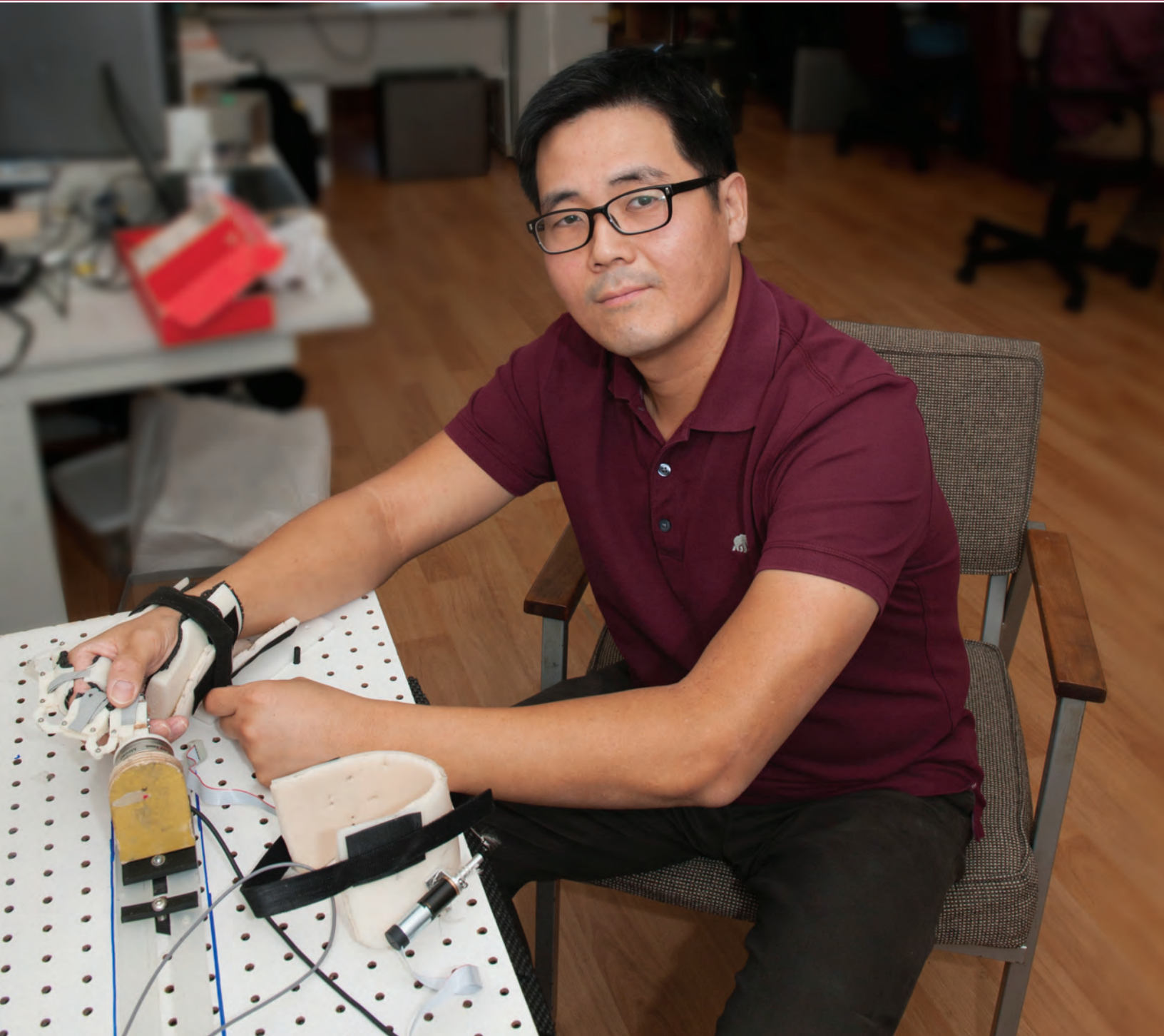


THE CATHOLIC UNIVERSITY OF AMERICA

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**Sang Wook Lee Awarded The Delsys Prize
for Innovation in Electrothermography**

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New Faculty and Staff



Eric Kommer, Ph.D.

Eric Kommer, Ph.D., joined the faculty of the School of Engineering's Department of Mechanical Engineering as an assistant professor in September of 2013. Prior to joining CUA he worked as a nuclear engineering consultant and taught as an adjunct professor at the U.S. Naval Academy. Kommer completed his Ph.D. in mechanical engineering at the University of Maryland in 2013 after serving for eight years as a nuclear-trained surface warfare officer in the U.S. Navy. His research interests include multiphase heat transfer, applied thermal engineering (especially in energy and power systems), and the optical properties of engineering materials.



Ujjal Bhowmik, Ph.D.

Ujjal Bhowmik, Ph.D., joined the electrical engineering and computer science department as a clinical assistant professor in the fall of 2013. He earned his Ph.D. in electrical engineering from the University of Alabama in Huntsville and M.Tech in Instrumentation from Indian Institute of Technology (IIT), Kharagpur, India. Bhowmik received a B.S. in electrical and electronic engineering from Khulna University of Engineering and Technology, Bangladesh. Before joining CUA, he was as a visiting assistant professor at the University of North Florida, Jacksonville, Fla. He was an assistant professor at Shahjalal

University of Science and Technology, Bangladesh, for six years. Bhowmik's research interests include medical imaging (mathematical modeling, simulation and application of three-dimensional cone-beam CT imaging), fingerprint identification and verification systems, and application of FPGA and microcontrollers. A paper based on his recent research work, "Segmentation of cracks in x-ray CT images of tested macroporous plaster specimens," was awarded as the best technical paper at IEEE Southeastcon 2014 conference.



Diego Turo, Ph.D.

Diego Turo, Ph.D., joined the Department of Mechanical Engineering as a clinical assistant professor in August 2014. He was a research assistant professor in the Department of Bioengineering at George Mason University in 2013 and a postdoctoral fellow in the Biomedical Imaging Laboratory at George Mason University from 2011 to 2013. Turo received his Ph.D. in acoustics from the University of Salford, Manchester, United Kingdom, in 2011, and Laurea degree (B.S. and M.S.) in aerospace engineering from the University of Naples "Federico II," Naples, Italy, in 2006. His research interests include linear and

nonlinear modeling of sound propagation in porous media, acoustic imaging, and shear wave elastography techniques for mechanical characterization of complex media.



Suraya Adam

Suraya Adam joined the biomedical engineering department as the assistant to the chair in August 2013. Prior to that, she worked at the Columbus School of Law as the coordinator of the Externships Program. She received a B.A. in political science and criminal justice at the University of Maryland, College Park, in 2007. She is pursuing a master's degree in economics at CUA. She loves traveling and describes herself as an almost enthusiastic foodie.

(New Faculty and Staff continued on page 13)

Dean's Message



I am very pleased to communicate with you again in my dean's message in this fall 2014 issue of "CUA Engineer." As I write, I have just completed the first year of my fourth four-year term as dean of the School of Engineering and witnessed another successful academic year filled with many accomplishments and milestones. I would like to highlight them below.

- In the fall semester 2013, we welcomed 152 new undergraduate students, including new freshmen, joint-degree students, and transfer students. This number reflects our ability to sustain the substantial increase in new students that took place in the fall semester of 2012 with a 45% increase in new students and, more important, about a 70% increase in new freshmen as compared to the fall semester 2010. The school also welcomed 51 new graduate students. During the past academic year, we granted 90 bachelor's degrees, 51 master's degrees, and 10 doctoral degrees. Graduates' names and degrees are listed on the inside back cover of this issue.
- The research productivity of our faculty in terms of published papers and conferences attended, service in technical and professional societies, and submitted and funded research proposals, etc., continued to be impressive as reflected in the Faculty Section.
- Regarding accreditation activities, the program chairs submitted the self-study reports to ABET by July 1, 2013. An ABET team consisting of team chairs, program evaluators, and observers of the Computing Accreditation Commission and the Engineering Accreditation Commission of ABET conducted an evaluation of our five programs including biomedical, civil, electrical, and mechanical engineering, and computer science in October 2013. Overall it was a successful visit with no major issues. We are awaiting the ABET Final Statement expected to arrive in September 2014.
- The school successfully recruited two tenure-track professors and one clinical professor. Associate Professor Binh Tran resigned from his post as assistant dean to return to his regular faculty appointment. Associate Professor Steven Brown was appointed associate dean of engineering for four years, effective Aug. 20, 2013.
- Regarding international programs, in January 2014, five CUA engineering students went to Hong Kong to study at the Hong Kong Polytechnic University (PolyU) and seven students from PolyU came to study at CUA under the existing student exchange program. In the fall 2013 semester, nine Vietnamese

students joined our school after completing two years in engineering degree programs at the top-ranked engineering universities in Vietnam through the 2+2 programs between CUA and these universities.

- At the School of Engineering Homecoming Luncheon in October 2013, Andrew J. Youniss, B.S.C.S. 1983, co-founder and CEO of Rocket Software, received the 2013 Engineering Distinguished Alumni Achievement Award.



- The support of the School of Engineering Executive Development Board continued to be strong. The board frequently conducted business during the year through phone conferences or in-person meetings. Board members continued to financially support the school through their annual donations.
- In July 2013, I traveled with Provost James Brennan to Santiago, Chile, and met with leaders of the Pontifical University of Chile. In December 2013, Provost Brennan and I went to Vietnam to visit the Ho Chi Minh City University of Technology of the Vietnam National University System (VNU). We then attended the 10th Anniversary Celebration Ceremony of the International University and met with officials of Saigon Technology University, the University of Danang, and the Danang University of Technology. During that trip, I also visited with the administrators of University of Science of VNU and the faculty of the Vietnam Academy for Water Resources in Hanoi, Vietnam.
- The Engineering New Frontiers summer camp was revamped, with a new format. The program took place in July 2013 with about 32 students from high schools around the country. During the one-week stay at CUA, the participants benefited from hands-on activities, cultural events, and field trips to local research facilities.



In summary, I am very happy with the progress we have made in the last academic year, especially in the area of student recruitment and accreditation. I look forward to another successful year in 2014–2015 and hope you enjoy reading this issue of "CUA Engineer."

Regards,

Charles Cuong Nguyen
Dean, School of Engineering
nguyen@cua.edu

How Children Move: Studying the Link Between Brain Injuries and Motor Function

Faculty Profile

Early childhood is a period of great development, as infants and toddlers learn lifelong motor skills like crawling, walking, grabbing, pulling, and twisting. If a child receives a brain injury during this time, that development can be sidetracked, causing challenges for years to come.

This is a problem Sahana Kukke, Ph.D., assistant professor of biomedical engineering, is hoping to solve.

“Kids with early brain injuries, where something happens around the time of birth or during pregnancy, their brains don’t develop normally,” she said. “They don’t reach their milestones as they grow up, so my interest is in learning how those motor skills are developed and how the brain and muscles connect to form these skills.”

After receiving her bachelor’s degree from Northwestern University in Evanston, Ill., Kukke earned her master’s in biomedical engineering at

Case Western Reserve University in Cleveland, where she began studying neurophysiology and the link between motor skills and spinal cord injuries. Later, while pursuing a Ph.D., in bioengineering at Stanford University, Kukke became interested in pediatric brain injuries.

“If an adult has a stroke, he or she has learned up to the point of the injury all the motor skills so there’s a particular methodology for recovery, but if it happens to a baby, they haven’t learned anything yet so they don’t know these normal patterns,” Kukke said. “There’s a lot of plasticity that occurs, a lot of adaptation and compensation that they naturally use as they’re trying to survive and trying to keep up, so that seemed interesting to me.”

Kukke refined her research during a three-year post-doctorate at the National Institutes of Health in Bethesda, Md. Her research continues to involve working with test subjects to measure

their behavior — how quickly and smoothly they can do things with their hands.

“We can put sensors on our skin to record muscle activity and record how active or inactive certain muscles are during movement,” she said.

Using an electroencephalography scalp cap with special sensors, Kukke can record the signals from the brain and analyze the electrical activity to see where the neurons are communicating through voltage changes. With this noninvasive research technique, Kukke has collected data on children who have experienced early brain injuries as well as children who are developing normally. She hopes her findings will lead to better rehabilitation techniques or even a cure for children whose muscle development has stalled due to brain injuries.

“That’s kind of the guiding light in the research — the future of how we can make rehabilitation better,” Kukke said. “We study and try to think of new ways to intervene and help. We’re at the place where we can try out different ideas and see if they lead to something.

“It’s a challenging field because not all children have exactly the same injury at exactly the same time in their lives. There’s a lot of variability in that, but that makes it kind of fun and tricky, like a puzzle.”

One thing Kukke is hoping to learn about is a tie between motor skills and sensory abilities. Often, children who have experienced brain injuries experience sensory disorders. Kukke hopes to determine whether or not those sensory pathways to the brain could be helpful in transmitting messages to muscles as well.

“We haven’t really spent too much time and energy in trying to learn exactly why and how the sensory pathways are disturbed, but my interest is in looking at how they are related to movement and whether we can use the sensory pathways to improve motor function,” Kukke said.

Since coming to CUA to teach in January 2014, Kukke said she has enjoyed working with colleagues interested in motor control research and conducting research at the National Rehabilitation Hospital. In the future, she hopes to build stronger relationships with the Children’s National Medical Center.

“It’s been a whole new experience for me,” Kukke said. “I feel like there’s a lot ahead and I’m excited.”



Interplanetary Engineering: The Future of Education and Space Exploration

Faculty Profile

Following weeks of preparation and tests, the students in the mechanical engineering course Aerospace Design had an unusual field trip this spring. After driving to Westminster, Md., they launched rockets more than 1,600 feet in the air. Prior to the launch, students conducted aerodynamic experiments on rockets and parachutes, measured the thrust from the rocket engines, and wrote computer program to predict where the rockets would land based on wind and field conditions.

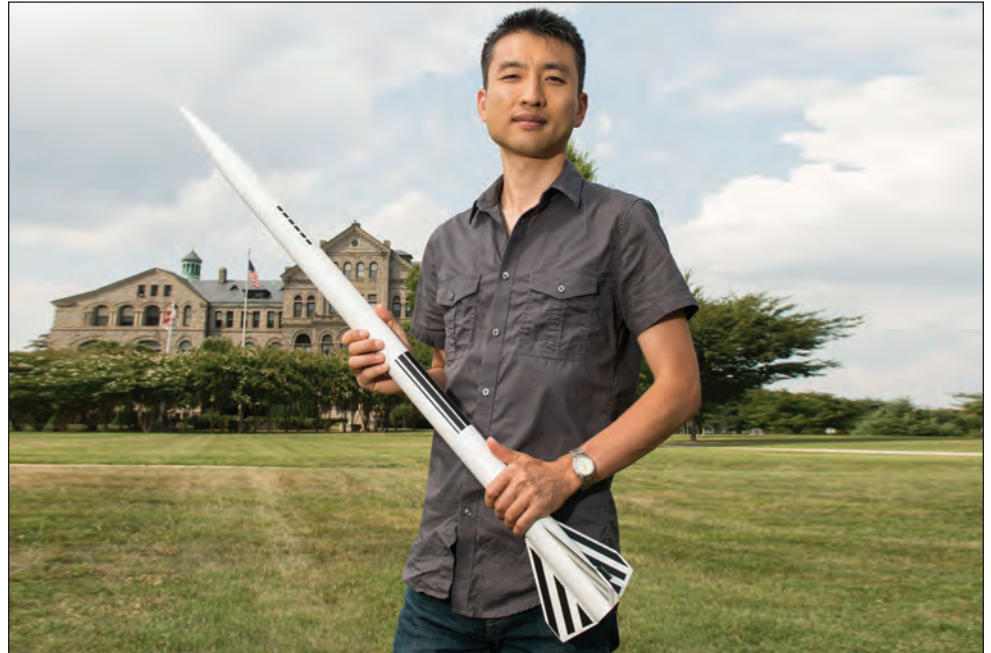
“There is no experimental device set up for this so the students had to create it themselves,” said class professor Masataka Okutsu, Ph.D., a clinical assistant professor in civil engineering who has taught at The Catholic University of America since 2012. “One thing I have noticed about students at Catholic University is they are really good at improvising. I will give them top-level objectives and they can figure it out. There’s a shop next to Pangborn Hall and they just gather the pieces of wood and cut it off and bolt and experiment on their own.”

That was not the only innovative project for the aerospace design students, who are mostly seniors and graduate level. Okutsu also worked with students to design a mission to Europa, one of Jupiter’s moons. The moon is shrouded in ice, which scientists believe could be covering a massive subsurface ocean — the body of which would be twice as large as Earth’s oceans.

By working together with help from other Catholic University engineers, the students researched a method scientists could use to determine the thickness of the ice in which an impactor would measure the vibrations caused by the impact. Students performed orbital mechanics calculations and found that the speed of impact would be more than 10 times of the speed of a bullet and that the collision would blast off and melt some of the ice to create a small crater the size of an Olympic swimming pool.

“The rest of the energy is going to travel through the ice as a shockwave and that is what will show up as vibrations,” Okutsu said. “So far, it looks like measuring the vibration may allow scientists to predict how thick the ice is. As far as I know nobody has done this kind of calculation before.”

This is the kind of research Okutsu is most passionate about. He first became interested in space when he was a high school student in



Tokyo. At the time, his goal was to become an astronaut.

“I started seriously thinking, some people work at a company and some people do other things and astronauts fly into space and that’s their job?” Okutsu said. “I didn’t know much about space when I was that age, but the more I thought about it and got curious, the more I was thinking, ‘I want to do that.’”

After researching the steps needed to become an astronaut, Okutsu enrolled in the aeronautics and astronautics program at Purdue University in West Lafayette, Ind., a program known for its many astronaut alumni, including Neil Armstrong. He also took flight lessons to earn his pilot’s license and spent a summer abroad learning Russian in case he ever worked on the space station.

Okutsu studied at Purdue for more than a decade, earning his B.S. degree in 1999, his master’s in 2001, and his Ph.D. in 2006. During that time, he became enamored with the engineering side of space exploration.

“Eventually, the initial thing that attracted me to becoming an astronaut became somehow not important and simply doing research on space explorations is what I started focusing on,” Okutsu said. “It became more exciting for me.”

Okutsu’s main field of research lies in mechanics applied to problems in space missions. He has done extensive work with gravity assists, in which

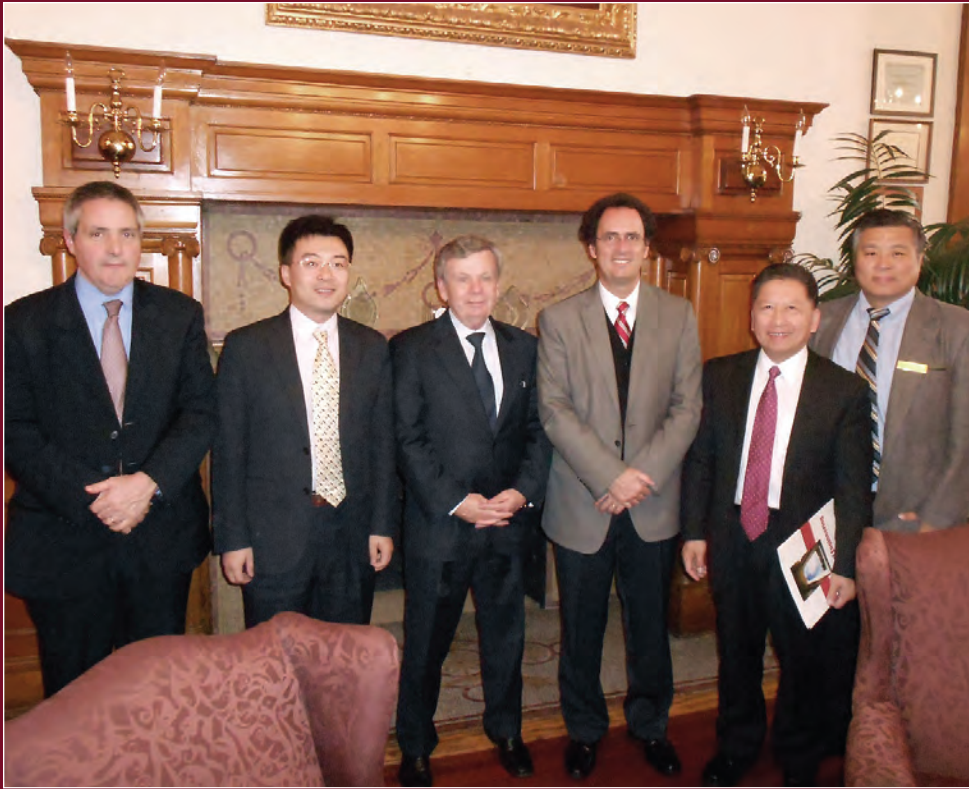
spacecraft utilize the gravitational fields of nearby planets or satellites to increase their flight velocities or change directions via “sling-shot effects.” He has also worked on end-of-mission studies for the Cassini mission at Saturn and the proposed Europa Orbiter mission at Jupiter. For the Cassini mission, Okutsu has tried to determine the best options for disposing of spacecraft without causing contamination issues.

Okutsu has also worked on projects related to Mars missions and an interplanetary space station that would fly between Earth and Mars as a reusable transportation system. As part of this research, he cowrote a paper with Buzz Aldrin, one of the first men who walked on the moon, and received national and international media coverage on MSNBC and BBC.

Okutsu has also worked on research and development for virtual education environments — classes taught entirely online through 3D multiplayer video games. In a recently published journal article, Okutsu said that the students involved in the virtual environments learned just as much as students in traditional classrooms.

“The finding that this worked is interesting because it opens the door to new possibilities that classes can actually be taught online,” Okutsu said. “We had our students doing projects and listening to the lectures, but these students can be located anywhere in the world. This might be a new way of learning things.”

Chilean Catholic University Signs MOU



(Left to right) Associate Dean J. Steven Brown, civil engineering Chair Lu Sun, Provost James Brennan, Dean Juan Carlos de la Llera Martin, Dean Charles Nguyen, and mechanical engineering Chair Sen Nieh.

Following up on a recent visit to the Pontifical University of Chile (PUC) in July 2013, on Nov. 21, 2013, CUA's School of Engineering welcomed Dean Juan Carlos de la Llera Martin of the PUC School of Engineering to campus.

After a day meeting with Nguyen, department chairs, and engineering faculty, Llera signed a Memorandum of Understanding (MOU) that lays the foundation for the two institutions to explore establishing several potential cooperative programs for research and education. The first is a 2+2 program that allows students from PUC to transfer to the CUA School of Engineering after completing two years of study at PUC in an appropriate degree program. The second program is a 4+1 program in which students with a bachelor's degree at PUC can join CUA in their fifth year to complete a Master of Science at CUA, with the opportunity for CUA students to earn a Master of Science at PUC in the same way. In addition, the two institutions agreed to begin working on a framework that will allow faculty from both institutions to collaborate on research through faculty sabbatical leave to conduct research, use of research facilities at the guest institution, joint authorship, and joint proposal submission.

Rocket Software CEO Honored



(Left to right) Provost James Brennan, Andrew Youniss, and Dean Charles Nguyen.

Andrew J. Youniss B.S.C.S. 1983, co-founder and chief executive officer of Rocket Software, Inc., received the 2013 Engineering Distinguished Alumni Award during the Alumni Homecoming Luncheon in September 2013. The award is bestowed on engineering alumni based on their exceptional professional achievements. Before approximately 100 attendees, including administrators, faculty, students, alumni, and staff, Dean Charles Nguyen summarized Youniss's remarkable business successes then presented him with the award plaque.

Youniss co-founded Rocket Software in 1990 and has been the driving force of the company. Rocket Software, headquartered in Waltham, Mass., is a privately held company and a leading global developer of software that helps corporations, government agencies, and other organizations reach their information technology and business goals successfully. The company's global customer base includes Nintendo, Fidelity Investments, Gucci, Lululemon Athletica, and West Marine.

Prior to co-founding Rocket Software, Youniss worked as a development manager for DB View Inc., a software company specializing in DB2 data-base tools. He also worked as a programmer and project development consultant at American Management Systems.

Youniss and his wife, Mariann Youniss, have three children, Jayne, Maddy, and Michael. His father, James Youniss, Ph.D., was a professor of the CUA Department of Psychology for many years. Youniss's uncle, Dick Youniss, was also a CUA psychology professor. Youniss's siblings, Jessica Youniss, Emily Hussey, and Carrie Maslen are also CUA graduates.

Civil Engineering Professor Honored by Alma Mater

Gunnar Lucko, associate professor and director of the Construction Engineering and Management Program in the Department of Civil Engineering, received Virginia Tech's prestigious Outstanding Young Alumni Award on April 10, 2014. The award acknowledges young alumni who have made significant contributions to the profession. Lucko, who holds M.S. and Ph.D. degrees from the Vecellio Construction Engineering and Management Program at Virginia Tech, is one of only 47 alumni to be granted this honor since its creation by the Charles E. Via Department of Civil and Environmental Engineering in 1998.

Lucko's research focuses on the derivation of new mathematical models for time, cost, and resource management in project management, and he is the first scholar to use singularity functions in construction engineering and management. Taking inspiration from the seemingly unrelated area of structural engineering, which he studied in his native Germany, in his research he has developed creative analogies that make several important contributions to the body of knowledge. In 2013, Lucko was recognized with the 2013 Daniel W. Halpin Award for Scholarship in Construction by ASCE, one of the highest honors for early-career construction researchers, for his invention of a new mathematical framework for project planning and control.

In addition to his scholarly research, Lucko contributes to CUA's strong tradition of service. In 2008 he led a humanitarian engineering project that combined research, teaching, and service in a student-centered workshop

format, which created an earthquake-resistant health clinic in a small village in rural El Salvador. He has also served for many years as a volunteer in the ACE Mentor Program of America.



Associate Professor Gunnar Lucko (second from right) receives alumni award from civil engineering department at Virginia Tech.

Associate Dean Named ASHRAE Fellow

Associate Dean J. Steven Brown (right) has been named a fellow of the American Society of Heating, Ventilating, and Air-Conditioning Engineers (ASHRAE), a recognition achieved by only approximately 1% of ASHRAE members. He was honored at a plenary session on Jan. 18 at the annual Winter Meeting of ASHRAE.

A member of ASHRAE since 1993, Brown also has served on a variety of ASHRAE Technical Committees. He also serves as an associate editor of the *ASHRAE HVAC&R Research Journal*. Brown is also a member of ASME, IIR, and is a registered professional engineer in the State of Maryland. He has served as an ABET Mechanical Engineering Program Evaluator since 2006.

In electing Brown a fellow, the ASHRAE Board of Directors recognized him as having attained a certain level of distinction in the field and having made significant contributions in education and research. His research interests lie in the areas of air conditioning and refrigeration, alternative refrigerants and cycles, organic Rankine cycles, thermodynamics, and two-phase flow and heat transfer. Brown has written more than 50 journal and conference papers, with very significant ones related to carbon dioxide refrigeration cycles and alternative refrigerants, particularly HFO refrigerants.



Biomedical Engineering Professor Wins Delsys Prize

Sang Wook Lee, assistant professor of biomedical engineering received the 11th Annual Delsys Prize – Promoting Innovation in Electromyography for his work titled “Impairment in task-specific modulation of muscle coordination correlates with the severity of hand impairment following stroke.” This study explores a novel method to characterize poststroke impairment in the ability to modulate muscle coordination patterns across tasks. Its results showed that the number of muscle modules extracted from the muscle activation patterns of a stroke survivor across tasks, which represents the degree of motor complexity, is well correlated with the clinical functionality score of the subject. Greater impairment was also associated with a change in the muscle module patterns themselves, with greater muscle co-activation. The reduction in the degrees-of-freedom of muscle coordination following stroke, along with other peripheral changes such

as muscle spasticity and/or weakness, was found to significantly affect the functionality of the hand of those affected.

The Delsys Prize was established in 2003 by Professor Carlo J. De Luca to promote innovation in the field of electromyography. The winner is selected by a five-member rotating board consisting of experts from scientific, engineering, and medical disciplines.

Professor Lee’s research interests include biomechanics of hand and upper extremity and rehabilitation of neurologically impaired patients. He is also interested in developing proactive ergonomic solutions to work-related hand disorders based on biomechanical analyses of hand and upper extremity musculature. He is a member of American Society of Biomechanics, Institute of Electrical and Electronics Engineers, American Heart Association, and Gait and Clinical Movement Analysis Society.



Leaders Explore Opportunities in Chile and Vietnam



(Left to right) Dean Nguyen, Provost Brennan, and an official of PUC in Santiago.

Following up on an earlier trip made by CUA’s President John Garvey to the Pontifical University of Chile (PUC), Dean Charles Nguyen, Provost James Brennan, and Attila Freska, assistant dean of The Catholic University of America (CUA) School of Business and Economics traveled to Santiago, Chile, in July 2013, to explore collaboration opportunities. During the two-day visit, the three met the president, provost, vice presidents, and deans of various schools of PUC. At a meeting with administrators of the PUC School of Business, the possibility of offering a joint degree program was discussed. Nguyen and Brennan also visited with the dean and faculty of the PUC School of Engineering and outlined a memorandum of understanding (MOU) to be signed by the two schools. During this trip, the administrators of CUA and PUC considered establishing several collaborative programs, including student and faculty exchanges, joint degrees, and joint research programs. CUA’s provost and PUC’s provost signed an MOU to lay the groundwork to achieve those goals.

In December 2013, Nguyen and Brennan traveled to Vietnam and visited several partner universities. Uyen Nguyen, Ph.D., director of international programs in Asia, organized the trip and joined in visits with the rector and faculty of the Ho Chi Minh City University of Technology (HCMC-UT) of the Vietnam National University (VNU) System and elaborated upon the existing 2+2 program between CUA and HCMC-UT. After attending the 10th Anniversary Celebration Ceremony of the International University of the VNU, the CUA delegation met the administrators of the Saigon Technology University, the University of Danang, and Danang University of Technology. When Brennan left Vietnam to go back to the U.S., Dean Nguyen and Director Nguyen flew to Hanoi, visiting with officials of the University of Science of the VNU and the faculty of the Vietnam Academy for Water Resources. Several mechanisms were proposed for research and educational collaboration between CUA and these universities. Some key University of Science administrators, including its rector, visited campus earlier in the year and signed an MOU with CUA.

Workshop Held To Understand Future Research Needs



One of the main goals in the School of Engineering's strategic plan is to foster collaborative research with government research agencies, federally funded

research centers, and private industry. Toward that end, Dean Charles Nguyen; Professor Ozlem Kilic, chair of the electrical engineering and computer science department; and Professor Lu Sun, civil engineering department chair, organized a May 2, 2014, workshop on campus that focused on a variety of research areas, including cyberspace, space situation awareness, PNT techniques in GPS denied areas, advanced sensing networks, advanced sensing techniques and signal processing, wireless communications, cognitive radios, and satellite communications and operations.

In addition to CUA engineering faculty and chairs, attending were representatives and researchers from government agencies, including Larry Schuette, Ph.D., of Office of Naval Research; Eric Hall of L-3 Communication Systems West; John Niles of The Aerospace Corporation; Genshe Chen, Ph.D.; Dan Shen, Ph.D.; and Tien Nguyen, Ph.D., of Intelligent Fusion Technology, Inc.

Dean Nguyen welcomed the group, then Ralph Albano, associate provost for research, offered opening remarks. Larry Schuette offered an overview of ONR and its R&D needs. Representatives and researchers from CUA and IFT also offered presentations and discussed their research capabilities as they related to the focused research areas. The workshop concluded with a round table discussion about the Office of Naval Research, its related R&D needs, and potential technologies to achieve them. Findings from the workshop will be published in the *Workshop Proceedings*, available from the school upon request.

ACE Mentoring Teaches High Schoolers About Construction Industry Practice

Since returning from his sabbatical at the University of Alberta in Canada, Gunnar Lucko, associate professor of civil engineering and director of the Construction Engineering and Management Program, has rejoined the ACE Mentoring program as a mentor in the group at Hayfield Secondary School in Fairfax, Va. An ACE volunteer since 2005, he recently completed a term of serving on its regional board of directors.

ACE is a national initiative of the construction industry in more than 200 cities to give high school students firsthand information on career opportunities in creating and maintaining the built environment. "ACE creates an interest into what goes into planning and operating a construction site," says Lucko. "We hope that it will help students with deciding about a career in a STEM [science, technology, engineering, and mathematics] field."

Besides giving back to his community, ACE mentorship is also an important aspect of his scholarly work, Lucko explains. "I try to share my publicly funded research for the National Science Foundation as widely as possible. I create educational activities that bring some of the insights directly to the students, for example a game about how to best manage budgets for construction projects."

Students in ACE meet their mentors biweekly during the spring and fall semesters; participate in hands-on activities, design sessions, and visit construction sites. For their 2013–2014 team project, Lucko's group at Hayfield designed a residential complex with retail spaces from conceptual sketches to finished computer renderings, schedule, and budget. It was presented to a professional jury at the annual presentation night.



Hayfield Secondary students in Associate Professor Lucko's mentoring group presenting their design project.

Engineering Faculty Teach and Learn in Taiwan



(Left to right) Dean Yuan, Professor Namazi, President Chiang, and a FJU faculty member.

Exploring global opportunities — a goal of the School of Engineering's strategic plan — senior faculty members Sen Nieh, professor and chair of mechanical engineering, and Nader Namazi, professor of electrical engineering and computer science, spent their spring 2014 sabbatical leaves in Taiwan, where CUA has signed memoranda of understanding (MOU) with several Taiwanese universities for research and educational cooperation.

Nieh was invited to spend his leave at the National Central University of Taoyuan, Taiwan. A recipient of an honorary guest professorship from the National Sciences Council of Taiwan Government, Nieh lectured on clean coal technology and fuel cells at several Taiwanese universities, including National Dong Hwa University, National Sun Yat-Sen University, Da Yeh University of Changhua (Middle), and Nuclear Energy Research Institute of Longtan. In addition, Nieh was consulted on clean energy/power generation and free media by Jin-Pyng Wang, the president of the Taiwanese Legislative Parliament.

Namazi spent his sabbatical leave at the Fu Jen Catholic University (FJCU), Taiwan, after receiving an invitation from the FJCU College of Science and Engineering. While there, Namazi explored research collaboration with its faculty members and taught a graduate course for its engineering school. He also visited with several faculty members of the Chung Yuan Christian University (CYCU) and was invited to team teach a short course on the CYCU campus.

Vietnamese Delegation Visits CUA



CUA participants and the Vietnamese delegation

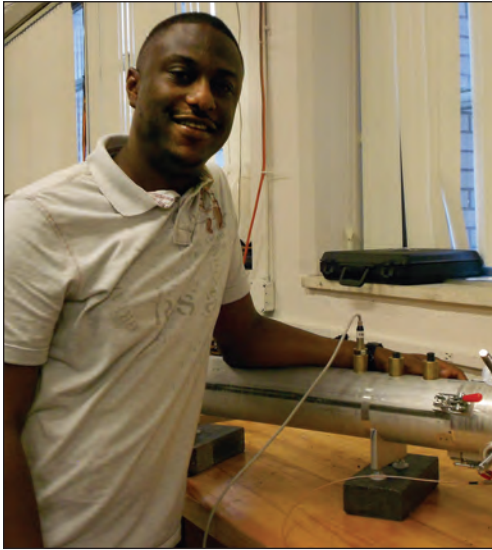
On Wednesday Dec. 4, 2013, the CUA School of Engineering welcomed a delegation from the Office of National Research Programs of the Ministry of Science and Technology Vietnam Studies. The day opened with welcoming remarks by Associate Dean Steve Brown representing Dean Charles Nguyen, who was travelling to Vietnam, followed by presentations of faculty members Zhaoyang Wang, associate professor of mechanical engineering, and John Judge, associate professor of mechanical engineering.

Wang, who guides several Vietnamese students in research at CUA, spoke from the perspective of a successful principal investigator about research funding and its links to graduate education. Judge then spoke as a successful principal investigator about proposal review panels, proposal preparation, budget, managing awards, and interactions with sponsors after the award has been granted.

A panel discussion followed the presentations. The panel, comprising Wang, Judge, Ralph Albano, associate provost for research, and Professor Steve Kraemer, chair of the Department of Physics. Topics of discussion included how to identify funding opportunities, preparing and submitting proposals, accepting awards, sources of internal research funding and overhead management, intellectual property, and the links between research funding and graduate education. The day concluded with an open discussion.

Both the delegation and the CUA faculty in attendance were impressed with the ideas and discussion that resulted from the day. The Vietnamese delegation commented that, based on the information gathered during the exchange, they will be able to improve their national research infrastructure.

Mechanical Engineering Student Wins Best Student Paper Award



Aldo Glean, a Ph.D. student in mechanical engineering, won a Best Student Paper Award in *Structural Acoustics and Vibration* for his work titled “Modification of the spectral response of a pipe resonator using a subordinate array of coupled Helmholtz resonators.” The paper was presented at the 166th meeting of the Acoustic Society of America in San Francisco, Calif.

The experimental study is based on the principle that the frequency and time domain response of a resonant structure can be altered by attaching an array of substantially smaller subordinate resonators. The study focused on applying this principle to an acoustic system, with the goal of altering the sound radiated from a pipe resonator. In the experiment, the acoustic response of a pipe was altered by attaching a set of small structures,

known as Helmholtz resonators. Each Helmholtz resonator is a small cavity that resonates at a single frequency, which depends on the volume of the cavity. The cavity sizes were designed so that the Helmholtz resonator frequencies formed a band that surrounded a single resonant frequency of the pipe. In this study, the pipe’s third resonance response was transformed into a band of frequencies with equal response amplitude.

This study demonstrates that the acoustic response of a resonant system can be modified to achieve desirable behavior by the inclusion of the appropriate set of small subordinate acoustic resonators. Applications of this technique include altering the acoustic behavior of systems such as musical instruments, architectural spaces, automobiles, aircraft, etc.

Solar Picnic Table Design Wins Accolades and Opportunities

A team of student engineers from CUA participated in a design competition sponsored by The Residence at Thomas Circle, also known as Thomas House, an assisted living community located in Washington, D.C. Among Thomas House residents is a group with an active interest in environmental conservation and “green” technologies. This group, known as the GoGreens, organized and sponsored the competition to design a solar-powered picnic table for use in the rooftop garden at Thomas House. The GoGreens provided general design specifications for a table that included seating for six, multiple power outlets, wheelchair accessibility, shade, and safety considerations. Students were free to consider any design approach that met those specifications.

Working diligently over a period of several weeks, the CUA team of three electrical engineering students and one mechanical engineering student created an elegant and functional design in SolidWorks. They analyzed how the design would react to high winds using finite element analysis and constructed a 1/10th scale model of the design using wood, cardboard, paper, and silicon wafers to simulate solar panels.

The GoGreens invited seven universities and colleges in the area to participate. Only Howard University and CUA offered complete designs. On Jan. 29 both teams presented their designs at Thomas House to a panel of experts, including architects, engineers, and end users. While the CUA team was confident that they had submitted the winning design, the panel declared the competition a tie. The CUA team agreed that a tie was the appropriate outcome given that only two out of the seven invited teams completed their designs. The cash prize of \$2,500 was split equally between the CUA team and the Howard team.

Associate Professor Scott Mathews, who advised the CUA team, is hopeful that future projects or competitions can be arranged with the GoGreens, or other similar groups. This competition generated considerable interest in future collaboration between the CUA School of Engineering and Howard University Department of Architecture.

The CUA Team:

Mohamed Alsedran—Team Captain (Graduate Student, Electrical Engineering)

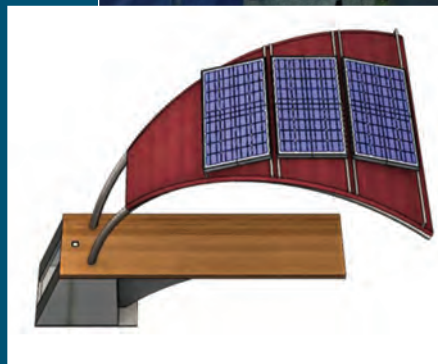
Jose Maheda (Undergraduate Student, Electrical Engineering)

Andrew Bean (Undergraduate Student, Electrical Engineering)

Ibrahim Makhadmi (Graduate Student, Mechanical Engineering)



The CUA Solar Picnic Table Team with faculty advisor Scott Mathews holding a check for \$1,250.



A drawing of the CUA Solar Picnic Table.

E-Week Brightens February

Engineering Week 2013–2014 more commonly known by students as E-Week — took place from Monday, Feb. 17, to Friday, Feb. 21, 2014. It was literally eventful for all students, engineering and others. The event comprises activities targeted towards the various fields of engineering and took place in the Edward J. Pryzbyla University Center. Each day featured events by a specific engineering society.

Monday's event, Biomanic Engineers and the Amazing Body, was presented by Biomedical Engineering Society. On Tuesday, the American Society of Civil Engineers built a tower and sunk a battleship. The Institute of Electrical and Electronics Engineers presented Target Practice with Smart Phone Controlled Projectiles, which demonstrated aspects of electrical engineering. That Thursday belonged to the American Society of Mechanical Engineers invited spectators to Fly With Us. And Friday was Diet Coke and Mentos day, dedicated to the Institute of Electrical and Electronics Engineers. On Friday evening the Society of Women Engineers hosted the E-week commencement celebration, which included karaoke and other activities to mark the end of a successful week.



Campers Enjoy Week Engaging New Frontiers



From July 14 to 18, 2014, the School of Engineering hosted the 4th Annual Engineering New Frontiers high school summer engineering camp, comprising lectures, design projects, and fun activities.

On their first day, more than 30 campers attended a lecture on the “Engineering Design Process” by faculty members Gregory Behrmann and Eric Kommer and toured D.C. that night. Tuesday morning found campers working on their SeaPerch (www.seaperch.org) projects. The campers, aided by faculty members and current CUA students acting as camp counselors, were divided into groups to build robots that would be able to move under water. In the afternoon, the campers visited a Bozzuto construction site where they saw engineering principles in action. Following this eventful day, the campers attended a Washington Kastles Tennis Tournament.

Wednesday began with a tour of NASA-Goddard Space Flight Center followed by an afternoon of work on the SeaPerch projects and the opportunity to attend a performance of *The Lion King* at The Kennedy Center. On Thursday, the campers continued perfecting their SeaPerch projects and negotiated the Big Maze Exhibit at the National Building Museum. Returning to campus, they tested their robots in the CUA swimming pool and afterward played games in the pool with some of the counselors.

On the final day, the campers toured the Naval Surface Warfare Center-Carderock (NSWC-Carderock) and tested their SeaPerch robots in NSWC-Carderock test basins.

At the end of the week, campers, counselors, and faculty were happy with the outcome and agreed that the 2014 Engineering New Frontier's camp was very successful for all.

Campers testing their SeaPerch robots at Naval Surface Warfare Center-Carderock, Bethesda Md.

Senior Design Day Caps Students' CUA Experience

On Monday, May 5, 2014, 76 seniors from four departments and five programs of the School of Engineering presented their capstone projects at the 6th Annual Engineering Senior Design Day, held in the Great Room of the Edward J. Pryzbyla University Center. Dedicated to projects seniors had been working on in conjunction with faculty members over the course of the academic year, the day was a great success. Mechanical engineering was represented by 29 students in five teams. Biomedical engineering featured 17 students in six teams. Civil engineering offered projects by 17 students working in four teams. Electrical engineering and computer science saw 13 students who worked in seven teams, for a total of 22 teams. Teams displayed their completed projects with presentations and posters, illustrating the final products of a yearlong process.

Commenting on the day, Associate Dean Steve Brown remarked, "I was very proud of the 22 groups and their faculty advisors and impressed with the students' presentations, posters, and capacity to articulate their work. The high quality projects presented on Senior Design Day were the culminating experience of four years of undergraduate studies and clearly demonstrate that the students are ready to enter the world of work where they will solve the problems facing society in the 21st century."



Hand Assistive Rehabilitation Pneumatic Exoskeleton (HARPE).

More than 40 faculty members and visitors attended the event to judge the presentations and poster sessions. Four winning teams were chosen, each from a different department. The judges selected SAE Aero Design East Competition: Balsa Hard from mechanical engineering, with team members Stephen Chite, Michael Gribbin, Michael Lamos, Jason Quisberth, and Peter Schramm. The winning biomedical engineering group comprised Majid Jamialahmadi, Alawiyah Al Hashem, and Wesley Conn who presented their Hand Assistive Rehabilitation Pneumatic Exoskeleton (HARPE)

project (see photo above). Electrical engineering/computer science winners were Iyael Beniam, Elena Fafaul, and Hilary Bruynell for their project, Robot Wars. Members of the civil engineering group chosen by the judges were Mariam Al-Awadhi, Chris Bruno, Jorge Cornet, Christie Melgar, and Michael Skehill; their project was titled CUA Rain – Rain Water Collection at CUA for Irrigation.

The day concluded with an awards ceremony with Provost James Brennan and Dean Charles Nguyen congratulating the four winning teams.

New Designs Lighten Concrete Canoe and Strengthen Steel Bridge

From April 3 through April 5, 20 engineering students participated in the 2014 ASCE Regional Conference for both the concrete canoe and steel bridge competitions, held this year at the University of Virginia in Charlottesville. This competition, held every year at a different school in the Virginia

Conference, determines which schools participate in the National Competitions.

Preparation for the event by both teams began before the start of the academic year using rules and regulations sent out during the summer. The captains of each team start preparing and gathering

whatever they may need. Once the school year starts, they hold weekly design meetings for both the canoe and bridge. Many hours go into the design and analysis to determine if construction is possible for a viable product.

This year's concrete canoe theme was based on the D.C. Metrorail Red Line. Construction featured a new mix, tested and determined to be stronger and lighter than mixes used in previous years. As a result, the canoe passed all of the tests before the racing portion of the competition.

The steel bridge underwent changes in design. Students used a k-truss to add strength, enabling the bridge to withstand the 2,400 pounds that would be loaded onto it during the testing part of the competition.

This was a major learning year for both teams who look forward to participating in the future with the ASCE Student Chapter.



Alumni Corner

1950s

Francis Barrington Paca, (now age 90), B.S. in mechanical engineering 1954, M.S. in Mechanical Engineering 1960. From 1948 to 1981, Paca held positions from test engineer to associate technical director at the Fort Belvoir Research and Development Center. From 1981 to 2011 he was a senior mechanical engineer and program manager at the VSE Corporation in Alexandria, Va.

Joseph V. Popolo, A.B. & B.E.E. 1959, M.E.E. 1961 CUA, M.B.A. 1967 Boston College. Popolo started IP Auctions, Inc., an online auction firm that specializes in the sale of intellectual property, primarily patents, trademarks, and other IP, which has expanded to the pursuit of litigation for infringement and raising capital for patent and technology investments.

1960s

Ken Kerkering, B.S.M.E. 1963 *cum laude*, Distinguished Graduate, USAF pilot training 1964. Kerkering flew 100 F-105 combat missions over North Vietnam and retired as a Lt. Col. after 20 years of service. He then flew for Continental Airlines for 18 years, 16 as a captain. When he retired in 2001, he had logged 21,000+ hours of flying time in USAF fighter and civilian commercial aircraft.

Phil Cowett, B.E.E. 1966, M.S.E.E. 1971 Virginia Tech. Cowett has worked at Harry Diamond Labs, Bendix, AlliedSignal, Raytheon, Northrop Grumman, BAE, Saft, Hauni. He now works in motor control design part time for eCycle, Inc. He has received eight patents.

1970s

Fred Ricci, Ph.D. 1973, biomedical engineering. Ricci was the first student at in CUA's biomedical engineering program to receive a Ph.D. Subsequently he has been the director of the Virginia Tech graduate center in Northern Virginia, elected to Who's Who in America, and named to the Cosmos Club for his achievements in science and engineering. He was also a businessman for a number of years and worked with Bell Laboratories and IBM.

1980s

Robert M. Silsby, B.M.E. 1983. Married to his college sweetheart (Maryellen Walsh, CUA 1983), Silsby retired in 2011 from a distinguished career in the senior intelligence service. He is a proud father of three, including Shannon Silsby, R.N. (CUA

2014). He provides technical advice to federal leaders as a vice president of a defense contractor and is managing partner at Astralis Associates.

Lawrence (Larry) Schuette, B.E.E. 1983, M.E.E. 1985, Ph.D. 1995. Schuette is director of research at the Office of Naval Research, responsible for the Department of the Navy Basic and Early Applied Research funding. Previously he was director of innovation at ONR. Schuette recently finished his 29th year as a part-time lecturer in the electrical engineering department and is looking forward to his 30th. He and his wife, Jennifer, have five children.

Melvin G. Williams Jr., M.S. in Engineering Management 1984. Vice Admiral (ret.) Williams is the associate provost for military and veterans affairs at The George Washington University (GW). He is responsible for serving and supporting the more than 1,300 GW student-military members, their families, and veterans, while working closely with GW senior leadership, students, alumni, and other affiliated stakeholders.

Robyn De Wees, B.S. in computer science 1987 (Arts and Sciences). Robyn DeWees, director, Mission Assurance at Northrop Grumman, was recently presented with the Corporate Promotion of Education award at the 2014 BEYA STEM Conference in Washington, D.C. The conference is a multicultural event that unites students, college administrators, recruiters, engineering and IT professionals, scientists, and high-level decision-makers from the corporate, government, and military communities in an effort to broaden diversity in this country's technical and scientific work forces.

1990s

Lucia Chiochio, B.M.E. 1990. Chiochio received her J.D. from Pace University School of Law and is a partner at Cuddy & Feder LLP in White Plains, N.Y. She was recently installed as the president of the Westchester Women's Bar Association.

Nicholas Kottenstette, B.M.E. 1995, Ph.D., 2008. The principal robotic control systems engineer at Corindus Inc., Kottenstette is leading development efforts for sensing and control of next generation vascular robotic intervention systems. He also directs a systems engineering co-op program.

2000s

Mary Ellen (Farabaugh) Owens, B.S. in computer science 2003, has been a senior analyst developer at

Goldman Sachs in New York since 2012, developing front-end web and desktop trading applications for the FICC (Fixed Income, Currency and Commodities) trading desks. Prior to this, she worked at both Bear Stearns and Susquehanna International Group as a software developer. She received the CFA (Chartered Financial Analyst) designation in 2006.

Michael Patrick Corrigan, B.E.E. 2003, has worked at Northrop Grumman Electronic Systems since his May 2003 graduation. He was recently appointed as a program manager in the Ground Based Tactical Radar Business Area within the Land & Self Protection Systems Division where his focus is on affordability for the platforms supported by the business area and includes management of multimillion dollars contracts. He has worked in an engineering lead role on the F-16, Apache Longbow, F-35 (JSF), and AMDR among other programs and as an engineering manager on the P8 program. He is received a dual M.B.A and M.S. in technology degree from the University of Maryland in 2011.

Joseph T. Kider Jr., B.S. in computer science 2003. Kider received his Ph.D. in computer science in 2012 from the University of Pennsylvania and is currently a postdoctoral researcher at Cornell University.

Silvia Vargas, M.S.E. 2004, M.S.C.S. 2006. Vargas is a senior security engineer with 3M as well as a cybersecurity professor at Montgomery College.

David J. Kriston, B.C.E. 2005. Kriston started a new position as assistant project executive at Clark Builders Group on May 1, 2013.

Allison Pfeffer, B.B.E. 2009. Pfeffer is working as a proposal writer for Opower, a software-as-a-service company that combines a cloud-based platform, big data, and behavioral science to help utilities around the world reduce energy consumption.

Rosette Gianniotis, B.M.E. 2010, M.S.E.M. 2011. Gianniotis is working for her family's architectural/engineering firm in Washington, D.C., as an HVAC/plumbing engineer. She recently obtained her LEED AP BD+C license and has been featured in Consultant-Specifying Engineer's May 2014 edition of the top 40 Under 40 in her field. She plans to obtain her P.E. in the near future.

Mike O'Shea, B.M.E. 2014. O'Shea recently joined Grant Engineering in New York City as a junior engineer.

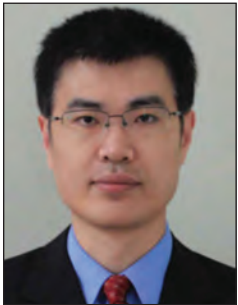
New Faculty and Staff *(continued from inside front cover)*



Christopher Raub, Ph.D.

Christopher Raub joins the Department of Biomedical Engineering as an assistant professor. He received his Ph.D. in biomedical engineering from the University of California, Irvine in 2009.

From 2010 to 2013 he trained as a postdoctoral scholar (NIH Kirschstein Fellow) in the Department of Bioengineering at the University of California, San Diego. From 2013 to 2014 he pursued a capstone postdoctoral experience in the Keck School of Medicine at the University of Southern California. His research areas include tissue engineering, biomedical optics, and bio-mechanics.



Min Liu, Ph.D.

“Max” Min Liu joins the Department of Civil Engineering as an assistant professor. His research is at the interface of structural engineering, building science, nanotechnology, and risk and

socio-economic analysis. He leads the Structural SOS (Safety, Optimization, and Sustainability) group to explore innovative solutions to the resilience and sustainability of our built environment. His current research topics include cost-effective mitigation of manmade hazards (e.g., progressive collapse) and natural hazards (e.g., earthquakes, strong wind), retrofit against structural damage and gradual deterioration, design of green buildings, and applications of promising nanomaterials in civil engineering. He received a Ph.D. in civil engineering from the University of Illinois at Urbana-Champaign. He has extensive industry experience in the U.S. and is a professional engineer, professional structural engineer, and accredited professional in green building design and construction (LEED AP BD+C).

Saving The Chesapeake, D.C. Metro Taxpayers’ Money, The Planet

Every year many incidents of algal blooms and hypoxia (lack of oxygen) occur in the Chesapeake Bay, caused by high discharges of nitrogen and phosphorus compounds, resulting in deterioration of the ecosystem and fish kills in the Bay. The main sources of these nutrients are agricultural/urban runoff and the outflow from wastewater treatment plants and domestic septic tanks. Wastewater treatment plants such as DC Water’s Blue Plains in southwest Washington, D.C., are making heroic efforts to reduce the nutrient levels in their effluent. Blue Plains serves more than 2 million people over an area of 725 square miles that includes the city of Washington and parts of Maryland and northern Virginia.

Removing nitrogen from wastewater is done through a process called biological nutrient removal in which a certain group of bacteria — collectively called denitrifiers — convert nitrate into nitrogen gas. Denitrifiers are heterotrophic and need a carbon source to survive. To supply that source, Blue Plains spends millions of dollars every year to purchase methanol, which serves as a carbon source to these

microbes. In addition to being costly, the use of methanol in wastewater treatment plants can contribute to greenhouse gas emissions and consequently to global climate change.

Researchers at The Catholic University of America are evaluating ways to reduce the amount of methanol needed for the denitrification process through optimal control of the biological denitrification process and use of a recently discovered group of bacteria referred to as autotrophic denitrifiers or Anammox. The Anammox process is autotrophic and therefore does not need a carbon source. Heather Stewart, a P.h.D. student in CUA’s physics department, is conducting a pilot study and advanced mathematical modeling to determine the parameters controlling the effectiveness of Anammox in nitrogen removal. These days Stewart spends most of her time at the Blue Plains plant measuring different water quality constituents in a pilot-scale experiment to gain a better understanding of the Anammox process. She is hopeful that her work will help the Chesapeake Bay, save taxpayers’ money, and help in efforts to limit global climate change.



George Mpoyo, a master’s degree student at CUA and process engineer at the Blue Plains plant, giving a tour of the facilities to the civil engineering students.

Mechanical Engineering Professor Awarded Fulbright



Jandro Abot, Ph.D., a clinical associate professor in the Department of Mechanical Engineering, has been awarded a Fulbright US Scholar Grant to do research abroad, as part of the Fulbright-Brazil Scientific Mobility Program in Nanotechnology and New Materials.

Abot's project, "Miniature Piezo-Impedance Sensors for Structural Health Monitoring Using Carbon Nanotube Yarn," will bring new light to the use of carbon nanotube (CNT) yarn in miniature piezoimpedance sensors to measure strain, pressure, acceleration, and other variables in components and structures.

CNTs have superior mechanical, thermal, and electrical properties and are grown in arrays that can be drawn into a web and further twisted into fiber-like yarns containing thousands of carbon nanotubes in their cross-sections. These carbon nanotube yarns exhibit piezoimpedance, which has been tapped by Abot and his research group to develop integrated and distributed structural health monitoring techniques to monitor strain and damage in polymers and composite materials.

Abot will spend the next two summers in Brazil studying models to govern the responses of piezoimpedance-based sensors consisting of CNT yarn and testing their validity in prototype miniature sensors that measure strain, pressure or acceleration. He will also offer seminars and colloquiums on CNT-based sensors and composite materials at two Brazilian universities.

Abot will be hosted in Brazil by Emilio C. Nelli Silva, professor and chair of the Department of Mechatronics and Mechanical Systems at the Universidade de São Paulo, the highest ranked university in Latin America. He will work on the research with American and Brazilian students.

Distinguished Alumnus Thomas Horton Beckett, Dies



Thomas Beckett, 67, of Apex, N.C., formerly of Warrenton, Va., passed away Monday, April 21, 2014, at his home in Apex.

He graduated from Duke University in 1969 with a bachelor's degree in electrical engineering and was selected by Admiral Hyman G. Rickover for duty at Naval Reactors. During his military tour he earned the equivalent of a master's degree in nuclear engineering at the Bettis Reactor Engineering School, and in 1981 earned a master's degree in electrical engineering from The Catholic University of America.

Beckett resigned his Navy commission in 1974 and continued to work as a civilian at Naval Reactors until his retirement in 2006. During his career he served as the Naval Sea Systems Command technical representative at Bettis Atomic Power Laboratory, the director for regulatory affairs at Naval Reactors, and was the deputy director of the Naval Reactors program from 1999 until his retirement.

He received a Presidential Meritorious Rank Award in 2002, The Catholic University Engineering Distinguished Alumni Award in 2004, a Secretary of Defense Meritorious Civilian Service Award in 2006, and The Catholic University Alumni Achievement Award in 2012.

He is survived by his wife, Linda, three children, six grandchildren, and two brothers.

Former Mechanical Engineering Chair Frank Andrews Passes



Frank Andrews, Capt. USN (ret.), former chair of the mechanical engineering department, died Feb. 22, 2014. He was 92. Andrews joined the engineering faculty in 1964 following a career as a highly decorated Navy captain. He served CUA with distinction until his retirement in 2000, making extraordinary contributions during his tenure that included establishing a graduate program in underwater acoustics cosponsored with the Department of Physics.

Commissioned in 1941 at the U.S. Naval Academy, Andrews served on destroyers then on the submarine USS *Sennett* on which he made four successful war patrols in

1944–45, including one into the Sea of Japan. Following the war, Andrews received a Ph.D. in physics from Yale University. He assumed command of the USS *Barracuda SSK-1*, a submarine equipped with a then highly advanced sonar system incorporating passive acoustics and low frequency active arrays. He served in a variety of commands before retiring from active service and joining CUA. As a result of his knowledge and experience in the study of underwater sound and acoustics, the program at CUA became one of the most respected in the field. More than 50 doctoral students graduated, many of whom remain distinguished faculty and researchers.

Andrews was a remarkable mentor to graduate students and numerous young faculty. A devoted family man, he was married to Maxine and had 12 children, 24 grandchildren, and six great grandchildren.

Faculty

Awards and Honors

- **Abot, J. L.**, Fulbright US Scholar, Fulbright-Brazil Scientific Mobility Program (Nanotechnology and New Materials): Miniature Piezo-Impedance Sensors for Structural Health Monitoring Using Carbon Nanotube Yarn, 2014.
- Best Technical Paper Award: **Bhowmik, U.K.**, Mandala, D., Hudyma, N.W., Kreidl, O. P., and Harris, A., "Segmentation of Cracks in X-ray CT Images of Tested Macroporous Plaster Specimens," *IEEE Southeastcon 2014*, March 13–16, 2014, Lexington, Ky.
- **Jeong, C.**, Society of Petroleum Engineers (SPE) Faculty Enhancement Travel Grant (USD 2100) for the travel to the 19th SPE Improved Oil Recovery Symposium, Tulsa, Okla., April 12–16, 2014.
- **Lee, S.W.**, Delsys Award for Innovation in Electromyography, Delsys Inc. (Natick, Mass.), 2013.
- **Lucko, G.**, Outstanding Young Alumni Award, Charles E. Via, Jr. Department of Civil and Environmental Engineering, Virginia Tech, 2014.
- **Lucko, G.**, Daniel W. Halpin Award for Scholarship in Construction, Construction Institute, American Society of Civil Engineers, Reston, Va., 2014.
- **Nieh, S.**, Awarded Honorary Guest Professorship, National Central University, Taoyuan, Taiwan, ROC, January 2014.

Grants

- **Abot, J. L.**, (PI), "Miniature Piezo-Impedance Sensors for Structural Health Monitoring Using Carbon Nanotube Yarn," Fulbright-Brazil Scientific Mobility Program, Summers 2014 and 2015, \$30,458.
- **Abot, J. L.**, (PI), "Strain Dependence of Impedance and Morphology in Carbon Nanotube Yarns towards their Development into Integrated Strain and Damage Sensors," National Aeronautics and Space Administration (DC Space Grant Consortium), June 3, 2013 to Aug. 25, 2013, \$28,500.
- **Abot, J. L.**, (PI) and Belay, K., "Tailoring Piezoimpedance, Surface and Configurations of Carbon Nanotube Yarn Sensors for Integrated Damage Detection in Composite Materials," Air Force Office of Scientific Research, TBD, \$75,000.
- **Brown, J.S.**, Advanced Simulation Models for Enabling Net-Zero Energy, High-Performance Buildings, National Institute of Standards and Technology, June 1, 2013–May 31, 2015, \$147,199.
- **Brown, J.S.**, "Information Models and Automated Reasoning for Smart Manufacturing and Advanced Robotics," National Institute of Standards and Technology, April 2, 2012–March 31, 2015, \$575,134.

- **Brown, J.S.** (PI), **Nieh, S.**, (Co-PI), and **Vignola, J.**, (Co-PI), "Development of STEM Workforce in Mechanical Engineering at The Catholic University of America in Support of NASA's Strategic Goals," D.C. Space Grant Consortium (NASA), Aug. 26, 2012 - Aug. 25, 2014, \$25,000.
- **Chang, L.-C.**, (PI), "Computer Software Programming Support for NHLBI Cardiac Magnetic Resonance Image Processing, Visualization and Quantification Tools," National Heart, Lung, and Blood Institute (NHLBI), National Institutes of Health (NIH), Award No. HHSN2682013-00207P. August 2013–May 2014, \$24,000.
- **Dutta, B.**, "Development of high efficiency thermoelectric microwires," ZT3 Technologies Inc., Thousand Oaks, Calif., 2007–present, \$2.75 million.
- **El-Araby, E.**, **Kilic, O.**, and **Chang, L.C.**, "NSF-MRI: Acquisition of a High-Performance Instrument for Heterogeneous and Biologically Inspired Architectures Research at CUA," National Science Foundation, September 2011–August 2013, \$200,000.
- **Kilic, O.**, "Hardware Accelerated Integration of Full Wave Model and Optimization of Rotman Lenses," Army Research Office, May 2009–May 2014, \$485,836.
- **Kilic, O.**, "Acquisition of Vector Network Analyzers for Testing, Validation of Advanced RF Design and Educational Purposes," DoD, July 2012–July 2013, \$245,620.
- **Lade, P.V.**, (PI) "Experimental Determination and Constitutive Modeling of Time Effects in Sand," National Science Foundation. Sept. 1, 2011–Aug. 31, 2015, \$331,985.
- **Lee, S.W.** (PI), **Lum, P.S.**, (Co-PI), Park, H.S. (Co-PI), Dromerick, A.W. (Co-PI), "Development of biomimetic hand exotendon device," National Institutes of Health, July 2013–June 2015, \$138,808.
- **Liu, H.** (PI), **Chang, L.** (Co-PI), **Kilic, O.** (Co-PI), and **Namazi, N.** (Co-PI), "Planning Grant: I/UCRC for Broadband Wireless Access and Application Center Site at The Catholic University of America," National Science Foundation, April 2014–March 2015, \$13,000.
- **Lucko, G.** (PI), "Construction Engineering Conference and Workshop 2014: Setting an Industry-Academic Collaborative Research Agenda." National Science Foundation, Sept. 1, 2013–Aug. 31, 2014, \$49,999.
- **Lucko, G.** (PI), "A Discrete Method for Allocation of Float along the Critical Path in Construction Project Schedules." National Science Foundation, July 1, 2013–June 30, 2016, \$300,000 + \$73,260 tuition remission.
- **Lum, P.S.**, (PI), "Robot therapy for rehabilitation of hand movement after stroke," NIH R15 Award, 9/13-9/16, \$457,954.
- **Lum, P.S.**, (PI), "Biomechanics of Upper Extremity function following Stroke," VA Merit Review Award, April 2012–April 2015, \$300,000.
- **Lum, P.S.**, (PI of CUA subcontract), "Clinical testing of robotic exoskeletons for rehabilitation of hand function in TBI (PI: Healtion)," U.S. Army Medical Research and Materiel Command, September 2012–September 2014, \$160,000.
- **Lum, P.S.**, (PI of CUA subcontract), "Exploiting interlimb coupling to improve robot-supported neurorehabilitation of the upper extremities (PI: Healtion)," U.S. Army Medical Research and Materiel Command, November 2009–November 2013, \$235,919.
- **Luo, X.L.**, "Numeric modeling of cell-cell signaling in microfluidics towards in vitro models of intestinal flora," The Catholic University of America Grant-in-Aid, October 2013–April 2014, \$3,310.
- **Massoudieh, A.**, (PI), "Probabilistic Optimization of Biologic Treatment Control," DC Water and Sewer Authority, October 2013–September 2014, \$50,684.
- **Massoudieh, A.**, (PI), "Collaborative Research: Horizontal Gene Transfer in Porous Media: Experiments and Modeling," National Science Foundation, September 2011–September 2014, \$62,633.
- **Massoudieh, A.**, (PI), "Bayesian Parameter Estimation of Activated Sludge Processes in Blue Plains Waste Water Treatment Plant," USGS through DC Water Resources Research Institute, March 2013–February 2014, \$12,056.
- **Nieh, S.** (PI), "Experimental Evaluation of the Effect of Polynuclear Aromatics in Reactive Flows," General Technical Services Subcontract to Support Power Command Power & Integration Directorate, U.S. Army RDECOM CERDEC, January 2013–July 2013, \$9,300.
- **Sun, L.** (PI), "CAREER: Stochastic and Dynamic Interaction of Vehicle-Pavement Systems and Its Applications to Transportation Infrastructure," National Science Foundation, CMMI-0644552 (June 2007–June 2013), \$410,000.
- **Tran, B.Q.**, and Mendoza, G., "Electromagnetic compatibility (EMC) Device Testing," Food and Drug Administration (#HHSF22301300470A), September 2013–September 2014, \$111,852.
- **Tran, B.Q.**, "Design and development of a wearable device for fall monitoring in the elderly," CUA Grant-in-Aid, October 2013–May 2014.
- **Tran, B.Q.**, "Neuroinformation processing and fusion based on functional-electroencephalograms (f-EEG)." Army Research Office, August 2014–April 2015, \$48,961.
- **Wilson, Jr., O. C.** (PI), "CAREER: Bone Inspiration in Research and Education," National Science Foundation, March 1, 2007–Feb. 28, 2014, \$459,000.

Presentations and Publications

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 - **Massoudieh, A.**, Sharifi, S., “Uncertainty Analysis in Groundwater Dating with Environmental Tracers using Markov Chain Monte Carlo Method,” *EWRI Congress*, Cincinnati, Ohio, 2013.
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 - Bui, V. B., Tran, L., **El-Araby, E.**, **Namazi, N. M.**, “Detecting Binary Non-Return-to-Zero Data in Free-Space Optical Communication Systems using FPGAs,” *SPIE*, Baltimore, May 2014. \
 - **Namazi, N. M.**, Burris, R., Gilbreath, G., Suite, M., Grant, K., “Demodulation of FM Data in Free-Space Optical Communication Systems using Discrete Wavelet Transformation,” *Discrete Wavelet transformation*, INTERTECH, (Book Chapter), Feb. 2, 2013.
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 - Memarzadeh, S., Banerjee, P. P., **Nehmetallah, G.**, “Noninterferometric Tomographic Reconstruction of 3D Static and Dynamic Phase and Amplitude Objects,” *SPIE DSS*, 2014, 9117–17.
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- **Nieh, S.**, Invited Breakfast Speaker, “Energy and Free Media – My Observations in Taiwan,” *Chinese Veterans Associations*, Tiancheng Hotel, Taipei, Taiwan, ROC, June 1, 2014.
- DuBois, T.G., R. Scenna, J. Kimmel, and **S. Nieh**, “Role of Aliphatic and Aromatic Hydrocarbon Compounds on Carbon Formation in JP-8 Fuel Reformers,” presented at *46th Power Sources Conference*, Orlando, Fla., June 9–December 2014.
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- Siebert, M. and **S. Nieh**, “Investigation of Hydrogen-Enriched Combustion of Kerosene in an Open Flame,” presented at *46th Power Sources Conference*, Orlando, Fla., June 9–December 2014.
- Wolfe, A.K. and **S. Nieh**, “Boxcar Model for Teaching Convection and HVAC Topics,” to be presented at *2014 Education and STEM International Conference*, Honolulu, Hawaii, June 16–18, 2014.
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- **Plaku, E.**, and McMahon, J., “Motion Planning with Linear Temporal Logic for Underwater Vehicles Operating in Constrained Environments,” *International Conference on Automated Planning and Scheduling: Planning in Continuous Domains*, Rome, Italy, 2013.
- **Plaku, E.**, “From Navigation to Robotic-Assisted Surgery: Combined Planning in Discrete and Continuous Spaces,” *Robotics: Science and Systems: Combining Robot Motion Planning and AI Planning for Practical Applications*, Berlin, Germany, 2013.
- **Plaku, E.**, and McMahon, J., “Combined Mission and Motion Planning to Enhance Autonomy of Underwater Vehicles Operating in the Littoral Zone,” *IEEE Intl. Conf on Robotics and Automation: Combining Task and Motion Planning*, Karlsruhe, Germany, 2013.
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- McMahon, J. and **Plaku, E.**, “Sampling-based Tree Search with Discrete Abstractions for Motion Planning with Dynamics and Temporal Logic,” *IEEE/RSJ International Conference on Intelligent Robots and Systems*, Chicago, 2014, pages 1022–1028.
- Le, D. and **Plaku, E.**, “Guiding Sampling-based Tree Search for Motion Planning with Dynamics via Probabilistic Roadmap Abstractions,” *IEEE/RSJ International Conference on Intelligent Robots and Systems*, Chicago, 2014, pages 513–520.
- Edelkamp, S. and **Plaku, E.**, “Multi-Goal Motion Planning with Physics-based Game Engines,” Dortmund, Germany, *IEEE Conference on Computational Intelligence and Games*, 2014, pages 1–8.
- **Plaku, E.**, and McMahon, J., “Motion Planning and Decision Making for Underwater Vehicles Operating in Constrained Environments in the Littoral,” *Towards Autonomous Robotic Systems*, volume 8069, pages 1–12, 2014.
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- **Sun, L.**, and Duan, Y., “Dynamic response of top-down cracked asphalt concrete pavement under a half-sinusoidal impact load,” *Acta Mechanica*, Vol. 224, DOI 10.1007/s00707-013-0849-7, March 2013.
- **Sun, L.**, “An overview of a unified theory of dynamics of vehicle–pavement interaction under moving and stochastic load,” *Journal of Modern Transportation*, Vol. 21, No. 3, pp. 135–162, 2013, DOI 10.1007/s40534-013-0017-8.
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- **Sun, L., Pan, Y.**, and Gu, W., “High order thin layer method for viscoelastic wave propagation in stratified media,” *Computer Methods in Applied Mechanics and Engineering*, Vol. 256, pp. 65–76, 2013, dx.doi.org/10.1016/j.cma.2013.01.004.
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 - Huynh, Q.T., Nguyen, U.D., Tran, S.V., Nabili, A., and **Tran, B.Q.**, "Fall Detection Using Combination Accelerometer and Gyroscope," in *Intl Conf. Advances in Electronics Devices and Circuits-EDC 2013*, Kuala Lumpur, Malaysia, 2013.
 - Lalonde, F., Gogtay, N., **Tran, B.Q.**, Hsu, C. C., Willey, J., Wu, J., and Moon, G., "Noninvasive scalp pair correlation functions electroencephalogram (EEG)," *Proc. SPIE ICA 9118*, 2014. (Invited paper.)
 - Huynh, Q.T., Nguyen, U.D., Liem, K.T., and **Tran, B.Q.**, "Detection of activities daily living and falls using combination accelerometer and gyroscope," *5th Intl. Conf. Development of Biomedical Engineering*, Ho Chi Minh City, Vietnam, June 2014.
 - Szu, H., **Tran, B.Q.**, and Lalonde, F., "Noninvasive detection of brain order-disorder transitions using functional EEG," *Proc. SPIE ICA* (DOI: 10.1117/2.1201405.005446).
 - Glean, A. A. J., **Vignola, J. F., Judge, J. A.**, and Ryan, T. J., "Impact Of Mass Ratio And Bandwidth On Apparent Damping Of A Harmonic Oscillator With Subordinate Oscillator Array," in *Proceedings of the 21st International Congress on Acoustics*, Montréal, Canada, June 2013, also in *Proceedings of Meetings on Acoustics (POMA) 19(1): 065068*, 2013
 - Good, C. E., Glean, A. A. J., **Vignola, J. F., Judge, J. A.**, Ryan, T. J., Bull, N., and Turo, D., "A Design of an Impedance Tube for Teaching Acoustics Material Properties and Laboratory Technique," in *Proceedings of the 21st International Congress on Acoustics*, Montréal, Canada, June 2013, also in *Proceedings of Meetings on Acoustics (POMA) 19(1): 025010*, 2013
 - Glean, A. J., **Vignola, J. F., Judge, J. A.**, and Ryan, T. J., "Modification of the Spectral Response of a Pipe Resonator Using a Sub-ordinate Array of Coupled Helmholtz Resonators," *166th Meeting of the Acoustical Society of America*, San Francisco, Dec. 2–6, 2013.
 - Good, C. E., Glean, A. A. J., **Vignola, J. F., Judge, J. A.**, Ryan, T. J., Bull, N., and Turo, D., "Measurements of sound absorption of living grass," *166th Meeting of the Acoustical Society of America*, San Francisco, Dec. 2–6, 2013.
 - Glean, A. A. J., **Vignola, J. F., Judge, J. A.**, Ryan, T. J., "Mass Sensing Using the Time Domain Response of a MEMS Structure with a Functionalized Subordinate Oscillator Array," *ASME 2013 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference*, Portland, Ore., August 2013.
 - Kieu, K., and **Wang, Z.**, "Single-camera-based 3D DIC for fast-speed measurement," *2014 SEM Annual Conference and Exposition on Experimental and Applied Mechanics*, Greenville, S.C., June 2–5, 2014.
 - Kieu, H., and **Wang, Z.**, "Passive 3D face reconstruction with 3D digital image correlation," *2014 SEM Annual Conference and Exposition on Experimental and Applied Mechanics*, Greenville, S.C., June 2–5, 2014.
 - Le, M., and **Wang, Z.**, "Some practical considerations in high-speed 3D shape and deformation measurement using single-shot fringe projection technique," *2014 SEM Annual Conference and Exposition on Experimental and Applied Mechanics*, Greenville, S.C., June 2–5, 2014.
 - Nguyen, H., **Wang, Z.**, Kieu, H., and Le, M., "Fast-speed, high-accuracy and real-time 3D imaging with fringe projection technique," *2014 SEM Annual Conference and Exposition on Experimental and Applied Mechanics*, Greenville, S.C., June 2–5, 2014.
 - **Wang, Z.**, Kieu, H., Nguyen, H., and Le, M., "Digital image correlation in experimental mechanics and image registration in computer vision: similarities, differences and complements," *Optics and Lasers in Engineering*, in press, (DOI: 10.1016/j.optlaseng.2014.04.002) 2014.
 - Kieu, H., Pan, T., **Wang, Z.**, Le, M., Nguyen, H., and Vo, M., "Accurate 3D shape measurement of multiple separate objects with stereo vision," *Measurement Science and Technology*, Vol. 25, No. 3, 035401, 2014.
 - Ma, J., **Wang, Z.**, and Pan, T., "Two-dimensional continuous wavelet transform algorithm for phase extraction of two-step arbitrarily phase-shifted interferograms," *Optics and Lasers in Engineering*, Vol. 55, No. 1, pp. 205–211, 2014.
 - **Wang, Z.**, Vo, M., Kieu, H., and Pan, T., "Automated fast initial guess in digital image correlation," *Strain*, Vol. 50, No. 1, pp. 28–36, 2014.
 - Pan, T., and **Wang, Z.**, "A polyaniline based intrinsically conducting coating for corrosion protection of structural steels," *Microscopy Research and Technique*, Vol. 76, No. 11, pp. 1186–1195, 2013.
 - **Wilson, Jr., O. C.**, "Inspiration in Research and STEM Education," presented at the Harford County Public Library for a youth STEM Outreach Activity, Aberdeen, Md., June 23, 2013.
 - **Wilson, Jr., O. C.**, and Omokanwaye, T., "Biomimetic Lessons for Processing Chitin Based Nanocomposites," in *Biopolymer Nanocomposites: Processing, Properties, and Applications*, Hoboken, N.J., Wiley Press, 2013, Chapter 4, pp. 53–82. 2013.

Activities

- **Abot, J. L.**, Ph.D., director in the development of international academic collaborations in the School of Engineering and led the Brazil Scientific Mobility Program; academic director of the Society of Hispanic Professional Engineers (professional chapter) in the Washington, D.C., metropolitan region and offered an FE preparation course for local professionals; on the Editorial Board of *Journal of Multifunctional Composites*; reviewed manuscripts for more than half a dozen journals.
- **Chang, L-C.**, Ph.D., academic advisory board, the D.C. Association for Computing Machinery (ACM), 2008–present; reviewer for *NeuroImage*.
- **Ei-Araby, E.**, Ph.D., publications chair, the 24th IEEE International Conference on Application-specific Systems, Architectures and Processors (ASAP 2013), June 2013; chair of the computer arithmetic session, The 24th IEEE International Conference on Application-specific Systems, Architectures and Processors (ASAP 2013), June 2013; guest editor for the *International Journal of Reconfigurable Computing* (Hindawi-IJRC); program committee member in the IEEE Transactions on Computers (IEEE-TC); program committee member of embedded hardware design in the *Journal of Microprocessors and Microsystems* (Elsevier-MICPRO); program committee member in the *Journal of Parallel Computing Systems and Applications* (Elsevier-PARCO); program committee member in the *Journal of System Architecture*, JSA (Elsevier — *The EUROMICRO Journal*); program committee member at the International Workshop on Dynamic Reconfigurable Network-on-Chip (DRNoC 2012).
- **Frenkel, V.**, Ph.D., consultant on the funded project "Delivery of silencing agents for improving aquaculture production efficiencies," U.S.–Israel Bi-national Agricultural Research and Development (BARD) Fund; reviewed grants for Focused Ultrasound Foundation; The Israeli Science Foundation; North Carolina Biotechnology Center; and Prostate Cancer, U.K.; reviewed manuscripts for the following journals: *Advanced Drug Delivery Reviews*, *Annals of Biomedical Engineering Medical Physics*, and *Imaging in Medicine*; appointed to the Editorial Board of the new journal: *JSM Biotechnology & Biomedical Engineering*.
- **Jeong, C.**, Ph.D., reviewer for *Journal of Engineering Mechanics and Soil Dynamics and Earthquake Engineering*, 2013–2014.

- **Judge, J. A.**, Ph.D., elected as a member to the ASME Technical Committee on Vibration and Sound and the ASME Micro/Nano Systems technical committee, ASME.
- **Kilic, O.**, Ph.D., elected Member-at-Large of the United States National Committee (USNC) for the International Union of Radio Science (URSI), 2012–2014; the United States National Committee (USNC) Chair of “Commission A: Electromagnetic Metrology” for the International Union of Radio Science (URSI), 2007–2011; member and publicity chair of the Applied Computational Electromagnetics Society, 2008–present; Education Committee member, Student Design Contest chair, and member of the Technical Program Committee IEEE Antennas and Propagation Society; editor-in-chief for *ACES Letters*, a new journal initiated in 2014.
- **Lade, P.V.**, Stress-Strain Behavior and Constitutive Modeling of Frictional Materials, Seven-Day Course presented at the Department of Civil Engineering, Zhejiang University, Hangzhou, China, July 15–23, 2013.
- **Liu, H.**, Ph.D., program committee member of the IEEE INFOCOM 2014, Toronto, Canada, 2014; program committee member of the IEEE ICC 2014, Sydney, Australia, 2014.
- **Lucko, G.**, Ph.D., served as past chair of the Construction Research Council, Construction Institute, American Society of Civil Engineers, Reston, Va., 2013–2014; guest editor for the *Practice Periodical on Structural Design and Construction* (Special Issue on Construction Engineering: Leveraging Project and Career Success, with Goodrum, P. M., Jaselskis, E. J., Schexnayder, C. J., Schaufelberger, J. E., Tatum, C. B., de la Garza, J. M.), American Society of Civil Engineers, Reston, Virginia, 2013–2014; mentor and member of the Senior Advisory Council, ACE Mentor Program of Greater Washington (Career Directions for Students in Architecture, Construction, and Engineering), Laurel, Md., 2013–2014; senior specialty editor for the *Journal of Construction Engineering and Management*, 2013–2014; reviewer for *Journal of Computing in Civil Engineering*, *Automation in Construction*, and *Journal of Construction Engineering and Management*, 2013–2014.
- **Lum, P.S.**, Ph.D., grant proposal reviewer for the Review Panel for the Nazarbayev University Research Center, Republic of Kazakhstan, November 2013; grant proposal reviewer for the Review Panel for the U.S. Department of Education entitled “NIDRR Rehabilitation Engineering Research Centers (RERC),” Washington D.C., September 2013.
- **Luo, X. L.**, editorial board member for *Journal of Bioengineering & Biomedical Science*, 2012–present; routine journal reviewer for *Analyst*, *Angewandte Chemie International Edition*, *Biofabrication*, *Biomedical Microdevices*, *Chemical Communications*, *Integrative Biology*, *Journal of Materials Chemistry B*, *Lab on a Chip*, *Nano-technology*, *PhyChemPhy*, and *Small and Soft Matter*.
- **Nguyen, C. C., D.Sc.**, taught a course entitled Medical Robotics to a group of Taiwanese students from Fu Jen Catholic University and Chung Yuan Christian University at CUA, June 24–July 16, 2013; traveled with Provost Brennan to Santiago, Chile, to meet with officials of the Pontifical University of Chile (PUC) for exploration of potential collaboration, July 17–19, 2013; public member on the 2013 Foreign Service Selection Board of the United States Department of State, June 5–July 10, 2013; attended the 17th Annual Youth Excellence Recognition Luncheon organized by the Vietnamese Culture and Science Association (VCSA) in Houston, Texas, as its advisory board member, Aug. 4, 2013; traveled with Provost Brennan to Vietnam, met with officials of the Ho Chi Minh City University of Technology (HUT) of the Vietnam National University System (VNU), attended the 10th Anniversary Celebration Ceremony of the International University, visited the Saigon Technology University and met with the administrators of the University of Danang and the Danang University of Technology, Dec. 3–7, 2013; traveled with Dr. Uyen Nguyen, director of international programs in Asia, to Hanoi, Vietnam, and met with the administrators of University of Science of VNU and the faculty of the Vietnam Academy for Water Resources in Hanoi, Vietnam, Dec. 8–9, 2013; attended the 3rd World Conference on Soft Computing, San Antonio, Texas, Dec. 16–18, 2013; attended the 2014 National Meeting of Engineering Deans and Directors from Catholic Colleges and Universities (EDCU) organized by Saint Louis University, St. Louis, Mo., April 27–29, 2014; attended a special meeting on “Educating Engineers to Meet the Grand Challenges” at the National Academy of Engineering (NAE) in Washington, D.C., April 30, 2014.
- **Nieh, S.**, Ph.D., speaker of the Invited Seminar Talk and Academic Exchange on Oxygen-Enriched Combustion for DECs and Reforming of Jet Fuels for Fuel Cell Applications, Department of Materials Science and Engineering, National Dong Hwa University, Hualian, Taiwan, ROC, March 14, 2014; speaker of the Invited Seminar Talk and Academic Exchange, “Combustion and Fuel Cells: Collaboration on Research, Teaching, and Academic Programs,” Department of Mechanical Engineering, National Central University, Taoyuan, Taiwan, ROC, March 18, 2014; speaker of the Invited Seminar Talk and Academic Exchange, “Vortex Combustion of Coal and Auththermal Reforming/Combustion of Jet Fuels,” Department of Mechanical Engineering, Chung Yuan Christian University, Taoyuan, Taiwan, ROC, May 7, 2014; speaker of the Invited Seminar Talk and Academic Exchange, “Vortex Combustion of Coal and Auththermal Reforming/Combustion of Jet Fuels,” Department of Mechanical and Electro-Mechanical Engineering, National Sun Yat-Sen University, Kaoshiong, Taiwan, ROC, May 13–14, 2014; speaker of the Invited Seminar Talk and Academic Exchange, “Vortex Combustion of Coal and Auththermal Reforming/Combustion of Jet Fuels,” Department of Mechanical Engineering, Da Yeh University, Changhua, Taiwan, ROC, May 29, 2014; speaker of the Invited Seminar “Clean VC/VFBC Burning of Coal and Waste,” Institute of Nuclear Energy Research, Atomic Energy Council, Longtan, Taiwan, ROC, June 12, 2014; speaker of the Invited Seminar “Oxygen-Enriched Reforming and Combustion of Heavy Liquid Hydrocarbon Fuels,” Refining & Manufacturing Research Institute, China Petroleum Company, Jiayi, Taiwan, ROC, June 16, 2014; speaker of the Invited Lecture and Round Table Meeting “Multi-Fueled Vortex Combustion and Clean Coal-Fired Vortexing Fluidized-Bed Boilers,” Tatan Thermal Power Plant, Taipower Company, Taoyuan, Taiwan, ROC, June 17, 2014.
- **Plaku, E.**, Ph.D., associate editor of *IEEE Intelligent Robots and Systems*; organized workshops on Combining Task and Robot Motion Planning at IEEE International Conference on Robotics and Automation, Karlsruhe, Germany, 2013, and at Robotics: Science and Systems, Berlin, Germany, 2013; program committee member on a number of leading international conferences in Robotics and Artificial Intelligence.
- **Simari, P. D.**, Ph.D., program committee member for the *Argentine Conference in Computer Science* (CACIC) October 2013; reviewer for the journals *Computer Aided Design (CAD)* and *Transactions on Graphics (TOG)*.
- **Tran, B.Q.**, journal reviewer for the *IEEE Transactions on Information Technology in Biomedicine*, *Sensors Journal* and *IEEE Transactions on Biomedical Engineering*; participated in the Biomedical Engineering Innovation, Design, and Entrepreneurship Alliance (BME-IDEA) meeting in Seattle, Wash. (September 2013); NIH grant review panels *AIDS Clinical Studies and Epidemiology Study Section* (July 2013; November 2013, March 2014) and NIH/CSR/ZRG1 SBIB-Q 80 Study Section (June 2013; October 2013; February 2014; June 2014).
- **Vignola, J. F.**, Ph.D., co-organized to conferences for the D.C. Chapter of the Acoustical Society of America, May and November 2013.
- **Wang, Z.**, Ph. D., proposal reviewer for the National Science Foundation; reviewer of over 30 manuscripts for 12 prestigious technical journals in 2013–2014.
- **Wilson, Jr., O. C.**, Ph.D., biomedical engineering, serving on the Editorial Board for the *Austin Journal of Biomedical Engineering*, 2013; serving on the D.C. Office of the State Superintendent for Education (OSSE) State Leadership Committee for the Implementation of the Next Generation Science Standard (NGSS), 2013; visited a number of schools in D.C. and Md. during the year as part of the Adopt a Professor Program

for Learning Enhancement (APPLE) K-12 STEM Outreach Project. The schools that were visited include John Burroughs Educational Campus, Buck Lodge Middle School and Bladensburg High School, Friendship Blow Pierce Public Charter School and McGruber High School, 2013; mentor for the DC Advanced Placement Biology Project, which worked with a number of D.C. public school biology teachers to enhance biology instruction and test scores, 2013.

Student Awards, Service, and Honors

- **Iyoel Beniam**, George McDuffie Award for Excellence in Electrical Engineering.
- **Nicole Bull**, American Concrete Institute National Capital Chapter Award, April 2014.
- **Caleb Capozella**, 2014 H.B. Atabek Award from the biomedical engineering department for academic excellence.
- **Stephen Chite**, The C.C. Chang Award for Excellence in Mechanical Engineering and the School of Engineering's Anthony J. Scullen Award for Academic Excellence, 2014.
- **Daniel Coleman**, American Society of Civil Engineers National Capital Selection Scholarship, March 2014.
- **Alec P. Droussiotis**, Construction Management Association of America National Capital Chapter Scholarship, 2014.
- **Alec P. Droussiotis**, American Society of Civil Engineers National Capital Chapter Scholarship, 2014.
- **Patrick Gilfoil**, The John N. Welch Award for Excellence in Computer Science.
- **M. Jamialahmadi, M., A. Al Hashem, and W. Conn**, corecipients of the 2014 District of Columbia Council on Engineering and Architecture Society's (DCCEAS) 1st place undergraduate paper competition for the paper "Hand Assistive Rehabilitation Pneumatic Exoskeleton (HARPE) for Stroke Patients."
- **Daniel Koehr**, the Dennis F. McCahill Award for Service in Civil Engineering, May 2014.
- **Minh Le**, EECS senior design project, 2013–2014.
- **Hong Nguyen**, the American Society of Mechanical Engineering and the Benjamin T. Rome Award, 2014.
- **Christopher J. Papp**, Construction Management Association of America National Capital Chapter Scholarship, 2014, and American Society of Civil Engineers National Capital Chapter Scholarship, 2014.
- **A. Taylor, A. Silue, and K. Lafferty**, corecipients of the 2014 District of Columbia Council on

Engineering and Architecture Society's (DCCEAS) 1st place undergraduate paper competition for the paper "Forearm Rotation Device: Relearning supination and pronation through repetitive motion rehabilitation training."

- **Alicia Taylor**, the 2014 Dean's Service Award and the Biomedical Engineering Society Award.
- **Brenda Tedrick**, the American Society of Civil Engineers National Capital Selection Award and the Timothy W. Kao Award for Academic Excellence in Civil Engineering, May 2014.
- **Lan Tran**, senior design project, 2013–2014.
- **Katherine Thomas**, 2014 Dean's Service Award.

School Honors Faculty and Staff for Excellence

- **2014 Kaman Award for Excellence in Teaching**
Gregory Behrmann
Clinical Assistant Professor, Biomedical Engineering

Behrmann received this award for his commitment and dedication to undergraduate instruction. He made important curriculum improvements to ENGR106 and ENGR102, and received outstanding teacher evaluations from students.

- **2014 Kaman Award for Excellence in Research**
Sang Wook Lee
Assistant Professor, Biomedical Engineering

Lee published four journal articles and received an NIH Award to develop a biomimetic hand exoskeleton for effective rehabilitation of stroke survivors. He also received the Delsys Award for Innovation in Electromyography.

- **Burns Faculty Fellows**
Sahana Kukke
Assistant Professor, Biomedical Engineering and Georges Nehmetallah, Assistant Professor, Electrical Engineering and Computer Science

Kukke was chosen for her proposed experiment in exploring the neural correlates of abnormal hand function in individuals with impaired arm function due to cerebral palsy.

Nehmetallah was named for his proposed numerical and experimental study of tomographic reconstruction of 3D static and dynamic phase and amplitude objects using transport of intensity.

- **2014 Dean's Service Award for Faculty**
John Judge
Associate Professor, Mechanical engineering

Judge was recognized for his outstanding service to the school and the University. He is actively involved in many committees throughout the University, including serving as the vice chair of the Academic Senate. He is the first recipient of this newly created award.

- **2014 Staff Excellence Award**
Suraya Adam
Administrative Assistant, Biomedical Engineering

Adam received this award for her outstanding service to the faculty, staff, and students of the department.



2013–2014 Honor Roll of Donors

The School of Engineering gratefully acknowledges the following alumni and friends for their generosity. This list includes donors who made gift between May 1, 2013, and April 30, 2014. We have strived to recognize everyone correctly. If you find an error or omission, please contact the Division of University Advancement at **202-319-6910**.

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- **Tiffany Suella Omokanwaye**
Dissertation: Ectopic Bone Matrix Mineralization: Unveiling the Osteoinductive Nature of Crab Cuticle. Otto Wilson (advisor)
- **Mostafa K. Ardakani**
Dissertation: Adaptive Routing Optimization in Continuous-Time Stochastic Dynamic Networks. Lu Sun (advisor)
- **Mesfini Lakew**
Dissertation: Optimization of Crash Reduction Factors and Contermeasures Costs: Case Study in D.C. Lu Sun (advisor)
- **Pejman Ghassemi**
Dissertation: Polarized Multispectral for Tissue Lesion Characterization. Jessica Ramella-Roman, Scott Mathews, and Ozlem Kilic (advisors)
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Dissertation: Development of Architecture and Standards for Widespread Adoption and Usability of Personal Health Records. Binh Tran (advisor)
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Dissertation: Exploiting Interlimb coupling to investigate upper extremity bimanual loading in robot-assisted neuro-rehabilitation on subjects with stroke. Peter Lum (advisor)
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Dissertation: Non-invasive Assessments of Cutaneous Injury Caused by High Voltage Electrical Injury: Experiments and Simulations. Jessica Ramella-Roman (advisor)
- **Aldo Glean**
Dissertation: System Response Manipulation using Arrays of Subordinate Resonators: Theory and Applications. Joseph Vignola (advisor)



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