INSIDE
Two young professors bring rare skills and knowledge to research

INSIDE
And David makes three: Kriston brothers and the School of Engineering
Table of Contents

New Faculty..............................inside front cover
Dean’s Message.................................1
Nanomechanics Makes the Future Happen....2
ASTM International Award of Merit
Given to Donald E. Marlowe.................2
Engineers Without Borders................3
Eye on Engineering and Computer Science....3
Kriston Family Engineering Legacy
Carries on CUA Tradition................3
That First Year..............................4
Walsh Receives Marine Aviator Wings......4
Electrical Engineer on the Move...........5
School of Engineering Remembers
C.C. Chang..................................5
Faculty
Presentations and Publications............6
Activities...................................8
Grants.....................................9
Awards and Honors.........................9
Student
Activities and Awards......................9
Elsharkawy Ensures Smart, Energy
Efficient, Reliable Dust...............10
Applying Risk-Based Engineering
Principles To Evaluate Today’s
Policy Issues............................10
Borlase Wins Coast Guard
Engineer of the Year Award............10
CUA’s Biomedical Engineering Shares
$679,282 Department of Commerce
Grant....................................11
Hidler, Tsopelas and Tran Honored
with Kaman Awards......................12
New Engineering Alumni Award
 Goes to Beckett........................12
ASEE Regional Meeting at CUA........13
New Director for the CUA Engineering
Management Program......................13
Employers Seek CUA Engineering
Students at Career Fair................13
Congratulations to the
Class of 2005!..............................back cover
Ph.D. Dissertations and Advisers ....back cover
School of Engineering Contact
Information.................................back cover

New Faculty

Jeffrey Giangiuli, M.S.E., a lecturer in The Catholic University of America
Engineering Management Program since the spring 1992 semester, joined the School
of Engineering as the director of the Engineering Management Program in the
summer of 2005. He has instructed graduate students in the areas of engineering
economics, systems analysis and decision analysis. He is a qualified nuclear plant
engineer and nuclear weapons officer, and a registered engineer-in-training.

Ozlem Kilic, D.Sc., joins the Department of Electrical Engineering & Computer
Science this fall as an assistant professor. Kilic received her Doctor of Science in
Electrical Engineering from the George Washington University in 1996. She joined
the U.S. Army Research Laboratory (ARL) in 2002, where she worked on broad-
band, miniaturized, electronically scanned antenna concepts and beam-formers,
concepts intended for applications to military systems, such as armor embedded and
conformal antennas, Rotman lens beam formers for array antennas and frequency
scanning array antennas. Before joining ARL, she worked on various communication
systems during employment at Lockheed Martin Global Telecommunications.
Some of her responsibilities included analysis, simulation, design and development
of various aspects of satellite communication systems, such as satellite and earth
station antennas, link budgets, payload analysis, and beam interference studies.
During her career and graduate study, she gained broad experience in electromag-
netics, specializing in microwave remote sensing and wave propagation as well as
antennas for satellite communications and military applications.

Gunnar Lucko, Ph.D., took on responsibilities as an assistant professor of civil
engineering and director of the construction engineering and management pro-
gram in January 2005. Prior to joining The Catholic University of America he
worked in his native Germany for an engineering firm. He received his Ph.D.
from Virginia Polytechnic Institute and State University and also holds a German
diploma in civil engineering from Hamburg University of Technology in northern
Germany. He has worked on research for the Construction Industry Institute,
investigating technology needs of the construction industry. Most recently he
conducted research on the residual value of used heavy construction equipment
and has developed statistical models to capture this essential part of owning cost
calculations. Other research interests are applying analytical techniques to schedules
and construction operations optimization. Lucko says he is impressed with “the
dedication to excellence in both research and teaching at CUA and the personable
atmosphere” that allows close interaction with his colleagues and his students. His
teaching philosophy is to assist his students in “actively learning how to learn and
evaluate scientific concepts.” In his spare time he enjoys playing the clarinet and
reading historical novels.

Peter S. Lum, Ph.D., was appointed to the faculty in September 2005 at the rank of
assistant professor of biomedical engineering. A native Washingtonian, Lum
received his Ph.D. from the University of California, Berkeley and San Francisco in
1993. Upon graduation, Lum was appointed to the research staff at the Department
of Veterans Affairs Rehabilitation Research & Development Center in Palo Alto,
Calif., until 2002. For the past three years, Lum has been an associate professor of
biomedical engineering at Virginia Commonwealth University with a joint appoint-
ment in physical medicine and rehabilitation and a research appointment at the
Hunter Holmes McGuire VA Medical Center. His research interests include
rehabilitation engineering, robotic therapy and biomedical design.

Jessica C. Ramella-Roman, Ph.D., was appointed to the biomedical engineering
faculty at the rank of assistant professor in September 2005. She graduated from the
Oregon Health Sciences University in 2004 and comes to Catholic University after
completing a successful post-doctoral fellowship at the Johns Hopkins University’s
Applied Physics Laboratory. Among Ramella-Roman’s research interests are
computational modeling, biomedical instrumentation and biomedical optics,
specifically for imaging skin pathologies and cancer detection. She has received
numerous awards and recognition for her research work.
Dean’s Message

June 1, 2005, marks the completion of my first term as dean of the School of Engineering. I began my journey in this leadership position in 2001 with a lot of uncertainties. After four years, I am very glad to inform you that the school has improved substantially, mainly due to the cooperation and contributions of faculty, staff, students and alumni. The school is stable, with good faculty morale, high and clear expectations for faculty performance, low faculty turnover rate and stable enrollment at both undergraduate and graduate levels. Developed and completed in 2002, the school’s strategic plan has guided faculty research and teaching activities as well as school-sponsored events. In addition, the Academic Advising Handbook, Administrative Handbook and Accreditation Handbook developed over the past years provide the school with a strong academic and administrative structure.

The past year has been particularly successful and exciting.

■ As a co-recipient with CUA’s Metropolitan College of a three-year, $3 million U.S. Department of Labor training grant, Technology Engineering Program, the school is offering master’s degree programs in information and technology and construction engineering. About 40 new graduate students have matriculated. Funding continues until January 2007.

■ The school granted 36 bachelor’s degrees, 40 master’s degrees and four doctoral degrees at our annual diploma distribution ceremony in May.

■ In July 2004, the Accreditation Board for Engineering and Technology sent the school its final report stating that all weaknesses have been resolved and all engineering programs are fully accredited until Sept. 30, 2008. Using the Accreditation Handbook, the school has been actively preparing for the next re-accreditation visit in October 2007. In support of the school outcome assessment process all graduating engineering seniors must take the engineering Fundamental Exam as part of their graduation requirements starting with the fall 2005 semester.

■ Our faculty continues to be very active in research and scholarly activities including writing and submitting proposals for funded research, publishing in peer-reviewed journals, serving on review boards, presentation at national and international symposia and serving as member of conference organizing committees.

■ In fall 2004, 63 freshmen and eight transfer students joined the school, as compared to a total of 61 total new students in fall 2003. With the commencement of the DOL program, the school also gained 51 new graduate students, as compared to 33 new graduate students in 2003.

■ In October 2004, the school inaugurated the School of Engineering Distinguished Alumni Achievement Award at the annual Homecoming Week luncheon. Tom Beckett M.S.E.E. 1981, received the inaugural award. (See article on page 12.)

■ The school welcomed five new faculty members with excellent academic backgrounds and industrial experience. They include a new director of the Engineering Management Program, two assistant professors in the Department of Biomedical Engineering, one assistant professor in the Department of Civil Engineering and one assistant professor in the Department of Electrical Engineering and Computer Science.

■ Our engineering students continue to make us very proud, winning numerous national and international competitions and scholarships, including the Society of American Military Engineers Scholarship and the Nemours Summer Research Scholarship.

■ As a board member of the Vietnam Education Foundation, I traveled to Vietnam in March 2005 with a delegation whose members included former NIH director and Nobel Prize Laureate Harold Varmus; the executive director of the Millennium Strategic Initiatives, Arlene Hardings; and several academicians and executives. We visited approximately 15 universities and research organizations in Saigon and Hanoi as sites for potential establishment of World Bank financed centers of excellence. During the last several visits to Vietnam, I worked with numerous universities on their academic programs. We expect to sign with several universities in Vietnam to enable them to transfer students into our undergraduate and graduate degree programs in the future.

■ In July 2004, at the Kodak Theater in Hollywood, Calif, I received a Community Service Award for Excellence in Engineering Education from Asia Entertainment, Inc. The annual award recognizes the achievements of Asian Americans in their particular fields. A DVD of the award ceremony, taped in front of 3,500 people as part of a musical and entertainment show that also features my academic career at CUA, has been distributed to about 3 million people worldwide.

The progress and success of the School of Engineering over the past year make me very proud as its dean. I am very happy to inform you that Very Rev. David M. O’Connell, C.M., president of CUA, offered me an opportunity to continue as dean of the School of Engineering for the next four years; I gladly accepted his offer. I look forward to starting my second term on Sept. 1, 2005. With its excellent faculty, high quality student body and a strong academic and administrative structure, the school is ready now to take on fund-raising events, development projects and expansion of academic programs. I am grateful for your continuing support and look forward to working with you in the next four years.

Charlie Nguyen
Dean, School of Engineering
Nguyen@cua.edu
Nanomechanics
Makes the Future Happen

Watch a train coming straight toward you from far away. For a long time it hangs in the distance, seemingly going nowhere. As it gets closer, it seems to speed up until suddenly it overtakes you and then is gone. That’s happening in the world of nanotechnology, in which electronic circuits and mechanical devices are built at the molecular level of matter. Long a distant dream, nanotechnology is beginning to yield usable products such as quantum dots that detect the presence of a severe respiratory virus early and quickly and carbon nanotubes that are revolutionizing the electronics industry.

But challenges to creating marketable nanotechnology-based products are still significant, says Assistant Professor of Mechanical Engineering Zhaoyang Wang. “As nanotechnology starts to enter the phase of actual applications, nanomechanics has emerged as an extremely important field of research. The success of nanotechnology depends on exploiting unexpected material behavior due to nano-scale phenomena, which often cannot be explained by conventional continuum mechanics.” Through his research, development of software and commitment to educating mechanical engineers, Wang is doing his part to ensure the success of nanotechnology.

CLOSELY WATCHED MATERIALS
Wang’s research interests lie in the development and application of advanced experimental mechanical techniques that help characterize micro- and nano-scale structures. “Typical problems we need to address,” he says, “include fracture analysis at these microscopic scales, deformations of grains and inter-granular slip in polycrystalline metals and ceramics, strain gradient plasticity, and the mechanics of nanomaterials and nanostructures.”

The professor has developed software that automatically analyzes those properties of experimental nano-level materials. “Getting accurate information about properties of nanomaterials is essential to production,” says Wang. “Because the new materials are created at a nano level, the properties, reliability and failure parameters are unknown. The software I designed automatically processes experimental data leading to quicker reactions on the part of the companies to unexpected results.” Electronics giant Intel uses Wang’s software to test its nano-scale materials.

TRAINING MECHANICAL ENGINEERS A CUA PRIORITY
Wang carries his commitment to the future of nanotechnology into his teaching life as well as his research. In the fall of 2004, he initiated two well-received graduate level courses, ME584 Introduction to Nanotechnology and ME582 Mechanical Fundamentals of Electronic Systems. But, he adds, “as nanotechnology becomes vital in the 21st century, there is a high demand to broaden the knowledge of mechanical engineering undergraduate students with interdisciplinary background in the field of nanotechnology.”

Wang has proposed to the National Science Foundation an education project incorporating nanotechnology into mechanical engineering undergraduate education. “The goal is to prepare mechanical engineering students with strong interdisciplinary knowledge of nanotechnology to meet the challenges of the profession in the new century,” he says. He plans to introduce undergraduates to nanotechnology and nanoelectronics courses during their freshman and sophomore years, building on that basic knowledge with advanced courses throughout their undergraduate careers.

“In the 21st century,” Wang says, “nanotechnology’s effect on the lives of people is expected to be at least the equivalent of the combined influences of microelectronics, medical imaging, computer-aided engineering and manmade polymers developed in the 20th century.” The nanotechnology train may seem to be in the distance, but Professor Wang has made sure CUA and his students are on board.

ASTM International Award of Merit Given to Donald E. Marlowe
School of Engineering alumnus Donald E. Marlowe, B.M.E. 1964, M.S. 1966, agency standards coordinator for the U.S. Food and Drug Administration, received a 2005 ASTM International Award of Merit and the accompanying title of Fellow in recognition for his dynamic and outstanding leadership in fostering the development and promulgation of surgical implant standards. The honor is the society’s highest recognition for individual contributions to standards activities. Marlowe began his career in 1963 as a mechanical engineer with the National Bureau of Standards, now the National Institute of Standards and Technology, or NIST. He became a project leader in NBS’ Composite Materials Program and later chief of the Dynamic Measurements Group. In 1977 he joined the FDA as a senior mechanical engineer with the research and testing staff of the FDA Bureau of Medical Devices, served as director of the Division of Mechanics and Materials Sciences from 1984 to 1995, and director of the Office of Science and Technology at the FDA Center for Devices and Radiological Health from 1995 to 2001. He has been the agency standards administrator since October 2002.

Marlowe also serves as a member of the ISO Technical Committee on Biological Evaluation, co-leader of the U.S. delegation to TC 194 and convener of the Working Group on Sample Preparation and Reference Materials. He is a member of the Association for the Advancement of Medical Instrumentation, the American National Standards Institute and the American Society of Mechanical Engineers and is a fellow of the American Institute for Medical and Biological Engineering.

In addition to mechanical engineering, Marlow holds a bachelor’s degree in physics from CUA. He has written more than 50 papers and presentations in the areas of materials properties, product testing, analysis of medical devices and consensus standards in development.
Engineers Without Borders

When you think about engineering, you probably think of all the technological marvels of modern life. But most of the people on the planet have never used a computer, flown in an airplane, or used any of the other fruits of engineering that we in developed countries take for granted. A third of the world’s population has no access to electricity; half have inadequate access to clean water and sanitation, and more than 80 percent of all people still live in poverty. Bernard Amadei, a professor of civil engineering at the University of Colorado at Boulder, felt that engineers have a responsibility to address these problems, so five years ago he founded Engineers Without Borders-USA, a nonprofit organization dedicated to helping developing areas worldwide. EWB-USA helps engineering students and professionals partner with disadvantaged communities to improve their quality of life with environmentally and economically sustainable engineering projects. Since 2000, more than 60 university chapters and 20 professional chapters of EWB-USA have been formed around the country, with current involvement in more than 80 projects in 35 countries.

“There at CUA, we have a student body with a lot of enthusiasm for helping others, and Engineers Without Borders provides an opportunity to connect the engineering skills our students learn with the values we have as a Catholic institution,” says John Judge, assistant professor of mechanical engineering. In January, he and William Kelly, professor of civil engineering, along with several engineering students, met with Professor Amadei and Cathy Leslie, executive director of EWB-USA, to discuss forming a student chapter at CUA. Amadei and Leslie returned to CUA in February to deliver a presentation to a larger group of students, who have applied to the university for recognition of EWB-USA as an official student organization. The new CUA chapter of EWB-USA plans to get off the ground this fall: students will choose a project in a community in the developing world, learn about the culture while applying their engineering skills to the problem, and raise funds to travel to the community in the spring to implement the project.

“We don’t get many opportunities to apply what we learn as engineers to service work,” says CUA mechanical engineering student Kerri Allen, “and EWB will give us the chance to do that while letting us learn about other cultures.”

For more information about Engineers Without Borders at CUA, contact John Judge at 202-319-5127 or judge@cua.edu. You can learn more about the organization on their Web site, www.ewb-usa.org.

Eye on Engineering and Computer Science

In June of 2005 the School of Engineering hosted its 16th annual Eye on Engineering and Computer Science summer camp for rising high school juniors and seniors. This camp helps students evaluate the various engineering disciplines and determine which might suit them best. This year 73 students, from across the country and around the world, participated.

The participants tested their civil engineering skills by building bridges, which were then evaluated and tested by civil engineering faculty members Panos Tsopefas and Gunnar Lucko. The two professors looked at the aesthetics of the design, the weight of the bridge itself and how much load it could bear to evaluate the success of the project.

To learn more about biomedical engineering, the participants designed robotic arms. Biomedical engineering professor Binh Tran challenged the teams’ designs to see if they could lift and displace a variety of sports balls, ranging from lightweight ping-pong balls to much heavier baseballs.

The final project was a double elimination robot ping-pong tournament. Each team constructed and programmed robots to autonomously play against each other. The robots had to find the balls on their side of the arena and somehow move them to their opponent’s side — without crossing over the territorial boundary, which meant they would have to work for their opponents. The participants employed principles of mechanical engineering, electrical engineering and computer science in designing their ‘bots.

In between the design projects, participants attended talks by guest speakers, including Andrew Malloy, B.E., 2002; Karlena Schwing, B.M.E. 1998 and J.D. 2004; Harris Rayvon Burris, Ph.D., 2003; and Jeanine Graham, B.B.E. 2005.

For more information on this and other School of Engineering enrichment programs, visit the Web site at http://engineering.cua.edu/activities.

Eye on Engineering and Computer Science has been made possible since 1990 through a generous gift by Jose Yglesias, B.E.E., 1951.

Kriston Family Engineering Legacy Carries on CUA Tradition

Faculty, staff and students at The Catholic University of America often liken the university to a family. That assessment is more than just a feeling; often parents, offspring and siblings attend and graduate from CUA.

The School of Engineering is proud to claim its own family legacy in David, Michael and Matthew Kriston and their father, Charles. David is the third of three siblings to receive a bachelor’s degree in civil engineering from CUA, succeeding Michael, who graduated in 2001 and Matthew, who graduated in 2002. All three brothers cite Dennis McCahill, current lecturer and former professor with civil engineering, as the key influence for choosing CUA. Fittingly, David received the 2005 Dennis McCahill service award for excellent service to the civil engineering department. In addition to captaining the club ice hockey team, David was secretary of ASCE.

Charles M. Kriston received his bachelor of chemical engineering degree in 1976. Although the engineering school can’t claim her, their mother, Marian Jane Cowan, earned a bachelor of science in medical technology from CUA in 1977. She is a daughter of Clyde Cowan, Ph.D., who taught physics at CUA until his death in 1974. An award in physics bearing his name is presented at the undergraduate honors ceremony. Marian’s brother, George, graduated from CUA in 1986, and her sister, Elizabeth, attended CUA for a year before pursuing art outside of the university. The Kriston brothers’ uncle, John Riordon, also attended CUA.

The brothers share more than degrees in civil engineering, tearing up the athletic fields in lacrosse and rugby and the ice rink as club hockey players and captains.

The School of Engineering alumni and brothers Matthew, Michael and David Kriston flank mentor and former civil engineering professor Dennis McCahill.
That First Year

Kelly McDonald, Class of 2008

As a civil engineering student just completing her first year, I'd like to report back on some opportunities we freshmen “Civils” can take advantage of.

One major undertaking for civil engineering students is the concrete canoe competition, which promotes teamwork from building to launching to racing. This year’s concrete canoe, “CUAL Runnings,” was first launched at the regional conference for the concrete canoe competition at Virginia Polytechnic Institute. CUA placed third in aesthetics. I participated in the actual race with fellow freshman, Rachel Marz. Since Catholic University was the host of the National Competition last year, this year’s team was automatically entered into the national competition held during summer 2005 at Clemson University in South Carolina.

CUA has an active chapter of the American Society of Civil Engineers. As secretary for the organization, I planned meetings and activities, updated and dispersed scholarship and internship opportunities to chapter members and maintained the budget. The monthly ASCE general meetings included guest speakers from the Federal Highway Administration, U.S. Navy Corps of Engineers, and others who shared their real-life profession engineering experiences. ASCE also fosters a relaxed environment that provides relief from the rigorous academic schedules that engineering students endure. ASCE cosponsored the annual Engineering Ball held at Maggiano’s Little Italy Restaurant and participates in service projects such as Habitat for Humanity and Rebuilding Together in the D.C. and Maryland area. ASCE offers a great way to meet fellow civil students as well as students from other engineering disciplines through social events such as barbecues and intramural volleyball tournaments.

During the summer, civil engineering majors take Elementary Surveying, a required two-week course on practical skills of surveyors and their duties. Each team developed an as-built survey of a dormitory in Centennial Village. After completing the fieldwork, we transferred all the data onto a plot in AutoCAD. Students walked out of the course able to pursue a job for surveying or construction companies.

Civil engineering majors are also required to complete two summers of internships with a construction company. This summer I worked as an intern for Skanska USA Building in Bethesda, Md. at the National Institute of Health, where Skanska is building a commercial vehicle inspection facility. The opportunity came as a result of my attending the Engineering Job Fair in January, an excellent way to make contacts and line up internships. At Skanska USA, I worked closely with the project engineer on the job site, spent time out in the field, and learned special construction-oriented computer programs.

With so many great engineering opportunities out in the real world today, and intelligent and caring professors who work very hard to teach us, CUA alumni are high achievers in the engineering industry. The university’s School of Engineering is a great place to learn and grow. As a freshman civil engineer with a concentration in construction management, I have been able to engage in many opportunities and activities throughout the school. My decision to choose CUA was right on.

Walsh Receives Marine Aviator Wings

First Lt. Brendan M. Walsh, B.M.E. 2002, received his wings as a Marine Aviator on April 1, 2005. Nearly three years of work in the Marine Corps culminated in the winging ceremony in Meridian, Miss.

Walsh began his military career in the summer of 2001 after completing his junior year at CUA. For 10 weeks that summer, he attended Marine Corps Officer Candidates School through a program called the Platoon Leader’s Class (Combined). Here candidates are evaluated for the qualities necessary to become a Marine officer. Upon successful fulfillment of all criteria for officer training, a candidate may choose to accept a commission in the Marine Corps after graduation from college. Walsh accepted his officer’s commission and shortly after graduating from CUA in May 2002, he began training at The Basic School (TBS) in Quantico, Va. At TBS, all Marine officers receive basic infantry training with the aim of becoming provisional rifle platoon commanders. Upon completion of TBS, officers move onto specialty schools.

Walsh qualified for Marine Aviation; after concluding his training at TBS he moved on to Aviation Preflight Indoctrination (API) in Pensacola, Fla. API assesses potential Navy and Marine aviators academically in subjects such as aerodynamics, engines, navigation, and, for the rigors of flight school, physiology. Candidates who pass these evaluations move onto primary flight training, where they learn basic flying. Walsh took primary at Whiting Field in Milton, Fla., in the T-34 (a single-engine propeller trainer). Upon completion of primary flight training, was assigned to Naval Air Station Meridian, Miss., in October 2003. In advanced training, students apply their knowledge from earlier flight training and adapt it to the more dynamic environment necessary for tactical strike aviation in the T-45 C (a single-engine jet trainer). After learning the basics of the T-45, students learn how to deliver unguided training bombs; fly low and fast to reach a target on time; air-combat maneuvers, dog-fight; and carrier qualification (CQ). CQ demands precision landing approaches resulting in 10 successful “traps” (catching one of the aircraft carrier’s four cables in the landing area with the aircraft’s tailhook at speeds of approximately 120 kts.) in a limited number of attempts. In addition to 10 successful traps, students are graded on each landing pass; additionally, they must meet a minimum GPA and boarding rate.

Upon completion of advanced flight training, Walsh received his wings and selected the F/A-18 Hornet pipeline for his fleet aircraft. Walsh is stationed in Lemoore, Calif., for training in the Hornet before reporting to his fleet squadron.
Standing in front of a group of colleagues, staff and students, Assistant Professor of Electrical Engineering and Computer Science Scott Mathews demonstrates “Deflect, Intercept, and Punch,” the last posture in his Tai Chi form. “Tai chi has its origins in martial arts and so strictly speaking every move has a martial application — a block, a strike, a blow,” he says after the class. “That’s how I originally got into it.” Mathews taught martial arts including tai chi for a decade while working in private industry before joining the faculty of the School of Engineering.

Although Mathews the martial artist says that he is “too scientific” to believe in Eastern mysticism, he also says, “I do feel as though my body has a need to move in a certain way. And the closest thing I have ever found to mimic this sort of natural thing that my body wants to do anyway is tai chi.”

Mathews the electrical engineer is also interested in movement. With Naval Research Laboratory scientist Dr. Alberto Piqué, Professor Mathews is developing ways to use lasers to place electronic devices onto or inside of circuit boards. “Our goal is to be able to lay a sheet of thousands of components on top of the circuit board, then have the laser fire on a particular device, which would be propelled off the sheet and onto the circuit board in exactly the place where it should go,” he says.

Besides pinpoint accuracy, lasers offer advantages over conventional robotics in speed and versatility. “What’s done right now with robots is pretty fast. But lasers have the potential to go a lot faster.

“And lasers can do a lot of different things — cut trenches, drill holes, cut existing wires, even take a very large circuit board, fabricate a whole bunch of circuits, and then cut out individual boards.”

Mathews and Piqué have had success in using lasers to move components and have published their findings. “But,” says Mathews, “a fully functioning machine is still a few years off.

“If anyone can build a fully functioning laser machine, it’s Mathews. “Before I came to the university, I was building laser machines for the private sector,” he says. At CUA he has already built a laser micro-machining system that Mark Mirotznik, associate professor of electrical engineering and computer science, will use to fabricate fiber optic sensors designed to help people learning to walk after suffering stroke or spinal cord injury.

Mathews envisions a new role for his laser system in molecular biology, helping fabricate components to turn biological information it into electrical signals. “The field of molecular biology offers a lot of really interesting engineering problems related to getting an electrical signal out of a DNA micro array or protein micro array, taking something physical that ends up as bits and bytes in the computer.” A micro array consists of hundreds or even thousands of individual biological samples that can be processed and tested simultaneously.

“I’m interested in new strategies, new ways to get that biological information into the computer using what I call an ‘integrated micro array.’ I want to build everything into a four-layered microchip,” he explains.

“The top layer would be the fluid handling layer, which uses tiny microscopic pumps and valves to bring in the right reactants at the right time. Underneath that is the biological layer, containing thousands of different DNA molecules or proteins or antibodies” he says. “Then comes the optical layer with lenses and filters to get the correct signal out. And finally, beneath that is the detector layer, basically a chip out of a digital camera — perhaps the cheapest imaging chip there is.”

Mathews has applied for a provisional patent and sees his new project as a long-term but very doable one that builds on his expertise. “Each of these four layers could take years to develop,” he says. “But we already have a definite advantage here at CUA because a laser machine like our system is vital to the process.”

He hopes to parlay that advantage into funding. “Getting a grant for this project would get us up and running in this up-and-coming field,” he says.


Pao, H.P. “Intense Internal waves on Shell,” Naval Research Laboratory, March 2, 2005.


Activities

Farid Ahmed, Ph.D., electrical engineering & computer science, served as the vice chair for the 2004 ASEE Mid-Atlantic Section Conference, held at The Catholic University of America, Washington, DC, Oct. 2004. He also served as the program committee member of the Multimedia Systems & Applications VIII conference at the SPIE International Symposium on Optics East, Boston, MA, 2005. Ahmed served as the program committee member and session chair of the ACM International Conference on Communication and Information Technology, Dhaka, Bangladesh, 2004.

Mohammed Arozullah, Ph.D., electrical engineering & computer science, was on sabbatical leave during spring 2005 semester, writing a book on multimedia transmission over optical Internet.


Arturo Fernández, Ph.D., mechanical engineering, served on the National Science Foundation panel for nanotechnology. Fernández also continued to serve on the subcommittee for multiphase flows of the American Society of Mechanical Engineers.

Joseph Hilider, Ph.D., biomedical engineering, attended the IEEE Engineering in Medicine and Biology conference in San Francisco, CA, in September 2005. In that same month Hilider presented at the Neurorehabilitation Conference of Switzerland meeting. Hilider continues to serve as associate editor for the IEEE Transactions on Neural Systems and Rehabilitation Engineering. He also was a member of the grant review panels for the National Institute on Disability and Rehabilitation Research, and the Veterans Affairs.

William E. Kelly, Ph.D., civil engineering, continued to serve on the Executive Committee of the Board of Directors of the American National Standards Institute 2004 and on the Executive Committee of ACE, Washington, DC, 2004. Also in 2004, Kelly served on the National Advisory Board for the ABET EC 200 Study and presented a workshop to the University of Maine Engineering and Technology Faculty on Assessment of Capstone Design Course, 2004. As part of the ASCE National Meeting in Baltimore in October, Kelly participated in the International Roundtable with ASCE President Patricia Galloway. He is a member of the ASCE International Activities Committee.


Charles C. Nguyen, D.Sc., Dean, visited approximately 15 universities and research institutions in Ho Chi Minh City and Hanoi, Vietnam, during a 10-day sojourn to the country in March 2005 to explore the potential for establishing centers of excellence in Vietnam to be financed by the World Bank. As a presidential appointee by President George W. Bush to the Board of Directors of the Vietnam Education Foundation in May 2004, he participated in this mission as a member of a delegation of the Millennium Science Institute. Other delegation members include Harold Varmus, former NIH director and a Nobel Prize Laureate and John Hopcroft, former dean of Cornell University. Nguyen also attended the Second Vietnamese American National Gala in Washington, DC, May 2005. The School of Engineering was the platinum sponsor for the gala. Also in 2005, Nguyen attended the National Academy of Engineering Awards Dinner and Presentation Ceremony, Feb. 21, 2005, in Union Station, Washington, DC. The dean delivered a keynote speech at Kansas State University, Manhattan, Kansas, as part of the New Year Celebration organized by the Vietnamese Student Association, also in February. Nguyen was invited by the White House to attend the Preserve America Ceremony in the Rose Garden of the White House, hosted by President and Mrs. Bush on May 2, 2005. He was also featured in the article “Profiling 30 Years of Struggle and Achievements: Dr. Cuong Nguyen,” Mach Sung Magazine, March 2005. In January 2005, Radio Free Asia interviewed Nguyen about his activities as a member of the Board of Directors of the Vietnam Education Foundation. He was also interviewed by Chu Tat Tien of Vienbao.com about education and culture in October 2004. The interview was published in the online magazine’s Web site www.vienbao.com.


Lu Sun, Ph.D., civil engineering, attended the Transportation Research Board Annual meeting.

Lu Sun, Ph.D., civil engineering, attended the 3rd International Conference on Earthquake Engineering and the US-China Smart Structure Workshop. He served on the National Science Foundation grant review panel 2004 and was the “Data Mining and Data Management” group leader for US-China Research Collaboration on Smart Structure.

Binh Q. Tran, Ph.D., biomedical engineering, was named co-chairman of Anthotaxix Incorporated Human Subjects Committee/Institutional Review Board for research activities. He co-convener the Technology and Aging Formal Interest Group of the Gerontological Society of America and serves as treasurer for the Washington Academy of Biomedical Engineering.

Panos Tsopelas, Ph.D., civil engineering, co-organized the National Concrete Canoe Competition together with the CUA ASCE Student Chapter. He also served as an associate editor of the ASCE Journal of Structural Engineering.

Grants


Hidler, J., “Quantification of Static and Dynamic Muscle Synergy Patterns in the Parotic Leg of Stroke Patients,” Whitaker Foundation, $74,802.


Students

Activities and Awards

Sara Delmonico, junior in civil engineering, received the Women’s Transportation Seminar — DC Chapter Scholarship.

Jeanine Graham, B.B.E. 2005, was awarded the Washington Academy of Biomedical Engineering Scholarship for her achievements in biomedical engineering research. She also received the 2005 School of Engineering Dean’s Service Award.

Cathryn Jensen, sophomore in biomedical engineering, was recognized as a 2005 CUA Nagel Foundation Scholar.

Stephanie Kennedy, junior in biomedical engineering, was recognized as a 2005 CUA Nagel Foundation Scholar. She was also a recipient of the national Biomedical Engineering Society’s Rita Shaffer Award.

Song Joo Lee, B.B.E. 2005, received the 2005 H.B. Arabek Award for academic excellence in biomedical engineering.

Caitlyn Matyas, freshman in biomedical engineering, received the 2005 Society of American Military Engineers Scholarship from the Washington DC chapter.

Thomas Scanstrist, junior in biomedical engineering, was recognized as a 2005 CUA Nagel Foundation Scholar and will receive the prestigious 2005–2006 Tau Beta Pi Scholarship. He also has been awarded the Nemours Summer Research Scholarship by the Nemours Institute whereby he will be involved in a 10-week internship experience to conduct research in cartilage tissue engineering.

Stephen Sizer, sophomore in biomedical engineering, was recognized as a 2005 CUA Nagel Foundation Scholar.

James Swiger, B.B.E. 2005, received the 2005 Biomedical Engineering Society Award for service excellence.

Awards and Honors

Farid Ahmed, Ph.D., electrical engineering & computer science, was elevated to the grade of Senior Member in IEEE.

William E. Kelly, Ph.D. civil engineering, received an ANSI Meritorious Service Award for 2004.

Scott A. Mathews, Ph.D., electrical engineering & computer science, received the Outstanding Oral Paper Award, along with Alberto Piquet, at the Fifth International Symposium on Laser Precision Microfabrication: LPM2004 in Kyoto, Japan. Their award winning paper was titled “Applications of Laser Direct-Write Techniques for Embedding Electronic and Micropower Components.”

Elsharkawy Ensures Smart, Energy Efficient, Reliable Dust

Recent advances in wireless communications, electronics miniaturization and low-power design have enabled the development of low-cost sensor networks, sometimes known as Smart Dust. Sensor devices, ranging in size from cubic inches to cubic millimeters, can have multiple on-board miniaturized sensors (such as for light, temperature, humidity, acoustics, imaging, GPS etc.), with limited, but effective, processing power and short-range radio or optical communication capabilities.

As sensors get cheaper, smarter and more reliable, they could be used in houses, highways, buildings and infrastructures. For example, a network of sensors could gather meteorological variables such as temperature and pressure, which can be used in preparing forecasts or detecting harsh natural phenomena. In disaster management situations such as earthquakes, sensor networks can be used to selectively map the affected regions directing emergency response units to survivors. In military situations, sensor networks can be used in surveillance missions and can be used to detect moving targets, chemical gases, or presence of micro-agents.

However, sensors in such environments are energy constrained and their batteries cannot be recharged. Energy-aware processing algorithms and network protocols that extend the lifetime of sensors yet still maintain the efficiency, reliability and quality of service constraints required are vital to the future success of sensor networks.

In collaboration with research teams from the University of Maryland College Park and the University of Maryland Baltimore County, Sameh Elsharkawy, assistant professor of electrical engineering and computer science, is developing algorithms and protocols for sensor networks that try to achieve that delicate balance of functionality, performance and energy efficiency. Professor Elsharkawy’s mission-oriented organization and management system optimizes the sensor network’s organization and clustering according to its intended applications and dynamically invokes changes in the network’s topology and functionality in order to adapt to run-time conditions. The system enables only a subset of the sensors to be turned on at any given time, thus avoiding wasting the energy of sensors that do not have to be involved. When a mission is assigned to the sensor network, the management system partitions this mission into sub-missions, and assigns them to a subset of the network’s clusters based on their functional capabilities and ability to meet the mission’s performance constraints. The share of each of the capable clusters or sensors from the assigned mission depends on its remaining energy level and available processing capacity. A sensor node’s tasks can be re-assigned to other surrounding nodes as a result of failures to maintain proper execution of the applications’ missions. The system coordinates this distributed execution of the assigned missions and reduces the network load by eliminating data redundancy.

The goal of Smart-Dust networks, says Elsharkawy, is to achieve efficient and reliable operation that can adapt to environment conditions, application changes and alterations or failures, while remaining virtually unattended. The professor’s organization system will make that possible.

Applying Risk-Based Engineering Principles To Evaluate Today’s Policy Issues

This summer a small group of engineering management students took on two technical, programmatic, political and policy questions facing two federal agencies. Should NASA return to flight? and What bases should the DOD close or realign under the base realignment and closure to make optimum use of its infrastructure?

The fast-paced, intensive course, co-taught by Jeffrey Giangiuli, a nationally recognized BRAC consultant and director of the Engineering Management Program, and Al Gallo, a senior program manager with NASA, is designed so that students first learn how to identify, evaluate, communicate, manage and mitigate risks associated with all types of engineering applications. After mastering the basic concepts and mathematics of the coursework, they then apply what they learned to the two practical exercises.

“The goal of the course,” Giangiuli says, “is to take a look at current problems using mathematical techniques to help managers make better decisions and understand the risks associated with them.

“We chose the two problems because they are technical issues that are in the news,” Giangiuli says “Are we getting the return on our investment? Is it worth the risk? These issues are very current and pertinent.”
Catholic University will share a three-year, $679,282 grant from the U.S. Department of Commerce’s Technology Opportunities Program, TOP, to improve health care and home monitoring services for 300 senior citizens at Edgewood Terrace — a 16-acre, low- and moderate-income residential community less than a mile from CUA’s campus — and to train 40 Edgewood residents for certification as biomedical health care technicians.

The Technology Opportunities Program promotes the use of digital, telecommunications and computer technology to benefit the community and create new jobs.

“TOP normally approves around 25 to 30 projects each year out of 500 applications,” says Binh Tran, chair of CUA’s Department of Biomedical Engineering and co-director of the Edgewood project. “That’s roughly 5 to 6 percent of the total proposals submitted. Receiving this funding is a real feather in Catholic University’s cap.”

CUA’s schools of engineering and nursing and its National Catholic School of Social Service will receive $257,000 of the grant; the rest will be split between the Community Preservation and Development Corp., Edgewood Terrace and other partners. In addition to the federal funds from the Department of Commerce, the research team also has nearly $1 million in matching funds from industry partners such as Verizon Communications Inc., the Microsoft Corporation and others.

The project, called Clinical eStorefront @ Edgewood Terrace, has three main components:

**BIOMEDICAL TECHNOLOGIES CENTER**

Located in Edgewood’s Seniors’ Center, CUA engineering, nursing and social work students will educate and train the senior citizens on the best home-monitoring equipment — such as blood pressure devices, devices to measure blood glucose levels, or other home health sensors — to have for their respective health conditions, how much they cost and how to use the equipment.

“This will allow seniors to make an informed decision before they go out and spend their own money,” Tran says. “With seniors, you’re often dealing with a limited income, so the wrong decision can be costly. Also, many of them are overwhelmed by the amount of technology available.”

In the virtual clinical “storefront” senior citizens can use the Internet and health sensors in the Demonstration Center to interact with clinicians located at the National Rehabilitation Hospital and CUA’s School of Nursing for treatment. For example, a resident with chronic shoulder problems could demonstrate via video his range of motion for a clinician, who can diagnose the problem and recommend treatment.

“In the past, patients always went to see a clinician, but now they don’t have to travel to get treatment,” Tran says. “Through the Biomedical Technologies Center, residents can remotely access health service providers through an e-health storefront at Edgewood Terrace. At this point, we envision the center being open for four hours a day, five days a week.”

**TRAINING AND CERTIFICATION**

Over the grant’s three-year life, the team will train 40 Edgewood residents to be certified as biomedical health care technicians. The training comprises computer education, installation of the in-home monitoring systems, data tracking and operating health equipment. Trainees also work with CUA students in the Demonstration Center as well as clinical partners. Once they successfully complete the program, participants will be certified and eligible to be hired by local hospitals and rehabilitation centers. “We’re looking at other local hospitals and nursing homes to hire these certified individuals.”

“This project continues our previous funded research projects over the past six years in the area of telehealth and home monitoring technologies for delivering health care service to underserved populations. Our goal is to develop models wherein technology supports successful aging in our seniors,” says Tran.

**IN-HOME HEALTHCARE TECHNOLOGIES**

A monitoring system that tracks a person’s daily activities at home using sensors, switches, a central transmitter and an in-house computer server will be installed in each senior citizen’s residence. Using existing electrical outlets and routine appliances, the sensors are connected to the central transmitter, which is hooked up into the server.

After it’s customized to a particular residence, the system can track how many times a person enters and leaves a certain room, how often he or she cooks and how many lights are left on during the day. In addition, appliances can be set to shut off automatically if they have been on for a long time and no motion has been detected around them.

“We also provide sensors for those with chronic illnesses to wear to collect information such as EKG data as well as heart and breathing rates,” Tran says.

Edgewood’s new Seniors Building houses more than 290 low-income, elderly residents. The joint research effort with biomedical engineering will provide health care access to residents via advanced telecommunications and health monitoring technologies in order to promote aging-in-place.
Hidler, Tsopelas and Tran Honored with Kaman Awards

Faced with the dilemma of too many candidates, the Kaman Awards selection committee decided to break tradition and honor two professors for their excellence in research. The winners of the 2005 Kaman Award for Research are Joseph Hidler of biomedical engineering and Panos Tsopelas of civil engineering.

Joseph Hidler, assistant professor of biomedical engineering, directs the Center on Applied Biomechanics and Rehabilitation Research, a joint project between The Catholic University of America and the National Rehabilitation Hospital. In 2004–2005, Hidler published five peer-reviewed journal publications and two conference proceedings publications in the area of robotic-assisted gait training for those suffering from stroke or spinal cord injury. He also made five conference presentations and four additional invited presentations. In April 2005, Hidler served as the keynote speaker at the JRH Annual Conference on Innovations in Neurorehabilitation in Montreal. His research has received more than $1 million in funded grants from The Whitaker Foundation, the Department of Education, the National Institutes of Health, and the U.S. Army.

Panos Tsopelas, associate professor of civil engineering, is the director of the Structural Control and Aseismic Research Laboratory, founded to improve techniques for seismic design and earthquake engineering. In 2004–2005 Tsopelas published two peer-reviewed articles, one refereed report, and two limited circulation reports to the U.S. Army. During the selection period, he made five conference presentations. Tsopelas’s research in honeycomb structures and ground pressure measurements for landmine detection is funded by the National Science Foundation and the U.S. Army.

Binh Q. Tran, associate professor and chairman of biomedical engineering, received the 2005 Kaman Award for Faculty Excellence in Teaching for his role in the classroom and teaching innovation. He regularly teaches Introduction to Engineering Laboratory and Engineering Mathematics to all engineering students as well as such biomedical engineering-specific courses as Junior Biomechanical Design, Home Care Technologies, and Cardio-Pulmonary Biomechanics. Tran has revamped several of the courses to integrate real-world problems with fundamental theory and concepts. His courses often require students to use modern engineering tools to solve common problems students will face after graduation. This marks the second time he has received the award: Tran was the recipient of the inaugural Kaman Teaching Award in 2002.

The Kaman Awards for Faculty Excellence are funded by a generous endowment from Charles H. Kaman, B.A.E., 1940. Each recipient is recognized at the annual School of Engineering luncheon and at the school’s graduation ceremony and each receives a plaque and a monetary gift. The research awardee is nominated by his or her faculty peers, while the teaching awardee can be nominated by students or faculty.

New Engineering Alumni Award Goes to Beckett

Faced with a surfeit of alumni worthy of honoring, the School of Engineering Executive Committee inaugurated The Engineering Distinguished Alumni Award in October 2004. It joins the CUA Alumni Achievement Award for Engineering. The new award is presented to engineering alumni who have made substantial contributions in their fields; nominees are chosen from names submitted by alumni, faculty, students, staff and CUA administrators.

Dean Nguyen officially introduced the new award and Thomas Beckett, M.E. 1981, deputy director of the Naval Reactors Program, its first recipient, at the October 2004 homecoming week luncheon hosted by the School of Engineering.

Commissioned in the U.S. Navy in 1969, Beckett was selected for duty at Naval Reactors, the joint program of the departments of the Navy and energy with cradle-to-grave responsibility for the reactors aboard all U.S. nuclear-powered warships. In 1974, he resigned his Navy commission, and has since then worked at Naval Reactors as a civilian. As the branch chief for aircraft carriers in the Instrumentation & Control Division, he led the program’s efforts to back-fit microprocessor instrumentation and control technology on the reactor plants aboard NIMITZ class aircraft carriers. He was promoted to deputy director of the Instrumentation & Control Division in 1992.

In 1994, Beckett was assigned to the Pittsburgh Naval Reactors office as the naval sea systems command technical representative. He returned to Naval Reactors headquarters in 1998 and assumed responsibilities as the director for regulatory affairs. Beckett led Naval Reactors’ Spent Fuel Management Program, which included negotiating agreements with federal, state and tribal officials, and led Naval Reactors’ efforts under the National Environmental Policy Act to develop new facilities to support nuclear powered warships in the Pacific Fleet. In 1999, Beckett was selected as the seventh deputy director in the more than 50-year history of the Naval Reactors Program.

“I am very glad that the School of Engineering has its own award to honor its excellent alumni. This new award is an excellent way to maintain a good relationship between our school and our alumni,” said Dean Nguyen.

Nomination forms and selection guidelines for the new award can be obtained from the dean’s office and submitted there.
AEE Regional Meeting at CUA

On Oct. 22 and 23, 2004, the CUA School of Engineering hosted the fall 2004 ASEE Middle Atlantic Section Meeting, “Engineering Workforce of the Twenty-First Century.”

At the first of two faculty workshops, sponsored by the CUA School of Engineering, ANSI and NIST, Ted Bickart, a former ASEE President, discussed a new IEEE initiative to help faculty members include standards in design. Professor Joe Hidler from CUA’s Department of Biomedical Engineering and Bob Laurenson ABET EAC chair elect led the second workshop on using capstone design courses for outcomes assessment.

At the banquet in the Great Room of the Edward J. Pryzbyla University Center following a reception for all participants, John Brighton, NSF Assistant Director for Engineering spoke about issues to be addressed to ensure that the United States continues to have a world-class technical workforce. Brighton expressed some concerns about the lack of diversity in the technical workforce and the need for faculty to do more to recruit women and underrepresented minorities to engineering careers.

On Saturday morning, Charles McGuire, vice president of engineering at Exxon Mobile Research & Engineering, presented the plenary talk at the Edward R. Crough Architectural Center’s Koubek Auditorium. McGuire raised some of the same issues, discussing especially the importance of diversity in Exxon Mobile’s workforce and the value of having different approaches to problem solving available to engineering teams.

Faculty and student paper presentations were held in the newly renovated Scullen Room and the new Biomedical Engineering Conference Room. These papers are available on a CD produced for conference.

During the Saturday morning conference, Nelson Macken, Ph.D., from Swarthmore College, presented a special workshop organized around a breakfast at the Pryzbyla Center for ASEE Campus representatives, assisted by Mr. Tim from ASEE Headquarters.

Faculty members from CUA and area universities moderated sessions at the conference on Saturday. Special thanks to the organizing committee and the School of Engineering staff members who helped with the conference, including Peggy Bruce, Jill Weaver, Emma Cox and Professor Farid Ahmed, and to Dean Nguyen for his support and encouragement.

New Director for the CUA Engineering Management Program

On July 1, 2005, Jeffrey Giangiuli was named director of the Engineering Management Program. Giangiuli, who received his undergraduate degree from the United States Naval Academy in Systems Engineering, is a 1991 graduate of the CUA Engineering Management Program and has been a lecturer in the program since 1992.

Giangiuli brings extensive experience in the fields of decision analysis, systems analysis, engineering economics and engineering risk management to the position derived from years of working on the complex operations, maintenance and regulatory issues at the United States Department of Defense and Department of Energy facilities. Giangiuli is a recognized expert in the areas of decision analysis, management systems and regulatory compliance associated with the nuclear and environmental issues facing DOD and DOE facilities and operations. He has developed management systems and strategies to overcome significant technical, regulatory and budgetary issues associated with nuclear and defense activities.

Prior to joining the faculty of the school, Giangiuli was the chief strategist and co-founder of Strategic Management Initiatives, Inc. (SMI), a management consulting firm, providing strategic management and engineering analyses and solutions to the problems facing Fortune 500 companies and the U.S. government in their management of complex technologies and processes, based in Gaithersburg, Md. The company was acquired by CALIBRE Systems, Inc. of Alexandria, Va. SMI achieved national acclaim, making INC magazine’s list of 500 fastest growing privately held businesses two years in a row.

In his new role as director of the Engineering Management Program, Giangiuli intends to build on the strong foundation established by his predecessor John Leonard to increase the number of full-time students, expand the number of courses offered, partner with select federal agencies and industry, vary the location of the classes both on and off campus, and obtain American Society for Engineering Management certification.

Employers Seek CUA Engineering Students at Career Fair

The 3rd annual Engineering Internship & Job Fair took place at CUA on January 28, 2004. The Office of Career Services, with a big assist from engineering faculty, brought 37 organizations from government and industry to campus to meet students and discuss openings for May grads and students seeking summer internships. Among the guests were organizations such as Clark Construction, ITT Industries, Northrop Grumman, U.S. Navy Engineering, U.S. Patent & Trademark office, and Whiting-Turner. Activity was brisk as students, résumés in hand and armed with advance research, circulated in the Pryzbyla Center Great Room, engaging the representatives and exploring options for their futures. Employer feedback was extremely positive about the event, the students and their academic programs; many expected to invite a number of students back for in-depth interviews. In fact, three firms had so many good candidates that they came back to campus and conducted interviews in Career Services with their CUA candidates. In short, it was a most successful event and the employers all reported a desire to return in 2006.

We’d like to include your organization in our next annual career fair for the School of Engineering. Please contact Career Services at 202-319-5623 or careers@cua.edu.
# Congratulations to the Class of 2005!

<table>
<thead>
<tr>
<th>Degree Program</th>
<th>Names</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Doctor of Philosophy</strong></td>
<td>George Borlase, Joseph Krycia, Jerry Rosson Smith, Teresa Walsh</td>
</tr>
<tr>
<td><strong>Master of Biomedical Engineering</strong></td>
<td>Jennifer Aloi, Linda Kent, Jennifer Medicus, Rajesh Puka, Maria Sinopoli</td>
</tr>
<tr>
<td><strong>Master of Civil Engineering</strong></td>
<td>Bashayer Al-Rashed, Huseyn Isikli, Richard Pietryka, Alper Ucak, Jun Yang</td>
</tr>
<tr>
<td><strong>Master of Electrical Engineering</strong></td>
<td>William Ellis, Azan Ettehadieh, Jean Francois, Eskander Haile, Lisa Hollinden, Dominic Prunesti</td>
</tr>
<tr>
<td><strong>Master of Science</strong></td>
<td>Umarani Adivikolanu, Jason Fox</td>
</tr>
<tr>
<td><strong>Master of Science in Engineering</strong></td>
<td>Esteban Acon, Adeyemi Adesina, Waleed Alkhaazi, Azzam Alsheikh, Jillian Bauer, Reagan Billingsley, David Bowden, Silvia Castillo, Michael Cathey, Arvind Chaurasia, Electra D'Silva, Thomas Kline, Albert Ladipoh, Roderic Mills, Cheryl Phillips, Suttinut Sahaukmontri, Fangemonique Smith, Melissa Torres, Paquita Wiggins</td>
</tr>
<tr>
<td><strong>Master of Science in Biomedical Engineering</strong></td>
<td>Josem Abdulla, Uduak Effiong, Jeannine Graham, Song-Joo Lee, Bradley Quinn, James Swiger III</td>
</tr>
<tr>
<td><strong>Master of Science in Computer Science</strong></td>
<td>Daniel Crum, David Kriston, David Destefano, Zack Gamble, James Horstmann Jr.</td>
</tr>
<tr>
<td><strong>Bachelor of Science</strong></td>
<td>David Bowden, David Nerburn, Christina Protopappas, Keith Roberson, Kealy Radersdorf, William Strouse, Kyaw Ya</td>
</tr>
<tr>
<td><strong>Bachelor of Electrical Engineering</strong></td>
<td>Loay Almannaei, Timothy Creazzo, Brian Guenther, Lamine Hachani, Curtis Himel, Nina Mafaher, Jason Pullam, Ramzi Vincent</td>
</tr>
<tr>
<td><strong>Bachelor of Mechanical Engineering</strong></td>
<td>John Mahoney, Matthew Pinckney, John Quinn III, Joseph Sobocinski, Kevin Voss</td>
</tr>
<tr>
<td><strong>Bachelor of Science in Computer Science</strong></td>
<td>David Destefano, Zack Gamble, James Horstmann Jr., Andrew Potter, Fady Sadeq</td>
</tr>
</tbody>
</table>

**Ph.D. Dissertations and Advisers**

- Jerry R. Smith Jr., “Modeling of RF Forward Scatter from 2-D Rough Sea Surfaces at Low Grazing Angles,” Mark Miroztzak, associate professor of electrical engineering and computer science and adviser.