Engineering for Society
Boldly innovating to better our world

2016 | 2017
SCHOLARSHIP REPORT
Civil and Environmental Engineering
Dear Friends,

This fourth annual scholarship report reflects the exceptional academic and professional accomplishments of the civil and environmental engineering faculty and PhD candidates for the 2016-2017 year. Our department has more than doubled in size of the faculty over the last seven years, with 46 faculty in civil and environmental engineering, and has more than doubled in size of the graduate program over the last seven years, with over 230 graduate students. Building out the research infrastructure of the university, this past spring the university opened the new 220,000 square foot Interdisciplinary Science and Engineering Complex that provides state-of-the-art laboratories in engineering and science.

This year the department launches a new BS in Environmental Engineering, with plans for it to be ABET accredited for our first graduates. This degree program reflects our significant growth and expansion of scope in environmental engineering and water resources engineering and includes several new courses. Last year we also launched two new graduate degrees, including an MS in Environmental Engineering (MSEnvE) 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 MSEnvE 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
**3 FEDERALLY FUNDED RESEARCH CENTERS**

- PROTECT, The Puerto Rico Testsite for Exploring Contamination Threats, funded by NIEHS
- CRECE, The Center for Research on Early Childhood Exposure and Development, funded by EPA and NIEHS
- ECHO, Environmental Influences on Child Health Outcomes, funded by NIH

**2016 WINNER:**
Andrew Myers for “Advancing Multi-hazard Assessment and Risk-based Design for Offshore Wind Energy Technology”

**166** masters students

33% female

**70** doctoral students

46% female

**QUICK FACTS — Civil and Environmental Engineering**

- **13 MULTI-INSTITUTIONAL RESEARCH CENTERS**
  - funding by eight federal agencies
  - DHS, NIST, NSF, EPA, DOE, NIH, NSA, HHS, NSA

- **173 TENURED/ TENURE-TRACK Faculty**
  - Including Affiliated Faculty

- **3566 UNDERGRADUATE students**
  - NEW FALL students 2015—2016
  - Bioengineering
  - Chemical Engineering
  - Civil and Environmental Engineering
  - Electrical and Computer Engineering
  - Mechanical and Industrial Engineering

- **3177 GRADUATE students**
  - NEW FALL students 2015—2016
  - Masters
  - 942 1178

**QUICK FACTS — College of Engineering**

- **40 NSF CAREER Awards**

- **77 YOUNG INVESTIGATOR Awards**

- **46 TENURED/ TENURE-TRACK Including Affiliated Faculty**

- **166** masters students
  - 33% female

- **70** doctoral students
  - 46% female

- **RECENT HIRES:**
  - Michael Kane
    - PhD, University of Michigan
  - Samuel Muñoz
    - PhD, University of Wisconsin-Madison
  - Aron Stubbins
    - PhD, Newcastle University
Faculty Honors and Awards

Professor Peter Furth received an Innovation in Education Award from the Institute of Transportation Engineers’ Transportation Education Council in recognition of his highly regarded Dialogue of Civilizations course, which other transportation engineering educators around the country have learned about, envied, and in some cases, emulated.

Professor Mark Patterson, Assistant Professor Loretta Fernandez, and Affiliated Professor Brian Helmuth were awarded a $300K National Science Foundation grant for “Tide Gate Modulation of Wetland Function: Decision Support through Engineering Best Practices” to develop best practices for the operation of tide gates, which serve as valves designed to protect life and property but often negatively affect wetlands.

Associate Professor Edward Beighley received a $651K grant from NASA for research supporting the Surface Water and Ocean Topography Satellite Mission. SWOT will make the first global survey of Earth’s surface water, providing understanding of how water bodies change over time.

College of Engineering Distinguished Professor Ming Wang, PhD graduate Nicole Martino, Ken Maser of the VOTERS research center, and former research faculty member Ralf Birken won the 2017 Outstanding Paper in Research Award from the American Society for Nondestructive Testing for an article published in the May 2016 issue of Research in Nondestructive Evaluation. The article, titled “Quantifying Bridge Deck Corrosion using Ground Penetrating Radar,” highlights some of the key work produced in the VOTERS center related to automated detection of damage in roadways and bridge decks using sensors mounted on vehicles driving through traffic.

Professor April Gu has been elected to the Association of Environmental Engineering and Science Professors (AEESP) Board of Directors. The AEESP is made up of professors in academic programs throughout the world who provide education in the sciences and technologies of environmental protection. Gu has also been selected as a Water Environment Federation (WEF) Fellow for her professional achievement, stature and contributions to the preservation and enhancement of the global water environment.

Professor Auroop Ganguly was awarded a grant from NASA, through its contractor Bay Area Environmental Research Institute (BAERI). This represents the latest in a series of grants awarded to Ganguly’s Sustainability and Data Sciences Laboratory, and will contribute to developing machine-learning approaches for the earth sciences to improve satellite and earth systems data through advances in estimation, forecasting, and modeling of the earth and its climate.

Professor Ali Touran was awarded a $235K grant from the Construction Industry Institute for research on the application of integrated project delivery for industrial projects. Northeastern University and Iowa State University, along with representatives from 17 major North American companies, are collaborating on the project.

Northeastern is taking part in a $157M NIH study called Environmental Influences on Child Health Outcomes (ECHO). The NIH awarded $157 million in its fiscal year 2016 to launch the seven-year initiative. Top research institutions will examine the effects of a variety of environmental factors—from air pollution and chemicals to stress and diet—on the health of children and adolescents. Taking part in the study are the Puerto Rico Testsite for Exploring Contamination Threats (PROTECT) Center and the Center for Research on Early Childhood Exposure and Development in Puerto Rico (CRECE), which are multidisciplinary research centers led by Akram Alshawabkeh, George E. Snell, and Babak Jalalzadeh Fard.

Northeastern University has been designated by the U.S. Department of Transportation as a Beyond Traffic Innovation Center (BTIC), one of 18 “forward thinking and influential institutions” to lead research aimed at solving some of the nation’s pressing transportation challenges over the next three decades. BTIC will be led by Professors Sara Wadia-Fascetti, Haris Kouatsopoulos, and Matthias Ruth.

Associate Professor Mehrdad Sasani won the 2016 Clemens Herschel Award from the Boston Society of Civil Engineers Section of the American Society of Civil Engineers in recognition of their paper “Analytical and Experimental Evaluation of Progressive Collapse Resistance of a Flat-Slab Posttensioned Parking Garage.”

STUDENTS

PhD student Maria Sevillano won the “Best Student Presentation” award at the Association of Science Engineering & Science Professors (AEESP) research and education conference in Michigan for her presentation, titled “Incidence of Antimicrobial Resistance Genes in Municipal Drinking Water Samples from the United Kingdom.” Sevillano was one of four winners chosen from more than 200 student presenters.

PhD student Babak Jalalzadeh Fard won first place at the American Geophysical Union’s 2017 spring Virtual Poster Showcase for his research poster, titled “Effective Mitigation and Adaptation Strategies for Public Health Impacts of Heatwaves for Brookline, Mass.”
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<th>FACULTY BY RESEARCH THRUSTS</th>
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<td><strong>CIVIL INFRASTRUCTURE SECURITY</strong></td>
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GEORGE ADAMS

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

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

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

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

SELECTED PUBLICATIONS

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

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

Hu, G.G. Adams

G.G. Adams

G.G. Adams

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

G.G. Adams

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

AKRAM ALshawabkeh

George A. Snell Professor of Engineering, Civil and Environmental Engineering; Associate Dean for Research; Director, PROTECT Superfund Research Center; 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

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


X. Yu, R. Ghasemizadeh, I.Y. Padilla, D. Kaeli, A.N. Alshawabkeh

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: Bioengineering, Civil and
Environmental Engineering, Electrical and
Computer Engineering
PhD, University of California, Santa Cruz, 1975
bio.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

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

L. Lewis, J. Ayers

J. Ayers, D. Blustein, A. Westphal

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 and Associate Chair for Undergraduate Studies, Civil and Environmental Engineering; affiliated faculty, Marine and Environmental Sciences
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

Honors and awards: College of Engineering Faculty Fellow

SELECTED PUBLICATIONS
A Review of Approaches and Recommendations for Improving Resilience of Water Management Infrastructure: The Case for Large Dams, ASCE Journal of Infrastructure Systems, 23(4), 2017, 02517001

A.R. Hughes, F.R. Schenck, J. Bloomberg, T.C. Hanley, T.C. Gouhier, R.E. Beighley, D.L. Kimbro, D. Feng
Biogeographic Gradients in Ecosystem Processes of the Invasive Ecosystem Engineer Phragmites Australis, Biological Invasions, 18(9), 2016, 2577-2595

Improved Error Estimates of a Discharge Algorithm for Remotely Sensed River Measurements: Test Cases on Sacramento and Garonne Rivers, Water Resources Research, 52, 2016, 278-294

Opportunities for Hydrologic Research in the Congo Basin, Reviews of Geophysics, 2016

Projections of Climate Change Effects on Discharge and Inundation in the Amazon River Basin, Climatic Change, 136(3-4), 2016, 555-570

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

Integrating Lateral Contributions and Longitudinal Controls Along River Reaches to Improve SWOT Discharge Estimates
Principal Investigator, National Aeronautics and Space Administration, SWOT Science Team

Integration of SWOT Measurements into Global Hydrologic Models
Co-Principal Investigator, National Aeronautics and Space Administration, SWOT Science Team
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
Y. Zhang, D. Bernal
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

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; affiliated faculty, Mechanical and Industrial 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
G.F. Giaccu, L. Caracoglia
L. Caracoglia, G.F. Giaccu, B. Barbiellini
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, C4015002
L. Caracoglia
Examining Monetary Losses due to Transient-Wind-Load Damage on Tall Building Envelopes by Stochastic Modeling, Wind Engineers - Official Journal of the Japan Association for Wind Engineering, 41(4), 2016, 325-329
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
P. Pourazarm, L. Caracoglia, M. Lackner, Y. Modarres-Sadeghi

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
J. Meng, Y. Zhang, S. Cranford, M. Minus

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, Marine and Environmental Sciences, 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 Lauderdale Prize in Industrial Ecology

SELECTED PUBLICATIONS
R. Phillips, L. Troup, D.J. Fannon, M.J. Eckelman
M.J. Eckelman, J.S. Sherman
Life-Cycle Assessment of Advanced Nutrient Removal Technologies for Wastewater Treatment, Environmental Science and Technology, 50(6), 2016, 3020-3030
M.J. Eckelman
Life-Cycle Inherent Toxicity: A Novel LCA-Based Algorithm for Evaluating Chemical Synthesis Pathways, Green Chemistry, 18(11), 2016, 3257-3264
M. Montazeri, L. Soh, P. Perez-Lopez, J.B. Zimmerman, M.J. Eckelman
Time-Dependent Life Cycle Assessment of Microalgal Biorefinery co-Products, Biofuels, Bioproducts, and Biorefining, 2016
M. Saha, M.J. Eckelman
Geospatial Assessment of Potential Bioenergy Crop Production on Urban Marginal Land, Applied Energy, 159, 2015, 540-547

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

R. Philips, L. Troup, D. Fannon, M. Eckelman

D. Fannon, M. Laboy
Teaching Building Science in Design Studio, Journal of the National Institute of Building Science, 4(6), 2016, 22-25

M. Laboy, D. Fannon


SELECTED RESEARCH PROJECTS

Building Resilience: A Tool for Adaptability Planning and Decision-Making
Co-Principal Investigator, Northeastern University
Decision Frameworks for Resilient and Sustainable Buildings
Co-Investigator, National Science Foundation
Future-Use Architecture: Design for Persistent Change
Principal Investigator, Latrobe Prize, American Institute of Architects, College of Fellows

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

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

L. Fernandez, W. Lao, K.A. Maruya, R.M. Burgess

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; Founding Director, Global Resilience Institute; 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
Boston Under Snow: Resilience Lessons for the Nation, A Center for Resilience Studies Assessment, Northeastern University, 2016

S. Flynn
The South Carolina Deluge: Lessons from a Watershed Disaster, A Center for Resilience Studies Assessment, Northeastern University, 2016

S. Flynn

S. Flynn
Bolstering Critical Infrastructure Resilience After Superstorm Sandy: Lessons for New York and the Nation, Northeastern University, 2015

S. Flynn
International Resilience Symposium: Understanding Standards for Communities and Built Infrastructure Resilience, National Institute of Standards and Technology, 2015

Measurable Resilience for Actionable Policy, Environmental Science and Technology, 47(18), 2013, 10108-10110

SELECTED RESEARCH PROJECTS

Bolstering Counter-Proliferation Efforts within Global Supply Chains
Principal Investigator, MacArthur Foundation

CRISP Type 2: Interdependent Network-based Quantification of Infrastructure Resilience (INQUIRE)
Co-Principal Investigator, National Science Foundation

Learning from Major Disasters that Disrupt Lifeline-infrastructure
Principal Investigator, U.S. Department of Homeland Security

Resilience Governance for Infrastructure Dependencies and Interdependencies
Principal Investigator, Critical Infrastructure Resilience Institute

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

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

SELECTED RESEARCH PROJECTS

Self-Organizing Traffic Signals
Principal Investigator, National Science Foundation

Bicycle Network Analysis
Principal Investigator, Delaware Department of Transportation
AUROOP GANGULY

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

SELECT PUBLICATIONS
T.J. Vandal, E. Kodra, S. Ganguly, A. Michaelis, R. Nemani, A.R. Ganguly
DeepSD: Generating High Resolution Climate Change Projections through Single Image Super-Resolution, Knowledge Discovery and Data mining, Halifax, Nova Scotia, Canada, 2017
A. Karpatne, G. Atluri, J. Faghmous, M. Steinbach, A. Banerjee, A. Ganguly, S. Shekhar, N. Samatova, V. Kumar
Theory-Guided Data Science: A New Paradigm for Scientific Discovery from Data, IEEE Transactions on Knowledge and Data Engineering, 2017
P. Ganguli, A.R. Ganguly
A.R. Ganguly, D. Kumar, P. Ganguli, G. Short, G. Klausner, J. Klausner
Climate Adaptation Informatics: Water Stress on Power Production, Computing in Science & Engineering, 17(6), 2015, 53-60
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

SELECTED RESEARCH PROJECTS
Deep Machine Learning in the Earth Sciences
Principal Investigator, National Aeronautics and Space Administration
High-Dimensional Statistical Machine Learning for Spatio-Temporal Data, with applications to Climate Science
Principal Investigator, National Science Foundation
Interdependent Network-Based Quantification of Infrastructure Resilience (INQUIRE)
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
Understanding Climate Change: A Data-Driven Approach
Co-Principal Investigator, National Science Foundation

EDGAR GOLUCH

Associate Professor, Chemical Engineering; affiliated faculty, Bioengineering, Civil and Environmental Engineering
PhD, University of Illinois, 2007
che.neu.edu/people/goluch-edgar

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

SELECTED PUBLICATIONS
H.J. Sismaet, A.J. Pinto, E.D. Goluch
Electrochemical Sensors for Identifying Pyocyanin Production in Clinical Pseudomonas Aeruginosa Isolates, Biosensors and Bioelectronics, 97, 2017, 65–69
T.A. Webster, H.J. Sismaet, I.J. Chan, E.D. Goluch
Electrochemically Monitoring the Antibiotic Susceptibility of Pseudomonas aeruginosa Biofilms, Analyst, 140, 2015, 7195-7201
P.N. Abadian, N. Yildirim, A.Z. Gu, E.D. Goluch
SPRi-Based Adenovirus Detection using a Surrogate Antibody Method, Biosensors and Bioelectronics, 74, 2015, 808-814
K. Mathwig, T. Albrecht, E.D. Goluch, L. Rassaei
Challenges of Biomarker Detection at the Nanoscale: Nanopores and Microelectrodes, Analytical Chemistry, 87, 2015, 5470-5475
T.A. Webster, H.J. Sismaet, A.F. Sattler, E.D. Goluch
Improved Monitoring of P. aeruginosa on Agar Plates, Analytical Methods, 7, 2015, 7150-7155 *emerging investigator themed issue
P.N. Abadian, E.D. Goluch
Using Surface Plasmon Resonance Imaging (SPRi) to Evaluate Bacterial Adhesion on Surface Coatings, Analytical Methods, 7, 2015, 115-122, *featured as a hot article in Analytical Methods

SELECTED RESEARCH PROJECTS
EAGER: Bio-Inspired Electrochemical Sensing of Small Molecules Using Antibodies
Principal Investigator, National Science Foundation
IDBR: TYPE A Nano-Constriction Devices for Isolation and Cultivation of Environmental Microbes
Principal Investigator, National Science Foundation
TARIK GOUHIER
Assistant Professor, College of Science; 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
P. Pillai, T.C. Gouhier, S.V. Vollmer
B. Speecker, 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
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

SELECTED RESEARCH PROJECTS
Coral-Microbial Interactions as Determinants of Disease Dynamics
Principal Investigator, National Science Foundation
The Effects of Fine-Scale Temperature and Desiccation Variability on the Distribution of Marine Species
Co-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
D.L. Kimbro, J.E. Byers, J.H. Grabowski, A.R. Hughes, M.F. Piehler
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
Economic Valuation of Ecosystem Services Provided by Oyster Reefs, BioScience, 632, 2012, 900-909

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

Professor and COE Faculty Scholar, Civil and Environmental Engineering; affiliated faculty, Bioengineering, Marine and Environmental Sciences
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: Fellow, Water Environment Federation; College of Engineering Faculty Fellow; National Science Foundation CAREER Award; National Science Foundation Education BRIGE Award; Soren 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, 1769–1776

N. Yildirim, F. Long, C. Gao, M. He, H.C. Shi, A. Gu
Aptamer-Based Optical Biosensor for Rapid and Sensitive Detection of 17 B-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; affiliated faculty, Marine and Environmental Sciences
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; regional 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; Moisissief 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

D. Deniz, J. Song, J.F. Hajjar

T.H. Nguyen, C.H. Le, J.F. Hajjar
Topology Optimization Using the P-Version of the Finite Element Method, Structural and Multidisciplinary Optimization, 2017

M.D. Danavit, 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


Wind-Wave Prediction Equations for Probabilistic Offshore Hurricane Hazard Analysis, Natural Hazards, 2016, 1-22

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, 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, Marine and Environmental Sciences
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
75 Years Since Monod: It is Time to Increase the Complexity of Our Predictive Ecosystem Models (opinion), Ecological Modelling, 346, 2017, 77-87

F.L. Hellweger, R.J. Clegg, J. Clark, C.M. Plugge, J.-U. Kreft
Advancing Microbial Research by Simulation: Teglcnologies for Individual-based Modelling, Nature Reviews Microbiology, 14, 2016, 461-471

F.L. Hellweger, N.D. Fredrick, M.J. McCarthy, W.S. Gardner, S. Wilhelm, H.W. Paerl
Dynamic, Mechanistic, Molecular-Level Modeling of Cyanobacteria: Anabaena and Nitrogen Interaction, Environmental Microbiology, 18(8), 2016, 2721-2731

Ocean Currents Distort Temperature Selection of Plankton: Insights from an Individual-Based Model, PLoS ONE, 11(12), 2016, e0167010

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. Berge
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

SELECTED RESEARCH PROJECTS

Charles River Swimming Water Quality Monitoring and Assessment
Principal Investigator, Charles River Conservancy

Development of a Next Generation Model for Predicting Cyanobacterial Toxicity: Integrating Molecular, Cellular, and Environmental Dynamics
Principal Investigator, Environmental Protection Agency/Sceince to Acheive Results

BRIAN HELMUTH

Professor, Marine and Environmental Sciences; jointly appointed, School of Public Policy and Urban Affairs; 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

Conceptualizing Ecosystem Tipping Points within a Physiological Framework, Ecology and Evolution, 2017

Interacting Environmental Mosaics Drive Geographic Variation in Mussel Performance and Species Interactions, Ecology Letters, 19, 2016, 771-779

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

M. Kearney, A. Matzelle, B. Helmuth

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

Co-Principal Investigator, Northeastern University
A. RANDALL HUGHES
Associate 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
R. Zerebecki, G.M. Crutsinger, A.R. Hughes
A.R. Hughes, F.R. Schenck, J. Bloomberg, T.C. Hanley, D. Feng, T.C. Gouhier, R.E. Beighley, D.L. Kimbro
Biogeographic Gradients in Ecosystem Processes of the Invasive Ecosystem Engineer Phragmites australis, Biological Invasions, 18(9), 2016, 2577-2595
A.R. Hughes, T.C. Hanley, F.R. Schenck, C.G. Hays
Genetic Diversity of Seagrass Seeds Influences Seedling Morphology and Biomass, Ecology, 97, 2016, 3538-3546
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
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

SELECTED RESEARCH PROJECTS
Alabama Center for Ecological Resilience
Principal Investigator, Gulf of Mexico Research Initiative
Principal Investigator, National Science Foundation Biological Oceanography
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

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
M.B. Kane, J. Scruggs, J.P. Lynch
**HARIS KOUTSOPOULOS**

Professor and Associate Chair of Graduate Studies, 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**  
C. Viggiano, H.N. Koutsopoulos, N.H.M. Wilson, J. Attanucci  
Journey-Based Characterization of Multi-Modal Public Transportation Networks, Public Transport Planning and Operations, 9(1-2), 2017, 437-461  
Y. Zhu, H.N. Koutsopoulos, N.H. Wilson  
A Probabilistic Passenger-to-Train Assignment Model Based on Automated Data, Transportation Research B, 2017  
Z. Ma, S. Zhu, H.N. Koutsopoulos, L. Ferreira  
Quantile Regression Analysis of Transit Travel Time Reliability Using Automatic Vehicle Location and Fare Card Data, Transportation Research Record: Journal of the Transportation Research Board, 2017, 2652  
G.E. Sánchez-Martínez, N.H.M. Wilson, H.N. Koutsopoulos  
E. Jenelius, H.N. Koutsopoulos  
Urban Network Travel Time Prediction Based on a Probabilistic Principal Component Analysis Model of Probe Data, IEEE Transactions on Intelligent Transportation Systems, 2017  
Z. Ma, H.N. Koutsopoulos, L. Ferreira, M. Mesbah  
Estimation of Trip Travel Time Distribution Using a Generalized Markov Chain Approach, Transportation Research Part C, 74, 2016, 1-21  
E. Jenelius, H.N. Koutsopoulos  
Travel Time Estimation for Urban Road Networks Using Low Frequency Probe Vehicle Data, Transportation Research Part B, 53, 2013, 64-81 *list of most cited papers since 2012*  

**SELECTED RESEARCH PROJECTS**  
Transport for London (TfL) Research Partnership  
Principal Investigator, TfL  
Mass Transit Railway (MTR) Research Partnership  
Principal Investigator, MTR  

**MICHELINE LABOY**

Assistant Professor, School of Architecture; affiliated faculty, Civil and Environmental Engineering  
MArch, MUP University of Michigan, Ann Arbor, 2005  
civ.neu.edu/people/laboy-michelle  

**Scholarship focus:** building and site systems integration; structures and landscape performance; building and urban resilience; green infrastructure; ecological concepts in design  

**Honors and awards:** Latrobe Prize, American Institute of Architects College of Fellows  

**SELECTED PUBLICATIONS**  
M. Laboy  
M. Laboy  
Landscape as a Conceptual Space for Architecture: Shifting Theories and Critical Practices, The Plan Journal, 0(0), 2016, 71-90  
M. Laboy, D. Fannon  
D. Fannon, M. Laboy  
Teaching Building Science in Design Studio, Journal of the National Institute of Building Sciences, 2016  

**SELECTED RESEARCH PROJECTS**  
Boston LightWells  
Principal Investigator, Boston Groundwater Trust and Autodesk BUILD Grant  
College of Fellows, Latrobe Prize  
Co-Principal Investigator, College of Fellows if the American Institute of Architects  
Future-Use Architecture: Design for Persistent Change  
Co-Principal Investigator, American Institute of Architects  
Resilient Home Online Design Assistant  
Principal Co-Investigator, American Institute of Architects Upjohn Research Initiative
PHILIP LARESE-CASANOVA

Associate Professor, Civil and Environmental Engineering; affiliated faculty, Marine and Environmental Sciences
PhD, University of Iowa, 2006
civ.neu.edu/people/larese-casanova-philip

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

Honors and awards: National Science Foundation CAREER Award

SELECTED PUBLICATIONS

N. Cai, P. Larese-Casanova
Application of Positively-Charged Ethylenediamine-Functionalized Graphene for the Sorption of Anionic Contaminants from Water, Journal of Environmental Chemical Engineering, 4, 2016, 2941-2951

N. Cai, D. Peak, P. Larese-Casanova

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

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; affiliated faculty, Electrical and Computer Engineering
PhD, Massachusetts Institute of Technology, 2012
civ.neu.edu/people/mueller-amy

Scholarship focus: biogeochemistry of natural and engineered systems; in-situ sensors and instrumentation for high-resolution process characterization; remediation and sustainability in natural and built coastal environments; sensor-driven closed-loop controls for resource optimization in engineered systems; signal processing and machine learning, embedded systems, and sensor networks

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

M.S. Orosz, A.V. Mueller

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

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, Royality Research Fund; University of Washington
SÍNAN 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
B. Yildirim, H. Yang, A. Gouldstone, S. Müftü
T. Kaşkici, M.-C. Weng, A. Nayak, T. Goker, S. Müftü
Contact Mechanics of a Thin, Tensioned, Translating Tape with a Grooved Roller, Journal of Tribology, 2017
Dynamics and Extreme Plasticity of Metallic Microparticles in Supersonic Collisions, Nature Scientific Reports, 2017
Q. Sheng, A.J. White, S. Müftü
Indentation of Polytetrafluoroethylene (PTFE) Thin-Film: Simulations by Using Continuum Damage Mechanics, Tribology Transactions, 60(1), 2017, 114-120
H. Yang, J.B.C. Engelen, W.A. Haberle, M. Lantz, S. Müftü
Q. Chen, F.C. Meral, S. Müftü, M. Akcakaya, K. Tuncali
SELECTED RESEARCH PROJECTS
Collaborative Research: Mechano-Lipidomics and Mechano-Cytosis of Drug Delivery Liposomes
Co-Principal Investigator, National Science Foundation
Improving Theoretical Models of Advanced Tape Transport Systems
Principal Investigator, Oracle Corporation
Multi-Scale Investigations of Particle Impact in Cold-Spray
Technical Point of Contact, Army Research Laboratory

SAMUEL MUÑOZ
Assistant Professor, Marine and Environmental Sciences; jointly appointed, Civil and Environmental Engineering
PhD, University of Wisconsin-Madison, 2015
civ.neu.edu/people/munoz-samuel
Scholarship focus: sedimentary records of environmental change, paleoclimate and climate change, rivers and fluvial processes, hydroclimatic extremes
SELECTED PUBLICATIONS
S.E. Munoz, S.G. Dee
El Niño Increases the Risk of Lower Mississippi River Flooding, Scientific Reports, 7, 2017, 1772
J.R. Walsh, S.E. Munoz, M.J. Vander Zanden.
Outbreak of an Undetected Invasive Species Triggered by a Climate Anomaly, Ecosphere, 7(12), 2016, 1-17
S.E. Munoz, K. Gruley, A. Massie, D.A. Fike, S.S. Schroeder, J.W. Williams
Cahokia’s Emergence and Decline Coincided with Shifts of Flood Frequency on the Mississippi River, Proceedings of the National Academy of Sciences, 112(20), 2015, 6319-6324
The Rise of Novelty in Ecosystems, Ecological Applications, 25(8), 2015, 2051-2068
Q. Sheng, A.J. White, S. Müftü
Indentation of Polytetrafluoroethylene (PTFE) Thin-Film: Simulations by Using Continuum Damage Mechanics, Tribology Transactions, 60(1), 2017, 114-120
H. Yang, J.B.C. Engelen, W.A. Haberle, M. Lantz, S. Müftü
Q. Chen, F.C. Meral, S. Müftü, M. Akcakaya, K. Tuncali
SELECTED RESEARCH PROJECTS
Collaborative Research: Mechano-Lipidomics and Mechano-Cytosis of Drug Delivery Liposomes
Co-Principal Investigator, National Science Foundation
Improving Theoretical Models of Advanced Tape Transport Systems
Principal Investigator, Oracle Corporation
Multi-Scale Investigations of Particle Impact in Cold-Spray
Technical Point of Contact, Army Research Laboratory
ANDREW MYERS
Associate Professor, Civil and Environmental Engineering
PhD, Stanford University, 2009
civ.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


S. Hallowell, A.T. Myers

V. Valamanesh, A.T. Myers, S.R. Arwade

S. Hallowell, A.T. Myers
Variability of Breaking Wave Characteristics and Impact Loads on Offshore Wind Turbines Supported by Monopiles, Wind Energy, 19(8), 2015, 1553

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
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

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

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; Associate Director and Chief Technology Officer, Global Resilience Institute

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, E. Vitry, N. Summers, C. Miternine Morphological Plasticity allows Coral to Actively Overgrow the Aggressive Sponge Terpios hoshinata (Mauritius, Southwestern Indian Ocean), Marine Biodiversity, 2015, 1-5


SELECTED RESEARCH PROJECTS

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

Tide Gate Modulation of Wetland Function: Decision Support Through Engineering Best Practices
Principal Investigator, National Science Foundation

Environmental Sustainability

AMEET PINTO

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

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


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


SELECTED RESEARCH PROJECTS

Estimating the Comammox Contribution to Ammonia Oxidation in Nitrogen Removal Systems
Principal Investigator, Water Environment & Reuse Foundation
MATTHIAS RUTH

Professor, 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
S. Dhakal, M. Ruth
B. KC, M. Ruth
The Essential Need for Bidirectional Coupling of Earth System and Human System Models, National Science Review, 3, 2016, 470-494
S. Königstein, M. Ruth, S. Gössling-Reisemann
R. Fazeli, M. Ruth, B. Davidsdóttir
Temperature Response Functions for Residential Energy Demand - A Review of Models, Urban Climate, 2016, 45-59
T. Yuanhong, M. Ruth, D. Zhu
Using the IPAT Identity and Decoupling Analysis to Estimate Water Footprint Variations for Five Major Food Crops in China from 1978 to 2010, Environment, Development and Sustainability, 16(5), 2016, 1-21

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, M. Sasani
J.A. Murray, M. Sasani
Seismic Hybrid Simulation of a Nonductile RC Building with Severe Damage to Multiple Columns, Earthquake Engineering and Structural Dynamics, 46, 2017, 733–752
C. Wan, C. Audi, M. Sasani
Modeling Floor Systems for Collapse Analysis, Engineering Structures, 127, 2016, 278–286
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
J.A. Murray, M. Sasani, X. Shao
Hybrid Simulation for System-Level Structural Response, Engineering Structures, 103, 2015, 228-238
S. Sagiroglu, M. Sasani
J.A. Murray, M. Sasani

SELECTED RESEARCH PROJECTS
A Decision and Design Framework for Multi-Hazard Resilient and Sustainable Buildings (RSB)
Principal Investigator, National Science Foundation
Near Collapse Performance of Existing RC Concrete Frame Buildings (NEESR)
Principal Investigator, National Science Foundation
THOMAS SHEAHAN
Sr. Associate Dean for Academic Affairs; Professor, Civil and Environmental Engineering; Training Core Leader, PROTECT Center
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
D. Meric, F. Hellwegar, A.N. Alshawabkeh, T.C. Sheahan
Nonlinear Nonequilibrium One-Dimensional Large-Strain Consolidation-Coupled Contaminant Transport Model of Capped Sediments, American Society of Civil Engineers Journal of Geotechnical and Geoenvironmental Engineering, 143(8), 2017
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
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 Macroalgae Ulva Rigida, Marine Pollution Bulletin, 88(1-2), 2014, 207-214

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
C.M. Shillaber, J.K. Mitchell, J.E. Dove
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
J.E. Dove, C.M. Shillaber, T. Becker, A. Wallace, P. Dove
MICHAEL B. SILEVITCH

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

PhD, Northeastern University, 1971
coe.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

JENNIE C. STEPHENS

Dean’s Professor of Sustainability Science and Policy, School of Public Policy and Urban Affairs; affiliated faculty, Civil and Environmental Engineering; Associate Director of Strategic Research Collaborations, Global Resilience Institute

PhD, California Institute of Technology, 2002
coe.neu.edu/people/stephens-jennie

Scholarship focus: renewable energy transformation, reducing fossil fuel reliance, energy resilience, energy democracy, integrating social justice with climate and energy innovations

SELECTED PUBLICATIONS

J.C. Stephens, D. Kopin, E.J. Wilson, T.R. Peterson

N. Markusson, M.D. Gjefsen, J.C. Stephens, D. Tyfield
The Political Economy of Technical Fixes: The (mis)alignment of Clean Fossil and Political Regimes, Energy Research and Social Science, 23, 2017, 1-10

P.C. Frumhoff, J.C. Stephens
The Siren Call of US Funding for Solar Geoengineering Research, Forum on US Solar Geoengineering Research, Harvard University and University of California, Los Angeles School of Law, 2017

Smart Grid Electricity System Planning and Climate Disruptions: A Review of Climate and Energy Discourse Post-Superstorm Sandy, Renewable and Sustainable Energy Reviews, 2017

E.M. Cody, J.C. Stephens, J.P. Bagrow, P.S. Dodds, C.M. Danforth
Transitions in Climate and Energy Discourse Between Hurricanes Katrina and Sandy, Journal of Environmental Studies and Science, 2016

R. Pearl-Martinez, J.C. Stephens
Toward a Gender Diverse Workforce in the Renewable Energy Transition, Sustainability: Science, Practice and Policy, 12(1), 2016

J.C. Stephens, E.J. Wilson, T.R. Peterson
ARON STUBBINS
Associate Professor, Marine and Environmental Sciences; jointly appointed, Civil and Environmental Engineering, Chemistry and Chemical Biology (joining January 2018)

PhD, Newcastle University, 2002
civ.neu.edu/people/stubbins-aron

Scholarship focus: aquatic environmental chemistry; carbon cycle; freshwater, coastal and ocean biogeochemistry; feedbacks between natural biogeochemical cycles and climate change; aquatic microplastics

SELECTED PUBLICATIONS
A. Stubbins, L.M. Silva, T. Dittmar, J.T. Van Stan
A. Stubbins
A Carbon for Every Nitrogen, Proceedings of the National Academy of Sciences, 113(39), 2016, 10736-10738
M.A. Moran, E.B. Kujawinski, A. Stubbins, R. Fatland, et. al.
Global Charcoal Mobilization from Soils via Dissolution and Riverine Transport to the Oceans, Science, 340(6130), 2013, 345-347

SELECTED RESEARCH PROJECTS
Linking Microbial Diversity, Gene Expression, and the Transformation of Terrestrial Organic Matter in Major U.S. Rivers
Principal Investigator, National Science Foundation
The Pulse-Shunt Concept: A Conceptual Framework for Quantifying and Forecasting Watershed DOM Fluxes and Transformations at the MacroSystem Scale
Principal Investigator, National Science Foundation
Transforming our Understanding of Carbon Dioxide Photoproduction in Oceanic Waters
Principal Investigator, National Science Foundation

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
R. Tapia, D.D. Gransberg, A. Touran
Managing Scheduling Risk due to Geotechnical Uncertainty Using Linear Scheduling, Proceedings of the Transportation Research Board, Washington, D.C., 2017
R. Masoumi, A. Touran
A. Touran, J. Liu
A.P. Gurgun, A. Touran
Public-Private Partnership Experience in the International Arena: Case of Turkey, Journal of Management in Engineering, 30(6), 2014

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
SARA WADIA-FASCETTI

Vice Provost, PhD Network; Professor, Civil and Environmental Engineering

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

K. Belli, C. Rappaport, S. Wadia-Fascetti

SELECTED RESEARCH PROJECTS

Northeastern ADVANCE
Principal Investigator, National Science Foundation

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

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

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

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

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

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

SELECTED PUBLICATIONS

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

X. Wang, B. Li, J. Hao, Y.J. Jung, K.-T. Wan

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


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

SELECTED RESEARCH PROJECTS

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

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

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

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

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

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

N. Martino, K. Maser, R. Birken, M.L. Wang

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, M.L. Wang

Y. Zhang, G. McDaniel, M.L. Wang

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
MISHAC YEGIAN
COE Distinguished Professor, Civil and Environmental Engineering
PhD, Massachusetts Institute of Technology, 1976
civ.neu.edu/people/egian-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
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

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
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

SELECTED RESEARCH PROJECTS
Neighborhood Connectivity and Social Inequality: Urban Travel Imbalances Based on Google Traffic Data
Principal Investigator, Northeastern University
Urban Geosocial Network Resilience
Principal Investigator, Northeastern University Global Resilience Institute Seed-Funding Program and Microsoft Azure for Research
Wei Cui
PhD 2017, Civil Engineering; Advisor, Luca Caracoglia

PERFORMANCE-BASED DESIGN FRAMEWORK FOR 3D COUPLED WIND-INDUCED RESPONSE OF TALL BUILDINGS IN TURBULENT WINDS

In this study, a novel performance-based analysis framework for tall building structures, located in hurricane-prone regions of the United States, is proposed and introduced. This framework consists of four integral parts: (1) long-term hurricane wind speed prediction model, (2) probabilistic 3D coupled aerodynamic and structural response for tall buildings, (3) wind tunnel testing procedure and protocols to examine the effect of wind load experimental errors on the predictions of building response, (4) numerical analysis method to combine and integrate the results of the three initial parts.

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

Noushin Fallahpour
PhD 2016, Environmental Engineering; Advisor, Akram K. Alshawabkeh

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

In this study, a series of experiments are conducted to (1) evaluate the effect of co-existing organic and inorganic compounds on the electrochemical dechlorination of trichloroethylene (TCE) in simulated karst media; and (2) assessment of the impacts of high groundwater flow rates in the presence of palladium (Pd) catalyst on TCE transformation rate and the accumulation of precipitates.

See full dissertation at coe.neu.edu/17/NoushinFallahpour
SELECTED PhD THESES

Angelina Louise Jay
PhD 2017, Civil Engineering; Advisor, Andrew T. Myers

EXPERIMENTAL INVESTIGATION OF THE LOCAL BUCKLING AND FATIGUE BEHAVIOR OF SLENDER AND TAPERED SPIRALLY WELDED STEEL TUBES TO ENABLE TALLER WIND TOWERS

The research completed in this dissertation provides an experimental foundation for the design of slender spirally welded tubes for use as wind towers. The work includes large scale testing to assess flexural local buckling strength and performance, including experimental assessment of residual stress fields, detailed measurements of the initial imperfect geometry of the tube, measurements of local deformation during and after the completion of each test to enable analysis of the onset and evolution of local buckling, and an experimental investigation into the fatigue behavior of the weld intersection detail. These experimental results are intended to inform existing codified design methodologies and to enable non-existing, but more sophisticated design procedures.

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

Reza Ghasemizadeh
PhD 2016, Civil and Environmental Engineering; Advisor, Akram N. Alshawabkeh

MODELING GROUNDWATER FLOW AND CONTAMINANT TRANSPORT IN THE NORTH COAST LIMESTONE KARST AQUIFER SYSTEM OF PUERTO RICO

Our first study applies an Equivalent Porous Media (EPM) approach to simulate groundwater hydraulics and contaminant transport in NPR karst aquifers. The water-table fluctuation results indicate that the model can practically reflect the steady-state groundwater hydraulics (normalized RMSE of 12.4%) and long-term variability (normalized RMSE of 3.0%) at regional and intermediate scales. Additionally, the EPM approach is capable to reproduce the spreading of a TCE plume at intermediate scales with sufficient accuracy (normalized RMSE of 8.45%). While the field data sparsity often limits the ability to locate and characterize the conduit system, a method is introduced in our second study for modeling the karst conduits. Connecting sinkholes and springs, implemented drain cells improve the developed regional model by simulating the drainage effects of conduit networks on local groundwater table.

See full dissertation at coe.neu.edu/17/RezaGhasemizadeh
Anshuman Kunwar
PhD 2017, Civil Engineering; Advisor, Dionisio Bernal

SYSTEM IDENTIFICATION FREE DAMAGE LOCALIZATION

One of the most widely used frameworks for vibration based structural damage identification involves characterizing damage as changes in the modal parameters of the structure between reference and damaged states respectively. Modal parameters are derived from the responses measured from the structure by implementing system identification. The sensitivity of the identified modal parameters to noise and lack thereof to the damage lead to inaccurate identification of parameters and incorrect damage characterization. As an obvious approach to circumvent problems associated with system identification, system identification free damage localization seems a worthwhile venture.

Steady State Shift Damage Localization (S3DL) is the major damage localization technique developed in this thesis. S3DL operate with two different frequency domain vector spaces. One of the vector spaces are derived from the Fourier transform of the measured responses in undamaged and damaged states and regarded as experimental subspace and the other one is called model subspace, formed by using the model of the undamaged structure and the postulated damage. The method operates under the premise that the spatial distribution of loads is invariant in undamaged and damaged state. The method does not require the time histories of the loads.

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

Yifeng Lu
PhD 2016, Interdisciplinary; Advisor, Ming L. Wang

MOBILE ACOUSTIC SENSING OF SURFACE WAVES FOR ROAD SUBSURFACE ASSESSMENT

Efficient and economical solutions for monitoring the conditions of transportation infrastructure are in urgent and critical demand in United States. The current state of road and bridge network health of United States has fallen into disturbing circumstances according to recent report cards administered by the American Society of Civil Engineering (ASCE). In 2013, road conditions scored a D and bridges received a grade of C+. The national transportation infrastructure conditions affect not only the lives of average people utilizing roadways, but also the economic efficiency and security of the country. Efforts to monitor the health of transportation infrastructure include examinations of both surface and subsurface levels. Diagnosing problems at the subsurface level is equally as vital for transportation infrastructure as identifying surface level issues. One major technique used to study the state of subsurface infrastructure is the surface wave method which uses mechanical vibration measurements nondestructively. The subsurface profile information, such as stiffness and layer thickness, is measured from the dispersion characteristics of the ground by exciting surface waves and then picking up their vibration responses.

See full dissertation at coe.neu.edu/17/YifengLu
Justin Adam Murray
PhD 2016, Civil Engineering; Advisor, Mehrdad Sasani

EVALUATING SEISMIC COLLAPSE RESISTANCE OF NON-DUCTILE RC FRAME STRUCTURES

In this project, to evaluate the seismic response of nonductile RC frame structures at both the element and system levels, a series of four hybrid simulations were conducted on RC structures representative of pre-1970s construction under severe seismic ground motion. Hybrid simulation is a method which combines physical test specimens with an analytical model to capture the response of an entire system. In each simulation, multiple full-scale RC columns were tested at the Multi-Axial Full Scale Sub-Structured Testing & Simulation (MUST-SIM) lab at the University of Illinois at Urbana Champaign. The remainder of the full three-dimensional structural system was modeled analytically in the computer program OpenSees. Shear-axial failures occurred in the physical specimens as a result of the ground motion, and the hybrid nature of the test allowed for study of the system-level response of the surrounding structural system.

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

Leila Pourzahedi
PhD 2016, Environmental Engineering; Advisor, Matthew J. Eckelman

ENVIRONMENTAL IMPACT ASSESSMENT OF NANOPARTICLES AND NANO-ENABLED PRODUCTS USING LCA FRAMEWORKS

This work makes meaningful contributions to the field of nano-LCA through generation of consistent and comparative life cycle inventory data sets on manufacturing nanoparticles and nano-enabled products, as well as model development through function-based expression of results. Findings of these studies could potentially influence material and process selection, help prioritize of research and development measures including green chemistry efforts, and guide evolving policy discussions on nano labeling and regulation.

See full dissertation at coe.neu.edu/17/LeilaPourzahedi
Mithun Saha
PhD 2016, Environmental Engineering; Advisor, Matthew J. Eckelman

GEOSPATIAL MODELING OF URBAN BUILDINGS AND LAND USE FOR CLIMATE CHANGE IMPACTS AND RESOURCE PRODUCTIVITY

Urbanization is expected to continue, with more than two-thirds of the world’s population likely to live in urban areas by 2050, leading to a net urban influx of approximately 2.5 billion people. Existing infrastructure must be equipped to address this dramatic urban growth while also adapting to potential adverse impacts of climate change and other natural hazards. To be sustainable, cities must themselves, become efficient users of materials and energy as well as respond to future climatic conditions. Two main urban engineering strategies are to map how current stocks may respond to climate change and to identify resources that could be used to improve local productive capacity and reduce dependencies on distant resources. The dissertation herein addresses these two overarching strategies through a series of specific case studies for the Boston area using GIS based urban stock assessment as a framework.

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

Alexandra Eileen Penney Schellenger
PhD 2016, Environmental Engineering; Advisor, Philip Larese-Casanova

OXYGEN ISOTOPE EFFECTS IN SELENATE DURING SELENIUM REDOX CYCLING

This work develops the applicability of oxygen stable isotope analysis for the purpose of identifying and examining selenium oxyanion transformations and immobilization in natural systems. Oxygen isotopes may be used in conjunction with selenium isotopes to provide a more complete picture of selenium cycling. The immobilization of selenate via reduction by the layered double hydroxide (LDH) chloride green rust was found to cause a fractionation in the oxygen isotope of selenate, resulting in enrichment of the heavier isotope (22.7‰) much larger than the one identified for selenium isotopes for reduction by green rust. The biotic reduction of selenate by the bacterium Sulfospirillum barnesi resulted in enrichment of the heavy oxygen isotope (1.5-5.8‰) that was distinct from the value found for reduction by green rust, indicating that these isotopes may be useful for distinguishing between the two dominant methods of selenate reduction in natural systems. These experiments also suggest that mass transfer prior to reduction may have a muting effect on fractionation of the oxygen isotope. Kinetic questions raised by the isotope work with chloride green rust were addressed through sorption experiments of selenate and selenite by the non-reducing LDH pyroaurite.

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COVER IMAGE

Ameet Pinto, assistant professor, and Maria Sevillano, PhD’20, work on preparing samples for DNA extraction to characterize nitrifying bacteria in full-scale wastewater treatment plants.