Engineering for Society
Boldly innovating to better our world

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2017 | 2018
SCHOLARSHIP REPORT
Civil and Environmental Engineering
Dear Friends,

Our department is on the move. As new opportunities impact our discipline, Northeastern University’s Department of Civil and Environmental Engineering is meeting them with timely innovation, vital research, and experiential education for our students.

Our department is strategically focused on urban engineering, preparing students for the great challenges of our time by exploring the unique ways in which the built and natural environment interact. Utilizing the latest advances in simulation, smart sensing, data and network science, and urban informatics, our faculty are conducting critical research in civil infrastructure security, environmental health, and sustainable resource engineering.

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

Over the last eight years, we have seen dramatic growth. The department’s faculty and graduate populations have both more than doubled, and we continue to expand our degree offerings at both the undergraduate and graduate levels. Our newly opened 220,000 square-foot Interdisciplinary Science and Engineering Complex advances our commitment as a top tier research institution, providing faculty and students with access to the highest quality, state-of-the-art laboratories.

Our scholars are engineering a resilient and sustainable future through leading-edge research. This fifth annual scholarship report details the exceptional academic and professional accomplishments of our faculty and Ph.D. candidates for the 2017-2018 year. For the latest highlights, please visit us at northeasten.edu/tomorrow. We look forward to building a better world together.

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

RECENT HIRES:
Qin Jim Chen  
PhD, Old Dominion University
Aron Stubbins  
PhD, Newcastle University
Hao Sun  
PhD, Columbia University

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

STATE-OF-THE-ART RESEARCH CENTERS
funding by eight federal agencies

ENGINEERING DEPARTMENTS
Bioengineering  
Chemical Engineering  
Civil and Environmental Engineering  
Electrical and Computer Engineering  
Mechanical and Industrial Engineering
FACULTY BY RESEARCH THRUSTS

**CIVIL INFRASTRUCTURE SECURITY**
George Adams
Joseph Ayers
Dionisio Bernal
Luca Caracoglia
Qin Jim Chen
Daniel Dulaski
Stephen Flynn
Peter Furth
Auroop Ganguly
Jerome Hajjar
Michael Kane
Haris Koutsopoulos
Yiannis Levdinis
Sinan Müftü
Andrew Myers
Mark Patterson
Mehrdad Sasani
Thomas Sheahan
Craig Shillaber
Michael B. Silevitch
Hao Sun
Ali Touran
Sara Wadia-Fascetti
Ming Wang
Qi Ryan Wang
Mishac Yegian

**ENVIRONMENTAL HEALTH**
Akram Alshawabkeh
R. Edward Beighley
Qin Jim Chen
Matthew Eckelman
Loretta Fernandez
Auroop Ganguly
Edgar Goluch
Tarik Gouhier
Jonathan Grabowski
Brian Helmuth
A. Randall Hughes
Philip Larese-Casanova
Amy Mueller
Samuel Muñoz
Annalisa Onnis-Hayden
Mark Patterson
Ameet Pinto
Thomas Sheahan
Aron Stubbins
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
Michelle Laboy
Mark Patterson
Craig Shillaber
Jennie C. Stephens
Ali Touran
Geoffrey Trussell
Ming Wang
Qi Ryan Wang
Assistant Professor Loretta Fernandez’s pilot study on using polyethylene passive samplers to monitor potential PCB transport across the engineered cap at the Grasse River Superfund site has received a $405K grant in collaboration with the U.S. Army Engineer Research and Development Center from the Environmental Protection Agency.

Assistant Professor Amy Mueller, in collaboration with the University of Washington and California Institute of Technology, will work on a $2.7M grant, titled “Implementation of a synthetic Anammox bio-granular technology in the main wastewater treatment line” and funded by DARPA’s Biological Robustness in Complex Settings program to increase the robustness of Anammox technology for municipal scale-applications in the main processing stream.

Professor Ming Wang received a patent for creating a “Real-time pavement profile sensing system using air-coupled surface wave,” and a patent for “Conformal & configurable millimeter-wave integrated array radar in a compact package.”

Associate Professor Matt Eckelman and his former PhD student Mithun Saha won the Clemens Herschel Award from the Boston Society of Civil Engineers section of the American Society of Civil Engineers, for their paper, entitled “Urban Scale Mapping of Concrete Degradation from Projected Climate Change.”

Assistant Teaching Professor Annalisa Onnis-Hayden won the 2017 Clair N. Sawyer Award from the New England Water Environmental Association (NEWEA) for her distinguished service to the association such as chairing the NEWEA Student Activity Committee, being a member of the Public Education Committee, and serving as the advisor for the Northeastern NEWEA student chapter.

Assistant Professor Ameet Pinto was awarded a National Science Foundation CAREER award for “Developing a Spatial-Temporal Predictive Framework for the Drinking Water Microbiome.” His project seeks to revolutionize the current United States drinking water monitoring system of “detect and mitigate” toward a proactive one of “predict and correct.” Pinto was also selected as the recipient of the 2018 International Society of Microbial Ecology/International Water Association Bio Cluster Award in the Rising Star Category.

Chair and Professor Jerome Hajjar was selected by Northeastern University for the prestigious annual Robert D. Klein Lecture where he presented his research on the need for “Urban Engineering: New Designs for a Resilient and Sustainable Future.”

Professor Auroop Ganguly’s climate analytics spinout company from his Sustainability and Data Sciences Laboratory, risQ, received a $750K Small Business Innovation Research (SBIR) Phase II grant from the National Science Foundation for continued research and development of its Climate Risk Analytics Platform. In addition, Ganguly was selected as a United Nations Environmental Effects Assessments Panel (UN EEP) review member to the upcoming 2018 quadrennial assessment report.

Assistant Professor Samuel Munoz was awarded a $595K grant from the National Science Foundation for “Extreme Floods on the Lower Mississippi River in the Context of Late Holocene Climatic Variability” in collaboration with the Woods Hole Oceanographic Institution and Coastal Carolina University.

Assistant Professor Qi “Ryan” Wang and Associate Professor Yingzi Lin, mechanical and industrial engineering, were awarded a grant from the National Science Foundation for “Personalized Systems for Wayfinding for First Responders.” The project will test the theoretical foundation of personalized wayfinding information systems that can effectively minimize the cognitive load of first responders on the individual level.

Professor Auroop Ganguly, civil and environmental engineering (CEE), Professor Edmund Yeh, electrical and computer engineering, and affiliated CEE Professor Stephen Flynn in collaboration with the College of Science and College of Computer and Information Science were awarded a $2.5 million National Science Foundation CRISP grant for “Interdependent Network-based Quantification of Infrastructure Resilience (INQUIRE).”

Interdisciplinary Engineering PhD student Lizzy Warner was part of a two-person team that won the top prize at the Department of Homeland Security Center of Excellence Summit for their interactive map that illustrates how critical infrastructure in Boston are connected to each other.

Erin Dillmann, E’20 and Michael Torrney, E’20, received the prestigious 2018 President’s Scholarship awarded by the American Council of Engineering Companies of Massachusetts Education Corporation. They were one of only eight nationwide that received an ACEC scholarship in 2018.
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.G. Adams

N.K. Mohammadi and G.G. Adams
Self-Excited Oscillations of a Finite-Thickness Elastic Layer Sliding Against a Rigid Surface With a Constant Coefficient of Friction, Journal of Applied Mechanics, 85(2), 2018

D. Hu and G.G. Adams

A. Basu, G.G. Adams, N.E. McGruer

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

D. Hu, G.G. Adams

G.G. Adams

AKRAM ALSHAWABKEH

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

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; ASCE Thomas A. Middlebrooks Award; National Science Foundation CAREER Award; Søren Buus Outstanding Research Award, College of Engineering

SELECTED PUBLICATIONS

A. Cathey, K.K. Fergusson, T.F. McElrath, D.E. Cantonwine, G. Pace, A.N. Alshawabkeh, J.F. Cordero, J.D. Meeker,
Distribution and Predictors of Urinary Polycyclic Aromatic Hydrocarbon Metabolites in Two Pregnancy Cohort Studies, Environmental Pollution, 232, 2018, 556-562

W. Zhou, L. Rajic, Y. Zhao, J. Gao, Y. Qin, A.N. Alshawabkeh
Rates of H2O2 Electrogeneration by Reduction of Anodic O2 at RVC Foam Cathodes in Batch and Flow-Through Cells, Electrochimica Acta, 277, 2018, 185-196

The Influence of Hydrogeological and Anthropogenic Variables on Phthalate Contamination in Eogenetic Karst Groundwater Systems, Environmental Pollution, 237, 2018, 298-307

Genotoxicity Assessment of Drinking Water Disinfection Byproducts by DNA Damage and Repair Pathway Profiling Analysis, Environmental Science & Technology, 52(11), 2018, 6565-6575

S. Hojabri, L. Rajic, A.N. Alshawabkeh

SELECTED RESEARCH PROJECTS

Puerto Rico Testsite for Exploring Contamination Threats (PROTECT)
Principal Investigator, National Institutes of Health

The Center for Research on Early Childhood Exposure and Development in Puerto Rico (CRECE)
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
coe.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. 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

F. Schenck, T.C. Hanley, R.E. Beighley, A.R. Hughes

R. Raoufi, and R.E. Beighley,

Absolute water storages in the Congo River floodplains from integration of InSAR and satellite radar altimetry, Remote Sensing of the Environment, 201, 2017, 57-72


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

SELECTED RESEARCH PROJECTS

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

Collaborative Research: Reevaluating precipitation extremes and flood hazard in the wake of Hurricane Harvey
Co-Principal Investigator, National Science Foundation, Hydrologic Sciences
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: Moisiseff Award, American Society of Civil Engineers

SELECTED PUBLICATIONS
D. Bernal
Eigenvalue Sensitivity of Sampled Systems Operating in Closed-Loop, Mechanical Systems and Signal Processing, 105, 2018, 481-487

D. Bernal
State Observers in the Design of Eigenstructures for Enhanced Sensitivity, Mechanical Systems and Signal Processing, 110, 2018, 22-30

D. Bernal, M.R. Ulriksen

D. Bernal

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

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

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, cable dynamics; climate change

Honors and awards: National Science Foundation CAREER Award

SELECTED PUBLICATIONS
L. Caracoglia
Modeling the Coupled Electro-Mechanical Response of a Torsional-Flutter-Based Wind Harvester with a Focus on Energy Efficiency Examination, Journal of Wind Engineering and Industrial Aerodynamics, 174, 2018, 437-450

V. Le, L. Caracoglia
Computationally Efficient Stochastic Approach for the Fragility Analysis of Vertical Structures Subjected to Thunderstorm Downburst Winds, Engineering Structures, 176, 2018, 152-169

W. Cui, L. Caracoglia
A Unified Framework for Performance-Based Wind Engineering of Tall Buildings in Hurricane-Prone Regions Based on Lifetime Intervention-Cost Estimation, Structural Safety, 73, 2018, 75-86

W. Cui, L. Caracoglia

F. Rizzo, L. Caracoglia
Examination of Experimental Errors in Scanlan Derivatives of a Closed-Box Bridge Deck, Wind and Structures, 26(4), 2018, 231-251

L. Ierimonti, I. Venanzi, L. Caracoglia
Life-Cycle Damage-Based Cost Analysis of Tall Buildings Equipped with Tuned Mass Dampers, Journal of Wind Engineering and Industrial Aerodynamics, 176, 2018, 54-64

G. Abbiati, V. La Salandra, O.S. Bursi, L. Caracoglia
A Composite Experimental Dynamic Substructuring Method Based on Partitioned Algorithms and Localized Lagrange Multipliers, Mechanical Systems and Signal Processing, 100, 2018, 85–112

T.H. Le, L. Caracoglia

SELECTED RESEARCH PROJECTS
Collaborative Research: Active Control of Nonlinear Flow-Induced Instability of Wind Turbine Blades under Stochastic Perturbations
Principal Investigator, National Science Foundation
QIN JIM CHEN
Professor, Civil and Environmental Engineering; jointly appointed, Marine and Environmental Sciences
PhD, Old Dominion University, 1997
civ.neu.edu/people/chen-qin-jim

Scholarship focus: coastal engineering and science, particularly in coastal hydrodynamics, fluid-structure interactions, natural and nature-based solutions, coastal hazard assessment and mitigation, and numerical modeling for coastal resiliency and sustainability

Honors and awards: James M. Todd Technological Accomplishment Medal, LES-BTR, 2018; Best Paper Award, Louisiana Association of Professional Biologists, 2017; LSU Rainmakers Award for innovative research, 2009; National Science Foundation (NSF) CAREER Award, 2006

SELECTED PUBLICATIONS
K. Liu, Q. Chen, K. Hu, K. Xu, R. Twilley
Modeling Hurricane-Induced Wetland-Bay and Bay-Shelf Sediment Fluxes, Coastal Engineering, 135, 2018, 77-90
K. Hu, Q. Chen, H. Wang, E.K. Hartig, P.M. Orton
Numerical Modeling of Salt Marsh Morphological Change Induced by Hurricane Sandy, Coastal Engineering 132, 2018, 63-81
L. Zhu, Q. Chen, Y. Ding, N. Jafari J.D. Rosati
A Semi-Analytical Model of Depth-Integrated Vegetal Drag Force Based on Stokes Second-Order Wave Theory, Journal of Waterway, Port, Coastal and Ocean Engineering, 2018
Q. Chen, W. Wu, L. Zhu
Recent Developments in Numerical Modeling of Coastal Hydrodynamics and Sediment Transport, Advances In Coastal Hydraulics, 2018, 145-198
T. Everett, Q. Chen, K. Karimpour, R. Twilley
Quantification of Swell Energy and its Impact on Wetlands in a Deltaic Estuary, Estuaries and Coasts, 2018

SELECTED RESEARCH PROJECTS
A Coastal Resilience Collaboratory: Cyber-enabled Discoveries for Sustainable Deltaic Coasts
Principal Investigator, National Science Foundation
Collecting Ecological Data and Models of Living Shoreline Restoration Projects (MD, NJ, NY, VA).
Principal Investigator, U.S. Geological Survey
Updating USACE's Nearshore Coastal Numerical Model to Calculate Benefits of Vegetated Shorelines
Principal Investigator, U.S. Army Corps of Engineers
Integrating High-Fidelity Models with New Remote Sensing Techniques to Predict Storm Impacts on Louisiana Coastal and Deltaic Systems.
Principal Investigator, Department of the Treasury RESTORE Act Center of Excellence for Louisiana
Coastal Flood Prediction and Mitigation: Integrating High-Fidelity Computer Models with Field Observations.
Principal Investigator, Global Resilience Institute

MATTHEW ECKELMAN
Associate Professor and Associate Chair for Research, 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 Laudise Prize in Industrial Ecology

SELECTED PUBLICATIONS
R. Phillips, L. Troup, D.J. Fannon, M.J. Eckelman
M.J. Eckelman, J.S. Sherman
Q. Tu, M.J. Eckelman, J.B. Zimmerman
Meta-analysis and Harmonization of Life Cycle Assessment (LCA) Studies for Algae Biofuels, Environmental Science & Technology 51(17), 2017, 9419-9432
L. Pourzahedi, M. Vance, M.J. Eckelman
M. Saha, M.J. Eckelman
A Geospatial Assessment of Ground Level and Rooftop Urban Agriculture Potential in Boston, USA, Landscape and Urban Planning 165, 2017, 130-141

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; resilient buildings; human comfort within the built environment

**SELECTED PUBLICATIONS**

H. Deng, D. Fannon, M. Eckelman

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

M. Laboy, D. Fannon

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

**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

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**LORETTA FERNANDEZ**

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

PhD, MIT, 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:** Research Associateship, National Research Council; Graduate Research Fellowship, National Science Foundation

**SELECTED PUBLICATIONS**

Cross Validation of Two Partitioning-Based Sampling Approaches in Mesocosms Containing PCB Contaminated Field Sediment, Biota, and Activated Carbon Amendment, *Environmental Science & Technology*, 51(17), 2017, 9996-10004.


L. Fernandez, P.M. Gschwend

**SELECTED RESEARCH PROJECTS**

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

Laboratory and Field Pilot Study on Using Polyethylene Passive Samplers to Monitor Potential PCB Transport Across the Engineered Cap at the Grasse River Superfund Site
Principal Investigator, U.S. EPA
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, MIT, 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, MIT, 2002
civ.neu.edu/people/ganguly-auroop

Scholarship focus: climate extremes and water sustainability; critical infrastructures and homeland security; nonlinear dynamics and artificial intelligence

Honors and awards: Runner-up Best Paper Award, ACM KDD 2017; First Prize at AGU Virtual Poster Spring 2017; Lead Author for Artificial Intelligence section in Sustained US National Climate Assessments; United Nations Environment Program Review Panel

SELECT PUBLICATIONS
A.R. Ganguly, U. Bhatia, S. Flynn
T. Vandal, E. Kodra, S. Ganguly, A. Michaelis, R. Neman, A.R. Ganguly
T. Vandal, E. Kodra, J. Dy, S. Ganguly, R. Neman, and A.R. Ganguly
Quantifying Uncertainty in Discrete-Continuous and Skewed Data with Bayesian Deep Learning, KDD, 24th ACM SIGKDD Conference on Knowledge Discovery and Data Mining, 2018
K. Clark, U. Bhatia, E. Kodra, A.R. Ganguly
P. Ganguli, D. Kumar, A.R. Ganguly

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
Quantification of Colloidal Filtration of Polystyrene Micro-Particles on Glass Substrate Using a Microfluidic Device, Colloids and Surfaces B: Biointerfaces 165, 2018, 381-387
C.R. Santiveri, H.J. Sismaet, M. Kimani, E.D. Goluch
Electrochemical Detection of Pseudomonas Aeruginosa in Polymicrobial Environments, ChemistrySelect, 3(11), 2018, 2926-2930
H.J. Sismaet, E.D. Goluch
Electrochemical Probes of Microbial Community Behavior, Annual Review of Analytical Chemistry, 2018
P.N. Abadian, P.J. Buch, E.D. Goluch, J. Li, Z. Zhang
Real-Time Monitoring of Urinary Encrustation Using a Quartz Crystal Microbalance, Analytical chemistry 90 (3), 2018, 1531-1535
E.D. Goluch
Microbial Identification Using Electrochemical Detection of Metabolites, Trends in Biotechnology, 35(12), 2017, 1125-1128
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
Device and Method for High Throughput Bacterial Isolation
N. Tandogan, P.N. Abadian, B. Huo, E.D. Goluch
Characterization of Bacterial Adhesion and Biofilm Formation, Antimicrobial Coatings and Modifications on Medical Devices, 2017, 67-95

SELECTED RESEARCH PROJECTS
SBIR Phase I: Point-of-Care Test for Identifying Gram-Negative Urinary Tract Infections in Companion Animals
Principal Investigator, National Science Foundation
TARIK GOUHIER
Associate Professor, College of Science; affiliated faculty, Civil and Environmental Engineering
PhD, McGill University, 2010
civ.neu.edu/people/gouhier-tarik

Scholarship focus: statistical and dynamical modeling; theoretical ecology

SELECTED PUBLICATIONS
P. Pillai, T.C. Gouhier, S.V. Vollmer

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

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

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
FACULTY

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; 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

B. Güldür Erkal, J.F. Hajjar

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

V.V. Saykin, T.H. Nguyen, J.F. Hajjar, D. Deniz, J. Song
Material Characterization Using Finite Element Deletion Strategies for Collapse Modeling of Steel Structures, Engineering Structures, 147, 2017, 125-133

T.H. Nguyen, C.H. Le, J.F. Hajjar
Topology Optimization Using the P-version of the Finite Element Method, Structural and Multidisciplinary Optimization, 56(3), 2017, 571-586


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, 04015157

SELECTED RESEARCH PROJECTS
Post-Disaster Infrastructure Assessment with Non-conventional Operations (PIANO) of Unmanned Aerial Systems
Co-Principal Investigator, Department of Homeland Security

CRISP Type 2: Identification and Control of Uncertain, Highly Interdependent Processes Involving Humans with Applications to Resilient Emergency Health Response
Co-Principal Investigator, National Science Foundation

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

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

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


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

SELECTED RESEARCH PROJECTS
Post-Disaster Infrastructure Assessment with Non-conventional Operations (PIANO) of Unmanned Aerial Systems
Co-Principal Investigator, Department of Homeland Security

CRISP Type 2: Identification and Control of Uncertain, Highly Interdependent Processes Involving Humans with Applications to Resilient Emergency Health Response
Co-Principal Investigator, National Science Foundation

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

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

PhD, University of California-Davis, 2006
hugheslab.squarespace.com

Scholarship focus: marine community ecology and biodiversity

SELECTED PUBLICATIONS

A.R. Hughes, J.H. Grabowski, H.M. Leslie, S. Scyphers, S.L. Williams
Inclusion of Biodiversity in Habitat Restoration Policy to Facilitate Ecosystem Recovery, Conservation Letters, 11(3), 2018, e12419

A.R. Hughes, J. Cebrian, K. Heck, J. Goff, T.C. Hanley, W. Scheffel, R.A. Zerebecki
Effects of Oil Exposure, Plant Species Composition, and Plant Genotypic Diversity on Salt Marsh and Mangrove Assemblages, Ecosphere, 9, 2018, e02207

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

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.B. Kane, L.P. Jerome, J. Scruggs
Development of a Scalable Distributed Model Predictive Control System for Hydronic Networks with Bilinear and Hybrid Dynamics, Journal of Computing in Civil Engineering, 32(5), 2018, 04018038

M. B. Kane
Modeling Human-in-the-Loop Behavior and Interactions with HVAC Systems, American Control Conference (ACC), IEEE, 2018, 6

M.B. Kane, C. Peckens

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 for Graduate Studies, Civil and Environmental Engineering  
PhD, MIT, 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:** August-Wilhelm Scheer Visiting Professor, TUM, Technical University of Munich; Traffic Simulation Lifetime Achievement Award, Transportation Research Board  

**SELECTED PUBLICATIONS**  
Z. Zhao, H.N. Koutsopoulos, J. Zhao  
Z. Zhao, H.N. Koutsopoulos, J. Zhao  
Individual Mobility Prediction Using Transit Smart Card Data, *Transportation Research C*, 89, 2018, 19-34  
G. Goulet-Langlois, H.N. Koutsopoulos, Z. Zhao, J. Zhao  
H.N. Koutsopoulos, Z. Ma, P. Noursalehi, Y. Zhu  
Transport Data Analytics for Planning, Monitoring, Control and Information. In Mobility Patterns, Big Data and Transportation Analytics, Elsevier, 2018  
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 *Paper is 4th in the list of most cited articles in the journal*  

**SELECTED RESEARCH PROJECTS**  
Transport for London (TfL) Research Partnership  
Principal Investigator, TfL  
Mass Transit Railway (MTR) Research Partnership  
Principal Investigator, MTR  
Massachusetts Bay Transportation Authority  
Principal Investigator, Boston (MBTA) Research Partnership  

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**MICHELLE 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**  
D. Fannon, M. Laboy, P. Wiederspahn  
D. Fannon, M. Laboy  
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**  
Future-Use Architecture: Design for Persistent Change  
Co-Principal Investigator, American Institute of Architects College of Fellows  
Boston LightWells  
Principal Investigator, Boston Groundwater Trust and AutoDesk BUILD Grant  
Resilient Homes Online Design Aide  
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

YIANNIS LEVENDIS

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

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

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

Honors and awards: Fellow, American Society of Mechanical Engineers; Fellow, Society of Automotive Engineers; Søren Buus Outstanding Research Award, College of Engineering; George Westinghouse Gold Medal, American Society of Mechanical Engineers; Percy Nichols Award, jointly awarded by the American Society of Mechanical Engineers and the Society of Manufacturing Engineers, 2015

SELECTED PUBLICATIONS

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

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

A. Ruscio, F. Kazanc, Y.A. Levendis

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

E. Rokni, A. Panahi, X. Ren, Y.A. Levendis

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

SELECTED RESEARCH PROJECTS

Co-firing Illinois Bituminous Coals with Highly-Fragmenting Lignite Coals for SOx/HCl Control
Principal Investigator, Illinois Clean Coal Institute
AMY MUELLER
Assistant Professor, Civil and Environmental Engineering; jointly appointed, Marine and Environmental Sciences; affiliated faculty, Electrical and Computer Engineering
PhD, MIT, 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

A.V. Mueller, H.F. Hemond

SELECTED RESEARCH PROJECTS
Implementation of a synthetic Anammox Bio-Granular Technology in the Main Wastewater Treatment Line
Co-Principal Investigator, DARPA Biological Technologies

Yeast-Based Chemical Sensors for Biohybrid Underwater Robots
Principal Investigator, Northeastern Tier 1.

SINAN MÜFTÜ
Professor, Mechanical and Industrial Engineering; affiliated faculty appointment in: Bioengineering, Civil and Environmental Engineering
PhD, University of Rochester, 1994
mie.neu.edu/people/muftu-sinan

Scholarship focus: mechanics and tribology of axially moving materials, webs; numerical simulation of tissue healing and bone remodeling; high velocity impact of micron scale particles

Honors and awards: Fellow, American Society of Mechanical Engineers; Søren Buus Outstanding Research Award, College of Engineering; Martin W. Essigman Outstanding Teaching Award, College of Engineering

SELECTED PUBLICATIONS
T. Kasıkcı, M.-C. Weng, A. Nayak, T. Goker, S. Müftü
Contact Mechanics of a Thin, Tensioned, Translating Tape With a Grooved Roller, Journal of Tribology, 140, 2018, 011405-1

T. Zhu, S. Müftü, K.-T. Wan
One-Dimensional Constrained Blister Test to Measure Thin Film Adhesion, Journal of Applied Mechanics, 85, 2018, 0545010-1


J. Sun, N. Tandogan, A. Gu, S. Müftü, E.D. Goluch, K.T. Wan
Measuring Particle Adhesion-Detachment and Filtration Efficiency by Microfluidics, Colloids and Surfaces B: Interfaces, 165, 2018, 381-387

SELECTED RESEARCH PROJECTS
Collaborative Research: High-Strain-Rate Dynamics of Copolymer Microparticles for Advanced Additive Manufacturing
Principal Investigator, National Science Foundation

Collaborative Research: Mechanics of Fusion of Dissimilar Lipid Bilayers and Multi-Lamellar Vesicles
Co-Principal Investigator, National Science Foundation

Engineered Materials and Materials Design of Engineered Materials (EMMDEM)
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
Climatic Control of Mississippi River Flood Hazard Amplified by River Engineering, Nature, 556(7699), 2018, 95-98

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

S.E. Munoz, S. Schroeder, D.A. Fike, J.W. Williams
A Record of Sustained Prehistoric and Historic Land use from the Cahokia Region, Illinois, USA, Geology, 42(6), 2014, 499-502

SELECTED RESEARCH PROJECTS
Collaborative Research: Re-evaluating Precipitation Extremes and Flood Hazard in the Wake of Hurricane Harvey
Principal Investigator, National Science Foundation (NSF) Hydrologic Sciences (HS)

Collaborative Research: Extreme Floods on the Lower Mississippi River in the Context of Late Holocene Climatic Variability
Principal Investigator, National Science Foundation (NSF) Paleo-Perspectives on Climate Change (P2C2),

Coastal Flooding Prediction and Mitigation: Integrating High-Fidelity Computer Models with Field Observations
Principal Investigator, Global Resilience Institute (GRI) of Northeastern University

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
Hurricane Risk Assessment of Offshore Wind Turbines, Renewable Energy, Elsevier, 2018

Imperfection Measurements to Predict Buckling Behavior of Slender Steel Tubes, Thin-Walled Structures, Elsevier, 2017


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

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

Development of a National Offshore Wind Research Agenda
Co-Principal Investigator, Massachusetts Clean Energy Center
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

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 PATTSON

Professor, Marine and Environmental Sciences; jointly appointed, Civil and Environmental Engineering; Associate Dean for Research and Graduate Affairs, COS, 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, N. Summers, C. Mitermique, 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
J. Elliott, M. Patterson, E. Vitry, N. Summers, C. Mitermique 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; National Science Foundation CAREER Award

SELECTED PUBLICATIONS
I. Bradley, A.J. Pinto, J.S. Guest
Design and Evaluation of Illumina MiSeq Compatible 18S rRNA Primers for Improved Characterization of Mixed Phototrophic Communities, Applied and Environmental Microbiology, 89(19), 2016, 5878-5891
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
J. Schroeder, M. Lunn, A.J. Pinto, L. Raskin, W.T. Sloan
Probabilistic Models to Describe the Dynamics of Migrating Microbial Communities, PLoS One, 10, 2015, e0117221
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, 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
A.J. Pinto, L. Raskin
PCR Biases Distort Bacterial and Archaeal Community Structure in Pyrosequencing Datasets, PLoS One, 7(8), 2012

SELECTED RESEARCH PROJECTS
Estimating the Comammox Contribution to Ammonia Oxidation in Nitrogen Removal Systems
Principal Investigator, Water Environment & Reuse Foundation
CAREER: Developing a Spatial-Temporal Predictive Framework for the Drinking Water Microbiome
Principal Investigator, NSF

MEHRDAD SASANI
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
M. Joyner, M. Sasani
A Multihazard Risk-Based Resilience Analysis of East and West Coast Buildings Designed to Current Codes, Journal of Structural Engineering, ASCE, 2018
S. Sagiroglu, M. Sasani
R. Ceskavich, M. Sasani
Methodology for Evaluating Community Resilience, Natural Hazards Review, ASCE, Vol. 19, No. 1 (04017021), pp. 1-13, 2018

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, MIT, 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. Hellweger, 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
Pathways to Coastal Resiliency: The Adaptation Gradients Framework, Sustainability, 2018
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

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)
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, Z.A. Ostrum
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
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

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
civ.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

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

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

Honors and awards: Fellow of the Association for the Sciences of Limnology and Oceanography

SELECTED PUBLICATIONS

D.H Howard, J.T.V. Stan, A. Whitetree, L. Zhu, A. Stubbins

J.T. Van Stan, A. Stubbins

S. Wagner, R. Jaffé and A. Stubbins
Dissolved Black Carbon in Aquatic Ecosystems, Limnology and Oceanography Letters, 3(3), 2018, 168-185

C. Li, P. Chen, S. Kang, F. Yan, L. Tripathee, G. Wu, A. Stubbins

M. Jennings , H. Abdulla, A. Stubbins, L. Sun, R. Wang, K. Mopper

SELECTED RESEARCH PROJECTS

Constraining the Source of Oceanic Dissolved Black Carbon Using Compound-Specific Stable Carbon Isotopes
Co-Principal Investigator, National Science Foundation
Transforming our Understanding of Carbon Dioxide Photoproduction in Oceanic Waters
Principal Investigator, National Science Foundation
Linking Microbial Diversity, Gene Expression, and the Transformation of Terrestrial Organic Matter in Major U.S. Rivers
Principal Investigator, National Science Foundation

HAO SUN

Assistant Professor, Civil and Environmental Engineering

PhD, Columbia University, 2014
civ.neu.edu/people/sun-hao

Scholarship focus: smart and resilient infrastructure; innovative sensing, data analytics and machine learning with applications to infrastructure engineering; computational mechanics and uncertainty quantification

Honors and awards: Forbes 30 Under 30: Science, Boeing Fellowship

SELECTED PUBLICATIONS

H. Sun, O. Buyukozturk
The MIT Green Building Benchmark Problem for Structural Health Monitoring of Tall Buildings, Structural Control and Health Monitoring, 25(3), 2018, e2115

H. Sun, A. Mordret, G.A. Prieto, N. Toksoz, O. Buyukozturk
Bayesian Characterization of Buildings Using Seismic Interferometry on Ambient Vibrations, Mechanical Systems and Signal Processing, 85, 2017, 468-486

A. Mordret, H. Sun, G.A. Prieto, N. Toksoz, O. Buyukozturk

SELECTED RESEARCH PROJECTS

Data Interferometry for Field Monitoring: Development and Applications in Structural and Crustal Systems
Principal Investigator, Subcontract from MIT; Shell Global
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

N. Montazeri, A Touran

Touran, A. and F. Panah

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

Systematic Approach for Estimating Construction Contract Time
Co-Principal Investigator National Cooperative Highway Research Program (NCHRP), National Academy of Engineering

GEOFFREY C. TRUSSELL

Professor and Chair, Department of Marine and Environmental Sciences; Director Coastal Sustainability Institute & 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, P.J. Ewanchuk, G.C. Trussell
Cascading Effects of a Top Predator on Intraspecific Competition at Intermediate and Basal Trophic Levels, Functional Ecology, 2018, 1-12

S.C. Donelan, G.C. Trussell

S.C. Donelan, G.C. Trussell
Synergistic Effects of Parental and Embryonic Exposure to Predation Risk on Offspring Size at Emergence, Ecology 99, 2018, 68-78

Trussell, G.C., C.M. Matassa, P.J. Ewanchuk

M.E.S. Bracken, J.G. Douglass, V. Perini, G.C. Trussell
Environmental Context and Scale Mediate the Effects of Biodiversity on Marine Primary Producers, Ecology 98, 2017, 1434-1443

S.C. Donelan, J.H. Grabowski, G.C. Trussell
Refuge Quality Impacts the Strength of Nonconsumptive Effects on Prey, Ecology 98, 2017, 403-411

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

Research Coordination Network: Evolution in Changing Seas
Co-Principal Investigator, National Science Foundation
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 Kellogg 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

D. Vine, S. Shahini Shamsabadi, Y. Zhao, R. Birken, M. Wang, S. Wadia
City-Wide Application of the Affordable and Rapid StreetScan Pavement Management System, ASCE Journal of Infrastructure Systems, 2017

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
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

J. Sun, N. Tandogan, A.Z. Gu, Sinan Müftü, E.D. Goluch, K.-T. Wan
Quantification of Colloidal Filtration of Polystyrene Micro-Particles on Glass Substrate Using a Microfluidic Device, Colloids and Surfaces B: Biointerfaces, 165, 2018, 381–387

J. Sun, S. Müftü, A.Z. Gu, K.-T. Wan
Intersurface Adhesion in the Presence of Capillary Condensation, Journal of Applied Mechanics, 85, 2018, 061009

W. Wang, J.V. Gray, S.E. Julien, K.-T. Wan
Mechanical Characterization of a Convex Shell (Contact Lens) with Meridional Thickness Variation, Experimental Mechanics, 58(6), 2018, 997–1002

T. Zhu, G. Li, S. Müftü, K.-T. Wan
One-Dimensional Constrained Blister Test to Measure Thin Film Adhesion, Journal of Applied Mechanics, 85, 2018, 054501

T. Zhu, G. Li, S. Müftü, K.-T. 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

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
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 Atomistic 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

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, N.E. Phillips, M.L. Small, R.J. Sampson

J. Chen, Q. Wang, Z. Lin, and X. Guo

Q. Wang, J.E. Taylor
Aggregated Responses of Human Mobility to Severe Winter Storms: An Empirical Study, PLoS one, 12, 2017

N Mohammadi, Q. Wang, and J.E. Taylor
Diffusion Dynamics of Energy Saving Practices in Large Heterogeneous Online Networks, PLoS one, 10, 2016

Y. Wang, Q. Wang, and 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

Personalized Systems for Wayfinding for First Responders
Principal investigator, National Science Foundation

Cognition-driven Display for Navigation Activities (Cog-DNA): Personalized Spatial Information System Based on Information Personality of Firefighters
Co-Principal Investigator, National Institute of Standards and Technology
MISHAC YEGIAN

COE Distinguished Professor, Civil and Environmental Engineering

PhD, MIT, 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; ASCE Thomas A. Middlebrooks Award

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
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

Kevin Luther Clark
PhD 2018, Civil Engineering; Advisor: Auroop Ganguly

MITIGATING INFRASTRUCTURE RISK: REDUCING UNCERTAINTY IN RESILIENCE MODELING

The National Airspace System (NAS) is a complex system of systems which plays a vital role in sustaining economic and personal growth in America. As part of the transportation critical infrastructure the NAS like other lifeline substructures is impacted by shocks caused by both man-made and natural phenomenon. The U.S. airport network (USAN) continues to show signs it is operating at capacity, and its supporting facility infrastructure is aging and is some cases operating in poor conditions. Recently critical infrastructure resilience has emerged as an essential research topic for academia, public and private industries. This is in reaction and perception of the range of shocks and stresses correlated with natural and man-made pressures on transportation infrastructure which are compounded by the uncertainty of climate variability and resource constraints. Measuring critical infrastructure resilience is challenging and requires an approach which focuses on the robustness of infrastructure. Here we develop and demonstrate a framework which utilizes the integration of network science based analysis, and system dynamics analysis to quantitatively characterize the airport network and supporting infrastructure resilience.

See full dissertation at coe.neu.edu/18/KevinLutherClark
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

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.

See full dissertation at coe.neu.edu/17/AnshumanKunwar
Mahdokht Montazeri
PhD 2017, Environmental Engineering; Advisor, Matthew Eckelman

ENVIRONMENTAL ASSESSMENT OF BIOBASED FUELS AND CHEMICALS USING LCA METHODOLOGY

This dissertation combines chemical engineering process modeling with LCA to assess environmental impacts of novel bio-based products and synthesis routes. Four projects of this dissertation include, (1) a statistical meta-analysis of life cycle GHG emission and energy use results for priority bio-based chemicals; (2) a process design and LCA analysis of a novel catalytic depolymerization process for production of aromatics from the lignin fraction of woody biomass; (3) an industry-sponsored assessment of the net environmental benefits of substitution of renewable chemical building blocks in the formulation of wood flooring coatings; and (4) evaluation of integrated fuel, energy, and chemicals production from a microalgal biorefinery, considering time-dependent fractional growth kinetics of freshwater and marine microalgae.

See full dissertation at coe.neu.edu/18/
MahdokhtMontazeri

Frank Schellenger Jr.
PhD 2018, Civil Engineering; Advisor, Ferdi Hellweger

LONG-TERM PHOSPHORUS LOADING FROM ONSITE WASTEWATER SYSTEMS TO SURFACE WATERS

Accelerated eutrophication caused by oversupply of nutrients from anthropogenic sources has impaired surface waters, especially lakes, in many places in the United States and worldwide. Nitrogen and phosphorus oversupply to surface waters has frequently caused overgrowth of aquatic plants and blooms of phytoplankton (algae) that damage fisheries, recreation, and property values. In many surface waters, phosphorus is the limiting nutrient, without which this overgrowth or bloom does not occur. Efforts to prevent, remediate, and mitigate the effects of phosphorus oversupply generally focus on surface sources and transport pathways of phosphorus, but review of the research literature suggests that phosphorus transport from domestic onsite wastewater systems (OWSs) via groundwater has not been considered a significant source because of sorption, and this source is not effectively addressed in lake management. We hypothesize that, with increasing time-in-use of an OWS, phosphorus may be transported via the groundwater surficial aquifer to a down-gradient surface water in ecologically relevant amounts. The results suggest that the phosphorus load from OWSs may be significant and should be considered in efforts to manage the effects of lake eutrophication.

See full dissertation at coe.neu.edu/18/
FrankSchellengerJr
**Lizhong Wang**  
PhD 2017, Civil Engineering; Advisor, Jerome F. Hajjar

**DECONSTRUCTABLE SYSTEMS FOR SUSTAINABLE DESIGN OF STEEL AND COMPOSITE STRUCTURES**

This dissertation first describes the deconstructable composite floor system utilizing clamping connectors. This floor system is anticipated to be used along with all-bolted construction for the remainder of the structure to facilitate deconstruction. The environmental benefits of utilizing DfD in the design of buildings is demonstrated with the life cycle assessment results of prototype structures. The experimental program for investigating the performance of the system is then introduced. Pushout tests are conducted to quantify the strength and ductility of the clamping connectors and evaluate the influences of the parameters. It is indicated that the strength of the ductile clamping connectors is comparable to that of steel headed stud anchors. In addition, the behavior of the clamping connectors is further validated through full-scale beam tests in which the flexural behavior of the deconstructable composite beams is investigated comprehensively. Combining experimental and finite element analysis results, strength design equations and resistance factors are proposed for calculating the shear strength of the clamping connectors and the flexural strength of the associated composite beams. This dissertation culminates with conclusions and future work.

See full dissertation at coe.neu.edu/18/LizhongWang

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**Yiwen Zhu**  
PhD 2017, Civil Engineering; Advisor, Haris Koutsopoulos

**PASSENGER-TO-ITINERARY ASSIGNMENT MODEL BASED ON AUTOMATED DATA**

This dissertation addresses the important problem of evaluating the performance of subway systems operating near capacity, especially from the passenger’s point of view. It develops a key building block towards this goal, the Passenger-to-Itinerary Assignment Model (PIAM), to identify the boarding train(s) of each passenger using Automatic Fare Collection (AFC) and Automatic Vehicle Location (AVL) data. PIAM is a model system, with a number of individual modules that interact but can also be used independently: the access/egress time model, left behind model, route choice model, and assignment model. The overall problem is challenging because of the large number of feasible itineraries a passenger may have. To deal with this, PIAM first estimates the left behind probabilities by station and time interval at the aggregate level and then assigns individual passengers to itineraries. The model is extended to incorporate trips involving route choice by estimating the route choice fractions and integrating them into the assignment model.

See full dissertation at coe.neu.edu/18/YiwenZhu
Geanna Flavetta, a PhD Candidate in the Fernandez laboratory, is working to determine how tide gates and their operation affect the transport of toxic chemicals in coastal marshes. She monitors chemical concentrations in water and sediment at several locations, and prepares models to inform best practices for operating these flood-control devices.