



# CIVILREMARKS

CIVIL AND ENVIRONMENTAL ENGINEERING AT MARYLAND

## Better Together

Cross-cutting capstone  
equips graduates for  
professional careers



## Chair's Message



As our alumni know, the University of Maryland Department of Civil and Environmental Engineering is dedicated to equipping students with the knowledge and skills needed to tackle grand challenges. We have a proud history of providing hands-on experiences, mentorship, and challenging research, co-curricular, extracurricular, and service-learning opportunities.

In this issue of *Civil Remarks*, you'll read about some of the strategies our faculty employ to not only build engineering knowledge but also instill professional best practices, raise awareness of important social issues surrounding the field, and foster an appreciation for multidisciplinary collaboration.

You'll also meet current students and recent graduates who leveraged our active student groups to apply classroom knowledge and hone the skills needed to be successful in the years after graduation.

And you'll learn about a nine-year partnership with the U.S. Department of Agriculture that has given students the rare opportunity to impact national efforts to preserve the environment.

These and numerous other endeavors are made possible by dedicated faculty and staff, exceptional students, and engaged, generous alumni. My deepest thanks to all those who work for the success of our students as we look forward to another great year in Glenn L. Martin Hall.

Charles W. Schwartz, Ph.D.  
PROFESSOR AND CHAIR  
DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

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## CIVILREMARKS

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AT MARYLAND

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# Better Together



University of Maryland's  
civil and environmental  
engineering capstone  
integrates six civil  
engineering fields to  
better equip students  
for professional careers.

Community gathering spaces, stormwater filtration, and high-quality retail just steps away from residences—these and other amenities proposed by Terrapin Design Group will reinvigorate Rossborough Lane in College Park and support users of the Maryland Transit Administration's new Purple Line light rail. One of a dozen design proposals under consideration, the project will also harmonize with the University of Maryland (UMD) historic campus.

If it were real. But in fact the design firm, proposal, and bid competition exist only in Glenn L. Martin Hall, where seniors in the Department of Civil and Environmental Engineering (CEE) are fulfilling the final requirement of their capstone course.

Like many capstone courses, ENCE 466 challenges students to complete a design project with real-world parameters.

What sets the UMD curriculum apart is its melding of transportation, structural, geotechnical, water resources, and environmental engineering principals, as well as project management, into a single, semester-long project.

"This course is the jewel of our undergraduate program," said Charles Schwartz, CEE chair. "With its multidisciplinary focus and seamless integration of industry mentors, ENCE 466 helps our students hit the ground running after graduation."

## The Making of a Company

Terrapin Design Group began much like every capstone firm in the last decade. The eight-person team was one of 12 created in Spring 2017 with special care to distribute expertise in the three CEE tracks: geotechnical and structural, transportation and project management, and environmental and water resources.

This mix and match of specialties is largely functional—each firm is, after all, expected to put forward a comprehensive design proposal. But the benefits extend far beyond the project at hand.

“Working with people in different disciplines to solve a cross-cutting problem simply makes for better engineers,” said

## Design, Revise, Repeat

With each firm established, the three-credit course begins to mimic the traditional project development process.

“In the first phase, the teams develop at least two design alternatives and compare their impacts to the base case impacts,” explained Anderson. “They’ll give a midterm presentation where they justify why they chose to move one alternative to the next phase. Then I’ll throw a little detour their way before they complete a detailed design in the final phase.”

The project changes with each semester. Students use real data—including CADD files showing existing topography and

Spring 2017 firms, for example, were charged with designing a transportation and building site plan that created a total of 160,000 square feet of retail, office, and residential space near a proposed Purple Line station. The teams also had to make room for 234 parking spots, on-site bicycle parking, and a 30-dock bike sharing station.

To accommodate larger crowds, students introduced turning lanes, reconfigured intersections, planned out additional pedestrian and bicycle facilities, and modified the Purple Line train signal priority.

Final proposals also featured strategies to address stormwater runoff from the roofs, sidewalks, and other impervious



Russ Anderson B.S. '97, M.E. '14, a transportation engineer at Wallace Montgomery and the ENCE 466 instructor. “It helps them understand how problems are approached differently across fields and what constraints others face.”

“The real world requires people to communicate and work in multidisciplinary teams to accomplish a challenge in a set time frame and budget,” added STV Incorporated Senior Vice President Joel Oppenheimer, who has advised capstone students for more than 10 years on nontechnical career skills.

underground features, recent traffic counts, soil borings, and property plats—to develop an alternative to current conditions or a proposed master plan scenario. Final designs must adhere to local codes and engineering best practices while balancing overarching goals of safety, mobility, sustainability, livability, and economic vitality.

“It’s ultimately just a glimpse of what working in a consulting firm is really like,” admitted Schnabel Engineering Associate Bill Billiet B.S. '06, M.E. '13. “But that glimpse is invaluable.”

surfaces called for in the designs. In accordance with Maryland’s stormwater management laws, students integrated natural hydrology and nature-based controls to capture and treat runoff from their sites.

“The fact that we had a class where each one of our disciplines was actually working together on a simulated, real-life project was really interesting and an amazing opportunity,” said Sami Khan, who completed the course in Fall 2016. “It was one of my favorite classes.”



## A Jury of Their Peers

In the final days of the semester, capstone firms present their designs to two very different audiences: community members and technical experts.

“Civil engineers—we’re the only ones who have to regularly work with the public,” said Anderson, adding that the emphasis he puts on developing a public outreach plan is inspired by his experiences in the Maryland Department of Transportation.

After providing a project overview tailored to the public, teams turn their attention to convincing a panel of engineers and planners from state and local agencies, construction companies, and consulting firms that their proposal provides the largest return on investment.

“I have participated in the program now for most of the nine years I’ve been in Maryland and have always been very impressed by the quality of the presentations,” said Eric Beckett, division chief for the Maryland Department

of Transportation State Highway Administration Regional and Intermodal Planning Division.

Judges score elements of each design on a scale of 0 to 10 as firms walk through detailed mockups of the proposed structures, transportation modifications, and stormwater controls. Students also present a plan for connecting new buildings to the grid and lay out a construction and cost schedule.

“The integration of industry assessment in the final grade is one of the major strengths of the course,” said Schwartz. “Students are given a glimpse of how their work will be judged in practice and are exposed to the type of critical feedback they will receive when they leave the university.”

## On-the-Job Training

When they’re not working on their proposals, capstone students are also

given ample opportunity for professional development.

Weekly lecture topics range from best practices for different pavement types to the importance of honing strong communication skills.

Some lectures are given by Anderson, but others come from government and industry guests. It’s a tradition that began with Donald Vannoy, who taught the class for roughly 20 years before retiring in 2006.

“It is important to connect education and industry for the long-term good of our profession,” said Tony Mawry B.S. ’87, a partner at Wallace Montgomery first invited to participate in the course by Vannoy. “The CEE students are brighter and more well rounded than ever. I get a lot of questions, which tells me that they really want to know about the challenges faced in the work I do and the challenges they will face in the years ahead.”

**>> INTERESTED IN GETTING INVOLVED WITH OUR CAPSTONE COURSE?  
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## MEET RUSS ANDERSON

Russ Anderson calls himself a facilitator—someone who prepares students to trade their textbooks for business cards. But his colleagues in the Department of Civil and Environmental Engineering (CEE) believe that description falls short.

“Russ has been a fantastic resource for CEE for many years,” said Charles Schwartz, CEE chair. “His sustained energy and enthusiasm for our capstone design class and for the students in it are truly amazing.”

Anderson, who also works at the Maryland-based Wallace Montgomery, began his career as a transportation engineer in his parents’ family room.

“I would put little tape roads with Lego houses on the floor,” he said. “I had little toothpick street signs and Matchbox cars—it got pretty elaborate.”

And it was as a transportation engineer that he first became involved with ENCE 466. Anderson was working at the Maryland State Highway Administration in 2004 when he and a team of five others steered the course for a year while long-time professor Donald Vannoy was on sabbatical.



From left to right: Brianna Murphy, Russ Anderson, and Scott Kearney.

He stayed on as a presentation judge before becoming the lead instructor in 2006.

“It’s rewarding to be given the opportunity to pass knowledge from the field to the students,” said Anderson. “It’s also just fun. I enjoy it.”

Teaching the course, he added, inspired him to return to the University of Maryland to earn a Master of Engineering in transportation through the Office of Advanced Engineering Education. |

# Innovative Teaching Strategies in CEE

## REDEFINING THE NORM

Evidence of the Department of Civil and Environmental Engineering's (CEE) commitment to education is found throughout the undergraduate and graduate curricula. Through the latest education pedagogy, unique infrastructure, tailored programs, e-learning technology, and real-world projects, CEE faculty are transforming the classroom to empower graduates to tackle the biggest issues facing the field.

### TERPS GO GLOBAL

Ten civil engineering students traveled to Prague this summer to study the building blocks of smart cities and sustainability. Students had the unique opportunity to work across cultures and disciplines with those enrolled in host institutions. Organized by Dimitrios Goulias, the 2017 study abroad program is the fourth in three years to focus on elements of sustainability.

>> LEARN MORE, VISIT [go.umd.edu/ceestudyabroad](http://go.umd.edu/ceestudyabroad)



IMAGE: MIKE MORGAN

### BUILT FOR THE WORKING ENGINEER

Thirty-six professional engineers earned a Master of Engineering in project management or civil and environmental engineering in 2016-17,

while another 10 received a Graduate Certificate in Engineering. Offered through the Office of Advanced Engineering Education, these practice-oriented programs make use of remote sites, online platforms, and blended courses to help engineers advance their career while balancing work and family.

>> LEARN MORE, VISIT [go.umd.edu/OAEEprograms](http://go.umd.edu/OAEEprograms)



### COMMUNITY PARTNERSHIP BRIDGES THEORY AND PRACTICE

Project management graduate students were given the unique opportunity to move from theory to practice in 2016-17 through the Partnership for Action Learning in Sustainability, an initiative of the National Center for Smart Growth. Overseen by Qingbin Cui, the projects challenged students to apply instruction on procurement processes and cost accounting to address real issues faced by Maryland's Anne Arundel County.

>> LEARN MORE, VISIT [go.umd.edu/partnerforaction](http://go.umd.edu/partnerforaction)



Fundamentals of Engineering Materials and two project management courses will be among the first courses taught in this state-of-the-art facility.

>> LEARN MORE, VISIT [go.umd.edu/teachingcenter](http://go.umd.edu/teachingcenter)

### CEE EMBRACES ACTIVE LEARNING CENTER

Civil and environmental engineering faculty are leveraging the space and technology of the University of Maryland Edward St. John Learning and Teaching Center to deliver team-based, active learning opportunities in Fall 2017.

### SCHOOL'S IN FOR SUMMER

A total of 118 undergraduates enrolled in five CEE summer courses in 2017, roughly nine times more than five years before. The jump is thanks to the department's 2014 decision to offer summer courses completely online.





## A DESTINATION FOR THE ENGINEERS OF TOMORROW

Demolition began in August for the new Whiting-Turner Infrastructure Engineering Laboratories. Starting Fall 2018, students will enjoy top-of-the-line equipment and an open design that groups structures, materials, soils, asphalt, and sample preparation areas into “dirty” and “clean” labs.

>> LEARN MORE, VISIT  
[go.umd.edu/labrenovations](http://go.umd.edu/labrenovations)

## Thank You to Our Lab Renovation Donors

### Gifts of \$1,500,000 and Up

The Whiting-Turner Contracting Company

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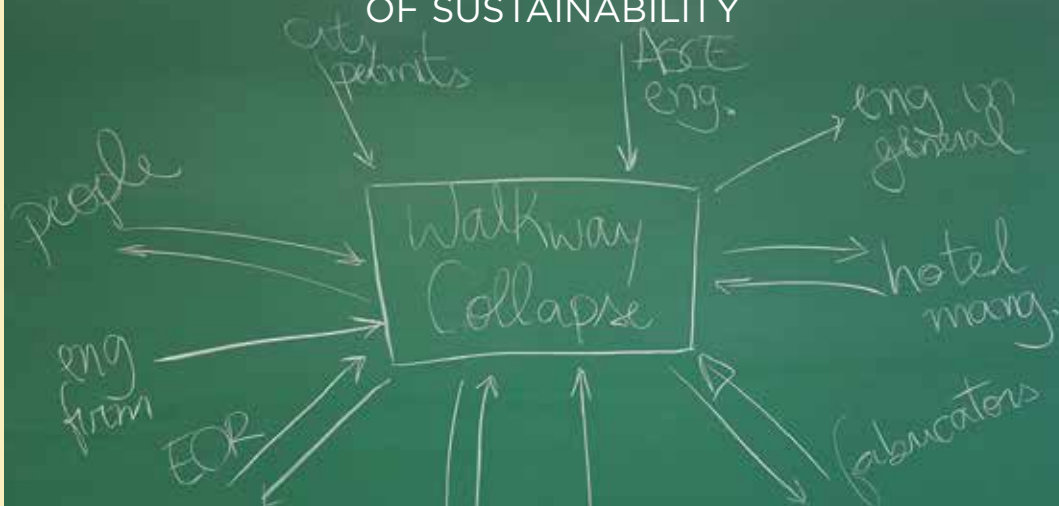
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# More Than CALCULATIONS

COURSE OFFERS HOLISTIC UNDERSTANDING  
OF SUSTAINABILITY



A quick glance at the Engineering for Sustainability syllabus is all it takes to know this class is distinct. In addition to the typical reading and calculations assignments, it lists details for a mock trial, ethics case studies, and weekly writing tasks that culminate in a debate.

Natasha Andrade B.S. '05, M.S. '08, Ph.D. '12, the first full-time lecturer in the Department of Civil and Environmental Engineering (CEE), has culled and molded these tasks to give students a wider view of sustainability and an appreciation for the role they will play in it.

“We look at the three pillars of sustainability: environmental, economic, and social,” said Andrade, who revamped the course two years ago with support from the University of Maryland Elevate Fellows course redesign program. “Social aspects are generally neglected in the engineering curriculum because it is very hard to incorporate that into a calculation-based course. I do a lot of different activities to incorporate social sustainability in this course.”

CONTINUED ON NEXT PAGE

IMAGE: NATASHA ANDRADE

## NATASHA ANDRADE

When she’s not in the classroom or meeting with students, you’ll find Natasha Andrade in the Environmental Engineering Laboratories. It’s here that she is investigating whether flame retardants are entering ecosystems at environmentally relevant levels through household fertilizer produced at the Blue Plains Advanced Wastewater Treatment Plant. |





Most notable, perhaps, is a mock trial centered around the 1981 collapse of two walkways in Kansas City's Hyatt Regency. The event killed 114 people and injured 216 more.

After reading briefs and watching an American Society of Civil Engineers video, the class is divided into groups representing the engineer of record, the company that built the hotel, and those injured. A fourth group is broken down further into juries independently responsible for passing judgement.

"Each group is given access to information only they would know and challenged to make their case," Andrade explained. "After [the juries] rule, we come back as a class and have a big discussion about the event and what impacted the rulings."

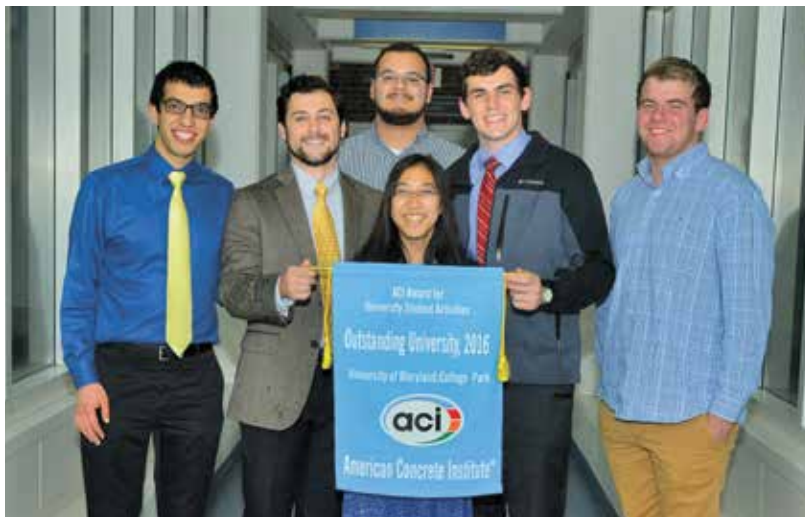
Before the sophomore-level class ends, students will also be challenged to walk in the shoes of residents, conservationists, and others involved in the creation of a wind farm in New York.

"It can be hard for students to see themselves in a position of influence," said Andrade. "What I try to focus on throughout the semester is that everyone has agency. Leadership doesn't come from the position. It comes from action. So I think it is important for them to understand the ethics and societal impacts of engineering."

Andrade has adjusted the classroom activities over the years to build more critical thinking and metacognitive skills. And it's this focus on pedagogical improvement that she hopes to see flourish at the university.

"It can be hard for research universities to keep a focus on quality education, but there is a push in the Clark School and on campus to do just that. I'm proud to be a part of that effort." |

## Student Concrete Group Earns Regional, National Recognition



**Student group celebrates receiving Outstanding University status from the American Concrete Institute.**

Students from the University of Maryland (UMD) Chapter of the American Concrete Institute (ACI) took home the grand prize for their performance at the Strongest University Competition in February. All 10 participating Terps were also awarded scholarships of \$1,000–5,000.

The event, which challenges teams to design the best concrete mix for a specified strength, was hosted by ACI's Maryland Chapter with support from the National Capital Chapter of ACI and the National Ready Mix Concrete Association. The four competing teams—two from UMD and two from Morgan State University—were also judged on their mix design, proficiency with material preparation, use of equipment, awareness of concrete mix procedures, and teamwork.

The student group's success came just weeks after UMD received Outstanding University status in recognition of their 2016 contributions to ACI-related activities.

>> **LEARN MORE, VISIT** [go.umd.edu/ACI](http://go.umd.edu/ACI)



IMAGE: JOHN CONSOLI

## UMD Solar-Powered House Bears Fingerprints of CEE Students

The University of Maryland Solar Decathlon home reACT is the culmination of nearly two years of research, innovation, and labor by roughly 400 faculty and students. But its core "kit-of-parts" design originated in part from the foresight of civil engineering students.

>> **LEARN MORE, VISIT** [go.umd.edu/reACT](http://go.umd.edu/reACT)





IMAGE: AL SANTOS

## Sami Khan

**SAMI KHAN HAS DEDICATED HIS ACADEMIC CAREER TO BUILDING THE RESEARCH, TECHNICAL, AND LEADERSHIP SKILLS NEEDED TO DESIGN STRUCTURES ABROAD.**

"In order to do that," he explained, "I have to not only understand the engineering aspects but also be able to communicate across cultures."

It's no surprise, then, that Khan was drawn to the University of Maryland (UMD) study abroad program. The Los Angeles native spent a semester in 2016 learning from world-renowned experts at Hong Kong Polytechnic University.

"I took a course there with a professor whose work I had first learned about in the states. And the work of professors I have here at the University of Maryland was being taught to students there," said Khan, who emigrated to Pakistan as a child. "It was absolutely amazing to experience that global exchange of knowledge firsthand."

But Khan's first foray into research with international appeal began in the lab of Department of Civil and Environmental Engineering (CEE) Assistant Professor Brian Phillips.

He and others in the lab are working to understand and improve a type of shock absorber filled with fluid that becomes stiffer when exposed to a magnetic field. These magnetorheological dampers have the potential to effectively limit the impact of an earthquake on a building.

Khan joined the project as a junior. Next year, he will defend a master's thesis focused on how the damper's performance is impacted by the settling of iron particles in the smart fluid.

"The settling is very slow, which is why little research has been done on this so far," said Khan, a participant in the department's combined B.S./M.S. program. "But that is also why it is so interesting from a civil engineering perspective. These buildings could stand for tens of years before an earthquake hits."

Khan has also leveraged the combined degree program to continue building leadership experiences. He serves as a chair for the Maryland Beta Chapter of Tau Beta Pi and is active in UMD's chapters of the American Society of Civil Engineers and Chi Epsilon, the national civil engineering honor society.

His success in these roles is largely due to his involvement in the university's RISE Leadership Academy.

"The seminars and lectures offered a lot of insight into what type of leader I could be and how I can help others succeed by offering a shared vision and mission," he said.

But, he is quick to add, many of these achievements would not have been possible if not for scholarships. Prior to being awarded a Richard and Stefanie Vogel Endowed Scholarship in 2014—the first of many that would help him take on more leadership positions—Khan worked a string of odd jobs while taking classes to make ends meet.

"I was on the Dean's List my first semester here, but then my grades really started falling," he said. "The scholarship allowed me to focus on my studies and become more engaged with the department and university." |

# UMD, USDA Partnership Puts Student Research Into Action

A nine-year partnership between environmental engineers at the University of Maryland (UMD) and the U.S. Department of Agriculture (USDA) has given engineering students the rare opportunity to directly advance efforts to safeguard the environment from historical contamination.

Department of Civil and Environmental Engineering Professor Alba Torrents and her lab joined other contractors working at the 6,500-acre Beltsville Agricultural Research Center (BARC) Superfund site in 2008. The center was placed on the U.S. Environmental Protection Agency's National Priorities List in 1994 due to historic areas of concern that required investigation.

"We are down to the really challenging sites—what we could consider the most difficult from a technical approach," said Dana Jackson, a professional geologist and the USDA Agricultural Research Service Superfund project manager who oversees BARC restoration efforts. "That's when I was informed there might be expertise within UMD that might have the interest and capacity to work in concert with us. With that special expertise, we have begun to solve many of the problems."

"A lot of people are doing this type of work," added Torrents. "But a successful, long-standing partnership between industry, the federal government, and a university like what we have is hard to find."

Their collaboration has focused on two projects.

At the site of a former research orchard, Torrents, Natasha Andrade B.S. '05, M.S. '08, Ph.D. '12, Marya O. Anderson M.S. '13, and a group of students have been examining better ways to characterize and reduce the threat of historical DDT to local wildlife.

"The DDT bioaccumulates in earthworms and can move into the tissues of birds and other animals that eat the contaminated worms," said Zijiang "River" Yang, a Ph.D. student on the project. "We are trying to determine if the wildlife is at risk from the DDT-contaminated soil and, if so, what we can do to mitigate that."

Ecological risk assessments like this are extremely labor and time intensive. But Yang is working to develop an easier



approach that would allow researchers to infer the threat DDT poses to birds and other animals based on soil tests alone.

"If we can determine the mathematical rate at which DDT concentrations change from soil to worm and worm to bird, we can determine how much DDT is accumulating in animals without having to sample them directly," he explained.

**"A successful, long-standing partnership between industry, the federal government, and a university like what we have is hard to find."**

ALBA TORRENTS, PROFESSOR, DEPARTMENT OF  
CIVIL AND ENVIRONMENTAL ENGINEERING

To do this, Yang will first have to develop a sampling strategy that accurately characterizes the range of DDT levels in soils across the 3-acre orchard.

The final design could also be used by researchers and officials tackling DDT contamination elsewhere.

The second UMD-affiliated project is located at the Beaver Dam Road construction debris landfill, which closed in the 1980s. There the team is focused on preventing trichloroethylene (TCE), an industrial solvent found in the groundwater, from entering the headwaters of Beaver Dam Creek and an adjacent wetland.

In 2013, BARC research team members Cathleen Hapeman, Laura McConnell, and Patricia Millner, along with UMD and the environmental consultants BMT Designers & Planners, built an in-ground permeable reactive barrier to help degrade the chemical to harmless breakdown products.





Gabriela T. Niño de Guzmán notes field conditions before gathering water samples.

But breaking down TCE can be tricky. Because some of the byproducts are actually more toxic than the original chemical, the team also decided to investigate whether the barrier could be seeded with a microbial community capable of degrading the solvent completely.

Gabriela T. Niño de Guzmán Ph.D. '17 and others would spend the next four years determining the best fill mixture, cataloging local soil bacteria, confirming the habitability of the barrier, and identifying an interim food source to boost the microbial population and activity critical to TCE degradation.

"Glycerol proved to be an easily accessible food source for the microbes. The mulch and other materials we use for the structure do not break down fast enough for them to use as food," she said. "Glycerol is also cheap and very widely available."

The next step will be to seed the barrier and monitor its impact on the chemical's concentrations in the outflowing water—a process that has itself been enhanced by UMD students.

Early in the project, Daniel Michaelson M.S. '12 discovered that the efficacy of similar structures nationwide is measured by collecting groundwater samples upgradient and downgradient from the barrier without allowing enough time for the groundwater to pass through—an approach that doesn't provide the level of detail needed to meet regulatory cleanup goals.

The findings led to a specialized network of sampling wells installed at the center of the TCE contamination and inside the barrier to ensure the team captures the actual degradation power of the barrier and microbes.

"These projects complement our research programs in developing natural resource management strategies and assessing conservation practices," said Hapeman. "This has been and continues to be a rewarding relationship for all involved." ■

## STEEL BRIDGE TEAM BUILDS THEIR WAY TO NATIONALS AT UMD-LED EVENT

On a basketball court turned build site in Ellicott City, Maryland, engineering students from the University of Maryland juggled speed and thoroughness on April 9 to construct the bridge that would secure them a spot at the national competition in Oregon.

The team placed second overall in the 2017 American Society of Civil Engineers Mid-Atlantic Regional Student Conference steel bridge competition. It's the second time in three years that Terps have advanced to nationals, where they competed with 42 other teams.

"I'm so proud of all that we have accomplished," said Scott Kearney B.S. '17, who led the team with Ben Seibert B.S. '17, following the regional event. "There were some extremely long nights, but everyone was willing to help."



Coordination for the Mid-Atlantic Regional Student Conference, which also featured a business meeting, professional and technical presentations, display contests, and concrete canoe and geowall competitions, was led by Nathalia Henriquez B.S. '17.

"The University of Maryland had not hosted regionals since 2007, and we felt we were finally in the position to take on this challenge again," she said.

>> LEARN MORE, VISIT [go.umd.edu/regionalconference](http://go.umd.edu/regionalconference)





## Martina Driscoll

**ASK MARTINA DRISCOLL B.S. '94 TO NAME A FAVORITE PROJECT FROM HER CAREER AT WISS, JANNEY, ELSTNER ASSOCIATES (WJE) AND YOU MAY BE SURPRISED BY THE ANSWER.**

It's not the Washington Monument earthquake repair or her documentation of Diocletian's Palace in Croatia—although she admits both were amazing experiences. Her favorite project took place at 2025 E Street Northwest in Washington, D.C., the location of the American Red Cross National Headquarters.

The complexities of the 775,000 square-foot Clark Construction Group project—which included completely

deconstructing, moving, and reconstructing a historic limestone building to allow for the erection of a new office tower and connecting skylight—might have been enough to endear it to Driscoll. But it was timing that secured the project its spot on top.

"It was the first project as a young engineer where I felt I was really contributing to the project's success independent of the project manager," she explained. "It was my professional coming-of-age project."

The daughter of a civil engineer, Driscoll joined WJE in 1997 after completing her M.S. at Cornell University, where her research focused on the durability of slag cement concrete.

"I figured out pretty early on in my graduate studies that I didn't want to focus on traditional building design," she said. "I found I really like solving problems, whether on historic properties or for more commonplace structures. When I learned about WJE and their forensic work, I knew it was the right fit."

Today, she's a unit manager overseeing a team of roughly 20 architects and engineers who help clients design buildings for greater longevity and serve as experts on renovation and failure investigation projects. It's her team that's consulting on the National Air and Space Museum cladding renovation and the Martin Luther King Jr. Memorial Library makeover.

Driscoll also serves on the WJE Board of Directors—the first woman elected to the position.

But the Virginia resident still finds time to return to her hometown to help magnify the reach and impact of the University of Maryland (UMD) Department of Civil and Environmental Engineering (CEE).

In February, Driscoll and Christine Reynolds M.S. '96 shared their experiences with the Washington Monument restoration as keynote speakers at the Suit Up and Be Civil networking event, hosted by UMD's chapter of the American Society of Civil Engineers. A former member of the student group herself, Driscoll said the event allowed her to pay forward opportunities the department gave her as an undergraduate to build industry connections.

"The university may be large, but I always felt that the civil engineering department was a small school within a larger one," said Driscoll, who was also elected to the CEE Board of Visitors in March. "It gave me a myriad of opportunities to gain hands-on experience, including technical, time management, and teamwork experience, which helped me significantly as I continued my education and headed into my professional life." ■

# Women Forge New Opportunities for CEE Students

University of Maryland (UMD) senior Wing-Mei Ko believes in getting involved. So when she discovered opportunities to amplify the civil and environmental engineering curriculum with hands-on activities, she jumped at the chance.

Through mix days, design workshops, a new training manual for the university's Concrete Canoe Mix Team, and management of the university chapter of the American Concrete Institute, Ko is empowering students to extend and apply what they learn in class.

Her path is far from unusual in the Department of Civil and Environmental Engineering (CEE). In fact, roughly 40 percent of the leadership positions in student groups affiliated with the department were held by women in Spring 2017.

And while their organizations and responsibilities vary, their goals remain the same: usher engineering Terps to new heights.

For Yeming Hao, 2016-17 president of the Intelligent Transportation Society of America and Institute of Transportation Engineers University of Maryland Student Chapter, this advancement starts by establishing ties with groups beyond Glenn L. Martin Hall.

"Our student chapter has now successfully held several seminars and social events with the National Transportation Center and industry organizations," said Hao. "Seeing so many students, professionals, and faculty members attend and enjoy our events is very rewarding."

Brianna Murphy B.S. '17 had her sights on a similar target when she took the reins of the Suit Up and Be Civil undergraduate networking event.

"When I first attended Suit Up, I was really impressed by how unique it is to have an event entirely run by students that offers real opportunities to network. And I saw potential to take it even further," said Murphy.

Thanks in part to her efforts, the event has become a trademark of UMD's chapter of the American Society of Civil Engineers, which itself experienced a year of growth under female leadership.

With Katie Edwards B.S. '17 at the helm—and Nathalia Henriquez B.S. '17 and Emily Snider B.S. '17 supporting operations—there was a 66 percent increase in group members, a 23 percent rise in underclassmen memberships, and expanded opportunities to gain leadership experience by serving on committees during the 2016-17 academic year. Edwards also launched a formal student mentoring program that pairs underclassmen with junior and senior CEE students.

"I had seen what we'd tried and what we hadn't tried, and I thought I was in a unique position to take on more leadership in the group to improve our operations and our long-term vision for how we want to grow as a chapter," explained Edwards. ■



## SUIT UP AND BE CIVIL

In its third year, Suit Up and Be Civil enabled over 160 students to network with roughly 150 professionals representing 47 companies from the D.C. metro area. Led by Brianna Murphy B.S. '17, the annual event also featured a keynote address from Wiss, Janney, Elstner Associates' Martina Driscoll '94 and Christine Reynolds M.S. '96. The duo spoke about their experiences restoring the Washington Monument after a 2011 earthquake. ■

From left to right: Katie Edwards, Nathalia Henriquez, Brianna Murphy, Yeming Hao, and Wing-Mei Ko.

## Jose Torero Directs Center for Disaster Resilience



Jose Torero has returned to the University of Maryland to serve as the director of the Center for Disaster Resilience in the Department of Civil and Environmental Engineering and the John L. Bryan Chair in Fire Protection Engineering.

An internationally renowned expert in fire safety and resilience, Torero is the only person in the field to hold fellowships in the Royal Society of Edinburgh (UK), Royal Academy of Engineering (UK), Australian Academy of Technology and Engineering (Australia), Queensland Academy of Arts and Sciences (Australia), Society of Fire

Protection Engineers (USA), Building Research Establishment (UK), and Institution of Civil Engineers (UK).

>> LEARN MORE, VISIT [go.umd.edu/josetoreroctr](http://go.umd.edu/josetoreroctr)

## MICHELLE BENSI JOINS CEE FACULTY



Michelle "Shelby" Bensi has joined the University of Maryland as an assistant professor in the Department of Civil and Environmental Engineering.

Bensi comes to the department from the U.S. Nuclear Regulatory Commission, where she worked for seven years as an engineer specializing in assessments of and risk-informed decision-making associated with flooding hazards in the wake of the 2011 Fukushima Daiichi accident.

>> LEARN MORE, VISIT [go.umd.edu/bensi](http://go.umd.edu/bensi)

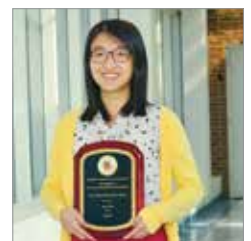
## Liu, Xue Recognized for Scholarly Excellence

Xiaocen Liu M.S. '17 and Yuan Xue M.S. '14, Ph.D. '17 are the 2017 winners of the Department of Civil and Environmental Engineering M.S. and Ph.D. awards, respectively. The competitions recognize the scholarly excellence and achievement of graduating master's and doctoral students based on a review of scholarly writings and accomplishments as well as an oral presentation.

Liu's thesis project pinpointed and posed solutions for some of the limitations to bioflocculation—the clumping of organic particles by bacteria and algae—in DC Water's Blue Plains Advanced Wastewater Treatment Plant. Improving this process means cleaner effluent flowing into waterways and more biosolids to be recycled as agricultural fertilizer.

For her project, Ph.D. award recipient Xue stitched together snowpack data from satellite images and global models to more accurately determine the mass of snow on earth and estimate how much water will be released when it melts. Her approach reduces the number of random errors in snow mass estimations for snow-covered North American regions, which could help natural resource managers better plan for available water.

>> LEARN MORE, VISIT [go.umd.edu/gradawards](http://go.umd.edu/gradawards)





## FACULTY ACHIEVEMENTS

Professor **BILAL AYYUB** received from the American Society of Naval Engineers the 2016 Solberg Award for his research



in the field of ship survivability. Presented annually since 1967, the Solberg Award recognizes significant contributions to naval engineering.

**AYYUB** was elected a Distinguished Member of the American Society of Civil Engineers, the highest honor bestowed by the organization.

**AYYUB** was also named chair of the Infrastructure Resilience Division of the American Society of Civil Engineers for fiscal years 2017-18. Established in 2014, the division develops resources for improving the hazard resilience of civil infrastructure and lifeline systems.

Professor **ALLEN P. DAVIS** received the Outstanding Alumni Award from the University of Delaware Department of Civil and Environmental Engineering for



his sustained dedication, leadership, and service to the profession and society. Davis, who earned his B.S., M.S., and Ph.D. at the University of Delaware, is an international leader in

urban stormwater management and treatment.

Research Professor **GERALD GALLOWAY** was awarded the Karl Mohr Distinguished Service Award for National Activities by the Floodplain Management Association.



The award recognizes individuals who have influenced national floodplain management policies or activities through their long-term efforts.

**GALLOWAY** was also named co-chair of a new National Academies of Sciences, Engineering, and Medicine study committee charged with identifying effective ways to measure the resilience of a community to natural hazards and other disruptions.

Associate Professor **DIMITRIOS GOULIAS** has been appointed head of the Civil



Engineering Unit of the Athens Institute for Education and Research, which promotes international and multidisciplinary cooperation in research, education, and conferences.

**THOMAS JACOBS**, director of the Center for Advanced Transportation Technology,



received the Chairman's Award from the Freeway Operations Committee of the Transportation Research Board.

Professor **MIROSLAW SKIBNIEWSKI** was named a Distinguished Visiting Fellow of the Royal Academy of Engineering to support his visiting professorship at Cardiff University.



**SKIBNIEWSKI** was also elected Honorary Lifetime Member of the International Association for Automation and Robotics in Construction for his lifetime contributions to scholarly research, teaching, and professional service.

**LEI ZHANG** was promoted to the rank of full professor by University of Maryland President Wallace Loh. Zhang is also the director of the National Transportation Center and the new Maryland Transportation Institute.



## STUDENT ACHIEVEMENTS

### CONGRATULATIONS TO ALL CEE STUDENTS WHO EARNED BEST PAPER AND POSTER AWARDS IN 2016-17, INCLUDING:

**MARIA COELHO**, Best Paper Award, 2017 International Conference on Systems

**WING-MEI KO**, First Place Poster Presentation, annual spring meeting of the Chesapeake Potomac Regional Chapter of the Society of Environmental Toxicology and Chemistry

**REBECCA HARTMAN**, Third Place Poster Presentation, annual spring meeting of the Chesapeake Potomac Regional Chapter of the Society of Environmental Toxicology and Chemistry

**E. MEGHAN RYAN**, David Miller Prize for Best Student Poster, 2017 Eastern Snow Conference

**QI YAO**, Second Place Poster Presentation, annual spring meeting of the Chesapeake Potomac Regional Chapter of the Society of Environmental Toxicology and Chemistry

**ZHONGXIANG WANG**, Stella Dafermos Best Paper Award, 2017 Transportation Research Board, Transportation Network Modeling Committee



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## CEE at a Glance



ENROLLED 2016-17

B.S.	M.S.	Ph.D.
410	61	110



36%

FEMALE STUDENTS

IN FALL 2016

37% Undergraduate

33% Graduate

## Students

B.S. | 127

M.S. | 18

Ph.D. | 12

DEGREES CONFERRED  
2016-17



ANNUAL RESEARCH EXPENDITURES IN FY16

# \$24.8 MILLION

# Research

Center for  
Advanced  
Transportation  
Technology

Center for  
Advanced  
Transportation  
Technology  
Laboratory

National  
Transportation  
Center

Center  
for Disaster  
Resilience

Maryland  
Water  
Resources  
Research  
Center

PRIMARY RESEARCH CENTERS

## Faculty

16.5 PROFESSORS

6 ASSOCIATE PROFESSORS

5 ASSISTANT PROFESSORS



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