Fall 2016 Newsletter

WELCOME FROM THE CHAIR

Dear Friends of Civil & Environmental Engineering,

As we welcome new students, faculty and professional collaborators to campus this fall, we relish the annual bounty of fresh ideas and experiences they bring. At the same time, we enthusiastically recommit to our longstanding mission- to continually improve the way we prepare our students to embrace emerging challenges in the real world- and to lead. Our methods are many, while expanding the department's project-based curriculum, embedding sustainability into every engineering solution we provide and perfecting our ability to present and communicate our ideas are central to all of our efforts.

One of the primary ways we stay current and mobile is by hiring new faculty. This we are delighted to welcome two outstanding researchers.

Bruno Gonçalves da Silva, earned a Ph.D. from the Massachusetts Institute of Technology, MIT and is an Assistant Professor in Geotechnical Engineering. His research is in the area of rock fracture mechanics, construction and biological materials. Bruno has studied the induced seismicity and fracturing processes that occur due to the hydraulic fracturing of rocks. This cutting edge research is critical to understanding the hydraulic stimulation of rocks in oil and gas exploitation, as well as in enhanced geothermal systems and rock slope stability problems. Danial Esmaili, joined us as a University Lecturer in Geotechnical Engineering. He graduated from his Ph.D. in Geotechnical Engineering from the University of Oklahoma (OU) in 2014. After graduation, Danial joined the Turner-Fairbank Highway Research Center at the Federal Highway Administration in McLean, VA as a NRC Postdoctoral Research Associate.

The CEE family of students, staff, faculty and alumni looks forward to a busy year of creativity, innovation and accomplishment on many fronts- in the classroom, in our laboratories and in our service to the community. At the same time, we reflect with pride on the achievements of the past several months and invite you to learn more about them in our fall 2016 newsletter. Wishing you all Happy Holidays this December!

Sincerely,

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Kolodziej awarded Concrete Industry Foundation Scholarship

The CEE department is proud to report that Richard Kolodziej, a senior, has received the Dominick & Josephine Desimone Scholarship from the Concrete Industry Foundation. Richard was honored for his academic and professional accomplishments at a dinner held this September at the New York Athletic Club. The event was attended by more than 200 guests who are leaders in construction, design, and engineering of concrete structures.

The essay Kolodziej wrote for the scholarship competition highlighted his passion for building and design. "Being around a family that has always been involved in the construction industry has helped guide me to where I am today," said Kolodziej.

Preparation for the ASCE Concrete Canoe competition gets underway

The student chapter of ASCE has been involved in constructing and racing concrete canoes on the local and conference level since the early 1970s. The first national competition was held in 1988 after almost two years of discussion between representatives from the American Society of Civil Engineers (ASCE) and Master Builders, Inc. NJIT has participated in the competition since 2011 and placed 15th among more than 200 university teams in 2016.

Competitors and judges for rowing tryouts held in June 2016
"This year our hopes are high for a higher ranking," said Ali Fardos, this year’s captain. Ali outlined the three basic elements that the team is improving over last year’s design:

- Concrete density (a lighter density leads to greater speed)
- Concrete mix durability
- Uniformity in shape and weight distribution

Over the next month, the team will be focused on the concrete composition. They will keep mixing and testing to achieve the ideal mix. We'll keep you posted on their progress as they advance toward the finish line this Spring.

By Spring 2017, the canoe has to be completed. The 2017 national competition will be held June 17-19 in Golden, Colorado.

Three Guys Balancing Athletics and Academics

When Jack Flanagan, Phillip Costa and Paulino Marques signed on to play soccer for NJIT, they had no idea that the real balancing wouldn't be with a soccer ball. These 3rd-year Civil Engineering Students have kept a high academic performance while leading the NJIT Men's soccer in a third, record-setting season. They juggle studies, practice and classes during their jam-packed days on campus.

When working with their schedules, it can become complicated to fit classes with their rigorous game schedule. Just this last semester, one such conflict arose. "We were able to switch from fluids to soils," said Flanagan. "The staff in Civil Engineering was a big help."

Their daily schedules include practice from 9:00 a.m. to 1:00 p.m... "Sometime about 1:30, I eat lunch", says Costa. From there, he attends class and studies in Colton Hall. He typically does not leave campus until 9:00 pm.

Each of the students shared some tips for maintaining high grades:

- Keep a small notepad and record all assignments and due dates.
- Spend some time at the end of the week organizing what needs to be done for each day of the coming week.
- Come to campus early, usually around 7 a.m., and stay late. This really gives us the full college experience.
- Take advantage of evening classes. This helps spread out the schedule and allows for some study in the afternoon, when energy levels are higher.
- Build good relationships with professors. By working together, we make sure work is done on time and we are doing well in courses.
Coach Barboto shared his appreciation for the three team members, "they are all hard-working." He added that Paulino "is a very funny guy with a colorful personality."

CEE Students Recognized by The Moles

The 2016 Moles Student Award recipient is Stefanie R. Pacifico. Stefanie, a senior and student leader, was selected based on faculty recommendations, her academic performance and her interest in heavy construction.

The 2016 Moles Scholarship Fund recipients are Whittier Hua and Ankur Patel. Whittier and Ankur are both seniors, with strong academic performances. Both are interested in heavy construction and are co-captains of our Steel Bridge Team. Whittier also works as a student tutor.

Additionally, the Arturo L. Ressi di Cervia Scholarship was awarded to Feras Ayoub, M.S. '17, B.S. '13 in June of 2016. This award is given to a graduate student who is nominated by faculty and exhibit outstanding academic performance. Ayoub is currently working as a geotechnical engineer with JZN Engineering, PC. in the New York City Area metro region.

The students will receive their awards in a ceremony given by the Moles' Education Committee at the New York Hilton on November 9, 2016.

The Moles is a fraternal organization devoted to the heavy construction industry. Members are industry leaders who are involved in construction and its related fields. The Moles' Education Committee supports young people from twenty participating schools with events such as the Annual Student Day, student awards, scholarships, career connections and networking opportunities. NJIT, Cornell University, Manhattan College and Stevens Institute of Technology are some of the universities who participated exclusive educational program.

ACADEMICS

New FE online course prepares students for FE Exam

The John A. Reif, Jr. Department of Civil and Environmental Engineering has partnered with PPI to provide a free Online Fundamentals of Engineering (FE) Exam Prep Course.

In its continuous improvement efforts and commitment to professional licensing, the CEE Department instituted a free 68-hour online preparation course to civil engineering juniors or seniors to help them prepare for and take the Fundamentals of Engineering (FE) exam before graduation. Students receive 12 months of access to the on-demand FE materials that include: lectures that review material in areas relevant to the exam, a Practice Exam that simulates the NCEES FE exam, web books of by Michael R. Lindeburg, PE, a quiz bank with thousands of practice problems organized by knowledge area, assessments for targeting strengths and weaknesses, flashcards for recalling key concepts on the go, and a study schedule with detailed and assignments that can be customized.

This course is designed to prepare students by reviewing critical topics from the FE Exam. The course includes some theory and high probability problems, and over half of the review is dedicated to refresher classes.
Industrial Advisory Board establishes student scholarship fund for FE certificate recipients

The CEE Industrial Advisory Board has created a scholarship fund to recognize civil engineering undergraduates students for their diligent preparation for professional licensure. Once students have successfully passed the FE exam, they are eligible for this scholarship.

Donating to this fund will ensure that your gift goes directly back to the students who successfully pass the Fundamentals of Engineering (FE) exam by reimbursing them for the testing fee.

To donate please follow the link: **FE student scholarship**

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**RESEARCH**

**Virtual Guide Dog: Next Generation Pedestrian Signal for the Visually Impaired**

Accessible pedestrian signals (APS) provide cross-walk information to the visually impaired (VIs). While this is not new technology, there have been many problems associated with the devices on the market today.

Joyoung Lee, assistant professor, is focusing on developing a device that would deliver accurate information to VIs, be more widely marketed and connect users with the signal information from controllers. This device is called Virtual Guide Dog (VGD). Integrating intersection geo-information and smartphone on-board sensors (e.g., GPS, compass, accelerometer, and gyroscope sensor), the VGD application can notify VIs of the proximity of an intersection and the street information for crossing.

Additionally, by employing a haptic interface using screen tapping, VGD can remotely place a pedestrian crossing signal to the controller wirelessly. Then, VGD informs the VI the start of a crossing phase by using text-to-speech technology, in which the VI is instructed to proceed.

This October, Lee presented the proof-of-concept (POC) test results at the 18th New Jersey Department of Transportation (NJDOT) Research Showcase. The POC test showed that VGD can keep user the user informed about the remaining distance as he or she approaches the intersection. It also proved that the GPS-only mode yielded greater distance deviation compared to the mode operating with both GPS and cellular positioning.

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**Professor’s Research introduces new technology for water quality monitoring**

Professor Sima Bagheri, who focuses on geospatial informational systems, has just completed a monograph assessing the water quality in the Hudson/Raritan Estuary and in New Jersey’s coastal waters. The assessment was completed using multispectral satellite, videography and imaging spectroscopy/
More can be read at: Convocation Keynote speaker.

Elgammal Recognized by ASCE

It is with great pride that the CEE faculty announces Muhammad Elgammal B.S.’12, M. S.’15, P. E. as the recipient of the ASCE Central Jersey Branch 2016 Young Civil Engineer of the Year award. This award is made in recognition for professional achievement in service to the advancement of the profession, evidence of technical competence, high character and integrity, and contributions to public service.

Elgammal gained the respect and recognition of his professors. And in the summer of 2011 he was employed as an intern for the Port Authority, working on the reconstruction of the World Trade Center (WTC) site. Now, he is a full-time employee at the Port Authority.
During his acceptance speech on the 18th of October, he acknowledged many of his Port Authority colleagues and the strength of his education. "I want to thank my NJIT professors for providing me and my peers with concepts that will carry us through our lives, most notably those of licensure and the meaning of responsible practice." To watch this video live: [Muhammad Elgammal](https://example.com)

Since his graduation in 2015, Elgammal has stayed involved in his community as a volunteer. In 2015, he was a volunteer for the Port Authority 'Future City' Kids, mentoring project with middle school students. The program encourages students interested in science, technology, engineering and mathematics.

**NJIT Alumnus and Overseer Inducted into National Academy of Construction**

The National Academy of Construction (NAC) has elected Nicholas DeNichilo ’73, ’78, president and CEO of Hatch Mott MacDonald and a member of the NJIT Board of Overseers, as a member of its 2016 class. He was inducted in October, at the NAC Annual Meeting in Napa, California.

DeNichilo is also a recipient of NJIT’s Distinguished Alumni Achievement Award and the American Society of Civil Engineers (ASCE) OPAL Award for lifetime achievement in leadership as well as the ASCE Parcel-Sverdrup Civil Engineering Management Award, among many honors.

**A Passion for learning and teaching**

Ashish Borgaonkar, adjunct professor. has always had a passion for learning. This passion has taken him from his homeland of India with an undergraduate degree, to a masters from Stony Brook University and on to a Ph. D. in environmental engineering at NJIT in 2011.

As a graduate student, he shared this passion by teaching others. In 2007, he started teaching CE320A as a Teaching Assistant. From this point, he became involved in the lives of students, helping them succeed and challenging them to think. Known for his patience and positive attitude, Ashish has received high reviews from students and his faculty. He won the Excellence in Teaching award in the Teaching Assistant Category for the 2009-10 academic year.

After receiving his Ph. D., Ashish continued teaching for the Civil Engineering department as an adjunct professor and kept getting excellent evaluations from students. Its no surprise that Prof. Walter Konon, submitted Ashish’s name to the Provost for 2016 Excellence in Teaching Award in the Adjunct Instructor category. He received this award at the convocation ceremony in September this year.

Ashish presently serves as Assistant Dean for Learning Communities of Students, where he continues to provide advice and guidance to NJIT students. He runs the Learning Communities program and coordinates First Year Seminar to ensure smooth transition for NJIT freshmen from high school to college. Each year he
Meet CEE’s New Faculty

We are pleased to announce that Bruno Gonçalves da Silva, has joined our faculty as an Assistant Professor. He comes, most recently, from the Massachusetts Institute of Technology, where he earned a Ph.D. in civil and environmental engineering. His research interests are the experimental and numerical study of the fracturing processes involving rocks and construction materials, such as concrete and steel, which are subject to various loading conditions. He is interested in the study of the mechanical properties, particularly fracturing, of natural structural systems, such as bone and nacre.

In a recent project, sponsored by the energy company Total, S.A., Gonçalves da Silva has been studying the induced seismicity and fracturing processes that occur due to the hydraulic fracturing of rocks in the laboratory. This research is important for a better understanding of the hydraulic stimulation of rocks, particularly in oil and gas exploitation, as well as in enhanced geothermal systems.

Gonçalves da Silva has been working in the laboratory hydraulic fracturing of rocks. For that purpose, he developed a pressure enclosure that allows one to apply water pressure to precut flaws while simultaneously visualizing the hydraulic fractures that initiate and propagate from these flaws. Since the hydraulic fractures propagate usually in less than 2 milliseconds, a High-Speed video camera is used in order to identify the types of fractures that develop (shear, tension or combination of both) and their order of initiation and propagation. A 14,000-frames-per-second video obtained with the High-Speed video camera during a hydraulic fracturing test of a granite specimen can be seen here. hydraulic fracturing

Gonçalves da Silva has also extensive industry experience having worked as a geotechnical engineer at Arup, New York, and as a structural engineer in Portugal and the United Kingdom.

We'd like to welcome Danial Esmaili, Ph.D. who joined the department this fall as a university lecturer in geotechnical engineering. Esmaili earned his Ph.D. in Geotechnical Engineering from the University of Oklahoma, Norman in 2014 and then joined Turner-Fairbank Highway Research Center at Federal Highway Administration in McLean, VA as a postdoctoral research associate, through the National Research Council Fellowship award.

While earning his degree as a post-doctoral researcher, Danial performed multi-scale laboratory tests and numerical analysis to examine the stability of unsaturated soils and reinforced earthen structures (RSS, GRS) in transportation applications.
In June, the state's five-year Transportation Trust Fund (TTF) expired and the fund ran out of money. Shortly after, New Jersey lawmakers decided to adopt a gas tax to fund repairs to aging roadways and bridges.

In July, members of the state legislature proposed a new gas tax of $.23. Governor Chris Christie announced "We are going to have constitutionally-dedicated revenue to improve roads, bridges and the mass transit systems in the state." Drivers began paying the tax on November 1 and on November 8, approved a constitutional amendment dedicating gas tax proceeds to transportation projects. This locks in more than $1 billion a year for the the TTF.

The state Department of Transportation (DOT) and U.S. DOT have estimated that the average NJ driver spends approximately $600 per year on vehicle repairs caused by bad road conditions. Once this $2 billion TTF plan is in full gear, the repairs could save NJ drivers approximately $600 in auto repairs over the next 8 years.

Additionally, the funding will bring jobs to New Jersey, specifically in the civil engineering sector, as upgrades to mass transit systems. "This is one of the most significant investments in New Jersey's infrastructure and economy in recent history," state Sen. Paul Sarlo, BS '92, MS '95, a Democrat who sponsored the legislation with Republican Sen. Steve Oroho, said in a statement. "We can now put people back to work on stalled transportation projects and launch the renewed Transportation Trust Fund with the sustained investments needed to repair and improve the state's infrastructure and to support economic growth." (Observer.com)