**CEE Quick Facts**

**SIZE**

<table>
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<th>1,155</th>
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<td>students</td>
<td>faculty and staff</td>
<td>campuses</td>
<td>buildings</td>
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*Fall 2012

**QUALITY**

*U.S. News & World Report* consistently ranks the School’s undergraduate and graduate programs among the top in the nation. The 2012 rankings were no different:

- No. 3 Graduate civil engineering
- No. 3 Undergraduate civil engineering
- No. 2 Undergraduate environmental engineering
- No. 3 Graduate civil engineering
- No. 6 Graduate environmental engineering

**BREADTH**

16 *degree programs* CEE’s 16 degree programs offer educational and research activities that span the breadth of specialties within the field of civil and environmental engineering.

**RECOGNITION**

- 8 Eisenhower Scholars
- 13 National Science Foundation Fellows
- 15 President’s Fellows

**DEVELOPMENT**

$36,000,000+ Since the beginning of Campaign Georgia Tech, CEE alumni and friends have invested more than $36 million towards our $45 million goal. These gifts have provided vital resources to support our students, faculty, and programs and to make critical improvements to the Mason Building. More than half of the funds raised have created permanent endowments that will support our School in perpetuity. Thank you.
Panama Canal Expansion Project.

PEOPLE ARE OUR PRIORITY. THE WORLD IS OUR LABORATORY.
Working with the people of Haiti to recover from the 2010 earthquake I was reminded, again, of the tragic impact that natural hazards can have upon vulnerable communities. I was also reminded of how much civil and environmental engineers can help.

-Reginald DesRoches
From the Chair

In the 2012 Annual Report, you will read about many of the pressing challenges facing our world today—from the impact of air pollution on iconic structures, like the Taj Mahal, to cost-effective ways of maintaining our society’s transportation infrastructure and sustainable methods for re-using building materials in regions, like the Caribbean, that are resource-poor.

These challenges have always been important to the work of civil and environmental engineers. As we forge ahead into the 21st Century, they will become more so.

The School of Civil and Environmental Engineering at Georgia Tech is responding to these challenges—and others we have yet to identify—by transforming the way we teach and conduct research. In addition to being grounded in fundamental engineering skills, the next generation of civil and environmental engineers will need to grasp the social context of technological developments: human population growth, changing demographics, increased urbanization, increased resource consumption, climate change, aging infrastructure, and the issues of infrastructure in developing countries.

CEE@GT’s commitment to impacting these areas becomes clear in the work of students like Aaron Costin, Samuel Harris, and Jazalyn Dukes—each of whom is mentioned in the pages that follow. It is also manifest in the dedication of our faculty whose research addresses compelling issues and ignites the ambitions of our students. In the interest of space, we have highlighted just four of the many research projects led by CEE faculty.

I invite you to visit the CEE website—and our campus—to get the full picture. Take a tour of the newly renovated Mason Building. The $12.5 million renovation has provided the School with state-of-the-art teaching and research facilities, and innovative spaces for student and faculty collaboration. What you will see is confirmation of something we say all the time: People are our priority. The world is our laboratory.

Reginald DesRoches, Ph.D.
Karen and John Huff School Chair and Professor
School of Civil and Environmental Engineering
Georgia Institute of Technology
www.ce.gatech.edu
The CEE Mission

The School of Civil and Environmental Engineering at the Georgia Institute of Technology is guided by a mission that is as relevant now as it was at our founding, in 1896:

- To provide comprehensive educational programs
- To conduct internationally recognized scholarly research
- To engage in service to the profession, the State of Georgia, the nation, and the world

Graduate Programs

The School of Civil and Environmental Engineering offers superior graduate education programs in multiple areas. Graduate and doctoral students work closely with CEE faculty to make significant research contributions to their own fields of interest and to support the trans-disciplinary focus of the School.

Academic Overview

Our mission is deeply embedded in the seven* degrees awarded by CEE:

- Bachelor of Science in Civil Engineering (BSCE)
- Bachelor of Science in Environmental Engineering (BSEnvE)
- Master of Science in Civil Engineering (MSCE)
- Master of Science in Environmental Engineering (MSEnvE)
- Master of Science in Engineering Science and Mechanics (MSESM)
- Master of Science (undesignated) (MS)
- Doctor of Philosophy (PhD)

* Three additional degrees are awarded in conjunction with other schools within the Institute:

- Master of Science in Computational Science and Engineering (MSCSE)
- Master of Science in BioEngineering (MSBIOE)
- Master of Transportation Planning/Transportation Engineering (MCRP/MSCE)
The Heart of CEE: 
OUR STUDENTS

From first-year to doctoral, CEE students are the lifeblood of our School, bringing a diversity of intellectual, creative, and life-based wisdom to our classrooms, laboratories, libraries—and beyond.

Jacob Tzegaegbe recognized with Marshall Scholarship

In 2012, one of CEE’s favorite sons, Jacob Tzegaegbe, was selected to receive the prestigious Marshall Scholarship—an honor that will allow him to pursue his doctoral studies in civil engineering at University College London, beginning in Fall 2013.

Tzegaegbe was the only Georgia Tech student chosen for this honor this year.

“The topic for my doctorate is undecided at this point, but will likely focus on evaluating best practices in context-sensitive design for major transportation infrastructure projects in developing countries,” he said. “My hope is to work with professors in the Bartlett School of Planning to learn more about how to plan infrastructure in developing countries.”

782 Undergraduate students*
373 Graduate students*
369 Degrees conferred in 2012 during the Spring, Summer, and Winter Commencement ceremonies

31% of the CEE student body is female*
19% of the CEE student body is from underrepresented groups*

*Fall 2012
EE doctoral student Aaron M. Costin is serious about everything he takes on—whether it’s integrating RFID and BIM technologies in the lab or painting beautiful seascapes in his studio.

“I pretty much work in the lab from 8 to 6, and then, to blow off stress, I paint,” says Costin, an accomplished painter who was granted a National Science Foundation fellowship to pursue his research interests in 2012. Over the last three years, Costin has presented papers before academic audiences in Cairo and Munich and published his research in the *Journal of Automation in Construction*. He plans to complete his doctorate in 2015.

“The thrust behind my research is to develop an algorithm integrating current techniques available through the electrical and computer engineering community that will allow people—whether it’s a worker or a firefighter or anybody—to navigate a building using the shortest, quickest route,” he said. “When you’re talking about construction, that’s going to save time, and when you save time, you save money. Most importantly, it has the potential to save lives.”
One of the many unique programs offered by the School of Civil and Environmental Engineering is supported by the Joe S. Mundy Global Learning Endowment. This generous $4 million gift to the School was made by Mrs. Marion Mundy in honor of her late husband, a Georgia Tech civil engineering alumnus.

The Mundy endowment supports selected students in the School with the opportunity to participate in an international experience during their enrollment. The objective is to encourage students to pursue educational and cultural experiences outside of the U.S. These experiences provide learning that increases their potential to be leaders in a global community.

CEE students have the opportunity to apply for funding throughout the academic year. The program covers travel expenses, fees, and living expenses per semester and includes travel related to study abroad programs, educational conferences, and undergraduate research. It has been a tremendous success since its inception, and the students in CEE are certainly making the most of it.

Since its founding in 2009:

- 70+ students have received funding from the Mundy endowment.
- Mundy Scholars have traveled to 25+ countries on 6 continents.
Mundy Scholar Denise Smith has described her 2012 visit to London as “an experience that will shape my perspective on life—as a student, a researcher, a transportation engineer, and an appreciator of culture.”

Smith traveled to England in November of 2012 to attend the First International Conference on Urban Sustainability & Resilience at University College London.

“The conference offered me the privilege of networking with people from all around the world and from many different academic and cultural backgrounds. In addition to the conference, I had a chance to learn more about transportation in the U.K., namely through using its transportation system, and by meeting with the London Department for Transport.”

Outside the conference hall, Smith used her weekly “Oyster” transportation pass to get to several of the city’s culturally diverse eateries—like the Shaka Zulu and the Laughing Halibut—and to visit the Transport Museum, where she took in an exhibit on the evolution of transportation in London.

“The museum was arranged as a time travel, starting with carriages in the 1800s and ending with current travel options. The museum showed how the modes of transportation have changed and improved over time.”

“A lot of emphasis was placed on the underground transit system and other public transportation.”

Perhaps her most fruitful jaunt was to the Department of Transport, where she met with staff from the Sustainable Travel & Equality team.

“I explained to them that I had been working on a project at Georgia Tech for the Georgia Department of Transportation, looking at the multimodal needs, constraints, and opportunities for the agency and for the state. I also told them that my interview with them would be useful in helping me shape the recommendations that I have to develop for GDOT as a part of the final report.”

They told me about problems London faces—including congestion and air quality—and they told me about innovative practices, such as congestion pricing, the travel demand management campaign, and carbon targets.”

Smith went to England thinking that its transportation system was “light years ahead” of the system in the United States, but she came back seeing similarities in the problems both systems face.

“This gave me a broader perspective on the issues and equipped me with a more well-rounded approach on how to tackle them,” she said.
For structural engineering doctoral student Jazalyn Dukes, the Mundy Endowment meant a well-timed visit to Lisbon, Portugal—a city where many claim the science of seismology was born.

“I visited Mosteiro dos Jeronimos, which actually survived the 1755 earthquake with little damage due to the many small columns that held up the heavy roof of the building,” she said. “The building was very beautiful.”

Lisbon was also the host site for the 15th Annual World Conference on Earthquake Engineering, where Dukes was able to meet with world-renowned experts in her field: the seismic design of bridges.

“I was able to get a sense of the challenges being addressed in institutions across the globe that relate to particular regions,” she said.

“I was drawn to sessions that described how techniques for seismic resistant structures have to be tailored to the region’s development and resources. I also attended presentations that focused on the future of early warning systems for residents. I was able to meet with professors and professionals about my research and receive feedback on my topic.”

Her tours of the city’s bridges gave her a lot to ponder. “When designed, the seismic history of the area had to be accounted for, and therefore the bridge was built with seismic detailing,” she said.

“The Vasco da Gama Bridge was completed in 1998, when the World Fair Expo 98 was hosted in Lisbon, and is the longest bridge in Europe. It was built to withstand seismic loads of earthquakes much larger than the historical event in 1755. By visiting these sites and learning more about the design of the structures, it was apparent how important mitigation against damage due to large earthquakes is to the citizens of Lisbon.”

Dukes also dove into the culture, touring Moorish castles in Sintra, dining at a Fado house, and visiting the dramatic Cabo da Roca cliff—the westernmost point of continental Europe. The best part didn’t come from a planned tour, however.

“On my last day in Lisbon, I was fortunate to connect with Pedro, a resident of Lisbon and a researcher at Universidade NOVA de Lisboa,” she said.

“Pedro gave me and my lab-mate a personal tour of the city. He showed us different locations along the coast, where he often surfs with his friends, and the hills behind the coasts where he often hikes. He even stopped to buy traditional sweets for us from his favorite place, called Pastéis de Feijão. This tour was definitely a highlight of my trip to Portugal as it offered a personal experience of life in that country.”
When CEE’s External Advisory Board traveled to Panama in 2012 to see the famed Panama Canal Expansion Project, Mundy Scholar Samuel Harris was thrilled to join them.

“I learned about something I love in a different country and I also learned how they tackle engineering problems,” said the transportation engineering student. “I think that this sort of experience is critical for anybody because the world needs to be viewed in many ways to understand it.”

Soon after he arrived, Harris was treated to a presentation on the Panama City Metro Project by CEE alumnus Roberto Roy.

“He talked about the demographics of the area and how they planned to implement the new system in an older city,” he said.

“I feel very privileged for this experience. We were able to get a first-hand look at the tunnel and the machine that was constructing it. The machine drills for a predetermined amount of length, and once it reaches that length, it takes a set of precast concrete components and places them around the tunnel. It then bolts them in place and sets a seal around it so that it is water-proof.”

Not all of his time was spent studying engineering projects. Harris toured the rain forest on one excursion, and took in the history in the Panama Canal Museum, in Old Town.

“This was an absolute joy to be able to walk through the history of Panama and learn how events shaped the future of the promising country. After the tour there was a native dance show that was performed. This downtime also allowed time to meet with more CEE alumni. They shared lots of insights and stories with me.”

Harris was in awe when the group visited the Panama Canal Expansion project, which was more massive than anything he had imagined. But it was on his last night in Panama that he got, perhaps, his biggest thrill.

“We had a special guest [at the farewell gala]: the Vice President of Panama, Juan Carlos Varela. When he entered the room I was already trying to devise a plan to introduce myself. Lucky for me, [Georgia Tech] President Peterson introduced me.”

And what did they talk about? Engineering, of course.

“One of the first things from the Vice President’s mouth was a comment on my Tau Beta Pi pin,” said Harris, referring to the national engineering honor society, of which he is a member. “It turns out that his brother was also a member and from there we had a long conversation about various topics.”
When Kari (Edison) Watkins isn’t riding a bike to her Georgia Tech office, she is hailing a bus to get there. If she has her way, more people will be joining her in both activities.

In 2012, Watkins worked with her graduate research team to begin the Atlanta launch of OneBusAway, a smart phone app that allows bus riders to know, in real-time, when the next bus is due to arrive.

“A lot of people think of public transportation as a stinky old bus that you have to wait for,” says Watkins, an assistant professor of civil engineering whose work focuses on collective transit, alternative transportation, and real-time user information software. “But if the service respects me, by being a nice, frequent, on-time vehicle, people change their attitude.”

Watkins has every expectation that Atlanta riders will adopt this app. When she first co-developed it with a colleague at the University of Washington, it was snapped up by more than 100,000 transit users in a three-year period. A study conducted three years later showed that those users trusted and used public transit more frequently as a result of that dependability.

“What we found in Washington was that in situations where people are waiting for a bus or a train, they perceive themselves to be waiting for up to twice as long as they actually are. So if a bus is late 10 minutes, they perceive it to be 20 minutes,” she said.

“But when they had this app, they were able to see how long they were actually waiting. Their perception of the wait-time dipped. And they began sharing that information with others who were also waiting.”

Watkins thinks more people will take advantage of available public transportation if they do not perceive it to be a protracted waiting game.

“A problem that plagues the transit industry is wait-time, something you don’t have when you drive a car,” she said.
“If you are standing around on a corner, waiting for a bus and you don’t know exactly when it’s going to come, you can’t make a decision about doing something else. That’s frustrating.”

A survey that Watkins conducted three years after implementing the OneBusAway app in Washington backed up this hypothesis: results revealed “significant positive shifts in satisfaction with transit, perceptions of safety, and ridership frequency as a result of the increased use of real-time arrival information.”

When she lived in Washington, Watkins was happy to use the OBA technology to commute to her job and to navigate the city with her two children in tow. Daily trips became opportunities to engage her children in discussions about what they saw outside. When she moved to Atlanta, she had to adjust her routine – and develop another app.

In 2012, Watkins and her Georgia Tech colleague, Dr. Christopher LeDantec rolled out CycleAtlanta, a smart phone app that allows cyclists to record their bicycle trips, noting where the best routes are, where the bike lanes are obstructed, and where the potholes are. The information collected can be used by the city to make strategic improvements to bicycle infrastructure.

“In cities that are relatively spread out, like Atlanta, collective transportation options can’t handle all of the demand, “ Watkins explains. “Alternative forms of transport, like cycling, need to be a part of the mix. The city can use the information we collect from this app to make future decisions about where infrastructure is needed to create bike-friendly routes throughout Atlanta,” Watkins said. “And this can, eventually, lead to more riders on public transportation. After all, bikes can take you to the bus station, and the train station.”
Why is the Taj Mahal turning brown?
REMOVING THE VEIL OF POLLUTION FROM AN ICONIC MONUMENT

The first time that environmental engineering professor Mike Bergin got a chance to see the Taj Mahal, a portion of the iconic monument was covered in wooden scaffolding for its once-every-five-years cleaning.

Though disappointed by the view, he was inspired by the challenge it presented.

“We really don’t know what the long-term effects of that cleaning are on the marble,” he said. “But if we want to mitigate this constant build-up of air pollution deposition at the Taj, we have to know exactly what has caused the problems,” he said.

That challenge is at the center of a two-year study that Bergin and colleagues from the University of Wisconsin, the Indian Institute of Technology-Kanpur, and the Archaeological Survey of India (ASI) have tackled under the auspices of the Indo-U.S. Science and Technology Forum (IUSSTF).

The overarching objective, Bergin said, is to determine the extent to which soot and dust are responsible for the browning of the Taj Mahal, and to determine the sources of these particulate matter (PM) components in an effort to develop strategies to keep the Taj clean.

Bergin explained that the particulate matter in the Agra region of India is emitted from a variety of sources including biomass burning (wood, crop residue and cow dung), fossil fuel combustion, and dust emission from both roads and agricultural practices.

The mix of PM in the area is tinted dark by black carbon soot particles (from incomplete combustion) as well as from soil/mineral dust from both local and regional sources—at times transported from hundreds to thousands of kilometers away.

To measure the exact composition of the PM in and around the Taj Mahal, Bergin’s team installed standard filters, whose contents were later analyzed by researchers and graduate students at Georgia Tech. They also stuck clean marble “targets” directly to the structure for several months to see what they collected. Once removed and analyzed, these small chunks of marble contained a wealth of information.

“Our preliminary results indicate extraordinarily high levels of particulate matter—on average 200 micrograms of particulate matter per cubic meter of air,” he said.

“To put that in perspective, Atlanta on a bad day will attain a level of about 20. The level around the Taj is more than an order of magnitude higher than U.S. National Ambient Air Quality Standards—with extremely high levels of soot black carbon.”

Bergin pointed out that the presence of this high level of PM does not necessarily explain the discoloration of the Taj Mahal. It could be something underneath the build-up of pollutants that caused the marble to darken, he said, so his team began developing a model that would explain how air quality changes the color we see on a surface.
“It was very complicated, but very interesting, too,” he said. “We needed to know if it was the PM causing the change or if it was something else.”

Although Bergin’s team is still in the process of analyzing samples for specific chemicals components that will identify PM sources, he said that combustion-related PM components are extraordinarily high in Agra and that they very likely play some role in the discoloration.

The investigation will not end with the production of that data, however.

“The whole purpose of this collaboration was to improve and strengthen relations between the scientific communities in India and the U.S.,” Bergin said. “As a result of this project, we have begun conducting research as part of another NSF-funded project which will allow us to study air quality in a larger portion of India.”
As a member of Georgia Tech’s Caribbean Hazard Assessment and Mitigation Preparedness (CHAMP) team, Dr. Kimberly Kurtis has been applying her expertise in material performance to a new arena.

In 2012, Kurtis and other CHAMP researchers traveled to Belize, Trinidad, and Jamaica to investigate the feasibility of using crushed and graded concrete construction debris as materials to rebuild infrastructure that has been damaged by earthquakes and hurricanes. The goal, she says, is to use recycled materials as both coarse aggregate and cementitious filler in concrete reconstruction.

CHAMP is a multi-disciplinary team of Georgia Tech researchers, faculty, undergraduates and graduate students who are engaged in addressing the region’s vulnerability to natural hazards. Kurtis’s team visited cement plants, concrete suppliers, and recycling facilities to investigate and analyze the materials used in typical construction practices in the region. The team also presented their ongoing research to students and faculty at the University of the West Indies in Trinidad.

“Testing done by faculty and students in structures, mechanics and materials has demonstrated that adequate compressive strength, durability, and earthquake resistance can be achieved when the debris is appropriately processed and the concrete is suitably proportioned and reinforced,” Kurtis said.

Back in CEE’s Structures and Materials Laboratory, graduate students like Mitchell McKay tested full-scale reinforced concrete beam-column connections produced with recycled aggregate concrete to rate its seismic performance. Despite the fact that it has a lower strength compared to traditional concrete, the recycled aggregate concrete provided good seismic performance when designed with proper reinforcing details.
“In addition to the region’s elevated exposure to natural hazards, the Caribbean is resource-constrained,” said Kurtis, an ACI and ACERS Fellow. “The availability of high-quality and economical sources of aggregates varies considerably among countries. Supplementary cementitious materials (SCMs), commonly used in much of the world’s concrete, are seldom available.”

To address this, the team has begun to examine if the fine particles resulting from crushing debris into aggregate can also be used in concrete, as an SCM or filler material. Caribbean cement samples returned to Atlanta have been analyzed by quantitative x-ray diffraction (QXRD) and isothermal calorimetry to determine their chemical composition and reaction characteristics, which are compared to U.S. cements. The combination of these cements with the recycling fines, which are challenging to dispose, are currently being evaluated.

“Using debris resulting from one event to reconstruct infrastructure which can withstand later events is a strategy which overcomes several important challenges with reconstruction in this region,” Kurtis said. “We see great promise in this research.”

Find out more about CEE’s involvement with CHAMP at www.champ.gatech.edu.
For CEE’s Dr. Yi-Chang James Tsai, transportation research isn’t about producing data. It’s about producing impact.

That’s the impetus behind the two-year, $1.9 million RS-GAMS Phase 2 project—a collaboration between Tsai and the U.S. and Georgia Departments of Transportation that promises to revolutionize the way highway infrastructure is inventoried, maintained, and managed. It is scheduled to finish in 2013.

“This will help to maintain our infrastructure in a cost-effective, sustainable way,” he says. “The technology has changed, improved, so we are in a good position to look at solutions to problems, not just data.”

The technology he describes is the Remote Sensing and GIS-enabled Asset Management System (RS-GAMS) which uses emerging LiDAR, 3D laser, 2D imaging, Inertia Navigation System, and GPS/GIS technologies to create an intelligent roadway asset inventory and management system. It also employs newly developed multi-sensor data fusion, image/signal processing, and artificial intelligence algorithms.

Light Detection and Ranging (LiDAR) is a remote sensing technology that uses a laser to measure and record the distance between objects. An analysis of the data returned from the LiDAR can produce a 3-D model that can pinpoint much of what is lost by video or visual observation from a moving car.

The system, installed on a sensing vehicle (GTSV), allows engineers to collect all needed data by driving. It detects pavement distresses, including potholes, rutting, and cracks along with signage. It automatically measures roadway geometries, including pavement width, curve, grade, and cross-slope—information that can be used to assess roadway safety and compute drainage capability under different categories of rainfalls. The RS-GAMS uses a face recognition algorithm that allows engineers to identify the location and condition of various assets, like signs. By simultaneously collecting visual, LiDAR, and GPS-generated data, the RS-GAMS can give highway engineers a spatially searchable database of assets and problems.

“Not only can you count all of the signs on a roadway; you can tell if a particular sign is missing, tilted or blocked,” says Tsai.

“The algorithm recognizes the sign and can detect problems. This technology can be applied to expedite infrastructure damage assessment following natural disasters because of its automatic and non-contact nature.”

The technology has a direct bearing on the economics and practicality of maintaining 18,000 miles of Georgia highways.

“If you physically go out to [I-285] to look for cracks in the roadway, you will have a hard time because the road is so busy,” says Tsai.

“And if you are depending on video to inventory the roads, you will end up with a terabyte of images that an engineer will have to review. And even then, the images might not be clear.”
The cost of such an inventory could run into the millions of dollars and take as long as a year to complete, Tsai points out. The RS-GAMS system can cut this down to a matter of weeks, at a fraction of the cost.

“The RS-GAMS not only acquires high-resolution roadway data from a vehicle, it also intelligently processes the data and transforms it into meaningful decision-making information,” said Tsai. “Increasingly, this sort of accountability is what the federal government is demanding from us.”

In 2012 Tsai worked with six graduate students to refine the RS-GAMS and to test the initial results. Some teams accompanied GDOT officials to the roadways to check the accuracy of the data, while others helped him to refine the analysis that will make this a boon to roadway engineers everywhere.

“When we are done, Georgia would like to be a pilot program for this system, and we think it will be very popular,” says Tsai. “This is data and information that will make states accountable for their road maintenance.”
Our People

CEE FACULTY & STAFF

The faculty and staff of the School of Civil and Environmental Engineering reflect our commitment to strength through diversity.

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DR. HAIYING HUANG
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PhD, University of Minnesota

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PhD, University of Texas, Austin

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Associate Dean for Academic Affairs, CoE & Professor
PhD, Columbia University

DR. LAWRENCE F. KAHN
Professor
PhD, University of Michigan

DR. JAEHONG KIM
Associate Chair, Georgia Power Distinguished Professor, PhD, University of Illinois, Urbana-Champaign

DR. KOSTAS KONSTANTINIDIS
Carton S. Wilder Jr. Assistant Professor, PhD, Michigan State University

DR. JOHN H. KOON
Professor of the Practice
PhD, University of California, Berkeley

DR. STANLEY D. LINDSEY
Professor of the Practice
PhD, Vanderbilt University
Faculty

DR. JIAN LUO
Associate Professor
PhD, Stanford University

DR. PAUL W. MAYNE
Professor
PhD, Cornell University

DR. RAFI L. MUHANNA
Associate Professor
PhD, Higher Institute for Structure and Architecture, Bulgaria

DR. JAMES A. MULHOLLAND
Professor
PhD, Massachusetts Institute of Technology

DR. SPYROS G. PAVLOSTATHIS
Professor
PhD, Cornell University

DR. GLENN J. RIX
Associate Chair & Professor
PhD, University of Texas, Austin

DR. PHANISH SURYANARAYANA
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Associate Chair & Professor
PhD, Georgia Institute of Technology

DR. ARASH YAVARI
Assistant Professor
PhD, California Institute of Technology

Research Engineers & Scientists

ROBERT S ABERNATHY
JULIAN DIAZ-OSPINA
VETRI VENTHAN ELANGO
JIABAO GUAN
ANGSHUMAN GUIN
YONGTAO HU
JIN YEON KIM
DAI SUKE MINAKATA
MEHMET TALAT ODMAN
MICHAEL Q. RODGERS
FRANK SOUTHWORTH
STACY V STRINGER
WONHO SUH
MICHAEL H SWANGER
YI-CHING WU
YANZHI XU
CHUANG-SHENG YANG
HUAMING YAO
HAMID ZAND
WEN ZHANG
GUANGXUAN ZHU

Adjunct Faculty

JOHN E ABRAHAM
ROBERT CHARLES BACHUS
KEVIN O CLARK
MAOHONG FAN
RAMI M HAJ-ALI
FRANK E LOEFFLER
JOHN LUH
ELIZABETH L MANN
JAMES ROBERT NELSON
CHRISTA DIANNE PETERS-LIDARD
JUSTIN V REMAIS
DANA KATHRYN SAVIDGE
COSTAS TSOURIS
JORGE A VANEGAS
SIMON P WASHINGTON
Staff

ERIN D. ADAMS
Human Resources Coordinator

MIKE ANDERSON
Director of Information Technology

JENNIFER BALACHANDRAN
Journal Assistant

TRACY A. BOOTHE, ED.D.
Academic Advising Manager

REBECCA COLTER
Grants Administrator

ELLEN CORMACK
Assistant to the Chair

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Administrative Professional

JENNY EATON
Administrative Professional Sr.

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CRYSTAL HANSON
Administrative Professional Sr.

GARY L. HOILMAN
Assistant Director Financial Operations

JOAN M. INCROCCI
Research Operations Program Manager

KENNETH IRWIN
Admissions Coordinator III

MARJORIE JORGENSON
Administrative Professional Sr.

LAURA P. KOVALCHICK
Director of Global Research Development

CAROL MADDOX
Administrative Professional Sr.

J.J. MARTINO
Information Technology Support Professional Sr.

KATHLEEN E. MOORE
Communications Manager

ELLA DENISE RHODES
Financial Administrator II

DENIS SATRIA
Computer Services Specialist II

ROBERT SIMON
Academic Advising Manager

MELISA SINGLEY
Financial Administrator II

MICHAEL R. SORENSON
Mechanical Specialist

SUSAN SUMNERS
Administrative Professional Sr.

JOHN TEMPLE
Information Technology Support Professional II

ANDREW UDELL
Facilities Manager Sr.

JOSHUA VANCE
Financial Administrator III

MARY KATE VARNAU
Journal Assistant

No photos available:

SUELLEN ROBERTSON
Research Project Coordinator II

LISA TUTTLE
Administrative Professional Sr.

The following employees left CEE in 2012:

EARL L. BABBITT III (deceased)
TANYA M. BLACKWELL
RUTH H. GREGORY
C. ROBERT HUDGINS
JOSEPH HUGHES
WONYONG JANG
FAZLURRAHMAN KHAN
MICHAEL MEYER
JEFFREY PAUL NEWMAN
SHIRLEY FUMIYE NISHINO
LAURIE SOMERVILLE
THERESE TALBOT
MADAN TANDUKAR
DENISE TAYLOR
Recognizing Excellence

Dr. Adjo A. Amekudzi
Frontiers of Engineering Education invitee, National Academy of Engineering

Dr. Dominic Assimaki
Shamsheer Prakash Research Award

Dr. Aris P. Georgakakos
Member, Advisory Committee on Water Information (ACWI)

Dr. Haiying Huang
Future Leaders of the American Rock Mechanics Association

Dr. Jaehong Kim
Environmental Science and Technology 2011 Top Environmental Technology Paper Award

Dr. Terry Sturm
ASCE Life Member Award

Dr. Kostas Konstantinidis
Carlton S. Wilder Junior Chair in Environmental Engineering

Dr. Kari Edison Watkins
Indo-American Frontiers of Engineering invitee, National Academy of Engineering

Dr. Jochen Teizer
Assistant Professor Georgia Institute of Technology’s CETL/BP Junior Faculty Teaching Excellence Award

Dr. Ioannis Brilakis
Assistant Professor Georgia Institute of Technology’s Faculty Award for Outreach

Frank E. Williams, Jr.
BS CE, ’56
Chairman, Williams Enterprises College of Engineering Engineering Hall of Fame Inductee

Emilio Venegas
BS CE ’76
President, Venegas Construction Corporation Distinguished Engineering Award Recipient
CEE Faculty & Staff Awards

In May of 2012 CEE recognized the outstanding achievements of our faculty, students, and staff during our Annual Awards Ceremony. Honorees included:

Dr. Dominic Assimaki
Excellence in Research Award

Eric D. Marks
Bill Schutz Graduate Teaching Assistant Award

Earl L. Babbitt, III (deceased)
Outstanding Staff Performance Award

Dr. Ward O. Winer
Special Presentation
A special presentation was made to thank Dr. Winer for serving as Interim Chair of CEE, October 2011 - May 2012.

Dr. Susan Elizabeth Burns
CEE Appreciation Award

Dr. Dapeng Zhu
Jean-Lou Chameau Research Excellence Award

Dr. Haiyang Huang
Bill Schutz Junior Faculty Teaching Award

Dr. Joan Larrahondo
Best Ph.D. Thesis Award
No photo available

Dr. Dominic Assimaki
Excellence in Research Award

Eric D. Marks
Bill Schutz Graduate Teaching Assistant Award

Earl L. Babbitt, III (deceased)
Outstanding Staff Performance Award

Dr. Ward O. Winer
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Jean-Lou Chameau Research Excellence Award

Dr. Haiyang Huang
Bill Schutz Junior Faculty Teaching Award

Dr. Joan Larrahondo
Best Ph.D. Thesis Award
No photo available
In 2012, the bid to renovate CEE’s home, the Jesse W. Mason Building, quietly brought together students, faculty, administrators, alumni and admirers of Georgia Tech to raise what’s projected to be a $12.5 million overhaul of the 90,000-square-foot building. Those renovations are scheduled to be finished in Fall 2013.

“This campaign to renovate the Mason has shown us what’s best about the Georgia Tech spirit,” said Karen and John Huff School Chair Dr. Reginald DesRoches.

“We are working together, with the State of Georgia, the Institute, and our many dedicated alumni to support a renovation that will continue CEE’s reputation as a world-class educational institution. Considering the support we’ve already received, it’s clear we will succeed.”

PROTECTING AN INVESTMENT

The Mason Building Renovation Project started out as an asbestos abatement project, but it didn’t stop there. Crews upgraded fire safety systems, and installed a sprinkler system. They also replaced or upgraded the HVAC, electrical and plumbing systems. As renovations continued, crews identified leaks in the roof and windows, both of which were replaced with upgraded versions.
INVESTING IN CEE’S MISSION

“This renovation was an opportunity to make the Mason Building into a 21st Century learning environment,” said DesRoches. “Something that will launch the success of our students, faculty, and programs.”

“The most important thing about all of these changes is that they will encourage collaboration among our students,” said Associate Chair Donald Webster. “The new student conference rooms will give our students valuable experience with the sorts of project-based work that civil and environmental engineers regularly engage in.”

That mission will be evident the minute visitors walk through the front doors:

• A display wall in the lobby with a digital screen delivers CEE news, real-time.
• The lobby area will feature comfortable new seating for 24.
• The Marvin Mitchell Chair’s Suite (CEE main office) is bright, airy, and welcoming.
• A new student commons area has three glass-paneled group project consulting rooms with flat-panel screens.
• A new student collaboration area on the first floor has 18 computer stations and casual seating.
• New, 30, 66, and 70-seat classrooms will be 15 percent larger than previous classrooms.
• State-of-the-art instructional technology has replaced outdated equipment.

• There will be new teaching laboratories for geotechnical engineering and construction materials.
• The CEE Business and Student Services suites are conveniently located next to the student lounge.
• New faculty and graduate student offices will accommodate CEE’s growth.
• A new faculty/staff lounge and 18-seat conference room have video-conferencing services.
• New graduate student office spaces encourage trans-disciplinary collaborations.
• Mason will have the most efficient wireless connectivity of any building on the Georgia Tech campus.
INVESTING IN THE FUTURE

The renovated Mason Building illustrates the School’s commitment to sustainability. Recycled materials were incorporated into some of the renovations, and special care was taken to preserve the structural floor, roof decking, and exterior walls. In addition:

- More than 350 new low-e, double-pane, windows reduce energy costs.
- The reflective white rubber membrane roof absorbs less heat, reducing cooling costs.
- Lavatory equipment uses far less water, saving precious resources—and money.
- Motion-detecting faucets in lavatories are powered by batteries that are recharged by harnessing energy from water flow. These can last for up to 40 years.
- New efficient air handling units use variable air volume (not constant volume)—saving energy and money.
- A new refrigeration unit in the physical plant eliminates chlorofluorocarbon (CFC) emissions.
- New recycling and storage bins allow materials to be recycled and reused.
- New water fountains allow water bottles to be refilled; a digital counter records the number of bottles saved.
- The outdoor air delivery system uses new flow-measuring stations and CO₂ monitoring.
- The use of low-emitting building materials—including low VOCs, adhesives and sealants, paints and coatings—makes the air healthier.
- New exhausts in janitors rooms, walk-off mats at entries, and MERV filters at AHUs reduce indoor chemical and pollutant sources.
"Adequate wasn’t good enough"

Faced with an engineering challenge, CEE alumni have a hard time relaxing. That’s what the School witnessed in 2012, when Howard Tellepsen, CE ‘66, and John Huff, CE ‘68, heard about the deteriorating condition of the Jesse W. Mason Building.

At the time, both men were on vacation with several other CEE alumni, touring the Panama Canal by boat. After discussing the situation in the boat’s galley for a few minutes, the two emerged with a plan to kick off the Mason Building Renovation Campaign. Three hours later, they had raised nearly a million dollars.

“We just thought that it was up to CEE alumni and friends—people who’ve really benefited—to take the next step, to make sure we had a building that truly reflected CEE’s stature. Adequate wasn’t good enough,” said Huff.

Ultimately, it will take more than $12.5 million to get the job done. “With this effort, we got the ball rolling, but we know it’s not done,” said Huff. “We’ve told the CEE development folks that they should use the money we raised for a challenge grant to all CEE alums, from as far back as the School has records. It’s that important.”

Tellepsen is confident that his fellow alums will heed the call. “Knowing what we’ve been able to accomplish over the course of our post-Tech careers, no one should doubt what we can achieve in the coming months,” he said. “And it’s up to every CEE alum and all the friends we can find to show the next generation of CEE grads that there’s nothing a Tech grad can’t do.”
Engineering in action was the theme of CEE’s 2012 annual alumni trip, Unlocking Panama: A Century of Industrial Progress, March 21-25, 2012.

Altogether, 80 CEE students, faculty, staff, and alumni joined us for this five-day excursion that featured tours of the Gamboa Rain Forest, the Gehry Museum of Biodiversity, and, of course, the Panama Canal.

“This trip gave new and seasoned civil and environmental engineers a chance to see the powerful impact our profession has on the world,” said Karen and John Huff School Chair Dr. Reginald DesRoches.

“Not only did we marvel at the grandeur of the historic canal, we were also able to get an inside look at the transportation system that is still evolving in this nation.”

That insider look was provided by none other than Georgia Tech alumnus, Roberto Roy, BSME ’69, the executive secretary the Panama Metro Authority. Modeled after transport systems in Chile, Colombia, and Italy, this $1.9 billion project will eventually connect Panama City’s northern and southern sections, providing transportation to more than 40,000 passengers per hour.

“Thus far, the Metro has created 5,000 jobs,” Roy told the CEE visitors. “The government has plans for a second and third line as well.”

The tour got another exclusive view of Panama City’s most storied landmark, the Panama Canal, from another Georgia Tech alumus, Deputy Administrator for the Panama Canal Authority (ACP), José Barrios Ng, MSECE ’71.

Barrios Ng told the group that, when it is finished in 2014, the $5.25 billion Panama Canal Expansion Project is expected to double the waterway’s capacity by increasing both the volume and size of ships in transit. CEE visitors were able to visit two lanes, each with its own set of locks. A third lane of traffic was under construction and will include several improvements.

“My academic interests lie in the cultural aspects of engineering systems and new technologies,” said Angela C. Belfort, one of four Mundy Scholars on the trip.

“Seeing the American influence in Panama has had a tremendous impact on my life and has given me a deeper understanding of how engineering systems and technology affect people and communities. I was excited to learn about the country’s engineering systems—past, present and future.”
The CEE External Advisory Board (EAB) is a vital component of the School. Its members work in both the public and private sectors and provide an important, outside perspective that is essential to maintaining the relevancy of CEE programs to industry. The EAB plays a significant role in vetting programs designed for students, alumni, and corporate constituencies to ensure the highest quality standards in curriculum, practice, and outreach.

Douglas Hooker, Joe Palladi, Brent Reid, and Frank Williams transitioned to emeritus status in 2012.