

Summer 2016 Newsletter

WELCOME FROM THE CHAIR



Dear Friends of Civil & Environmental Engineering,

Welcome to Summer 2016!

We are proud of the completion of yet another exceptional academic year in the John A. Reif, Jr. Department of Civil and Environmental Engineering. We continue to rank among the top 10% in the nation by the American Society for Engineering Education (ASEE) for the number of civil engineering bachelor degrees awarded. This past May, we celebrated one of our largest classes of graduates. They are now making their way to successful and fulfilling careers and will continue to benefit from NJIT's outstanding alumni network.

Our faculty, students and staff are busy conducting leading edge research that enhances our civil, environmental and transportation infrastructures. I invite you to read through some of our recent news below to fully appreciate their work.

As always, I value and welcome your support of the CEE Department, which facilitates the development of our programs and empowers new initiatives.

Sincerely,



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STUDENTS

Civil Engineering 2016 commencement

Congratulations to our 2016 graduates! On May 17, our graduates were joined at Commencement by their families, faculty and staff in recognition of a job well done.

ANNOUNCEMENT

Thursday, August 4, 2016 -New Jersey NJASCE "Raise the Bar Forum," an initiative to advance the profession and the public welfare by raising educational requirements for licensure of future professional engineers.

4-8 PM Kupfrian Lecture Hall 117.

ADVISORY BOARD

The CEE Industrial Advisory Board represents a diverse cross section of civil and environmental engineering professionals, including design consultants, construction managers, contractors and attorneys.

Jerome F. Gallagher, Jr., Esq. '80 Chair
Norris, McLaughlin, Marcus, PA

Ted Cassera, P.E., '72
Omland Engineering Associates

Anthony Castillo, P.E., '95 '02
SESI Consulting Engineers

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David Good, P.E., '78, '92
Mueser Rutledge Consulting Engineers

Andre Grebenstein, LEED AP '95
The Martin Group

Gregory Kelly, P.E.
Parsons Brinckerhoff

Gareth Middleton, P.E., '93 '04
Tishman Construction, an AECOM
Company

Rocco Palmieri, P.E, P.P., PLS '72, '77
Partner Engineering and Science

Maurice Rached, P.E.
Maser Consulting

Joseph Stanley, P.E., P.P., '78, '85
Mott MacDonald

Wei Wang, P.E., '95

This spring The Newark College of Engineering commencement combined the graduation of baccalaureate and graduate degree recipients. The Department of Civil Engineering hosted a celebration in the atrium of the Campus Center, where students were awarded for their outstanding performance during their tenure at NJIT.



The Department's Student Excellence Awards recognized students from the CEE who have exhibited outstanding academic performance, leadership, and service to the academic community. These awards were given as follows:



CEE Student Leadership Awards to Oscar Chaves, Andrew Meegoda and Kristina Espineli This award recognizes graduating seniors who have demonstrated significant leadership involving student activities, department services, and community service. This award was presented by John Schuring, Ph.D., P.E.



CEE First Year Student Excellence Award to Peter O'Connor



CEE Sophomore Excellence Award to Deep Patel by Walter Konon, P. E.

Urban Tech

Michael Wright, P.E., P.P., PMP '79 Arora and Associates, P.C.

Writers/Editors/Graphics/Design:

Tom Jaworski, P.E.

Heidi Young

Tracey Regan

Anne Daniecki

Special Thanks:

NJIT Office of Strategic Communications

NJIT Office of Alumni Relations

CEE Faculty/Staff, Students & Alumni



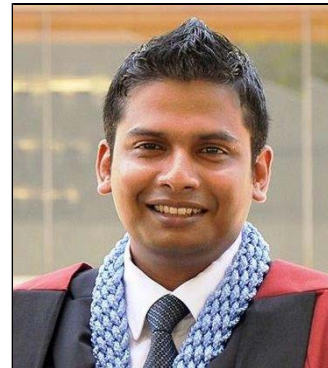
CEE Junior Student
Excellence Award to
Whittier Hua



CEE Senior Student Excellence
Award to Rajet Das, presented
by Taha Marhaba, Ph.D., P.E.,
F.ASCE.



CEE Masters Excellence
Award to Steven Anen,
presented by Hsin-Neng Hsieh,
Ph.D., P.E. This award
recognizes one full- time
masters student from the CEE
department who has
exhibited outstanding
academic performance,
scholarly work, leadership and
service to the academic
community. The student
must have at least 12 graduate
credit hours completed at
NJIT.



CEE Doctoral Excellence
Award to Janitha H.
Batagoda, presented by
Jay Meegoda, Ph.D. P.E.
This award recognizes one
full-time doctoral student
from the CEE Department
who has exhibited
outstanding academic
performance, scholarly
work, leadership and
service to the academic
community. The student
must have at least 24
credit hours completed.

[Industry Mentoring Program \(IMP\)](#)

Thomas Jaworski, P. E. undergraduate advisor and director of undergraduate retention, continues to expand the Industry Mentoring Program (IMP) which engages students with professionals working in the built environment disciplines.

The IMP was established for the purpose of supporting the CEE Department goals of blending academics with the solution of real-world problems in the practice of civil engineering. This program provides students an opportunity to interact with practicing professionals during class lectures and to work side-by-side with them on student research projects.



Carl L. Goldknopf, P.E., (Senior Consultant) *GZA GeoEnvironmental Inc., Engineers and Scientists*



Todd M. Hay, P.E., CPWM, CME (Associate Vice President) *Pennoni Associates Inc., Consulting Engineers*



Sanjiv Inamdar (Regional General Manager) *Structural Preservation Systems, LLC, materials protective systems*



Allan Pincus (Director - 3D Printing Technology) *Design Point Solutions, 3D printing*



Paul Eng-Wong, P.E., (Principal) *Vanasse Hangen Brustlin, Inc., transportation, land development, environmental services*

Jaworski is looking forward to expanding this outreach program to other firms with specializations in transportation engineering, geotechnical engineering, bridge and building design, design aesthetics and engineering economics .

RESEARCH

Bridge scour collaborative research project

For more than a decade, the New Jersey Department of Transportation (NJDOT) has engaged in an aggressive Scour Action Plan, assessing bridges over waterways in order to protect against scour damage. Scour occurs when sediments erode from around a bridge's foundation during large storms. Recent "super storms" Irene and Sandy demonstrated the destructive potential of scour to bridges throughout the Northeast. A simulation of the scour process by flow science is available at [Bridge scour simulation](#).

In 2011, NJDOT engaged researchers in NJIT's CEE department to develop a new predictive scour model that would reflect New Jersey's unique geological and hydrolic/hydraulic conditions. The result is the Scour Evaluation Model (SEM), which was developed by a team of CEE faculty and graduate and undergraduate research assistants. The scour project is being directed by professors John Schuring, Robert Dresnack and Gene Golub.



James Falcetano, (senior, CEE) Tom Banderia, (senior, Mathematics) Robert Dresnack, P. E., Ph.D , Dillion Collins, (M.S. student) Abofazl Baya (Ph.D. student)

In 2015, this model was finalized and approved by NJDOT and the Federal Highway Administration (FHWA). The CEE research team has now received a second grant to bring SEM into statewide practice. Three consulting firms, including AECOM, Mott McDonald and McCormick Taylor, will be working with CEE's researchers this summer to implement the model to the first 15 bridges in the state.

In applying the model, a variety of geotechnical, hydrologic, and hydraulic data are inputted for a particular bridge. James Falcetano, a junior CEE student commented on his role in the hydrologic evaluation, "The Q100 determines whether a bridge has seen a 100-year storm event. It is one of the

seven principal characteristics that are evaluated for each bridge. This new model has reduced the number of bridges originally identified in the 90's as "scour critical" and it will definitely have a positive impact for New Jersey taxpayers ."

These data are analyzed to produce scour risk ratings, which are then evaluated using a two-dimensional risk decision matrix. This generates a scour priority rating and specific recommended actions, which may include priority installation of scour countermeasures or a return to normal status. Bridge importance, including average daily traffic and detour length, are also evaluated and factored into the bridge priority. The new SEM is designed to improve public safety and reduce costs of maintenance to bridges.



Student researchers, Dillion Collins and Abofazl Bayat, assess the pier foundations of a Northern Passaic County bridge .



James Falcetano , Tom Banderia , Steve George, Director of Labs-Academics

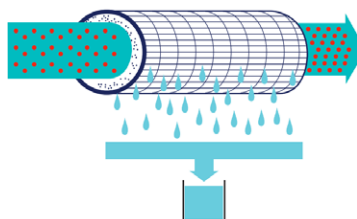
Current student researchers include:

Graduate Research Assistants: Abofazl Bayat (Ph.D. student) and Dillion Collins (M.S. student)

Undergraduate Research Assistants: James Falcetano (senior student, CEE), Kristopher Kozlowski (senior student, CEE), and Tom Banderia (senior, Mathematics)

Microwave-assisted Antifouling Membrane Filtration Technology

Membrane technology provides micro and ultrafiltration of individual substances or substance mixtures. Membrane filtration has been extensively used in water and wastewater treatment. It is also used in desalination, dairy making, the recovery of rare metals and biomass or water separation.



In the Spring of 2016, after winning an Undergraduate Research and Innovation (URI) phase one grant, CEE Andrea Cano and ChE Mehnaz Moon, began to develop a membrane that will filter wastewater. As part of their proposal for the

grant they had conducted extensive research on a new technology using microwave irradiation. With the help of their mentor Wen Zhang, Ph. D. they decided that this technology improved upon current technologies by offering chemical-free and in-situ membrane defouling or mitigation.

Mehnaz is taking the lead on the project and increasing the team's understanding about this relatively new technology



Mehnaz Moon

. " I'm excited to be involved with this project, because if it is successful, it will lead to efficient filtering with antifouling properties which save energy and reduce cost," said Mehnaz. Near the end of June, Ashima Agarwal, a high school student intern from New Providence High School, will join the team and be mentored by Mehnaz.

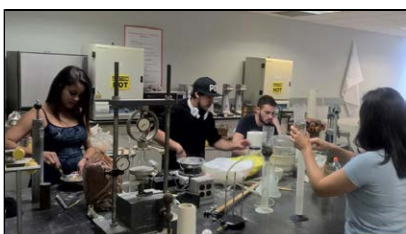
Currently, the research is focused on identifying energy location inside the microwave oven, calculating water flowrate through the membrane, proving the existence of nanobubbles by measuring zeta potentials. Research outcomes would largely lead to novel approaches for membrane fouling control and membrane cleaning, which potentially transform and upgrade current membrane filtration practices.

ACADEMICS

Brazilian students join efforts for clean water

Jay Meegoda, Ph.D., P. E. and his research team are joined this summer by four students from Brazil to work on an ongoing project to supply clean drinking water to villages in Sri Lanka. The students include Priscila Tanioka, a CE student from Faculdade de Engenharia de Sorocaba (Facens), Alisson Giaretta, a CE student from Federal University of Pelotas (UFPEL), Vitor Russyere Sousa Barros, CE from Federal Institute of Education, Science and Technology of Goiás (IFG) and Ana Carvalho, a senior CE student from Centro Federal de Educação Tecnológica de Minas Gerais (CEFET).

The Brazilian students are working with various materials, including rice hulls and red clay in the lab.



As reported in our Spring 2016 newsletter, this team continues their work to provide effective water filters that can be produced locally to remove contaminants and heavy metals that are causing Chronic Kidney Disease (CKD) for many people in rural villages in Sri Lanka.

To gain more information, two NJIT students, Patrick Delong, (CEE) and Janitha H. Batagoda, P. E., made a trip to Sri Lanka in May. "We need to be sure we can produce the filters locally, so finding sources of red clay and determining where kilns can be constructed was very important," said Batagoda. In part, the struggle to convince people to use the filters will require gaining the trust of authorities and acceptance of the new technology. Batagoda and Delong also did some investigation to identify key people that can help promote their efforts locally.



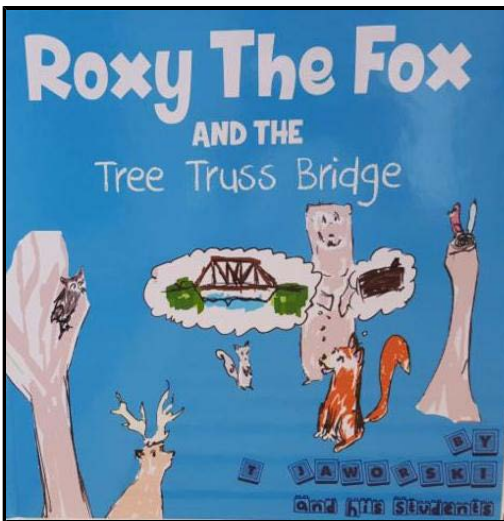
Batagoda and Delong also visited fourth and fifth grade classes and learned how CKD has impacted the lives of these children and their families. In order to start communicating with the children, the two passed out NJIT Frisbees to the kids and taught them how to play with them. "Many of these kids have lost loved ones or parents whose lives will be dramatically shortened by the disease," said Batagoda.



People suffering from the disease are provided medication initially and dialysis in the later stages. However, there is no cure.

"Roxy the Fox and the Tree Truss Bridge" - FIRST READING!

The National Academy of Engineering (NAE) and other professional engineering societies have identified the need for students to gain technological literacy and strengthen their interest and skills in STEM principles as a national imperative. Studies have shown that if students, especially female students, are not provided with design and engineering knowledge and experiences in school, they are very unlikely to consider a technological field of study.



Based on this initiative, some upper class and freshman civil engineering students, under the direction of Thomas Jaworski, P.E., set out to raise awareness of STEM (Science, Technology, Engineering and Mathematics) opportunities among local elementary-aged students.

Their approach was to write and illustrate a children's book about engineering. The book features a charming and intellectual character, "Roxy the Fox." Roxy, an engineer, shows young readers how critical thinking and problem solving can work together.

The book is set to be published later this summer. In May NJIT students visited Abington Elementary School in Newark, NJ to read the story to a group of third, fourth and fifth graders. "The audience was quite receptive," said Jaworski, "and the students had a lot of fun." Ms. Nelida Grompone, who teaches fourth and fifth graders, said, "The students loved Roxy and want to be like her."

The book consists of 25 pages, with full-color illustrations about Roxy and bridge construction. Copies of the published book will be donated to the STEM program in the Newark Public School District.

Gabrielle Grompone and Joe Vitale, the NJIT students who read the book, said, "It was an enjoyable and rewarding experience reading the book we wrote."



Special thanks to Nelson Ruiz the school's principal and Alejandro Echevarria the Chief Information Officer for their support. Visit: [CHILDREN'S BOOK ABOUT ENGINEERING](#)

ALUMNI

2016 CEE Alumni Awards

As part of the CEE graduation ceremony, two alumni were recognized for



their exceptional achievements in career, public service and/or volunteer activities.

CEE Distinguished Young Alumni Award presented to Vatsal Shah, Ph.D. '15, BS

'08, in recognition of his exceptional achievements in career, public service and/or volunteer activities that bring honor to the CEE Department. After graduation, Vatsal joined Hatch Mott MacDonald and rose quickly to the ranks of Senior Project Engineer. In 2011, he became one of the state's youngest licensed professional engineers.



The CEE Distinguished Alumni Award was presented to Mr. Jerome Gallagher, B.S. '80, in recognition of his exceptional achievements and his volunteer activities

that bring honor to the CEE Department. Mr. Gallagher serves as the chairman of the CEE Advisory Board and is a major stakeholder and contributor to our mission of continuous improvement and excellence in academics, research and service. He also serves in the New Jersey State Bar Association Debtor-Creditor Law and Construction Law Sections and is a member of a Professionals Group Advisory Council at Provident Bank.

Congratulations!

Michael S. Bruno, '80, P.E., M.S., Ph. D, has recently been appointed Vice Chancellor for Research at the University of Hawai'i at Mānoa.



Prior to his appointment, he was the dean of the School of Engineering and Science and professor of ocean engineering at Stevens Institute of Technology in Hoboken, New Jersey. He was also the director of the Center for Maritime Security, a Department of Homeland Security National Center of Excellence. Dr. Bruno is a visiting professor of mechanical engineering at University College London.

The research publication for the University of Hawa'i can be viewed at [Kaunānā](#).

SPOTLIGHT



SPOTLIGHT ON CIVIL AND ENVIRONMENTAL ENGINEERING

The **SPOTLIGHT ON CIVIL AND ENVIRONMENTAL ENGINEERING** is a periodic publication highlighting some

noteworthy news about topics related to the practice of civil and environmental engineering.



N. J. Bridges -Sixth worst in the U.S.

More than one-third of the bridges in New Jersey are deficient, the sixth highest among the 50 states, according to new federal highway figures.

The numbers issued by the Federal Highway Administration underscore the need for federal and state officials to find the money to fix them.

The year-end numbers show that 2,343 of the state's 6,609 bridges, or 35%, need repairs, cannot adequately handle traffic loads or do not meet current safety standards. Nationally, 24 percent of bridges are rated as deficient, according to the latest statistics through Dec. 31, 2015.

Of the 10 state with the most deficient bridges, eight are in the Northeast, including New York and Pennsylvania.

Source: [Jonathan D. Salant | NJ Advance Media for NJ.com](#)