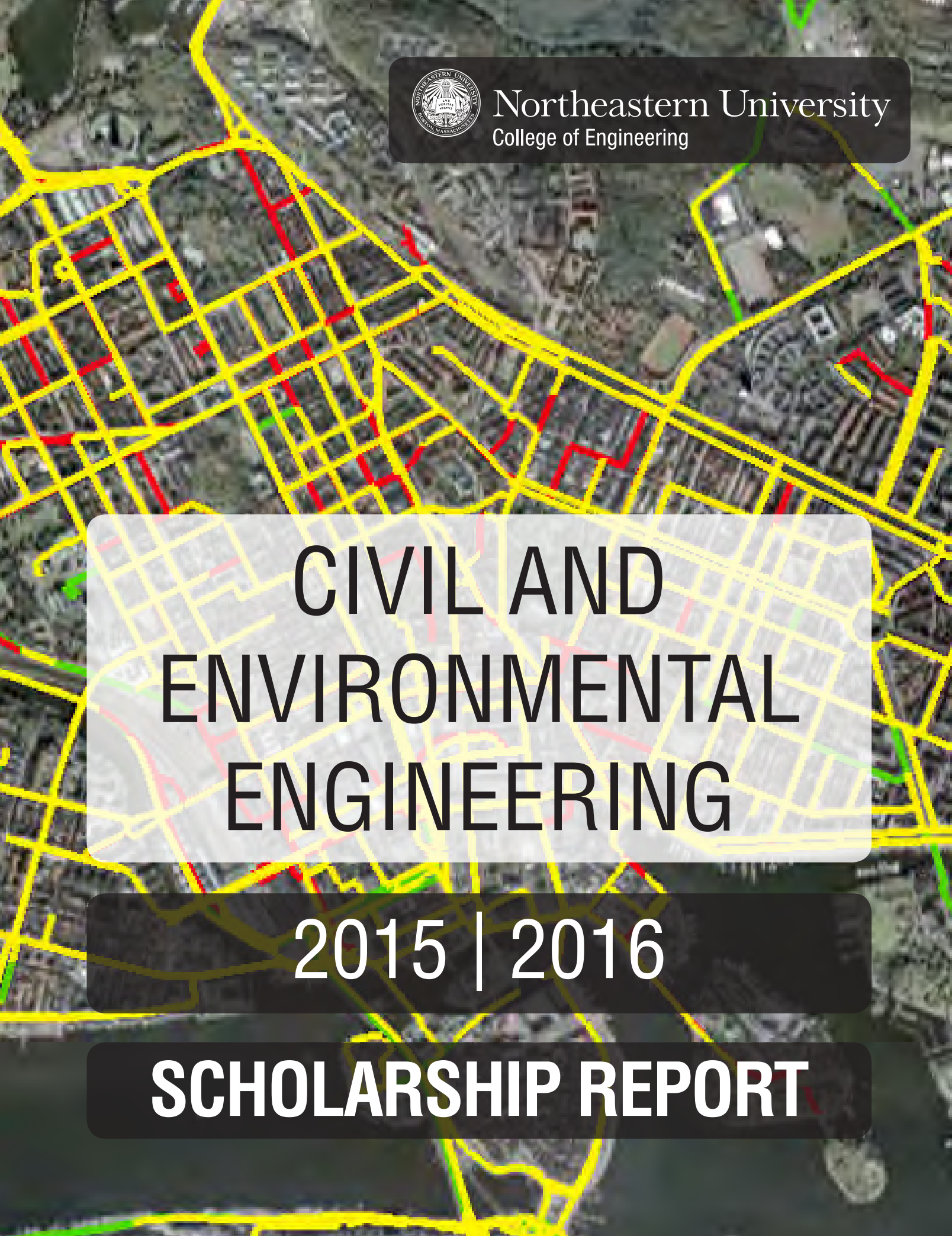
COVER IMAGE

Northeastern Civil Engineering Professor Haris Koutsopoulos uses big data to advance the state of the art in transportation network analysis. The image shown was developed using informatics gathered from GPS observations to evaluate average speed and highlight congestion of transportation links in an urban network.



Northeastern University
College of Engineering

CIVIL AND ENVIRONMENTAL ENGINEERING

2015 | 2016

SCHOLARSHIP REPORT

QUICK FACTS — Civil and Environmental Engineering

2
FEDERALLY FUNDED RESEARCH CENTERS

PROTECT, The Puerto Rico Testsite for Exploring Contamination Threats, funded by NIH

CRECE, The Center for Research on Early Childhood Exposure and Development, funded by EPA and NIEHS

8
NATIONAL SCIENCE FOUNDATION CAREER Awards

2016 WINNER:

Andrew Myers for "Advancing Multi-hazard Assessment and Risk-based Design for Offshore Wind Energy Technology"

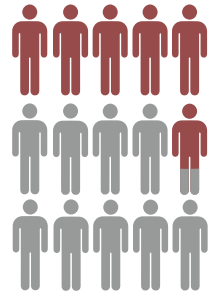
39
TENURED/ TENURE-TRACK
Plus Affiliated Faculty

RECENT HIRES:

Ameet Pinto PhD, Virginia Tech
Amy Mueller PhD, MIT
Qi Ryan Wang PhD, Virginia Tech

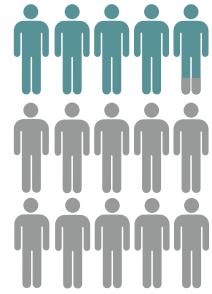
166
masters students

32% female



65
doctoral students

38% female



QUICK FACTS — College of Engineering

12 MULTI-INSTITUTIONAL RESEARCH CENTERS funded by six federal agencies

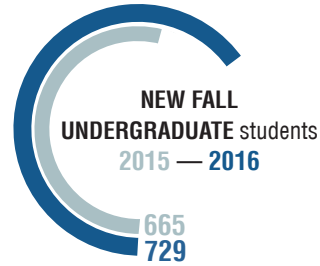
DOE, DHS, NIH, NSA, NIST, NSF

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

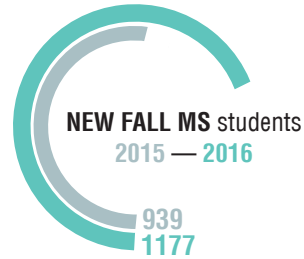
64
YOUNG INVESTIGATOR Awards

169
TENURED/ TENURE-TRACK Faculty

36
NSF CAREER Awards



3550
UNDERGRADUATE students



3210
GRADUATE students

HONORS ACHIEVEMENTS

FACULTY HONORS AND AWARDS

CDM Smith Professor and Chair of civil and environmental engineering **Jerome Hajjar** along with electrical and computer engineering Professors Mario Sznaier, Octavia Camps, Ali Abur, and Edmund Yeh, mehcanical and industrial engineering Professor Jackie Griffin, 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 CRISP grant for the "Identification and Control of Uncertain, Highly Interdependent Processes Involving Humans with Applications to Resilient Emergency Health Response."

Professor **Akram Alshawabkeh**, George A. Snell and his team were awarded a **$2.9M** grant for the Center for Research on Early Childhood Exposure and Development in Puerto Rico (CRECE).

Professor **Haris Koutsopoulos** was awarded the Traffic Simulation Lifetime Achievement Award by the Transportation Research Board. He has been a pioneer and a leader in the field of traffic simulation modeling for over 20 years.

CDM Smith Professor and Civil and Environmental Engineering Department Chair **Jerome Hajjar** is a co-recipient of the 2016 ASCE Moisseiff Award from the American Society of Civil Engineers for his paper on "Quasi-static Cyclic Behavior of Controlled Rocking Steel Frames."

College of Engineering Distinguished Professor **Ming Wang** was awarded a patent for his design of a "Saliva Glucose Monitoring System."

Associate Professor **Edward Beighley** received a $651K NASA grant for "Integrating Lateral Contributions and Longitudinal Controls Along River Reaches to Improve SWOT Discharge Estimates."

College of Engineering Distinguished Professor **Ming Wang**, Professor and Associate Dean of Graduate Education **Sara Wadia-Fascetti**, and COE Distinguished Professor for electrical and computer engineering Carey Rappaport were awarded a patent for "Roaming Mobile Sensor Platform for Collecting Geo-referenced Data and Creating Thematic Maps."

Assistant Professor **Andrew Myers** received a $500K NSF CAREER award for his project entitled "Advancing Multi-hazard Assessment and Risk-based Design for Offshore Wind Energy Technology."

Associate Professor **Ferdi Hellweger** was featured in the Charles River Conservatory's third volume of River Stories, which highlights local writers and artists. "My Computerized Charles River," explores Hellweger's experience and research in cleaning up the Charles River.

Assistant Professors **David Fannon**, **Matthew Eckelman**, and Architecture Assistant Professor Michelle Laboy's project "Building Resilience: A Tool for Planning and Decision-making" was selected to be a part of the 2015 AIA Upjohn Research Initiative.

Professor **Dionisio Bernal** received a National Science Foundation grant for "Monitoring the Health of Structural Systems from the Geometry of Sensor Traces."

Professor **Mishac Yegian** and George A. Snell Professor of Engineering Professor **Akram Alshawabkeh** were awarded a $342K NSF grant for "Field Application of Induced Partial Saturation (IPS) for Liquefaction Mitigation."

Assistant Professor **Matthew Eckelman** is a part of a $10M, 5-year EPA center which is co-hosted by Yale and John Hopkins. The "SEARCH: Solutions to Energy, AiR, Climate, and Health" Center is one of three in the country and includes Yale, Johns Hopkins, Stanford, Michigan, University of Chicago, Pacific Northwest National Laboratory, North Carolina State University, the Center for Disease Control, and Northeastern University.

Associate Professor **Auroop Ganguly's** article, "Changes in Observed Climate Extremes in Global Urban Areas," was Selected by Environmental Research Letters (ERL) as a feature in their Highlights of 2015 collection.

Associate Teaching Professor **Daniel Dulaski** helped present a transportation improvement plan to the town of Mansfield that received a $2.37M MassWorks grant. The project was conceived through the Civil and Environmental Engineering NU Transportation Capstone program.

Associate Professor **Luca Caracoglia** was awarded a National Science Foundation award for "Active Control of Nonlinear Flow-induced Instability of Wind Turbine Blades under Stochastic Perturbations."

STUDENTS

PhD student **Robert Phillips** won first place in the student poster competition at the 2016 International Symposium on Sustainable Systems and Technology meeting.

PhD student **Dongmei Feng**, studying under Ed Beighley, was selected as a Student Research Fellow for the 2016 National Water Center Summer Institute.

Kelly O'Connell E'16, won the 2015-2016 Co-op Student of the Year award from the Cooperative and Experiential Education Division of ASEE.

PhD student **Wenjun Zhang** received this year's Outstanding Graduate Student Award in the category of Research: Life Science, Physical Sciences, and Engineering.

Julieta Moradei E'16, won the Thornton Tomasetti Foundation National Scholarship, 2016 Sears B. Condit Award, and was awarded the 2016 Civil and Environmental Engineering Chair Award.

FACULTY BY RESEARCH THRUSTS

CIVIL INFRASTRUCTURE SECURITY

George Adams
Joseph Ayers
Dionisio Bernal
Luca Caracoglia
Steven Cranford
Daniel Dulaski
Stephen Flynn
Peter Furth
Auroop Ganguly
Jerome Hajjar
Michael Kane
Haris Koutsopoulos
Sinan Müftü
Andrew Myers
Mark Patterson
Mehrdad Sasani
Thomas Sheahan
Craig Shillaber
Michael Silevitch
Ali Touran
Sara Wadia-Fascetti
Ming Wang
Qi Ryan Wang
Mishac Yegian

ENVIRONMENTAL HEALTH

Akram Alshawabkeh
Edward Beighley
Matthew Eckelman
Loretta Fernandez
Auroop Ganguly
Tarik Gouhier
Jonathan Grabowski
April Gu
Ferdi Hellweger
Brian Helmuth
A. Randall Hughes
Philip Larese-Casanova
Amy Mueller
Annalisa Onnis-Hayden
Mark Patterson
Ameet Pinto
Matthias Ruth
Thomas Sheahan
Geoffrey Trussell
Kai-Tak Wan

SUSTAINABLE RESOURCE ENGINEERING

Luca Caracoglia
Daniel Dulaski
Matthew Eckelman
David Fannon
Peter Furth
Auroop Ganguly
Tarik Gouhier
Jonathan Grabowski
Jerome Hajjar
Brian Helmuth
A. Randall Hughes
Michael Kane
Haris Koutsopoulos
Mark Patterson
Matthias Ruth
Craig Shillaber
Ali Touran
Geoffrey Trussell
Ming Wang
Qi Ryan Wang

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

AKRAM ALSHAWABKEH

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

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

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

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

SELECTED PUBLICATIONS

L. Rajic, R. Nazari, N. Fallahpour, A.N. Alshawabkeh
Electrochemical Degradation of Trichloroethylene in Aqueous Solution by Bipolar Graphite Electrodes, Journal of Environmental Chemical Engineering, 4(1), 2016, 197-202

N. Fallahpour, S. Yuan, L. Rajic, A.N. Alshawabkeh
Hydrodechlorination of TCE in a Circulated Electrolytic Column at High Flow Rate, Chemosphere, 144, 2016, 59-64

N. Yang, J. Cui, L. Zhang, W. Xiao, A.N. Alshawabkeh, X. Mao
Iron Electrolysis-assisted Peroxymonosulfate Chemical Oxidation for the Remediation of Chlorophenol-contaminated Groundwater, Journal of Chemical Technology and Biotechnology, 91(4), 2016, 938-947

X. Yu, R. Ghasemizadeh, I.Y. Padilla, D. Kaeli, A.N. Alshawabkeh
Patterns of Temporal Scaling of Groundwater Level Fluctuation, Journal of Hydrology, 536, 2016, 485-495

A.M. Aker, D..J Watkins, L.E. Johns, K.K. Ferguson, O.P. Soldin, L.V. Anzalota Del Toro, A.N. Alshawabkeh, J.F. Cordero, J.D. Meeke
Phenols and Parabens in Relation to Reproductive and Thyroid Hormones in Pregnant Women, Environmental Research, 151, 2016, 30-37

SELECTED RESEARCH PROJECTS

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

The Center for Research on Early Childhood Exposure and Development in Puerto Rico (CRECE) studies how mixtures of environmental exposures and other factors affect the health and development of infants and children living in Puerto Rico
Director and Principal Investigator, National Institutes of Health/ Environmental Protection Agency

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

JOSEPH AYERS

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

PhD, University of California, Santa Cruz, 1975
bioe.neu.edu/people/ayers-joseph

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

SELECTED PUBLICATIONS

L.L. McGrath, S.V. Vollmer, S.T. Kaluziak, J. Ayers
De Novo Transcriptome Assembly for the Lobster Homarus Americanus and Characterization of Differential Gene Expression Across Nervous System Tissues, BMC Genomics, 17, 2016, 3-12

J. Ayers
Underwater Vehicles Based on Biological Intelligence, ASME Journal of Dynamic Systems, Measurement and Control, 138, 2016, 1-5

L. Zhu, A.I. Selverston, J. Ayers
The Role of Ih in Differentiating the Dynamics of the Gastric Mill and Pyloric Neurons in the Stomatogastric Ganglion of the Lobster, Homarus americanus, Journal of Neurophysiology, 115(5), 2016, 2434-45

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

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

J. Ayers, D. Blustein, A. Westphal
A Conserved Biomimetic Control Architecture for Walking, Swimming and Flying Robots, Lecture Notes in Artificial Intelligence, 2012, 1-12

SELECTED RESEARCH PROJECTS

Biomimetics of Jellyfish Tentacles
Principal Investigator, Schlumberger Doll, Inc

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

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

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

R. EDWARD BEIGHLEY

Associate Professor, Civil and Environmental Engineering

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

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

SELECTED PUBLICATIONS

R. Ray, R.E. Beighley, Y. Yoon
Integrating Runoff Generation and Flow Routing in Susquehanna River Basin to Characterize Key Hydrologic Processes Contributing to Maximum Annual Flood Events, ASCE Journal of Hydrologic Engineering, 2016

D. Alsdorf, R.E. Beighley, A. Laraque, H. Lee, R. Tshimanga, F. O'Loughlin, G. Mahe, B. Dinga, G. Moukandi, R. Spencer
Opportunities for Hydrologic Research in the Congo Basin, Reviews of Geophysics, 2016

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

Y. Yoon, R.E. Beighley, H. Lee, T. Pavelsky, G. Allen
Estimating Flood Discharges in Reservoir-regulated River Basins by Integrating Synthetic SWOT Satellite Observations and Hydrologic Modelling, ASCE Journal of Hydrologic Engineering, 21(4), 2015

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

F. Hossain, J. Arnold, R.E. Beighley, C. Brown, S. Burian, J. Chen, A. Mitra, D. Niyogi, R.A. Pielke, V. Tidwell, D. Wegner
What Do Experienced Water Managers Think of Water Resources of Our Nation and Its Management Infrastructure?, PLoS ONE, 10(11), 2015

SELECTED RESEARCH PROJECTS

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

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

DIONISIO BERNAL

Professor, Civil and Environmental Engineering

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

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

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

SELECTED PUBLICATIONS

D. Bernal
Non-recursive Sequential Input Deconvolution, Mechanical Systems and Signal Processing, 2016

D. Bernal, A. Kunwar
Steady State Shift Damage Localization, Meccanica, 2016, 1-11

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

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

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

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

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

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

SELECTED RESEARCH PROJECTS

Monitoring the Health of Structural Systems from the Geometry of Sensor Traces
Principal Investigator, National Science Foundation

Algorithm-fused High Performance Damage Detector: Optimal Sensor Distributions
Principal Investigator, National Science Foundation

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

LUCA CARACOGLIA

Associate Professor, Civil and Environmental Engineering

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

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

Honors and awards: National Science Foundation Early CAREER Development Award

SELECTED PUBLICATIONS

L. Caracoglia
Comparison of Reduced-order Models to Analyze the Dynamics of a Tall Building under the Effects of Along-wind Loading Variability, ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Part A: Civil Engineering, 2(2), 2016

L. Caracoglia, G.-F. Giaccu, B. Barbiellini
Estimating the Standard Deviation of Eigenvalue Distributions for the Nonlinear Free-vibration Stochastic Dynamics of Cable Networks, Meccanica—An International Journal of Theoretical and Applied Mechanics AIMETA, 2016

W. Cui, L. Caracoglia
Exploring Hurricane Wind Speed along US Atlantic Coast in Warming Climate and Effects on Predictions of Structural Damage and Intervention Costs, Engineering Structures, 122, 2016, 209-225

T.-H. Le, L. Caracoglia
Modeling Vortex-shedding Effects for the Stochastic Response of Tall Buildings under Non-synoptic Winds, Journal of Fluids and Structures, 61, 2016, 461-491

W. Cui, L. Caracoglia
Physics-based Method for the Removal of Spurious Resonant Frequencies in High-frequency Force Balance Tests, ASCE Journal of Structural Engineering, 142(2), 2016

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

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

SELECTED RESEARCH PROJECTS

Collaborative Research: Active Control of Nonlinear Flow-Induced Instability of Wind Turbine Blades under Stochastic Perturbations
Principal Investigator, National Science Foundation

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

STEVEN CRANFORD

Assistant Professor, Civil and Environmental Engineering

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

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

Honors and awards: Civil and Environmental Engineering Excellence in Teaching Award

SELECTED PUBLICATIONS

S. Cranford
When is 6 Less Than 5? Penta- to Hexa-graphene Transition, Carbon, 96, 2016, 421-428

R.E. Roman, K. Kwan, S. Cranford
Mechanical Properties and Defect Sensitivity of Diamond Nanothreads, Nano Letters, 15(3), 2015, 1585-1590

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

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

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

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

SELECTED RESEARCH PROJECTS

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

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

MATTHEW ECKELMAN

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

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

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

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

SELECTED PUBLICATIONS

S.M. Rahman, M.J. Eckelman, A. Onnis-Hayden, A.Z. Gu
Life-cycle Assessment of Advanced Nutrient Removal Technologies for Wastewater Treatment, Environmental Science and Technology, 50(6), 2016, 3020-3030

M. Montazeri, M.J. Eckelman
Life-Cycle Assessment of Catechols from Lignin Depolymerization, ACS Sustainable Chemistry and Engineering, 4(3), 2016, 708-718

M.J. Eckelman
Life-Cycle Inherent Toxicity: A Novel LCA-based Algorithm for Evaluating Chemical Synthesis Pathways, Green Chemistry, 18(11), 2016, 3257-3264

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

M. Montazeri, L. Soh, P. Pérez-López, J.B. Zimmerman, M.J. Eckelman
Time-dependent Life Cycle Assessment of Microalgal Biorefinery co-products, Biofuels, Bioproducts, and Biorefining, 2016

L. Pourzahedi, M.J. Eckelman
Comparative Life Cycle Assessment of Silver Nanoparticle Synthesis Routes, Environmental Science: Nano, 2(4), 2015, 361-369

SELECTED RESEARCH PROJECTS

Air Climate and Energy Center—SEARCH: Solutions for Energy AiR Climate and Health
Senior Personnel, Environmental Protection Agency

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

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

RSB: A Decision and Design Framework for Multi-hazard Resilient and Sustainable Buildings
Co-Principal Investigator, National Science Foundation

DAVID FANNON

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

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

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

SELECTED PUBLICATIONS

H. Zhang, E. Arens, M. Taub, D. Dickerhoff, F. Bauman, M. Fountain, W. Pasut, D. Fannon, Y. Zhai, M. Pigman
Using Footwarmers in Offices for Thermal Comfort and Energy Savings, Energy and Buildings, 104, 2015, 233-243

SELECTED RESEARCH PROJECTS

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

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

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

LORETTA FERNANDEZ

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

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

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

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

SELECTED PUBLICATIONS

B.D. Drollette, K. Hoelzer , N.R. Warner, T.H. Darrah, O. Karatum, M.P. O'Connor, R.K. Nelson, L.A. Fernandez, C.M. Reddy, A. Vengosh, R.B. Jackson, M. Elsner, D.L. Plata
Elevated Levels of Diesel Range Organic Compounds in Groundwater Near Marcellus Gas Operations are Derived from Surface Activities, Proceedings of the National Academies of Science, 112(43), 2015, 13184-13189

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

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

SELECTED RESEARCH PROJECTS

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

STEPHEN FLYNN

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

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

Scholarship focus: critical infrastructure resilience; public policy

SELECTED PUBLICATIONS

S. Flynn
The Role of Community Resilience in Advancing Security, State, Society, and National Security: Challenges and Opportunities in the 21st Century, Jayakumar, S. (Ed.) Singapore: World Scientific Publishing, 2016

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

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

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

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

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

SELECTED RESEARCH PROJECTS

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

Center for Resilience Studies Network: Learning from Major Disasters that Disrupt Lifeline-infrastructure
Principal Investigator, Department of Homeland Security

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

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

PETER FURTH

Professor, Civil and Environmental Engineering

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

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

SELECTED PUBLICATIONS

M.B. Lowry, P. Furth, T. Hadden-Loh
Prioritizing New Bicycle Facilities to Improve Low-stress Network Connectivity, Transportation Research, 86, 2016, 124-140

B. Cesme, P. Furth
Self-organizing Traffic Signals using Secondary Extension and Dynamic Coordination, Transportation Research Part C, 48, 2014, 1-15

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

P. Furth, T.H. Muller
Conditional Bus Priority at Signalized Intersections: Better Service with Less Traffic Disruption, Journal of the Transportation Research Board, 1731, 2000, 23-30

SELECTED RESEARCH PROJECTS

Self-organizing Traffic Signals
Principal Investigator, National Science Foundation

Bicycle Network Analysis
Principal Investigator, Delaware Department of Transportation

AUROOP GANGULY

Associate Professor, Civil and Environmental Engineering

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

Scholarship focus: climate extremes and water sustainability; critical infrastructures security and resilience; applied data sciences for complex systems

Honors and awards: College of Engineering Faculty Fellow

SELECTED PUBLICATIONS

U. Bhatia, D. Kumar, E. Kodra, A.R. Ganguly
Network Science Based Quantification of Resilience Demonstrated on the Indian Railways Network, PLoS One, 10(11), 2015

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

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

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

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

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

SELECTED RESEARCH PROJECTS

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

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

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

TARIK GOUHIER

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

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

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

SELECTED PUBLICATIONS

B. Spiecker, T.C. Gouhier, F. Guichard
Reciprocal Feedbacks Between Spatial Subsidies and Reserve Networks in Coral Reef Meta-ecosystems, Ecological Applications, 26(1), 2016, 264-278

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

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

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

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

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

SELECTED RESEARCH PROJECTS

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

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

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

JONATHAN GRABOWSKI

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

PhD, University of North Carolina at Chapel Hill, 2012
civ.neu.edu/people/grabowski-jonathan

Scholarship focus: environmental science and policy, fisheries, ecological economics

SELECTED PUBLICATIONS

P.S.E. Zu Ermgassen, J.H. Grabowski, J.R. Gair, S.P. Powers
Quantifying Fish and Mobile Invertebrate Production from a Threatened Nursery Habitat, Journal of Applied Ecology, 53, 2016, 596-606

L.F. Dodd, J.H. Grabowski, M.F. Piehler, I. Westfield, J.B. Ries
Ocean Acidification Impairs Crab Foraging Behavior, Proceedings of the Royal Society B, 282, 2015

D.L. Kimbro, J.E. Byers, J.H. Grabowski, A.R. Hughes, M.F. Piehler
The Biogeography of Trophic Cascades on U.S. Oyster Reefs, Ecology Letters, 17, 2014, 845-854

A.B. Rodriguez, F.J. Fodrie, J.T. Ridge, N. Lindquist, E.J. Theuerkauf, S.E. Coleman, J.H. Grabowski, et al.
Will Oyster Reefs Keep their Heads Above Water?, Nature Climate Change, 2014, 493-497

M.D. McMahan, D.C. Brady, D. Cowan, J.H. Grabowski, G.D. Sherwood
Using Fine-scale Acoustic Telemetry to Observe the Effects of a Groundfish Predator (Atlantic cod, Gadus morhua) on the Movement Behavior of the American Lobster (Homarus americanus), Canadian Journal of Fisheries and Aquatic Sciences 70(11), 2013, 1625-1634

J.H. Grabowski, R.D. Brumbaugh, R. Conrad, A.G. Keeler, et al.
Economic Valuation of Ecosystem Services Provided by Oyster Reefs, BioScience, 632, 2012, 900-909

P.S.E. Zu Ermgassen, M.D. Spalding, B. Blake, L.D. Coen, B. Dumbauld, S. Geiger, J.H. Grabowski, et al.
Historical Ecology with Real Numbers: Past and Present Extent and Biomass of an Imperiled Estuarine Habitat, Proceedings of the Royal Society B, 279, 2012, 3393-3400

SELECTED RESEARCH PROJECTS

Aligning Coastal Restoration with Ecological and Societal Needs
Principal Investigator, National Center for Ecological Analysis and Synthesis

Assessing Social Impacts in Groundfish Fishing Communities
Principal Investigator, National Oceanic and Atmospheric Administration

Social and Ecological Factors Influencing Shoreline Hardening in the Northeast: Implications for Vulnerability, Resilience and Informed Decision Making
Principal Investigator, Northeast Sea Grant College Consortium

APRIL GU

Associate Professor, Civil and Environmental Engineering, Director of Graduate Studies; affiliated faculty, Bioengineering

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

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

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

SELECTED PUBLICATIONS

J. Lan, N. Gou, S. Rahman, C. Gao, M. He, A. Gu
A Quantitative Toxicogenomics Assay for High-throughput and Mechanistic Genotoxicity Assessment and Screening of Environmental Pollutants, Environmental Science and Technology, 50(6), 2016, 3202–3214

S. Rahman, M. Eckelman, A. Onnis-Hayden, A. Gu
Life Cycle Assessment of Advanced Nutrient Removal Technologies for Wastewater Treatment, Environmental Science and Technology, 50(6), 2016, 3020-3030

D. Li, S. Zeng, M. He, A. Gu
Water Disinfection Byproducts Select for Antibiotic Resistance-Role of Environmental Pollutants in Resistance Phenomena, Environmental Science and Technology, 50(6), 2016, 3193-3201

Y. Li, X. Wang, A. Onnis-Hayden, K.-T. Wan, A. Gu
Universal Quantifier Derived from AFM Analysis Links Cellular Mechanical Properties and Cell-surface Integration Forces with Microbial Deposition and Transport Behavior, Environmental Science and Technology, 48(3), 2014, 1769-1778

N. Yildirim, F. Long, C. Gao, M. He, H.C. Shi, A. Gu
Aptamer-based Optical Biosensor for Rapid and Sensitive Detection of 17 ß-Estradiol in Water Samples, Environmental Science and Technology, 46(6), 2012, 3288-3294

SELECTED RESEARCH PROJECTS

CRECE-Center for Research on Early Childhood Exposure and Development in Puerto Rico
Project Principal Investigator, National Institute of Environmental Health Sciences

Exploring Analysis of Environment and Health Through Multiple Alternative Clustering
Co-Principal Investigator, National Science Foundation

PROTECT-The Puerto Rico Testsite for Exploring Contamination Threats Program
Co-Principal Investigator, National Institute of Environmental Health Sciences

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

JEROME HAJJAR

CDM Smith Professor and Chair, Civil and Environmental Engineering

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

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

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

SELECTED PUBLICATIONS

J.S. Steelman, L.A. Fahnestock, J.F. Hajjar, J.M. LaFave
Performance of Non-seismic PTFE Sliding Bearings when Subjected to Seismic Demands, Journal of Bridge Engineering, ASCE, 21(1), 2016

M.D. Denavit, J.F. Hajjar, T. Perea, R.T. Leon
Seismic Performance Factors for Moment Frames with Steel-concrete Composite Columns and Steel Beams, Earthquake Engineering and Structural Dynamics, Special Issue on Earthquake-induced Collapse of Structural Systems, 45(10), 2016, 1685-1703

M.R. Denavit, J.F. Hajjar, T. Perea, R.T. Leon
Stability Analysis and Design of Composite Structures, Journal of Structural Engineering, ASCE, 142(3), 2016

V. Valamanesh, A.T. Myers, S.R. Arwade, J.F. Hajjar, E.M. Hines, W. Pang
Wind-wave Prediction Equations for Probabilistic Offshore Hurricane Hazard Analysis, Natural Hazards, 2016, 1-22

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

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

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

SELECTED RESEARCH PROJECTS

Collaborative Research: Transforming Building Structural Resilience Through Innovation in Steel Diaphragms
Co-Principal Investigator, National Science Foundation

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

Fast and Accurate Infrastructure Modeling and Inspection with Low-flying Robots
Principal Investigator, National Science Foundation

FERDI HELLWEGER

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

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

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

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

SELECTED PUBLICATIONS

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

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

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

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

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

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

SELECTED RESEARCH PROJECTS

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

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

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

BRIAN HELMUTH

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

PhD, University of Washington, 1997
civ.neu.edu/people/helmuth-brian

Scholarship focus: ecological forecasting and resilience of coastal environments

Honors and awards: Google Science Communications Fellow

SELECTED PUBLICATIONS

K.J. Kroeker, E. Sanford, J.M. Rose, C.A. Blanchette, F. Chan, F.P. Chavez, B. Gaylord, B. Helmuth, T.M. Hill, G.E. Hofmann, M.A. McManus, B.A. Menge, K.J. Nielsen, P.T. Raimondi, A.D. Russell, L. Washburn
Interacting Environmental Mosaics Drive Geographic Variation in Mussel Performance and Species Interactions, Ecology Letters, 19, 2016, 771-779

B. Helmuth, B.D. Russell, S.D. Connell, Y. Dong, C.D.G. Harley, F.P. Lima, G. Sará, G.A. Williams, N. Mieszkowska
Beyond Long-term Averages: Making Biological Sense of a Rapidly Changing World, Climate Change Responses, 1, 2014, 10-20

L.E. Petes, J.F. Howard, B. Helmuth, E.K. Fly
Science Integration into US Climate and Ocean Policy, Nature Climate Change, 4(8), 671-677

R. Griffis, J. Howard, E. Babij, B. Helmuth, A. Himes-Cornell, P. Niemier, M. Orbach, L. Petes et. al
Oceans and Marine Resources in a Changing Climate: A Technical Input to the 2013 National Climate Assessment, Island Press, 2013

M. Kearney, A. Matzelle, B. Helmuth
Biomechanics Meets the Ecological Niche: The Importance of Temporal Data Resolution, Journal of Experimental Biology, 215, 2012, 922-933

D.S. Wethey, L.D. Brin, B. Helmuth, K.A.S. Mislan
Predicting Intertidal Organism Temperatures with Modified Land Surface Models, Ecological Modeling, 222, 2011, 3568-3576

SELECTED RESEARCH PROJECTS

Predicting how Fine-scale Temperature Variation will Affect the Spatial Distribution and Temporal Stability of Species and Communities under Climate Change
Principal Investigator, National Science Foundation

Using an Energetics Framework to Forecast the Interactive Effects of Abiotic and Biotic Stressors on Intertidal Mussels
Principal Investigator, National Science Foundation

A. RANDALL HUGHES

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

PhD, University of California-Davis, 2006
civ.neu.edu/people/hughes-randall

Scholarship focus: marine community ecology and biodiversity

SELECTED PUBLICATIONS

T.C. Hanley, A.R. Hughes, B. Williams, H. Garland, D.L. Kimbro
Effects of Intraspecific Diversity on Survivorship, Growth, and Recruitment of the Eastern Oyster Across Sites, Ecology, 97, 2016, 1518-1529

A.R. Hughes, T.C. Hanley, N.P. Orozco, R.A. Zerebecki
Consumer Trait Variation Influences Tritrophic Interactions in Salt Marsh Communities, Ecology and Evolution, 5, 2015, 2659-2672

A.R. Hughes, D.A. Mann, D.L. Kimbro
Predatory Fish Sounds can Alter Crab Foraging Behavior and Influence Bivalve Abundance, Proceedings of the Royal Society B, 281, 2014

A.R. Hughes, A.F.P. Moore, M.F. Piehler
Independent and Interactive Effects of Two Facilitators on Their Habitat-providing Host Plant, Spartina alterniflora, Oikos 123, 2014, 488-499

A.R. Hughes, K.E. Lotterhos
Genotypic Diversity at Multiple Spatial Scales in the Foundation Marsh Species, Spartina alterniflora, Marine Ecology Progress Series, 497, 2014, 105-117

P.I. Macreadie, A.R. Hughes, D.L. Kimbro
Loss of 'Blue Carbon' from Coastal Salt Marshes Following Habitat Disturbance, PLoS One, 8, 2013

A.R. Hughes
Neighboring Plant Species Creates Associational Refuge for Consumer and Host, Ecology, 93, 2012, 1411-1420

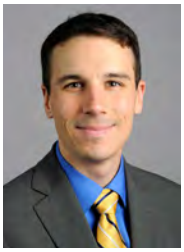
SELECTED RESEARCH PROJECTS

Effects of Genetic Diversity, Epigenetic Change, and Root-associated Fungal Colonization on Trait Variation in the Foundation Plant Spartina alterniflora
Principal Investigator, National Science Foundation

Alabama Center for Ecological Resilience
Principal Investigator, Gulf of Mexico Research Initiative

Massachusetts Living Shorelines for Habitat Enhancement and Coastal Resilience
Principal Investigator, National Fish and Wildlife Federation

MICHAEL KANE



Assistant Professor, Civil and Environmental Engineering

PhD, University of Michigan 2014
civ.neu.edu/people/kane-michael

Scholarship focus: model predictive control; wireless control systems; automatic control of complex infrastructure systems

SELECTED PUBLICATIONS

M.W. Häckell, R. Rolfes, M.B. Kane, J.P. Lynch
Three-tier Modular Structural Health Monitoring Framework Using Environmental and Operational Condition Clustering for Data Normalization: Validation on an Operational Wind Turbine System, Proceedings of the IEEE, PP(99), 2016, 1-15

M.B. Kane, J. Scruggs, J.P. Lynch
Model-predictive Control Techniques for Hydronic Systems Implemented on Wireless Sensor and Actuator Networks, 2014 American Control Conference, 2014, 3542-3547

HARIS KOUTSOPOULOS

Professor, Civil and Environmental Engineering

PhD, Massachusetts Institute of Technology, 1986
civ.neu.edu/people/koutsopoulos-haris

Scholarship focus: urban transportation networks and informatics, urban mobility, intelligent transportation systems, public transportation operations

Honors and awards: Traffic Simulation Lifetime Achievement Award, Transportation Research Board

SELECTED PUBLICATIONS

G. Goulet Langlois, H.N. Koutsopoulos, J. Zhao
Inferring Patterns in the Multi-week Activity Sequences of Public Transport Users, Transportation Research C, 64, 2016, 1-16

G. Sanchez-Martinez, H.N. Koutsopoulos, N.H.M. Wilson
Real-time Holding Control for High-frequency Transit with Dynamics, Transportation Research B, 83, 2016, 1–19

E. Van der Hurk, H.N. Koutsopoulos, N.H.M. Wilson, L.G. Kroon, G. Maroti
Shuttle Planning for Link Closures in Urban Public Transport Networks, Transportation Science, 2016

A. O'Sullivan, F. Pereira, J. Zhao, H.N. Koutsopoulos
Uncertainty in Bus Arrival Time Predictions: Treating Heteroscedasticity with a Meta-Model Approach, IEEE Intelligent Transportation Systems Transactions, 2016

A. Tympakianaki, H.N. Koutsopoulos, E. Jenelius
c-SPSA: Cluster-wise Simultaneous Perturbation Stochastic Approximation Algorithm and its Application to Dynamic Origin-destination Matrix Estimation, Transportation Research Part C, 55, 2015, 231-245

E. Jenelius, H.N. Koutsopoulos
Impact of Sampling Protocol on Bias and Consistency in Travel Time Estimation of Probe Vehicle Data, Transportation Research Part B, 71, 2015, 120-137

E. Jenelius, H.N. Koutsopoulos
Probe Vehicle Data Sampled by Time or Space: Consistent Travel Time Allocation and Estimation, Transportation Research Part B: Methodological, 71, 2015, 120-137

SELECTED RESEARCH PROJECTS

Transport for London (TfL) Research Partnership
Principal Investigator, TfL

Mass Transit Railway (MTR) Research Partnership
Principal Investigator, MTR

PHILIP LARESE-CASANOVA

Associate Professor, Civil and Environmental Engineering

PhD, University of Iowa, 2006
civ.neu.edu/people/larese-casanova-philip

Scholarship focus: environmental chemistry and mineralogy; transformation and remediation of water pollutants; nanomaterial sorbents for water treatment

Honors and awards: National Science Foundation CAREER Award

SELECTED PUBLICATIONS

N. Cai, D. Peak, P. Larese-Casanova
Factors Influencing Natural Organic Matter Sorption onto Commercial Graphene Oxides, Chemical Engineering Journal, 273, 2015, 568-579

A.E.P. Schellenger, A. Onnis-Hayden, D. Jaisi, P. Larese-Casanova
Oxygen Kinetic Isotope Effects in Selenate during Microbial Reduction, Applied Geochemistry, 63, 2015, 261-271

P. Paydary, P. Larese-Casanova
Separation and Quantification of Quantum Dots and Dissolved Metal Cations by Size Exclusion Chromatography-ICP-MS, International Journal of Environmental Analytical Chemistry, 95(15), 2015, 1450-1470

N. Cai, P. Larese-Casanova
Sorption of Carbamazepine by Commercial Graphene Oxides: A Comparative Study with Granular Activated Carbon and Multiwalled Carbon Nanotubes, Journal of Colloid and Interface Science, 426, 2014, 152-161

A.E.P. Schellenger, P. Larese-Casanova
Oxygen Isotope Indicators of Selenate Reaction with Fe(II) and Fe(III) Hydroxides, Environmental Science and Technology, 47(12), 2013, 6254-6262

SELECTED RESEARCH PROJECTS

CAREER: Quantum Dot Degradation in Aquatic Environments
Principal Investigator, National Science Foundation

Insights to Selenium Cycling and Remediation Revealed by Stable Oxygen Isotopes
Principal Investigator, National Science Foundation

Recrystallization of Stable Iron Oxides in Reducing Environments
Principal Investigator, National Science Foundation

AMY MUELLER

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

PhD, Massachusetts Institute of Technology, 2012
cive.neu.edu/people/mueller-amy

Scholarship focus: applications driven optimization, study, and remediation of the natural and built environments enabled by sensors and instrumentation development; signal processing and machine learning; closed-loop controls; sensor networks and communication

Honors and awards: National Science Foundation, Ocean Sciences Postdoctoral Research Fellowship

SELECTED PUBLICATIONS

A.V. Mueller, H.F. Hemond
Statistical Generation of Training Sets for Measuring NO3-, NH4+, and Major Ions in Natural Waters by an Ion Selective Electrode Array, Environmental Science: Processes and Impacts, 18(5), 2016, 590-599

A.V. Mueller, M.S. Orosz, A. Narasimhan, R. Kamal, H. Hemond, Y. Goswami
Evolution and Feasibility of Decentralized Concentrating Solar Thermal Power Systems for Modern Energy Access in Rural Areas, MRS Energy and Sustainability, 2016

M.S. Orosz, A.V. Mueller
Dynamic Simulation of Performance and Cost of Hybrid PV-CSP-LPG Generator Micro Grids with Applications to Remote Communities in Developing Countries, Proceedings of the ASME 2015 Power and Energy Conference, 2015, San Diego

A.V. Mueller, H.F. Hemond
Extended Artificial Neural Networks: Incorporation of a Priori Chemical Knowledge Enables use of Ion Selective Electrodes for in-situ Measurement of Ions at Environmentally-relevant Levels, Talanta, 117, 2013, 112-118

A.V. Mueller, H.F. Hemond
Towards an Automated, Standardized Protocol for Determination of Equilibrium Potential of Ion-selective Electrodes, Analytica Chimica Acta, 690(1), 2011, 71-78

SELECTED RESEARCH PROJECTS

Examining the Role of Anoxic Events on Coastal Micronutrient (Fe) Supplies from a Novel High-resolution Profiling Sampler
Principal Investigator, National Science Foundation

Remus-ISS: Enabling Adaptive in-flight Sampling for High Resolution Studies of Trace Metals
Co-Principal Investigator, Royalty Research Fund; University of Washington

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

ANDREW MYERS

Assistant Professor, Civil and Environmental Engineering

PhD, Stanford University, 2009
cive.neu.edu/people/myers-andrew

Scholarship focus: offshore wind structures; multi-scale experimental testing of structures; computational simulation; fracture and damage mechanics of metals; probabilistic modeling

Honors and awards: National Science Foundation CAREER Award; Civil and Environmental Engineering Excellence in Teaching Award

SELECTED PUBLICATIONS

A. Jay, A.T. Myers, F. Mirzaie, A. Mahmoud, S. Torabian, E. Smith, B.W. Schafer
Large-scale Bending Tests of Slender, Tapered Spirally Welded Steel Tubes, Journal of Structural Engineering, ASCE, 2016

A. Jay. A.T. Myers, S. Torabian, A. Mahmoud, E. Smith, N. Agbayani, B.W. Schafer
Spirally Welded Steel Wind Towers: Buckling Experiments, Analyses and Research Needs, Journal of Constructional Steel Research, Elsevier, 125, 2016, 218-226

S. Hallowell, A.T. Myers
Site-specific Variability of Load Extremes of Offshore Wind Turbines exposed to Hurricane Risk and Breaking Waves, Wind Energy, Wiley, 2016

V. Valamanesh, A.T. Myers, S.R. Arwade, J.F. Hajjar, E. Hines, W. Pang
Wind-wave Prediction Equations for Probabilistic Offshore Hurricane Hazard Analysis, Natural Hazards, Springer, 2016

A.T. Myers, S.R. Arwade, V. Valamanesh, S. Hallowell, W. Carswell
Strength, Stiffness, Resonance and the Design of Offshore Wind Turbine Monopiles, Engineering Structures, Elsevier, 2015

V. Valamanesh, A.T. Myers, S.R. Arwade
Multivariate Analysis of Extreme Metocean Conditions for Offshore Wind Turbines, Structural Safety, Elsevier, 2015

SELECTED RESEARCH PROJECTS

CAREER: Advancing Multi-hazard Assessment and Risk-based Design for Offshore Wind Energy Technology
Principal Investigator, National Science Foundation

Enabling Advanced Wind Turbine Tower Manufacturing with Reliability-based Design
Principal Investigator, National Science Foundation

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

Risk and Decision-making for the Hurricane Threat to Offshore Wind Farms
Principal Investigator, Massachusetts Clean Energy Center

Optimization of Tapered Spiral Welding for Wind Turbine Towers
Co-Principal Investigator, National Science Foundation

ANNALISA ONNIS-HAYDEN

Associate Teaching Professor, Civil and Environmental Engineering

PhD, University of Cagliari, Italy, 2004
civ.neu.edu/people/onnis-hayden-annalisa

Scholarship focus: biological treatment processes; ecotoxicology and toxicity assessment; microbial population dynamics and ecology in engineered biological systems

Honors and awards: Civil and Environmental Engineering Excellence in Teaching Award; Martin W. Essigman Outstanding Teaching Award, College of Engineering

SELECTED PUBLICATIONS

Y. Men, P. Han, D.E. Helbling, N. Jehmlich, C. Herbold, R. Gulde, A. Onnis-Hayden, A.Z. Gu, D.R. Johnson, M. Wagner, K. Fenner
Biotransformation of two Pharmaceuticals by the Ammonia-oxidizing Archaeon Nitrososphaera Gargensis, Environmental Science and Technology, 2016, 50(9), 4682-4692

S.M. Rahman, M.J. Eckelman, A. Onnis-Hayden, A. Gu
Life Cycle Assessment of Advanced Nutrient Removal Technologies for Wastewater Treatment, Environmental Science and Technology, 2016, 50, 3020-3030

A.E. Schellenger, A. Onnis-Hayden, D.P. Jaisi, P. Larese-Casanova
Oxygen Kinetic Isotope Effects in Selenate During Microbial Reduction, Applied Geochemistry, 63, 2015, 261-271

Y. Li, X. Wang, A. Onnis-Hayden, K.T. Wan, A.Z. Gu
Universal Quantifier Derived from AFM Analysis Links Cellular Mechanical Properties and Cell-Surface Integration Forces with Microbial Deposition and Transport Behavior, Environmental Science and Technology, 48(3), 2014, 1769-1778

A. Onnis-Hayden, N. Majed, A.Z. Gu
Decoupling the Microbial Populations for Phosphorus and Nitrogen Removal in Integrated Fixed-film Activated Sludge Enhanced Biological Phosphorus Removal (IFAS-EBPR) System, Water Research, 45, 2011, 3845-3854

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

SELECTED RESEARCH PROJECTS

Insights to Selenium Cycling and Remediation Revealed by Stable Oxygen Isotopes
Co-Principal Investigator, National Science Foundation

Investigate Mechanisms for Optimization and Design of Sidestream EBPR Processes as a Sustainable Approach for Achieving Stable and Efficient P Removal
Co-Principal Investigator, Water Environment Research Foundation

MARK PATTERSON

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

PhD, Harvard University, 1985
civ.neu.edu/people/patterson-mark

Scholarship focus: development of autonomous underwater robots for civil infrastructure and marine sensing; decision support tools for gray/green infrastructure like tide gates; environmental fluid mechanics; biomechanics and mass transfer in living systems

Honors and awards: Member of the Year Award, Association of Unmanned Vehicle Systems International; Lockheed Martin Award for Excellence in Ocean Science and Engineering

SELECTED PUBLICATIONS

J. Elliott, M. Patterson, N. Summers, C. Miternique, E. Montocchio, E. Vitry
How does the Proliferation of the Coral-killing Sponge *Terpios hoshinata* Affect Benthic Community Structure on Coral Reefs?, Coral Reefs, 2016, 1-13

E.C. Edson, M.R. Patterson
MantaRay: A Novel Autonomous Sampling Instrument for In Situ Measurements of Environmental Microplastic Particle Concentrations, Proceedings of the IEEE/Marine Technology Society OCEANS 2015, 2015, 1-6

J. Elliott, M. Patterson, E. Vitry, N. Summers, C. Miternique
Morphological Plasticity allows Coral to Actively Overgrow the Aggressive Sponge *Terpios hoshinota* (Mauritius, Southwestern Indian Ocean), Marine Biodiversity, 2015, 1-5

W.S. Howard, A. Gu, M.M. Garcia, M. Patterson, E. Izzo
State of the World Report 2015: Water Challenges, Fédération Internationale Des Ingénieurs-Conseils (FIDIC) (International Federation of Consulting Engineers), Geneva, 2015, 46

S. Mukhopadhyay, C. Wang, M. Patterson, M. Malisoff, F. Zhang
Collaborative Autonomous Surveys in Marine Environments Affected by Oil Spills, Cooperative Robots and Sensor Networks 2014 (Second Edition), (Editors, A. Koubaa and A. Khelil), Special edition in the "Studies in Computational Intelligence" Springer Book Series, 554, 2014, 87-113

SELECTED RESEARCH PROJECTS

MantaRay Microplastics Sampler
Co-Principal Investigator, Schmidt Marine Technology Partners, Schmidt Family Foundation

The Effects of Black Band Disease and Ocean Acidification on the Physiological Performance of a Scleractinian Coral
Co-Principal Investigator, Protect Our Reefs, State of Florida

AMEET PINTO

Assistant Professor, Civil and Environmental Engineering

PhD, Virginia Tech, 2009
civ.neu.edu/people/pinto-ameet

Scholarship focus: microbial ecology and physiology, drinking water treatment and distribution, wastewater treatment, public health microbiology, molecular microbiology, 'omics analyses

Honors and awards: Bright IDEAS Award, Engineering and Physical Sciences Research Council

SELECTED PUBLICATIONS

Q.M. Bautista, J. Schroeder, M.C. Sevillano-River, R. Sungthong, U. Ijaz, W. Sloan, A.J. Pinto
Microbial Communities in Full-scale Drinking Water Distribution Systems – a Meta-analysis, Environmental Science: Water Research and Technology, 2016

Q.M. Bautista, O. Blakemore, J. Schroeder, J. Moses, M. Haffey, W. Sloan, A.J. Pinto
The Impact of Sampling, PCR, and Sequencing Replication on Discerning Changes in Drinking Water Bacterial Community over Diurnal Time-scales, Water Research, 90, 2016, 216-224

A.J. Pinto, D.N. Marcus, U.Z. Ijaz, Q.M. Bautista, G.J. Dick, L. Raskin
Metagenomic Evidence for the Presence of Comammox Nitrospira-like Bacteria in a Drinking Water System, mSphere Journal, 1, 2015

A.J. Pinto, J. Schroeder, M. Lunn, W.T. Sloan, L. Raskin
Spatial-temporal Survey and Occupancy-abundance Modeling to Predict Bacteria Community Dynamics in the Drinking Water Microbiome, mBio Journal, 5(3), 2014

A.J. Pinto, L. Raskin
PCR Biases Distort Bacterial and Archaeal Community Structure in Pyrosequencing Datasets, PLoS One, 7(8), 2012

A.J. Pinto, C. Xi, L. Raskin
Bacterial Community Structure in the Drinking Water Microbiome is Governed by Filtration Processes, Environmental Science and Technology, 46, 2012, 8851-8859

MATTHIAS RUTH

Professor and Director, School of Public Policy and Urban Affairs; jointly appointed, Civil and Environmental Engineering

PhD, University of Illinois, 1992
civ.neu.edu/people/ruth-matthias

Scholarship focus: dynamic modeling of social, economic and environmental systems, and their interactions; urban infrastructure systems analysis and modeling; urban climate impacts and adaptation; energy and resources economics and policy

SELECTED PUBLICATIONS

M. Ruth, O. Özgün, J. Wachsmuth, S. Gößling-Reisemann
Dynamics of Energy Transitions Under Changing Socioeconomic, Technological and Climate Conditions in Northwest Germany, Ecological Economics, 111, 2015, 29-47

S. Qiu, M. Ruth, S. Ghosh
Evacuated Tube Collectors: A Notable Driver Behind the Solar Water Heater Industry in China, Renewable and Sustainable Energy Reviews, 47, 2015, 580-588

M. Ruth, R.S. Franklin
Livability for all? Conceptual Limits and Practical Implications, Applied Geography, 49, 2014, 18-23

J. Zhu, M. Ruth
The Development of Regional Collaboration for Resource Efficiency: a Network Perspective on Industrial Symbiosis, Computers, Environment and Urban Systems, 44, 2014, 37-46

J. Wachsmuth, A. Blohm, S. Gössling-Reisemann, T. Eickemeier, M. Ruth, R. Gasper, S. Stürmann
How Will Renewable Power Generation be Affected by Climate Change? The Case of a Metropolitan Region in Northwest Germany, Energy, 58, 2013, 192-201

J. Zhu, M. Ruth
Exploring the Resilience of Industrial Ecosystems, Journal of Environmental Management, 122, 2013, 65-75

E. Douglas, P. Kirshen, M. Paolisso, C. Watson, J.Wiggin, M. Ruth
Coastal Flooding, Climate Change, and Environmental Justice: Identifying Obstacles and Incentives for Adaptation in Two Metropolitan Boston Massachusetts Communities, Mitigation & Adaptation Strategies for Global Change, 17(5), 2012, 537-562

SELECTED RESEARCH PROJECTS

RSB: A Decision and Design Framework for Multi-hazard Resilient and Sustainable Buildings
Co-Principal Investigator, National Science Foundation

Incentives and Governance, Critical Infrastructures Resilience Center
Principal Investigator, Department of Homeland Security

The Effect of Energy-saving Regulations on the Location of Manufacturing
Principal Investigator, National Science Foundation

MEHRDAD SASANI

Associate Professor, Civil and Environmental Engineering

PhD, University of California at Berkeley, 2001
civ.neu.edu/people/sasani-mehrdad

Scholarship focus: progressive collapse of structures; earthquake engineering; structural resilience, integrity and reliability

Honors and awards: Fellow, American Society of Civil Engineers; Fellow, Structural Engineering Institute; National Science Foundation CAREER Award

SELECTED PUBLICATIONS

J.A. Murray, E. Hecht, M. Sasani
Modeling Bar Slip in Nonductile Reinforced Concrete Columns, Journal of Structural Engineering, ASCE, 04016085, 2016, 1-12

J.A. Murray, M. Sasani
Near-collapse Response of Existing RC Building under Severe Pulse Type Ground Motion using Hybrid Simulation, Earthquake Engineering and Structural Dynamics, 45(7), 2016,1109–1127

L. Keyvani, M. Sasani
Analytical and Experimental Evaluation of Progressive Collapse Resistance of a Flat-slab Posttensioned Parking Garage, Journal of Structural Engineering, ASCE, 141(11), 2015

J.A. Murray, M. Sasani, X. Shao
Hybrid Simulation for System-level Structural Response, Engineering Structures, 103, 2015, 228-238

S. Sagiroglu, M. Sasani
Progressive Collapse Resisting Mechanisms of Reinforced Concrete Structures and Effects of Initial Damage Locations, Journal of Structural Engineering, ASCE, 140(3), 2014, 1-12

J.A. Murray, M. Sasani
Seismic Shear-axial Failure of Reinforced Concrete Columns Versus System Level Structural Collapse, Journal of Engineering Failure Analysis, 32, 2013, 382-401

M. Sasani, S. Sagiroglu
Gravity Load Redistribution and Progressive Collapse Resistance of a 20-story RC Structure Following Loss of an Interior Column, Structural Journal, ACI, 107(6), 2010, 636-644

M. Sasani, J. Kropelnicki
Progressive Collapse Analysis of an RC Structure, The Structural Design of Tall and Special Buildings, 17(4), 2008, 757-772

SELECTED RESEARCH PROJECTS

NEESR: Near Collapse Performance of Existing RC Concrete Frame Buildings
Principal Investigator, National Science Foundation

RSB: A Decision and Design Framework for Multi-hazard Resilient and Sustainable Buildings
Principal Investigator, National Science Foundation

THOMAS SHEAHAN

Professor, Civil and Environmental Engineering; Sr. Associate Dean for Academic Affairs

ScD, Massachusetts Institute of Technology, 1991
civ.neu.edu/people/sheahan-thomas

Scholarship focus: soft ground engineering, coastal adaptation, education and training for engineers and scientists

Honors and awards: Fellow, American Society of Civil Engineers

SELECTED PUBLICATIONS

S. Barbuto, T.C. Sheahan, J.P. Shine, A. Alshawabkeh, et al.
Benchscale Assessment of the Efficacy of a Reactive Core Mat to Isolate PAH-spiked Aquatic Sediments, Soil and Sediment Contamination: An International Journal, 23(1), 2014

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

M.A. Kenney, E. Hamin, T.C. Sheahan
Reconceptualizing the Role of Infrastructure in Resilience, EOS meeting report, 95(33), 2014

D. Cheney, L. Rajicb, E. Sly, D.Meric, T.C. Sheahan
Uptake of PCBs Contained in Marine Sediments by the Green Macroalga *Ulva* Rigida, Marine Pollution Bulletin, 88(1-2), 2014, 207-214

K. Santora. E.J. Mason, T.C. Sheahan
A Model for Progressive Mentoring in Science and Engineering Education and Research, Innovative Higher Education, 38(5), 2013, 427-440

SELECTED RESEARCH PROJECTS

Sustainable Adaptive Gradients in the Coastal Environment: Reconceptualizing the Role of Infrastructure in Resilience
Co-Principal Investigator, National Science Foundation

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

CRAIG SHILLABER

Assistant Teaching Professor, Civil and Environmental Engineering

PhD, Virginia Tech, 2016
civ.neu.edu/people/shillaber-craig

Scholarship focus: geotechnical subsurface characterization through in-situ and laboratory methods; quantification of construction energy and carbon; sustainable geotechnics

SELECTED PUBLICATIONS

C.M. Shillaber, J.K. Mitchell, J.E. Dove
Energy and Carbon Assessment of Ground Improvement Works. I: Definitions and Background, Journal of Geotechnical and Geoenvironmental Engineering, 142(3), 2016

C.M. Shillaber, J.K. Mitchell, J.E. Dove
Energy And Carbon Assessment of Ground Improvement Works. II: Working Model And Example, Journal of Geotechnical and Geoenvironmental Engineering, 142(3), 2016

E.K. Phillips, C.M. Shillaber, J.K. Mitchell, J.E. Dove, G.M. Filz
Sustainability Comparison of a Geosynthetic-reinforced Soil Abutment and a Traditionally-founded abutment: A Case History, Proceedings of the Geotechnical and Structural Engineering Congress, ASCE, Reston, VA, 2016, 699-711

C.M. Shillaber, J.K. Mitchell, J.E. Dove
Sustainability Considerations in Deep Mixing Applications, with Examples from LPV 111 in New Orleans, LA., Proceedings, Deep Mixing, Deep Foundations Institute, 2015, 511-520

C.M. Shillaber, J.K. Mitchell, J.E. Dove
Assessing Environmental Impacts in Geotechnical Construction: Insights from the Fuel Cycle, Proceedings, GeoCongress 2014, Geo-Characterization and Modeling for Sustainability, Geotechnical Special Publication No. 234, ASCE, Reston, VA, 2014, 3516-3525

J.E. Dove, C.M. Shillaber, T. Becker, A. Wallace, P. Dove
Biologically Inspired Silicification Process for Improving Mechanical Properties of Sand, Journal of Geotechnical and Geoenvironmental Engineering, 137(10), 2011, 949-957

MICHAEL B. SILEVITCH

Robert D. Black Professor, COE Distinguished Professor, Electrical and Computer Engineering; affiliated faculty, Civil and Environmental Engineering

PhD, Northeastern University, 1971
ece.neu.edu/people/silevitch-michael

Scholarship focus: subsurface sensing and imaging systems, detection of explosives related anomalies, engineered system development and engineering leadership

Honors and awards: Life Fellow, Institute of Electrical and Electronics Engineers; 2015 National Academy of Engineering Gordon Prize, for developing an innovative method to provide graduate engineers with the necessary personal skills to become effective engineering leaders

SELECTED RESEARCH PROJECTS

ALERT: Awareness and Localization of Explosives Related Threats, A Department of Homeland Security Center of Excellence. ALERT seeks to conduct transformational research, technology and educational development for effective characterization, detection, mitigation and response to the explosives-related threats facing the country and the world
Director and Principal Investigator, Department of Homeland Security

CenSSIS: Center for Subsurface Sensing and Imaging Systems, Gordon-CenSSIS, a graduated NSF Engineering Research Center, was created to develop new technologies to detect hidden objects, and to use those technologies to meet real-world subsurface challenges in areas as diverse as noninvasive breast cancer detection and underground pollution assessment
Director and Principal Investigator, National Science Foundation

Research and Development of Reconstruction Advances in CT Based Object Detection Systems
Principal Investigator, Department of Homeland Security

ALI TOURAN

Professor, Civil and Environmental Engineering

PhD, Stanford University, 1980
civ.neu.edu/people/touran-ali

Scholarship focus: risk assessment; construction cost/schedule uncertainty; project delivery systems; simulation; construction productivity

Honors and awards: Fellow, American Society of Civil Engineers; President's Award, Boston Society of Civil Engineers

SELECTED PUBLICATIONS

A.P. Gurgun, A. Touran
Public-private Partnership Experience in the International Arena: Case of Turkey, Journal of Management in Engineering, 30(6), 2014

A.P. Gurgun, Y. Zhang, A. Touran
Schedule Contingency Analysis for Transit Projects Using a Simulation Approach, Journal of Civil Engineering & Management, 19(4), 2013, 465-475

P. Bakhshi, A. Touran
A Method for Calculating Cost Correlation among Construction Projects in a Portfolio, International Journal of Architecture, Engineering and Construction, 1(3), 2012, 134-141

P. Bakhshi, A. Touran
A New Approach for Contingency Determination in a Portfolio of Construction Projects, Journal of Risk Analysis and Crisis Response, 2(4), 2012, 223-232

SELECTED RESEARCH PROJECTS

Integrated Project Delivery in Industrial Projects
Co-Principal Investigator, Construction Industry Institute

Managing a Portfolio of Projects – Metrics for Improvement
Principal Investigator, Construction Industry Institute

GEOFFREY C. TRUSSELL

Professor and Chair, Marine and Environmental Sciences; Director, Marine Science Center; affiliated faculty, Civil and Environmental Engineering

PhD, College of William & Mary, 1998
civ.neu.edu/people/trussell-geoffrey

Scholarship focus: evolutionary and community ecology; coastal sustainability

Honors and awards: Ray Lankester Investigatorship; Sigma Delta Tau Outstanding Professor

SELECTED PUBLICATIONS

C.M. Matassa, G.C. Trussell
Effects of Predation Risk Across a Latitudinal Temperature Gradient, Oecologia, 177, 2015, 775-784

S.M. Donelan, G.C. Trussell
Parental Effects Enhance Risk Tolerance and Performance in Offspring, Ecology, 96(8), 2015, 2049–2055

C.M. Matassa, G.C. Trussell
Prey State Affects the Ecological Consequences of Temporal Variation in Predation Risk, Proceedings of the Royal Society B, 281, 2015, 1796

E.S. Bryson, G.C. Trussell, P.J. Ewanchuk
Broad-scale Geographic Variation in the Organization of Rocky Intertidal Communities in the Gulf of Maine, Ecological Monographs, 84, 2014, 579-597 (cover article)

L.P. Miller, C.M. Matassa, G.C. Trussell
Climate Change Enhances the Negative Effects of Predation Risk on an Intermediate Consumer, Global Change Biology, 20, 2014, 3834-3844

N.D. Chu, S.T. Kaluziak, G.C. Trussell, S.V. Vollmer
Phylogenomic Analyses Reveal Latitudinal Population Structure And Polymorphisms in Heat Stress Genes in the North Atlantic Snail Nucella Lapillus, Molecular Ecology, 23, 2014, 1863-1873

N.D. Chu, S.T. Kaluziak, G.C. Trussell, S.V. Vollmer
Thermal Stress and Predation Risk Trigger Distinct Transcriptomic Response in the Intertidal Snail, Nucella lapillus, Molecular Ecology, 23, 2014, 6104-6113

J.L. Orrock, E.L. Preisser, J.H. Grabowski, G.C. Trussell
The Cost of Safety: Refuges Increase the Impact of Predation Risk in Aquatic Systems, Ecology, 94(3), 2013, 573-579

SELECTED RESEARCH PROJECTS

Collaborative Research: Intertidal Community Assembly and Dynamics: Integrating Broad-scale Regional Variation in Environmental Forcing and Benthic-pelagic Coupling
Principal Investigator, National Science Foundation

Collaborative Research: Using an Energetics Framework to Forecast the Interactive Effects of Abiotic and Biotic Stressors on Intertidal Mussels
Co-Principal Investigator, National Science Foundation

SARA WADIA-FASCETTI

Professor, Civil and Environmental Engineering; Associate Dean, Graduate Studies

PhD, Stanford University, 1994
civ.neu.edu/people/wadia-fascetti-sara

Scholarship focus: condition assessment methodologies for infrastructure systems; life cycle and life span analysis; nondestructive testing and evaluation; structural and earthquake engineering uncertainty

Honors and awards: American Society of Engineering Education Sharon Keillor Award for Women in Engineering Education; Minorities in Engineering Award, American Society of Engineering Education; National Science Foundation CAREER Award; Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring, selected by President Bush and awarded at the White House

SELECTED PUBLICATIONS

A. Ganguli, C.M. Rappaport, D. Abramo, S. Wadia-Fascetti
Synthetic Aperture Imaging for Flaw Detection in a Concrete Medium, NDT & E International, 45(1), 2012, 79-90

K. Belli, S. Wadia-Fascetti, C. Rappaport
Integrated Sensor and Media Modeling Environment Developed and Applied to Ground-penetrating Radar Investigation of Bridge Decks, Journal of Computing in Civil Engineering, 25(1), 2011, 10-20

K. Belli, C. Rappaport, S. Wadia-Fascetti
A Time Domain Equivalent Source Model of an Impulse GPR Antenna Based on Measured Radiation Field, Research in Nondestructive Evaluation, 22(4), 2011, 197-207

SELECTED RESEARCH PROJECTS

Northeastern ADVANCE
Principal Investigator, National Science Foundation

IGERT: Intelligent Diagnostics for Aging Civil Infrastructure
Principal Investigator, National Science Foundation

VOTERS: Versatile Onboard Traffic Embedded Roaming Sensors
Co-Principal Investigator/Deputy Director, National Institute of Standards and Technology

KAI-TAK WAN

Professor, Mechanical and Industrial Engineering; affiliated faculty 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

MING WANG

COE Distinguished Professor, Civil and Environmental Engineering

PhD, University of New Mexico, 1983
civ.neu.edu/people/wang-ming

Scholarship focus: network-wide pavement and bridge deck inspections: sensor technology for infrastructure; saliva-based sensor technology for disease diagnosis and monitoring; structural health monitoring for bridges; subsurface fault detection using air-coupled GPR systems

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

SELECTED PUBLICATIONS

Y. Du, W. Zhang, M.L. Wang
An On-chip Disposable Salivary Glucose Sensor for Diabetes Control, Journal of Diabetes Science and Technology, 2016

Y. Du, W. Zhang, M.L. Wang
Sensing of Salivary Glucose Using Nano-structured Biosensors, Biosensors, 6(1), 2016, 10

W. Zhang, M.L. Wang, S. Khalili, S. Cranford
Materiomics for Oral Disease Diagnostics and Personal Health Monitoring: Designer Biomaterials for the Next Generation Biomarkers, OMICS: A Journal of Integrative Biology, 20, 2016, 12-29

W. Zhang, M.L. Wang, S. Cranford
Ranking of Molecular Biomarker Interaction with Targeted DNA Nucleobases via Full Atomistic Molecular Dynamics, Scientific Report, Nature Publishing Group, 6, 2016, 18659

N. Martino., K. Maser, R. Birken, and M.L. Wang
Quantifying Bridge Deck Corrosion Using Ground Penetration Radar, Research in Nondestructive Evaluation, 27(2), 2016, 112-124

W. Zhang, Y. Du, M.L. Wang
Noninvasive Glucose Monitoring using Saliva Nano-biosensor, Sensing and Biosensing Research, 4, 2015, 23-29

M. Lee, R. Vilbig, D. Busuioc, R. Birken, N. Sun, and M.L. Wang
Novel Miniaturized Designs for In-traffic Air-coupled Ground Penetration Radar Systems, Journal of Environmental and Engineering Geophysics, 20(1), 2015, 71-79

Y. Zhang, G. McDaniel, M.L. Wang
Pavement Microtexture Measurement using Tire/Road Noise, Journal of Civil Structural Health Monitoring, 5(3), 2015, 253-261

SELECTED RESEARCH PROJECTS

VOTERS: Versatile Onboard Traffic Embedded Roaming Sensors
Principal Investigator, National Institute of Standards and Technology

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

QI RYAN WANG

Assistant Professor, Civil and Environmental Engineering

PhD, Virginia Tech, 2015
civ.neu.edu/people/wang-ryan

Scholarship focus: urban and social resilience; geo-social networking; coupled, human-natural systems, natural disaster response and evacuation; urban computing

SELECTED PUBLICATIONS

Q. Wang, J.E. Taylor
Patterns and limitations of urban human mobility resilience under the influence of multiple types of natural disaster, PLoS one, 11(1), 2016

Q. Wang, J.E. Taylor
Process Map for Urban-human Mobility and Civil Infrastructure Data Collection Using Geosocial Networking Platforms, Journal of Computing in Civil Engineering, 30(2), 2015

Q. Wang, J.E. Taylor
Energy Saving Practice Diffusion in Online Networks, Energy and Buildings, 76, 2014, 622-630

Q. Wang, J. E. Taylor
Quantifying Human Mobility Perturbation and Resilience in Hurricane Sandy, PLoS ONE, 9(11), 2014

MISHAC YEGIAN

COE Distinguished Professor, Civil and Environmental Engineering

PhD, Massachusetts Institute of Technology, 1976
civ.neu.edu/people/yegian-mishac

Scholarship focus: geotechnical earthquake engineering; soil dynamics; geosynthetics; seismic response of landfills; base isolation; liquefaction; bridge engineering; use of shaking table in earthquake engineering

Honors and awards: Fellow, American Society of Civil Engineers

SELECTED PUBLICATIONS

E. Eseller-Bayat, S. Gokyer, M.K. Yegian
Earthquake Engineering Experimental Facility for Research and Public Outreach, Seismic Evaluation and Rehabilitation of Structures, 26, 2014, 379-387

E. Eseller-Bayat, S. Gokyer, M.K. Yegian, O. Deniz, A. Alshawabkeh
Bender Elements and Bending Disks for Measurement of Shear and Compression Wave Velocities in Large Fully and Partially Saturated Sand Specimens, ASTM Geotechnical Testing Journal, 36(2), 2013, 1-8

E. Eseller-Bayat, S. Gokyer, M.K. Yegian, E. Ortakci, A. Alshawabkeh
Design and Application of Simple Shear Liquefaction Box, ASTM Geotechnical Testing Journal, 36(3), 2013, 1-9

E. Eseller-Bayat, S. Gokyer, M.K. Yegian, A. Alshawabkeh
Liquefaction Response of Partially Saturated Sands: An Empirical Model, ASCE Journal of Geotechnical and Geoenvironmental Engineering, 139(6), 2013, 872-879

SELECTED RESEARCH PROJECTS

Field Application of Induced Partial Saturation (IPS) for Liquefaction Mitigation
Principal Investigator, National Science Foundation

SELECTED PhD THESES

Ali Ciblak

PhD 2016, Civil Engineering; Advisor, Akram N. Alshawabkeh

PERFORMANCE OF IRON ELECTROLYSIS FOR TRANSFORMATION OF TRICHLOROETHYLENE IN GROUNDWATER

In this study, iron electrolysis is assessed as a potential technology for the remediation of TCE contaminated groundwater. Groundwater contamination with chlorinated solvents, such as trichloroethylene or TCE, is a major environmental challenge. The development of innovative, efficient, and sustainable remediation technologies is needed. A three-stage experimental program is conducted in this study: (i) the evaluation of chemical changes in the electrolyte due to iron electrolysis in batch reactors, as well as the investigation of TCE degradation rates; (ii) the optimization of electrochemical operating variables using a multivariable statistical approach; and (iii) the assessment of a proposed electrochemical system under flow conditions for the remediation of groundwater contaminated with TCE.

See full dissertation at **coe.neu.edu/AliCiblak**

Hadi Kazemiroodsari

PhD 2016, Civil Engineering; Advisor, Mishac K. Yegian

ELECTRIC CONDUCTIVITY FOR LABORATORY AND FIELD MONITORING OF INDUCED PARTIAL SATURATION (IPS) IN SANDS

This dissertation focuses on this aspect of the IPS research. The monitoring system developed was based on using electric conductivity fundamentals and probes to detect the transport of chemical solution, calculate degree of saturation of sand, and determine the final zone of partial saturation created by IPS. To understand the fundamentals of electric conductivity, laboratory bench-top tests were conducted using electric conductivity probes and small specimens of Ottawa sand. Bench-top tests were used to study rate of generation of gas bubbles due to reaction of sodium percarbonate solution in sand, and to confirm a theory based on which degree of saturation were calculated.

The various laboratory and field tests confirmed that electric conductivity and the probes devised and used can be invaluable in the implementation of IPS, by providing information regarding transport of the chemical solution, the spacing of injection tubes, duration of injection, and the zone and degree of partial saturation caused by IPS.

See full dissertation at **coe.neu.edu/HadiKazemiroodsari**

Devashish Kumar

PhD 2016, Interdisciplinary; Advisor, Auroop R. Ganguly

CLIMATE EXTREMES: PREDICTABILITY, IMPACTS, AND CONSEQUENCES AT REGIONAL SCALES

Our study starts with the evaluation of the performance of latest generation of global climate models, Coupled Model Intercomparison Project Phase 5 (CMIP5) in simulating current climatology and multi-model agreement in projected climate change. Subsequently I studied the performance of CMIP5 models in simulating and projecting wind extremes at regional scales. Both of these studies were focused on long-term climatology, the end of the century time horizon. Multi-sector stakeholders are looking for reliable projections of climate change at near-term planning horizons as most of the decisions are made at time scales of one-to-two decades. Consideration of climate uncertainty especially climate internal variability and model response variability becomes more important as they dominate signal of climate change.

One of the important contribution of my research has been on enhancing the present understanding of the role of different sources of uncertainty with projection time horizons at multiple spatial scales for precipitation and temperature. Finally, the framework has been applied to study the how much thermoelectric power production will be at risk due to warmer and scarcer water under nonstationary climate change.

See full dissertation at **coe.neu.edu/DevashishKumar**

Kenny Kwan Yang

PhD 2016, Civil Engineering; Advisor, Steven W. Cranford

MOLECULAR COOPERATIVITY AND COMPATIBILITY VIA FULL ATOMISTIC SIMULATION

This research attempts to develop bottom-up molecular scale understanding of material behavior, with the global objective being the application of this understanding into material design/characterization at an ultimate functional scale. In particular, it addresses the subject of cooperativity at the nano-scale. This research aims to define the conditions which dictate when discrete molecules may behave as a single, functional unit, thereby facilitating homogenization and up-scaling approaches, setting bounds for assembly, and providing a transferable assessment tool across molecular systems.

See full dissertation at **coe.neu.edu/KennyKwanYang**

Reza Masoumi

PhD 2016, Civil Engineering; Advisor, Ali Touran

A FRAMEWORK FOR PROJECT PORTFOLIO FORMATION USING A HYBRID OF MULTICRITERIA DECISION-MAKING METHODS

The main contribution of this dissertation is the development of a comprehensive framework for the formation of construction project portfolios. The most important phase of project portfolio management is portfolio formation. The survival of organizations depends on selecting the highest value projects considering a restricted budget, and above all organizational goals. A large and far-reaching online survey on portfolio management found that many organizations don't have a systematic approach in portfolio formation under budget restriction. This finding served as the main impetus for developing a framework for portfolio formation in the field of construction capital projects.

The designed framework selects projects that are better aligned with organizational goals under a budget constraint. This framework creates balance in portfolios in terms of business lines and project types by allocating appropriate budgets among them following strategic objectives.

See full dissertation at **coe.neu.edu/RezaMasoumi**

Fritz Rudolph Pangihutan-Nababan

PhD 2016, Civil Engineering; Advisor, Mishac K. Yegian

DEVELOPMENT AND EVALUATION OF INDUCED PARTIAL SATURATION (IPS), DELIVERY METHOD AND ITS IMPLEMENTATION IN LARGE LABORATORY SPECIMENS AND IN THE FIELD

The research presented in this dissertation was focused on: 1) development of an automated chemical solution preparation and delivery system, which will induce partial degree of saturation in liquefaction susceptible sands, 2) implementation of the system in large scale laboratory and field tests, and 3) verification that partial saturation reduces liquefaction potential.

Liquefaction of saturated loose sands during an earthquake is associated with the build-up of excess pore water pressure, leading to loss of shearing strength of the sand. Current liquefaction mitigation techniques used in practice are expensive, and cannot be implemented on sites with existing structures.

See full dissertation at **coe.neu.edu/FritzNababan**

Vahid Valamanesh

PhD 2016, Civil Engineering; Advisor, Andrew T. Myers

PROBABILISTIC HAZARD ANALYSIS OF EXTREME ENVIRONMENTAL CONDITIONS FOR OFFSHORE WIND TURBINES

The dissertation herein addresses two overarching themes. The first theme is structural modeling of offshore wind turbines (OWTs). While performance-based structural modeling of infrastructure subjected to natural hazards is a well-established field, modeling of OWTs presents some interesting challenges since an OWT can be considered as both a machine and a structure. In particular, the structural characteristics of an OWT vary significantly depending on the operational condition of the turbine. One of these characteristics, aerodynamic damping, is examined in detail in this work, and a closed-form equation for estimating the magnitude of aerodynamic damping for use in structural analysis software is proposed. The second theme is probabilistic characterization of hurricane-induced offshore hazard relevant to design and risk evaluations of OWTs.

See full dissertation at **coe.neu.edu/VahidValamanesh**

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