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Waste Not, Want Not

Necessity is the mother of invention, they say, and that is as true in the field of wastewater treatment as it is elsewhere.

As rising energy costs drive up the cost of wastewater treatment, treatment plants are reaching out to researchers in the field to help find new ways to lower the energy use associated with wastewater treatment, and to re-use the by-products of the treated water. One of the people they are consulting is Professor Rumana Riffat of the Department of Civil and Environmental Engineering.

“Thirty to 40 years ago, the emphasis was on cleaning up the wastewater to take everything out of it and to discharge it into the river in a more or less pristine condition,” she explains. “That is still the goal, but now we don’t want to throw out everything that we are taking out of the water. We’re now trying to come up with beneficial re-use for products that we previously categorized as waste.”

Biosolids, or treated sludge, form a large portion of the products that come out of treated wastewater, and some of them can be re-used as fertilizers rather than discharged as waste. Class A biosolids can be used more widely as fertilizers than Class B biosolids, but they are more expensive to create.

Wastewater treatment plants create biosolids and natural gas through a fermentation process called anaerobic digestion, which uses a high temperature and micro-organisms that mostly already exist in the sludge. Because of the energy costs involved in treating the sludge at the required temperature—55 degrees Celsius for Class A biosolids—many plants instead opt to produce Class B biosolids, which can be manufactured at lower temperatures.

Millions of gallons of sludge are treated every day at wastewater treatment plants, so a reduction in the temperature required to produce Class A biosolids—even a 10-degree reduction, according to Professor Riffat—could lead to significant energy savings for plants. To try to hasten the day when this is possible, she and her students are working to determine whether a treatment at 45 degrees Celsius is sufficient to achieve the pathogen destruction necessary to produce Class A biosolids.

Professor Riffat and her research team are conducting this research as part of a U.S. Department of State-funded, collaborative research project with Quaid-i-Azam University in Pakistan. The project aims to develop small-scale, sustainable wastewater treatment systems for the locality, with the goal of re-using water and biosolids. She conducts additional research at the nearby Blue Plains treatment facility, one of the largest such facilities in the world, and has a long-standing collaborative relationship with the District of Columbia Water and Sewer Authority.

Yet, Professor Riffat is not content with the gains that have been made recently across the discipline. She aspires to more, saying, “Now we are taking a second look at digestion as a process for producing energy instead of something that just eats up energy.”
The Art of Computing

Professor Tim Wood of the Department of Computer Science comes from a family of artists: his relatives are painters, weavers, and potters. He’s not an artist himself, but he is very creative, and he learned at an early age that computers were his “medium” of choice for expressing his creativity. “Creating things inside a computer is in many ways similar to creating a work of art,” he argues. “It requires a mix of creativity and problem solving.”

What he creates inside computers is the infrastructure necessary to help run the “big data,” or data-intensive, operations that we all hear so much about these days. Big data operations can include everything from companies collecting information on millions of customers and their preferences, to scientists across the world compiling masses of climate data daily to aid in weather predictions, to governments gathering health care information about us.

As these and other sorts of data-intensive operations multiply, the storage space to hold all these data must grow along with them, as must the computation power necessary to analyze the data and “answer the interesting questions,” as Professor Wood puts it. He is quick to say that he’s actually agnostic about the questions; what interests him is finding ways to make the infrastructure that supports big data more reliable, more efficient, and more secure.

“Because we have so much data to process, we really need to develop entirely new techniques,” he explains. “This requires us to approach the problems in a different way.” His approach to improving the infrastructure in cloud computing and big data systems is to focus on the virtualization layer, a piece of software that sits beneath the operating system and above the hardware.

Professor Wood’s work on the virtualization layer allows him and his collaborators to develop improved reliability or better security without having to change the operating systems or the applications that people want to use. “That is our expertise. That gives us an edge,” he claims. “By working at that layer, we’re able to provide support for many different types of applications, because it’s not specific to any of those applications.”

Through his research to manage the performance of big data systems, Professor Wood has developed new techniques to run big data applications using resources that otherwise would have been left idle in a cloud computing platform. “We’re able to make these systems much more energy efficient by making use of computers that otherwise wouldn’t have been fully utilized, and we’re able to do this without hurting the performance of other applications running on the system,” he states.

Although still early in his career, Professor Wood already has had a great deal of success with his research, winning two National Science Foundation grants—including the very prestigious Career Award—and a Google research award. It seems he indeed has found the right outlet for his creativity.
Optimization research normally aims to improve the performance of computing systems—for example, making data transfer on a smart phone faster—but Professor Tian Lan of the Department of Electrical and Computer Engineering is applying optimization techniques to cyber security problems. And that, he says, is a new perspective.

Security is essential for all communications systems, thus the large number of people across the globe who work to improve it. The most common approach is to concentrate on solving one particular issue in the security system or to develop security solutions for only one component of a particular system. But Professor Lan studies novel techniques that provide an autonomous defense for the entire system by reorganizing and optimizing system resources in response to physical or cyber attacks.

“We’re investigating a wide range of solutions for both the commercial and government sectors to harden the security of these systems,” he states.

“By constructing security models and developing algorithms to optimize resource allocation and pricing, Professor Lan and his colleagues expect to advance cloud computing security and provide more choice for customers. Once the team publishes its results, providers such as AT&T, Amazon, Google, and others would be free to use the algorithm in their data centers. For cloud customers, purchasing higher reliability and availability for their cloud applications would be only a checkbox away.

Under a separate grant with DARPA (Defense Advanced Research Projects Agency), Professor Lan is working with Advanced Communications Science (the lead contractor on the project) and colleagues at Princeton University on another computer security-related project, Mission-oriented and Resilient Cloud. That project aims to help the U.S. military plan and execute missions securely on the cloud. “I work on the algorithms that can help to translate mission models to configure data, automate resource planning, and optimize both mission effectiveness and security,” notes Professor Lan.
A Systems Approach

Professor Ekundayo Shittu of the Department of Engineering Management and Systems Engineering studies the economics of global climate change and how public policy should be structured in response to global climate change concerns.

While he acknowledges that disagreements exist about the causes of climate change, he works within the school of thought that human actions are largely responsible for climate change; therefore, he tries through his research to discern the optimal policies that decision makers can enact to encourage firms and individuals to adopt sustainable policies and practices.

Traditionally, efforts to study and optimize public policy decision making have been hived off into separate disciplines: economists tend to focus on cost-benefit analyses, while public health researchers look at the impact on public health, and engineers assess the adoption of new technologies. However, Professor Shittu has another approach.

“I take a systems engineering approach,” he says. “I build on research tools from economics, decision theory, statistics, optimization modeling, and environmental policy to achieve a more robust solution, particularly in the face of multiple and sequential uncertainties.”

Because changing regulatory policies can create a great deal of uncertainty for firms trying to plan for future operations and investments, the mix and appropriateness of policies can affect how quickly firms adopt sustainability practices. Likewise, a number of factors affect how well individuals exhibit behaviors that the policies may try to encourage, such as switching to renewable resources or retrofitting conventional technologies in their homes. Even beyond that, the policies also can have unanticipated consequences that impact other public policy goals such as poverty alleviation.

“When you look at new technologies, such as solar panels, most people stop at asking what's the cost of installing the panels,” Professor Shittu explains. “I take it a step further and ask what are the social welfare costs of the solution and whether a particular system will accommodate those costs.”

Professor Shittu already is being recognized for his research. For example, he was invited by the United Nations' Intergovernmental Panel on Climate Change to participate in writing Chapter Two of its Fifth Assessment Report, titled “Integrated Risk and Uncertainty Assessment of Climate Change Response Policies,” which was published last April.

Professor Shittu is thrilled that others see the value of his approach. “When you have a systems engineer look at these problems, they understand the economics and the technology,” he states. “It’s a classic case of having the right toolbox to address the problem in a holistic manner.”
Manifold Tasks

Professor Taeyoung Lee of the Department of Mechanical and Aerospace Engineering takes a unique approach to his research in dynamics and controls. “Engineers are used to thinking of systems in Cartesian coordinates, but many interesting mechanical or aerospace systems evolved on a curved space called a manifold,” he explains, noting that he opts to study dynamics and controls on a manifold.

Taking the example of spacecraft to illustrate the importance of his approach, Professor Lee explains that many people study spacecraft controls on a flat space to approximate the nonlinear space of attitudes, referred to as the special orthogonal group. That approach simplifies the problem but creates problems of its own. His approach, on the other hand, uses a host of tools from differential geometry and applied mathematics to look at the curved space as it is, without using any approximation.

One of his current research projects looks at transporting a payload by several unmanned aerial vehicles (UAVs). This has both military and commercial applications (think Amazon drones), but the dynamic coupling between the UAV and the payload needs to be better understood if the UAV is to transport a payload through complex trajectories. For military operations, the UAV may need to fly low to the ground to avoid enemy detection, so it must be able to navigate through dense vegetation. In commercial applications, it may need to navigate urban environments and avoid crashing into buildings or pedestrians.

Most UAV-payload research ignores the dynamic coupling between the drone and the payload in the configuration manifold, and, as a result, the drone is limited to following a straight trajectory fairly slowly. However, Professor Lee says, “My research is to study nonlinear control for a complete dynamic model of a payload and drone and the string connecting them such that we can transport the payload aggressively and through complex trajectories.”

According to Professor Lee, research of this kind is done primarily in math departments, and mathematicians generally “don’t have a strong interest in the spacecraft or aircraft or a good sense of the dynamics,” he says. “It’s very hard to find someone in an engineering department doing this.”

He notes that interdisciplinary research of this type can be fairly slow going, so the challenge is to remain focused and consistent. From all appearances, however, his research isn’t proceeding slowly at all. In fact, he’s been at SEAS just three years and already has received three separate National Science Foundation grants and has been selected to work two summers at the Air Force Research Lab. His monographs in geometric mechanics will be published in the next year, as well.
The old SAT analogies: they were removed from the exam in 2005, but those of you who graduated from high school before then probably remember them. “Wet” is to “liquid” as something is to something else? Or “satiated” is to “hunger” as something is to something else?

With another audience, I might hesitate to drudge up memories of the SAT, but you are engineers and computer scientists, and those of you who had to complete the analogies section probably sailed through it.

The SAT analogies were designed to test a person’s ability to see relationships between words.

Oddly enough, what caused me to remember them were two tag lines I recently saw—one used by GW, and one used by us here at SEAS. They were printed on two pieces of literature that landed together on my desk, and as I glanced down, I immediately, though very unintentionally, saw the relationship between them.

Analogies are about relationships, and most of what’s important in life comes down to relationships—not between words, of course, but between people. It was the idea of relationships that immediately became apparent to me as I glanced at the two tag lines: “Making History” and “Be a Part of It.”

“Be a Part of It” is the tag line we use at SEAS. It’s an open invitation to all—our alumni, our students, our research and corporate partners, our donors, and others—to be a part of the achievements and growth happening here. This growth happens in our classrooms and labs, of course, but it also happens when our students have opportunities to learn through competitions, clubs, conferences, study abroad, entrepreneurship challenges, and more. It happens when more of our alumni reconnect to SEAS and enliven the SEAS community with their interests and talents. And it happens when others join with us to develop new joint research projects.

“Making History” is the tag line for the university’s capital campaign—the largest capital campaign in the university’s 193-year history—which was launched publicly this past June. With a goal of raising $1 billion by 2018, the campaign aims to raise the funds necessary to implement Vision 2021, the strategic plan that provides a blueprint for GW’s growth and was adopted last year by the Board of Trustees.

The relationship I see between the two tag lines is that the one enables the other. By being a part of our growth here at SEAS, you help make history here at GW. You help enable the achievements and successes here; you are part of the history we make.

Your contributions matter to the success of the school. Look at where SEAS is right now and how far we’ve come in just five years, and you’ll notice that those successes rest on relationships—the relationships that alumni and donors form with students, and students form with faculty, and faculty form with research partners, and so on. These are the relationships that are created when we join together for a common purpose.

The Making History campaign invites us to join together to bring the university’s strategic plan to fruition through three broad goals: enhancing academics, supporting students, and breaking new ground. I invite you to see how SEAS fits into the campaign priorities, how we’ve already built the foundation that makes our aspirations achievable, and how you can “Be a Part of It.”
Terry Collins
SEAS alumnus Terry Collins (D.Sc. ’76) studied electrical engineering at SEAS and subsequently built a very successful career in communications and signal processing. Despite the demands on his time, Terry has maintained his connection to SEAS and GW over the course of his career, serving as a longtime member of the school’s National Advisory Council and, more recently, as a university trustee.

Earlier this year, Terry and his wife, Alisann, made a gift to SEAS to endow a professorship in biomedical engineering. Their gift helped the school hire for a critical position, the founding chair of the new Department of Biomedical Engineering. (See story on page 14.)

"Alisann and I were motivated to make a gift to SEAS by the current momentum in the school and the need for science and engineering leadership in the nation’s capital. Our George Washington University has made substantial investments in SEAS over the last several years with new facilities, quality faculty hires, and greater emphasis on R&D. We all know that science and engineering are critical to solving many current and future problems and we want our students to be able to lead in solving these problems. Endowed professorships accelerate the quality of our faculty and research and strengthen GW. We see this as a start to greatness if our many alumni recognize the need and continue to support SEAS as we are doing.”

Hannah Stuart
SEAS alumna and donor Hannah Stuart graduated in 2011 with a bachelor’s degree in mechanical engineering. She began her graduate studies in design and robotics the next fall at Stanford University. As an undergraduate, Hannah conducted fuel cell research at Beijing Jiaotong University through a 2010 National Science Foundation International Research Experience for Students, and she later entered her research in the SEAS Student Research and Development Showcase, winning the Best Undergraduate Poster prize that year. In 2011, she was part of a team of SEAS undergraduates that won one of the coveted spots in NASA’s Microgravity University Program and had the chance to conduct experiments aboard the “Weightless Wonder,” NASA’s reduced gravity aircraft.

"Research empowers curiosity; it teaches students to seek out both exciting problems and the technical tools to solve them. The supportive environment at SEAS fostered my confidence and passion as an engineer by allowing me to pursue undergraduate research experiences. These opportunities also provided a strong foundation to continue research at Stanford University, where I completed my MSME in 2013, and am now a Ph.D. candidate. The inspiration and guidance I received at GW started me on a path I never imagined. Actively enabling more undergraduates to have these research experiences can make an indelible impact on the future of both the students and SEAS.”
SUPPORT STUDENTS

Applications to SEAS have been growing steadily over the last five years. And so has enrollment. In fact, this fall we enrolled the largest freshman class in the history of the school. But to keep growing our enrollment, we need to be able to provide more scholarships to students who have the talent and the drive to master an engineering or computer science education, but who don’t have the means to afford a SEAS education.

SEAS seeks your support through the Making History capital campaign to ensure that we can make an engineering or computer science education accessible to a greater number of talented students. We also seek to provide increased study abroad options to our students to better prepare them for careers in which engineering is practiced in an increasingly global fashion.

Scholarships/Aid for top graduate students are the deciding factor for many of the brightest students in determining which college they will attend. The top students often get robust scholarship offers from several colleges, and SEAS needs to be able to compete with other schools to draw some of those students here. We have the location and programs—and now the facilities—to be competitive, but the fact is that we need to be able to offer the scholarships and fellowships that these students can command. Everyone benefits when we enroll more of the best students.

Study abroad is an experience that matures students beyond almost any experience they can get on campus. Ask a SEAS student about her study abroad last semester to Korea, and you will see their faces light up and hear the enthusiasm in their voices. If you ask them what they learned, most of them in one way or another will tell you that they became more independent and learned to handle situations they didn’t previously know they could. On top of that, of course, they got a crash course in working with engineering students from other countries and cultures, and a foretaste of working on projects with people from other corners of the globe during their careers.

Simon Lee
Simon Lee (MS ’05) studied engineering as an undergraduate at Korea University and later immigrated to the U.S. as a young professional engineer. Here in the Washington, D.C. metropolitan area, Simon built STG, Inc., which he still leads as its CEO and chairman. He continued his engineering studies at SEAS as a graduate student in systems engineering and has remained involved with SEAS as a member of the school’s National Advisory Council.

In 2010, Simon endowed a student exchange program between SEAS and Korea University. The endowment provides assistance for our students who wish to study abroad at Korea University, giving them the opportunity to learn firsthand about another culture while studying and working with aspiring engineers and computer scientists there.

"Today's business world is all about globalization. Students must embrace the notion of globalized partnerships and learn from other cultures in order to grow into tomorrow’s world leaders. Programs such as the U.S.-Korean Student Exchange offer more than an education—they prepare students to excel in the modern business world. Today’s leaders have a responsibility to enable future leaders to learn from each other. I encourage other SEAS alumni to support the SEAS study abroad programs. We can begin to lay the foundation for cross-cultural partnerships that can flourish for generations and strengthen over time, building bridges that link educational institutions and bring students from different countries and cultures closer together.”

Matt Knouse
Matt Knouse graduated from SEAS with a bachelor’s degree in computer science in 2009 and a master’s degree in engineering management in 2011. Now an abuse analyst for Google, Matt also serves on the SEAS National Advisory Council and is a SEAS donor. As a junior, Matt spent a semester in France and considers it a key part of his college education.

"Breaking down barriers is a part of success. I give to SEAS because the school broke down barriers that previously prevented engineering students from studying abroad. By creating partnerships with stellar schools, building programs that accommodate the rigorous academic requirements of engineering students, and providing scholarships for study abroad, SEAS has helped students overcome the academic and financial obstacles that often keep our engineers from studying abroad. Offering students the chance to learn engineering through the lens of another culture? That's SEAS creating opportunities for our students—and that's money smartly spent.”
Through the Making History campaign, SEAS seeks your support to foster research and innovation opportunities across the school, as well as your support of our new state-of-the-art facilities, which will become available when the Science and Engineering Hall opens in January 2015.

The Science and Engineering Hall changes the game for SEAS. When this new 500,000-gross-square-feet, 14-story structure opens, faculty and students will have opportunities that until now they have only dreamed of. New core facilities—such as a vibration-free and particulate-free nanotechnology fabrication facility, a powerful imaging facility, and a three-story high bay—will fulfill possibilities for on-campus, state-of-the-art research across many disciplines.

Research initiatives can take the “raw material” of original ideas and brilliant insights and move them along the path to tangible and beneficial products, processes, and services. Just as we invest in education to tap the potential in our children, we need to invest in good ideas to tap their potential. Having a pool of funds that can be used to provide quick start-up assistance that bridges the gap from idea to research project is a necessary and invaluable tool for a dean. These funds help create the agility the school needs to seize opportunities when they arise, which is essential for any school that aspires, as we do, to move to the top ranks of research schools.

**Scott Amey**
Scott Amey (MS ’75) completed his master’s degree in computer science at SEAS and pursued a career in information technology and engineering services contracting. Scott’s unflagging support of SEAS over the years includes both service and philanthropy. He established the SEAS Career Services Office in 2004 and managed it as a volunteer for more than two years, and he serves on both the school’s National Advisory Council and the university’s Board of Trustees.

Scott and his wife, Deborah, also have been longtime, faithful donors to SEAS. They have supported numerous initiatives ranging from the Senior-Alumni BBQ to the Science and Engineering Hall construction. As part of their commitment to SEAS, Scott and Deborah initiated the $1 million Amey Challenge Match for the Science and Engineering Hall in 2011. They successfully completed the match in February 2013. “I support the Science and Engineering Hall (SEH) because I see this facility as a major drawing card for both outstanding, research-focused professors and bright, energetic undergraduate and graduate science and engineering students. Having been a computer science major at SEAS, I want the SEH to include a state-of-the-art software engineering lab. I also donated to the SEAS Career Services Office, because I want to see every SEAS student obtain a challenging job upon graduation. Even with the great new SEH, I still encourage all SEAS graduates to help the campaign. There is great need for scholarships and fellowships.”

**Muriel Dumit**
Muriel Dumit is a civil and sanitary engineer at Greeley and Hansen, an environmental engineering consulting firm. She received her bachelor’s degree in civil engineering from SEAS in 2009 and her master’s degree in environmental engineering in 2011. As a student at SEAS, Muriel had an internship with the District of Columbia Water and Sewer Authority that focused on implementing novel wastewater treatment processes, measuring greenhouse gas emissions from wastewater treatment processes, and analyzing their effect on air quality and climate change.

“I contribute to SEAS to support the school in becoming a leading institution in research and engineering. The Science and Engineering Hall will provide students with world-class facilities and resources that allow them to partake in cutting-edge research and development and have access to the most innovative technologies. Having the right tools and environment will greatly enhance their learning experience.”
IN THE LAST 5 YEARS, SEAS HAS...

**HIRED** 44 new faculty members, most of them from top-ranked engineering and computer science programs across the country and around the world.

**INCREASED** the school’s number of women faculty members. Nationally, women composed 14% of tenured and tenure-track faculty at engineering schools in 2012; at SEAS, women were 18% of our faculty in 2012. By 2014, women composed 22% of the SEAS faculty.

**EXPANDED** the number and range of research options available for interested undergraduate students. For some of our students, these research experiences have led to opportunities to travel abroad to continue a research project, to join a start-up team and participate in entrepreneurship competitions, and even to orbit Earth as part of NASA’s Microgravity University program.

**34%** **INCREASED** undergraduate enrollment by 34%.

**37%** **INCREASED** graduate enrollment by 37%.

**CREATED** new study abroad options, which traditionally are very limited for engineering students at most colleges. SEAS has established programs in Ireland, Korea, and Turkey, and more of our students are taking advantage of them.

**GROWN** our research expenditures by 30%.

**BUILT** robust new research programs or expanded research in critical technological sectors, such as robotics, high-performance computing and computational modeling, nanotechnologies, cybersecurity/information assurance, and biomedical engineering.

**YOU**

You are an alumnus or alumna of SEAS, and no matter where you are in your career, I hope that you have seen, or have begun to see, the benefit of your engineering or computer science degree. Perhaps something within these pages has caught your attention, piqued your interest, or simply reminded you of the importance of a strong engineering or computer science education. If so, I hope you can take a moment, like your fellow alumni pictured on these pages, and reflect on an initiative you’d like to help support. (And feel free, also, to tell us your reasons for choosing the initiatives that you want to support. We’re interested in knowing what’s important to you and why.)

The Making History campaign comes at a good time for SEAS, because we’ve already built a strong foundation that will support the research, initiatives, and programs we aim to develop over the course of the campaign. In short, we’re ready and well-positioned for growth.

Enrollment is up; faculty hires are up; research expenditures are up. Guess what other important factor is up in the “SEAS equation”? The answer: alumni and donor giving and participation. In the past five years, alumni giving has increased by a factor of four.

Help us make history right here at SEAS. Be a part of it. Consider how far we’ve come in five short years, and think about where we’ll be in five more. Better yet, imagine the even greater rate of growth and change SEAS will undergo as more and more of our alumni and friends choose to join their classmates and colleagues in supporting SEAS.

I’ll leave you with an analogy of your own to complete: “SEAS” is to “me” as __________ is to __________.

Feel free to fill it in and share your version of it with me.
Elizabeth Hubler

CHANGING HER PATH But Not Her Aspirations

Just a few blocks down 23rd Street from Tompkins Hall sits the Lincoln Memorial. Hundreds of thousands of tourists visit the memorial each year, but only a small percentage of them probably are aware that in addition to being our nation’s 16th president, Abraham Lincoln was both an inventor and a lawyer.

Ahead of his presidency, Lincoln, who embraced the patent system because it “added the fuel of interest to the fire of genius,” registered Patent No. 6469 for a vessel to lift boats over shoals—the only patent registered to a U.S. president to this day.

It’s fitting, then, that in the proximity to his memorial, GW offers a program that reflects his passion for innovation and law: a bachelor’s of science degree in mechanical engineering with a concentration in patent law. And it’s this very combination that attracted the SEAS Dean’s Fellow, Elizabeth Hubler, to SEAS.

Hailing from the Midwest, like Lincoln himself, Elizabeth had sundry interests growing up. She credits her older sister, who was studying mechanical engineering at Ohio State University at the time, with encouraging her to explore engineering. Following her advice, Elizabeth joined the FIRST robotics team in high school and got her first taste of engineering. As she started looking into colleges, she discovered the field of patent law and the SEAS program with the patent law concentration.

“I liked the idea of being hands on, and mechanical engineering provides that,” Elizabeth recalls. “Once I found out about the patent law track, that solidified what I wanted to do.”

Elizabeth enrolled in the bachelor’s program at SEAS in the fall of 2010, and never looked back. Just as she did in high school, Elizabeth has pursued a number of interests here at SEAS and has been involved in a range of activities and organizations. Primary among them is the research she began under the mentorship of her advisor, Professor Michael Plesniak. Now a master’s candidate in mechanical engineering, Elizabeth is continuing her research with Professor Plesniak.

“I got lucky with the research that I decided to do with Professor Plesniak,” she says. “I thought I’d come for the patent law concentration and go straight to law school. I got involved in researching airflow through human vocal cords and how it is affected if you have a polyp or another vocal disorder, and working with Professor Plesniak changed my path. I decided to stay for my masters to continue the research before pursuing law school.”

Elizabeth’s research has been particularly fruitful, earning her a number of honors, beginning with the Undergraduate Prize in the SEAS Student Research and Development Showcase—which she won not once, but twice. Following those wins, she received the second place Undergraduate Award in the biomedical engineering category at GW’s 2014 Research Days, and earlier this fall she won second place in the Best Poster Presentation competition at the National Science Foundation Workshop on the Fluid Dynamics of Living Systems.

Elizabeth gratefully acknowledges all those at SEAS who have helped her, everyone from the SEAS deans to her research professors and other students. “I’m lucky, because I have a whole spectrum of mentors, from my peers all the way through administrators,” she remarks. “It’s really cool that at a place like SEAS, the administrators know what’s going on with my research.”

As an undergraduate, Elizabeth also was involved with the GW chapter of Engineers Without Borders, which has an ongoing project to help people in La Peña, El Salvador improve water quality and sanitation in their village. She took on a leadership role in the chapter, organizing trips to La Peña and participating in them during her sophomore, junior, and senior years.

As she begins her master’s program, Elizabeth is concentrating on her studies, her research, and her new role as the SEAS Dean’s Fellow. She still retains the aspirations that brought her to SEAS as a freshman—her desire to be an inventor and a lawyer—but she doesn’t regret the other interests she has pursued along the way.

“I don’t think I would change anything that I’ve done over the past four years if I were to do it over again,” muses Elizabeth. “If anything, I’d wish for more time in the day to do more.”
Asghar Mostafa
Taking Risks and REAPING THE REWARDS

Asghar Mostafa (BS ’81, MS ’82) was fascinated with computers. He heard his teachers talk about the computer’s potential to “revolutionize the world,” and he knew he wanted to be involved in the business side of developing this new technology. But while he knew what he wanted, he didn’t know the best route to get there.

With that experience under his belt, Asghar began his career as a serial entrepreneur. In 1990, he launched his first company, ISDN Systems Corporation (ISC), a provider of integrated services digital network and frame relay equipment.

After selling ISC in 1995 to U.S. Robotics, Asghar joined U.S. Robotics/3Com for a time as the vice president and general manager of its broadband access division. In 1997, he founded Advanced Switching Communications (ASC), which he took to initial public offering in 2000, before founding his third company, Vinci Systems, in 2003. Tellabs bought Vinci Systems in 2005, and Asghar transitioned there for a year as the vice president of product development.

Since then, he has founded two more companies, Entourage Systems, Inc., and his current company, Rubriq. After nearly 30 years as a serial entrepreneur, Asghar has learned valuable lessons about what it takes to create a successful technology company, and he’s happy to share his knowledge with the next generation of entrepreneurs, as he did during the SEAS Entrepreneurship Seminar Series offered a few years back.

When asked about his experiences, he speaks extensively about building the right team of people. “You have to have a loyal team that sticks with you. That’s the most important thing,” he remarks. “If you don’t have a good team, it doesn’t matter how much money you have; the chance of success is very small.”

Asghar speaks from his heart on this, noting that he has had a loyal group of 25-30 people who have worked for him in each of his companies. He considers this his biggest achievement, adding, “They give me the encouragement to take risks, because I know I have the right team.”

Knowing firsthand the risks involved in starting a business, Asghar still recommends that would-be entrepreneurs give their ideas a shot. “If you find your passion is to start your own company, go ahead and do it. Take the risk,” he pleads. “Even if your first company isn’t successful, you’ll learn so much. No large company, no MBA program will be able to give you that experience.”

Even with the obligations of his busy career, Asghar has remained connected to SEAS and GW. He is a longtime member of the SEAS National Advisory Council and an active promoter of entrepreneurship activities and programs at GW. He also has been a strong supporter of the new Science and Engineering Hall and was an early donor to it, pledging $1 million to help start the fundraising for the building.

Asghar has been honored for his professional successes with the GW Distinguished Entrepreneurial Achievement Award (2008) and the GW Alumni Achievement Award (2010). In 2011 he also was inducted into the GW Engineering Hall of Fame.

Asked why he remains involved with and donates to SEAS, Asghar replies: “There’s tremendous satisfaction in that. There are a lot of places in the world where your contribution would have a minimal impact, but SEAS can find the areas in which you can have an impact based on your background and experience. The first step is to commit. We’ll open the door for you to join the team.”
**Bigger and Better: The R&D Showcase**

Sometimes more really is better. Take the 2014 SEAS Student Research and Development Showcase, for example. More students participated—so many, in fact, that the Marvin Center’s Grand Ballroom was filled to capacity—and more sponsors provided more prize money for the winning research than in previous years.

2014 marked the eighth year of the annual showcase, which aims to show the innovative research that SEAS graduate and undergraduate students are conducting with SEAS faculty. Open to the broader research community and the public, the showcase also provides networking opportunities for students, alumni, and investors.

The $5,000 first place prize was awarded to Bhaven Mehta, a doctoral student in the Department of Electrical and Computer Engineering (ECE) who is advised by Professor Mona Zaghloul. The aim of his project, “Highly sensitive gas sensor using plasmonic antennas,” is to “build a sensor that will be able to detect a very small concentration of gas molecules,” Bhaven reported. “This can be used in air monitoring systems used in different industries.”

Christopher Blower, advised by Professor Adam Wickenheiser of the Department of Mechanical and Aerospace Engineering (MAE), received the $4,000 second place prize for his project, “A three-dimensional iterative panel method and boundary layer

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**SEAS Forms a Department of Biomedical Engineering**

In an unmistakable sign of its growth, SEAS formed a Department of Biomedical Engineering this fall, adding a new doctoral degree program and increasing the number of SEAS academic departments to six.

The school’s biomedical engineering faculty and degree programs previously were part of the Department of Electrical and Computer Engineering. However, with enrollment and research in the biomedical engineering programs multiplying, SEAS and the GW administration made the decision to create a new department dedicated to biomedical engineering, and to begin recruiting several new distinguished faculty to it.

In November, Dr. Igor Efimov accepted the school’s offer to become the founding chair of the newly-established department, effective January 1, 2015. He will hold the Alisann and Terry Collins Professorship in the department. Dr. Efimov will join SEAS from Washington University in St. Louis, where he currently is the Lucy and Stanley Lopata Distinguished Professor of Biomedical Engineering and the director of the Cardiac Imaging Laboratory, a National Institutes of Health-funded cardiovascular research and engineering laboratory.

“Dr. Efimov is a very accomplished researcher with a strong national and international reputation and professional ties in many countries,” Dean David Dolling said. “But he’s more than a researcher. He’s also entrepreneurial and innovative, and these are important qualities that he will use to help lead and grow our research and academic programs.”

Other factors also will foster the growth of the new department’s programs. One of them is the new Science and Engineering Hall, slated to open at the start of the spring 2015 semester. The state-of-the art imaging facilities and clean room will create new possibilities for research and learning, and the building’s location across the street from GW’s School of Medicine and Health Sciences will facilitate collaboration with the university’s medical faculty.

Another factor that bodes well for the department’s growth is the university’s close proximity to national agencies that fund and partner with academia in biomedical-related research fields, such as the National Institutes of Health and the Food and Drug Administration.

The new department currently is home to five full-time faculty members and 17 secondary, affiliated, or adjunct faculty and collaborating clinicians from a range of SEAS and GW academic departments. The school plans to double the number of full-time biomedical engineering faculty within the next five years.

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Christopher Blower, advised by Professor Adam Wickenheiser of the Department of Mechanical and Aerospace Engineering (MAE), received the $4,000 second place prize for his project, “A three-dimensional iterative panel method and boundary layer
model for bioinspired multi-wings.”

Remarking on the showcase’s value, Christopher mentioned, “I personally have gained several beneficial industrial contacts with whom I can discuss potential ideas and employment, and create new alliances to collaborate with for future projects.”

Hasan Goktas of ECE received the $3,000 third place prize for “A novel resonator cell for both a portable biosensor and high-quality filter for cell phones,” while Benjamin Holmes of MAE was awarded the $2,000 Entrepreneurship Prize for “Development of biomimetic 3D printed scaffolds for osteochondral regeneration.” Hasan and Benjamin are advised by Professors Mona Zaghloul and Lijie Grace Zhang, respectively.

For the second year in a row, Elizabeth Hubler, advised by Professor Michael Plesniak of MAE, won the $2,000 Undergraduate Prize for her project, “Evaluation of synthetic self-oscillating models of vocal folds.” (Read more about Elizabeth on page 12.) She stated that future applications of their work “could include inserting patient-specific vocal fold models and running experiments to help doctors and voice pathologists determine the best course of treatment, because it’s much easier to poke, probe, and shine lasers on an experimental setup than on an actual human being.”

Runner-up prizes of $500 each were awarded to Morteza Abkenar and Noah Weichselbaum (Graduate Prize), Sarah Pickus (Undergraduate Prize), and Nima Mobadersany and Krishna Kumar (Entrepreneurship Prize).

SEAS thanks its sponsors for generously donating the prize money for the showcase: RIVidium, LGS Innovations, the Bruce J. Heim Foundation, Hegarty Research, Siemens, Capital Construction Consultants, ICES, Tektronix, and Dow (MS ’83) and Elma Levy. SEAS also thanks the keynote speaker for the event, SEAS alumnus Kevin Kelly (MS ’97), who challenged students during his talk to think about defining and enabling innovation in their careers.

**Women Faculty and Students Are Selecting SEAS**

Visitors to engineering schools across the U.S. may expect to see few women as they walk through the halls of departments traditionally populated by men. But, a walk through GW’s engineering and computer science departments shows a different picture.

Over the past five years, SEAS has increased dramatically the number of new faculty it has hired, including the number of female faculty members. By spring 2014, women made up 22 percent of tenure track faculty at SEAS, compared to a national average of just 14 percent. “Our percentage of women faculty is now 50 percent above the national average, and we want to grow this further,” said Dean David Dolling.

The school has made similarly impressive gains among female students, who now constitute approximately 38 percent of the undergraduate student body. Enrollment of female students at SEAS is twice the national average of 18 percent, and its graduation rates of female engineering students put GW among the top 10 schools nationally, according to the American Society for Engineering Education.

SEAS also hosts active chapters of the Society of Women Engineers and the professional and social engineering sorority Alpha Omega Epsilon, which offer students mentoring, networking, and career and leadership development opportunities.

Female students at SEAS increasingly are taking leadership roles in extracurricular activities, too, as they have done in the Engineers Without Borders’ GW chapter project in La Peña, El Salvador, the Team Capitol DC’s Harvest Home entry in the 2013 U.S. Department of Energy Solar Decathlon, and in other projects.

With its continued emphasis on being at the forefront of engineering schools in recruiting and welcoming women, SEAS also is developing a collaborative program with Holton-Arms School, an all-girls school in Washington, D.C. The program, which officially began last summer, will provide research experiences and engineering seminars for selected students to encourage the girls to consider careers in engineering.
Pedal Forward previously won the 2012 Clinton Global Initiative-University competition, hosted at GW. The team’s mission is to create sustainable solutions to ill health and poverty through the manufacture, sale, and use of bamboo bicycles.

“The GW Business Plan Competition was an incredible experience,” recalled Matthew. “It forced us to not only think deeper into the problem we are trying to solve, but also made us put all of our ideas down on paper. We’re excited to use our prize money to purchase initial inventory and begin taking pre-orders on our bicycles.”

The Pelton Award:
A SEAS Tradition

Just days before commencement—with classmates, professors, parents, and alumni looking on—eight graduating SEAS students representing five engineering disciplines presented their research at the annual Pelton Award for Outstanding Senior Project.

“The Pelton Award is a school-wide competition that features some of the most innovative projects from the graduating class,” explained Bhagirath Narahari, associate dean of undergraduate affairs and programs. “It represents the culmination of the students’ work on their senior projects.”

The students are judged on the engineering conception of their project, the quality of the engineering calculation and design, the feasibility of the project’s implementation, and the effectiveness of their formal oral presentation. They are given bonus points if their project is deemed patentable or sustainable.

Based on these criteria, the panel of alumni and faculty judges awarded the first place prize to Geneva Goldwood and Jonathan Johnson of the Department of Mechanical and Aerospace Engineering for their project, “A tissue-engineered scaffold and phototherapy for nerve tissue regeneration.” Geneva and Jonathan created an implantable device to increase nerve regeneration. The device consists of a tissue-engineered scaffold with an embedded optical fiber that stimulates nerve cell growth.

Brandon Bernier and Srinivas Tapa of the Department of Electrical and Computer Engineering received the second place prize for their project, “Collision avoidance system for the visually impaired.” They developed a device to help the visually impaired protect
The competition was held in Green River, Utah, with 22 teams from across the country vying for an award in its basic category, which required sending a 10-pound payload to 10,000 feet above ground level using a student-designed and-built experimental sounding rocket.

Students were evaluated on the design of their rocket, readiness for launch, ability to recover the rocket, and peak altitude obtained. The SEAS team successfully launched its rocket, named Fat George, on the first day of the competition and subsequently recovered it.

Kiren Caldwell, who had just finished his undergraduate studies at SEAS, led the team in the June competition. Now a first-year master’s student in the Department of Mechanical and Aerospace Engineering, Kiren recalls that he found the competition very beneficial. “It was really great going to the competition and being able to learn from the judges, who have years of rocketry experience and from the other teams competing. We definitely got a lot out of the competition and are looking forward to performing even better this year,” he said.

In the 2015 competition, the SEAS Rocket Team will compete in both the basic (10,000 feet) and advanced (25,000 feet) categories.

Fat George Takes Third Place

Some may call it beginner’s luck, but Professor Murray Snyder, faculty advisor to the SEAS Rocket Team, calls it strong teamwork and good engineering.

Last summer the SEAS Rocket Team participated for the first time in the Experimental Sounding Rocket Association’s annual intercollegiate competition, and placed third in the basic category. The competition was held in Green River, Utah, with 22 teams from across the country vying for an award in its basic category, which required sending a 10-pound payload to 10,000 feet above ground level using a student-designed and-built experimental sounding rocket.

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New Faculty

Dr. Saniya LeBlanc
Saniya LeBlanc joined SEAS in January 2014 as an assistant professor in the Department of Mechanical and Aerospace Engineering. She received a Ph.D. degree in mechanical engineering with a minor in materials science from Stanford University in 2012. Her research goals are to develop energy conversion technologies using advanced materials and scalable manufacturing techniques. Before joining GW, Professor LeBlanc was a research scientist at the start-up company Alphabet Energy, where she created research, development, and manufacturing characterization solutions for thermoelectric technologies and evaluated the potential of new power generation materials.

Professor Zhang Receives Prestigious NIH Award
Medical researchers are steps closer to creating human organs using 3D printers, but they have significant barriers to cross before science fiction becomes a reality. Professor Lijie Grace Zhang of the Department of Mechanical and Aerospace Engineering is addressing those obstacles with a project that could pave the way for complex tissue regeneration.

Professor Zhang recently received a prestigious 2014 Director’s New Innovator Award from the National Institutes of Health (NIH) for her project, “A Novel 3D Bioprinted Smart Vascularized Nano Tissue,” which aims to find a solution for treating large tissue defects in patients. The five-year award totals more than $2.2 million. “With this award, I want to create a product that is really useful for human health,” she said.

The New Innovator Award is designed “to support unusually creative new investigators with highly innovative research ideas at an early stage of their career,” according to the NIH.

“Professor Zhang’s research has the potential to impact not only clinical bone treatment and tissue and organ regeneration, but also basic physical and life science research,” said Dean David Dolling. “Researchers who are able to develop the sorts of insights that spawn truly pioneering investigations like Professor Zhang’s are rare, and the NIH New Innovator awards are rightly reserved for them.”

With the 3D bioprinting technique, scientists build tissue and organs layer by layer using a printer. The process enables them to create custom-designed tissue organ substitutes. While this technology has gained momentum in recent years, researchers still are struggling to regenerate complex tissues, such as vascularized bone, cartilage, and muscle.

Critical-sized bone defects that are caused by traumatic injury or diseases such as cancer are notoriously difficult to regenerate. Large and complex portions of the tissue need to have an adequate vascular network to survive and thrive post-defect. These vascular networks mimic the body’s circulatory system, and bioprinting them is the key to 3D printed organs, according to Professor Zhang.

This project will combine her experience in nanobiomaterials, tissue engineering, and drug delivery with advanced 3D bioprinting techniques to develop a vascularized bone tissue construct using “smart” materials.

Professor Zhang’s bioprinting system will have two features distinct from those of other labs. She and her research team will use a class of highly innovative nanomaterials, and they will create the microvascular network using “smart” materials, a special type of shape memory material that can change over time.

“Since human tissue in its basic form is full of nanoscale features, these nanomaterials will play a key role in modulating the repair and regeneration of tissues,” said Professor Zhang.

EDITOR’S NOTE: This article is excerpted from the GW Today article “GW Researcher Receives $2 million NIH New Innovator Award.”
Top Performers
When asked to nominate faculty members for the 2014 SEAS Faculty Research and Teaching Awards, students, faculty peers, and alumni alike offered a multitude of positive stories. “He enjoys learning as much as he does teaching,” wrote one student in his nomination of Professor Tim Wood for the Outstanding Young Teacher Award. Another nominator mentioned using her notes from Professor Sameh Badie’s classes—even now, almost 10 years after graduating—to verify a formula or to help decipher a code requirement in her job.

On the research side, the words of praise were equally strong, with a peer-nominator for Professor Michael Keidar referring to him as “the most talented researcher” he had worked with in 16 years.

At the awards presentation, Dean David Dolling shared comments like these from grateful nominators as he honored five faculty members who have achieved extraordinary research and teaching success.

Professor Michael Keidar (Department of Mechanical and Aerospace Engineering) was honored with the 2014 SEAS Distinguished Researcher Award for his contributions to the fields of spacecraft propulsion, plasma medicine, and nanotechnology. He has achieved international recognition as a prolific and versatile researcher who has had a great deal of success on many fronts: in research discoveries and patents, in funding, in publications, and in recognition within his research community.

Professor Howie Huang (Department of Electrical and Computer Engineering) received the 2014 Outstanding Young Researcher Award for his work to develop the next generation of high-performance computing technology. In a short period of time, he already has made significant contributions in the area of flash-based storage devices and data-intensive applications, and he has emerged as a leader in his field.

Professor Sameh Badie (Department of Civil and Environmental Engineering), who has dedicated himself to serving his students and preparing them for careers in structural and civil engineering, was named the 2014 SEAS Distinguished Teacher. Among other accomplishments, he has made key contributions to enhancing the department’s capstone design course and to preparing students to complete it.

The 2014 SEAS Outstanding Young Teacher Award was presented to two faculty members, Professors Zoe Szajnfarber and Tim Wood.

Professor Szajnfarber (Department of Engineering Management and Systems Engineering) received the award, in part, for her success in redeveloping significant portions of the department’s curricula at the bachelor’s, master’s, and doctoral levels and for designing and creating new courses. Professor Wood (Department of Computer Science) received the award for his innovative approaches to learning, his highly effective and engaging teaching style, and his spirit of collegiality.

Professor Michael Plesniak, the chairman of the Department of Mechanical and Aerospace Engineering, has taken on additional responsibilities at SEAS as the school’s executive director of research development. The position was created this fiscal year to help SEAS respond to new research opportunities that the school’s growth is generating.

“As a result of our recent growth in faculty and research programs, SEAS is now better positioned to collaborate on a much broader range of projects and studies,” explained Dean David Dolling, “and Professor Plesniak is helping SEAS take advantage of them.”

Since joining SEAS in 2008, Professor Plesniak has built a dynamic department with a number of very productive research programs, including one of the country’s leading fluid dynamics programs. Noting Professor Plesniak’s record of accomplishment, Dean Dolling selected him to develop interdepartmental teams of SEAS researchers who will be able to collaborate and compete for the larger research grants for which individuals alone cannot compete.

Professor Plesniak said he is “eager to identify new opportunities for SEAS to build research relationships and partnerships with corporations, government laboratories, and research centers and institutes in other universities.”
Dor also uses his spring breaks as opportunities to serve. Last year, he joined GW’s Alternative Spring Break program on a trip to Joplin, Missouri, to help continue the rebuilding process for the community that was struck by a catastrophic tornado in 2011. Now, he plans to continue participating in the program.

“I’m doing everything I can to be a better person,” he says. “I’m always looking for the social implications of what we study. I know to put society’s well-being in front of my own.”

In addition to learning through his extracurricular activities, Dor also takes advantage of the opportunities that are open to him as a Clark Engineering Scholar. Referring to both the engineering leaders he has met through the program and the other scholars, Dor speaks of the program as a “hub for ideas and creativity” and an “amazing opportunity.”

As he looks ahead, Dor sees himself being an educator and working in local government. He’s particularly interested in city planning issues and hopes to use his understanding of philosophy to guide his work as an engineer and city planner. He also might consider working in the federal government someday, but regardless of his path, he takes with him the sure belief that “everything is interconnected.”

I-Beams and Balance Beams


Brenna Marcoux, a senior studying civil engineering and a gymnast, has had the chance to explore both at GW, and she has found some surprising connections between them.

In the classroom, Brenna has explored the strength of truss and beam bridges, the flexibility of the wires in power line systems, and the importance of balance when using surveying equipment. At gymnastics competitions, she has had to apply strength and flexibility to her floor routine and near perfect balance on the beams.

In fact, the chance both to study civil engineering and to compete in college-level gymnastics is exactly why Brenna decided to attend GW—it is one of the few schools that she considered that offered both a strong engineering program and a competitive gymnastics program. Giving up one or the other was a sacrifice she didn’t want to make.

At GW, Brenna has excelled not only in the classroom and on the mats, but also within the SEAS community. Despite the grueling schedule of an engineer-athlete, she’s managed to make time to be an academic mentor to some of her teammates, work in the SEAS Undergraduate Advising office, and join the GW chapter of the Society of Women Engineers (SWE).

Through her involvement with SWE, Brenna had the opportunity last year to attend the annual SWE conference, where she got a glimpse of work-life balance for women engineers. “It was really cool listening to very successful women engineers talk about their experiences and how they’ve integrated their home and private life with continuing to be a professional engineer,” Brenna recalls.

Brenna already has developed many of the skills that will allow her to balance both roles. And she recognizes that her experiences as an athlete and an engineer have reinforced each other. Diligence, time management, and a good attitude are all qualities that a student and an athlete need, but they are especially important to Brenna, who is both.

“I hold myself to the highest standard because I wouldn’t have it any other way,” she states. “I don’t want to have regrets. I don’t want to fall short of what I know I can do.”

Dual Interests, Dual Degrees

Dor Hirsh Bar Gai grew up in Israel surrounded by family and friends who, like him, shared interests in philosophy and math. He learned to see philosophy and math (and later, engineering) as the building blocks of the world.

Now a junior working toward a dual degree in systems engineering and philosophy, Dor has not abandoned either in favor of the other. “I see them as two sides of the same coin,” he remarks.

His own philosophy emphasizes social responsibility, and here at GW, Dor has been involved in a number of extracurricular activities, all of which align with his desire to help others. Last year, he served as a resident assistant in West Hall and is working again this year to mentor and to act as a resource to many of the on-campus residents. He has been a tutor for students from School Without Walls, a high school adjacent to GW’s campus, and he volunteers at GW’s GrowGarden, which donates its produce to a local kitchen that serves meals to the homeless.
While undergraduate research opportunities might be hard to come by in larger engineering schools than SEAS, Lucas has been able to pursue his interest in virtualization through two research projects with computer science professor Timothy Wood.

“I had Dr. Wood for a class and worked as a server administrator for him,” Lucas recounts. “That led to a summer opportunity to research with him. I’ve learned more in research than in any class. It’s a lot of self-learning because you have to try a lot of different things.”

Lucas also works in the SEAS Computing Facility in information security. “I’m responsible for identifying and responding to security threats, and if there’s a compromise, trying to figure out what went wrong,” he explains.

And since studies, research, and work do not satiate Lucas’ computer-related interests, he also serves as president of the GW chapter of ACM (the professional association for computer scientists), and he has been active in the school’s programming team, the GW Tech Collective, and in Buff and Blue Hat, a new student organization that focuses on applied security by setting up a hacking lab so students can practice how to defend against hacking attacks.

Lucas’ passion for computers couldn’t be any clearer, but his thirst for an education extends beyond computers. Now in his final year of undergraduate studies, he has no plans to leave academia behind when he graduates; in fact, he hopes eventually to complete a doctoral degree and become a professor.

An Amazing Internship
During her freshman year, Adedayo Jobi-Odeneye was asked to think about her dream job. She knew that such a job—if it existed—would combine her engineering background with both medicine and global health efforts. As it turns out, she didn’t even have to wait for graduation to get the chance to work in a position that combined her interests.

Last summer, Adedayo—then a rising senior studying biomedical engineering—traveled to Nicaragua as part of the Engineering World Health Summer Institute. She worked in local hospitals repairing non-functioning medical equipment, applying the fundamental skills she has learned in SEAS classrooms.

“The most valuable skill I learned was troubleshooting,” recalls Adedayo. “I learned that the first part of finding a solution, whether in locating the problem or successfully repairing the equipment, is troubleshooting.”

Reflecting on her experience, Adedayo says that she is amazed by all she learned and accomplished through the program. “It could be challenging at times,” she recalled, “but I always remembered what my professor once said, ‘Reach for the low hanging fruit.’ If I couldn’t fix a machine myself, at least I could troubleshoot and diagnose the problem, help technicians with English, and lend a hand to those who could fix it.”

Adedayo is grateful for the experience and excited about the new opportunities she anticipates it will open up for her, and she is even more certain that she wants to continue working in global health—where she believes more dream jobs exist for her.
Thank You

Support from you—our alumni, parents, corporate partners, foundations, students, faculty, staff, friends, and others—is vitally important to the SEAS transformation. The support that you provide to the school helps make a difference in how far and how fast that transformation advances. It can help us enhance scholarships and fellowships for students, sustain important faculty research, and build new learning initiatives. In short, your generosity strengthens the building blocks of the SEAS transformation: our students and faculty.

Sincerely,

David S. Dolling
Dean
Terry and Alisann Collins
Establish Endowed
Scholarship Program and
Professorship at SEAS
SEAS alumnus Terry Collins (D.Sc. ’76) and his wife, Alisann, have donated $2.5 million to the school to establish the Alisann and Terry Collins Endowed Scholarship and to create an endowed professorship in biomedical engineering.

Dean David Dolling responded to the announcement of the Collins’ gift, saying, “We’re extremely grateful to Terry and Alisann Collins for their generosity. They’ve watched the transformation happening at SEAS, and they understand the real difference that a gift of this magnitude can make to the school and to the lives of students. They know that talented faculty and students reinforce each other’s thinking and innovation, so by designating their gift to support both scholarships and a professorship, Terry and Alisann are creating a multiplier effect for learning and research here at SEAS.”

Dr. Collins, a GW trustee and member of the SEAS National Advisory Council, recently explained the couple’s decision to donate to SEAS, saying that they were motivated to do so by their desire to give promising students a chance to go to college, and by the current momentum in SEAS, along with the need for science and engineering leadership in the nation’s capital.

“Helping promising students afford a college education is particularly important to Alisann and me,” Dr. Collins stated. “I was the first person in my family to go to college and I received a scholarship to attend college. I know from firsthand experience how the chance to go to college opens doors and changes futures. I know my life would have been much different without that scholarship.”

Regarding the professorship, Dr. Collins referred to the “substantial investments in SEAS” that GW has made over the last several years, saying, “Alisann and I wanted to contribute to this momentum by creating an endowed professorship.” The professorship coincides with the formation of the new Department of Biomedical Engineering this fall. (See article on page 14.)

Supporting the SEAS Transformation
SEAS thanks our alumni and friends whose generous gifts during the 2013-2014 fiscal year (July 1, 2013 to June 30, 2014) supported new funds or programs that are helping to further the SEAS transformation:

Alessandro Chierici (BS ’65, MS ’67) and his wife, Rose-Marie (CCAS, BS ’65), made a planned gift to establish the Chierici Endowed Scholarship Fund.

Jon Halpern (BS ’79) and his wife, Robyn, made a pledge to create the Jon and Robyn Halpern Scholarship Fund, which will provide financial support for SEAS students studying electrical engineering.

Mark V. Hughes III (BA ’69, MS ’77) and his wife, Susan, made a gift in support of the Dean’s Excellence Fund, which provides annual unrestricted funds to meet the school’s most critical unbudgeted needs.

Ashok Jha (BS ’86, MS ’92) made a pledge to create the Jha Annual Scholarship Fund, which will provide annual scholarships to SEAS undergraduate students. Ashok is also an annual sponsor of the Pelton Senior Design Competition’s Senior-Alumni BBQ.

Shoa-Kai Liu (MS ’86) and his wife, Li Qing Liu, made a pledge to create the Innovation Investment Management Company LLC International Graduate Student Fellowship, which will provide fellowships to graduate students from China, Taiwan, or Hong Kong.

Frank Moy (BS ’65) and his wife, Marcia Mau, made additional funds available for the Frank Moy and Marcia Mau Annual Scholarship, which provides financial support for SEAS students studying mechanical and aerospace engineering.

Thomas D. Rutherfoord, Jr. and his wife, Jean, made a gift through the Thomas Rutherfoord Foundation to the Science and Engineering Hall.

Tyler Wean (BS ’01, MS ’03) and his wife, Kristi (GWSB, MBA ’07), made a named gift through the Double Eagle Foundation to the Science and Engineering Hall.
Alfred and Evelyn Ferrari Provide a Bequest to SEAS

Alfred Ferrari (MS ’67, D.Sc. ’72) took his first job out of college at NASA, during the exciting times of the space race between the U.S. and the former Soviet Union. At NASA, he worked as a specialist in the calculation of gravity. Over the course of his career, he had numerous opportunities to work in other challenging positions in research, technology development, and management.

“The education I received from SEAS played a key role during my entire working career,” Dr. Ferrari said. Now retired, he wants to help the next generation of aspiring engineers receive the sort of education that will prepare them for equally meaningful careers. Dr. Ferrari and his wife, Evelyn, have chosen to accomplish this by establishing the Alfred and Evelyn Ferrari Scholarship Fund, which is endowed permanently through a $1 million bequest, and by funding a $50,000 annual use scholarship to help support students today.

“My wife and I wanted to provide GW/SEAS students needing financial support with the opportunity to get a high quality education, thereby preparing them for successful careers in their chosen fields of endeavor,” he explained.

Although Dr. and Mrs. Ferrari live in California, they have remained connected to SEAS and have followed the school’s transformation. In fact, Dr. Ferrari noted, “We regret we don’t live closer to GW/SEAS during these very exciting times.”

David and Cecile Wang Gift Supports Biomedical Engineering

A generous gift from SEAS alumnus David Wang (BS ’51) and his wife, Cecile, is helping SEAS create even more opportunities for students and faculty in its newly established Department of Biomedical Engineering.

Mr. and Mrs. Wang previously created an endowment for SEAS with an initial gift several years ago. However, as time passed they came to believe that their gift would have more impact if it was spent over a shorter number of years, rather than being invested over a longer term. So, they added $400,000 this year to their earlier gift, giving SEAS a total of more than $600,000 to use toward activities that will promote the school’s biomedical engineering programs.

“We’re very grateful to Mr. and Mrs. Wang,” Dean David Dolling said. “Their gift is especially helpful as we launch our new biomedical engineering department, and it will help accelerate the department’s development.”

The Wangs’ gift will support key goals of the department and a variety of activities across it. Most notably, it will provide graduate student fellowships for up to 10 students, support a biomedical innovation center, and produce seed funding for interdisciplinary research collaborations with national laboratories and leading medical researchers.

In addition, their gift will sponsor a distinguished speaker series for the department and an annual biomedical engineering day to promote the work of its faculty and students.

Mr. Wang, now retired, was formerly the executive vice president of International Paper and is an emeritus member of the SEAS National Advisory Council.
SEAS Inducts Six Alumni into Hall of Fame

With the space shuttle Discovery serving as his backdrop, Dean David Dolling inducted six members into the GW Engineering Hall of Fame, held this year at the National Air and Space Museum’s Steven F. Udvar-Hazy Center in Chantilly, Virginia.

Jennifer P. Byrne (Ph.D. ’12) is vice president of Engineering and Technology, Aeronautics for Lockheed Martin Corporation and is responsible for leading the design, development, operation, and sustainment of the F-35, F-22, F-16, and many other aircraft. She joined Lockheed Martin in 1993, and has led several critical initiatives for the corporation.

Pradman P. Kaul (BS ’67) is president and chief executive officer of Hughes Communications, Inc., the world’s leading supplier of broadband satellite services and network solutions using interactive VSAT products. He has been recognized for his professional achievements many times over the course of his career, most notably in 2004, when he was inducted into the National Academy of Engineering.

Laird H. Moffett (D.Sc. ’76) is chief scientist at Envisioneering, a small business that provides mission support and technology development for U.S. national security. He provides management consulting and technical expertise to the Electronic Warfare Branch and the Directed Energy Warfare Office at the U.S. Naval Surface Warfare Center.

Nayereh S. Rassoulpour (MS ’90) is president and chief executive officer of NSR Solutions, Inc., a small business that provides a wide array of information technology and professional services for the federal and state governments and the private sector. Ms. Rassoulpour started her business in 1990 with one employee, and today the company has grown to more than 300.

Ian A. Waitz (MS ’88) is dean of the School of Engineering and the Jerome C. Hunsaker Professor of Aeronautics and Astronautics at the Massachusetts Institute of Technology, where he has been on the faculty since 1991. He is a member of the National Academy of Engineering and a Fellow of the American Institute of Aeronautics and Astronautics.

Ya-Qin Zhang (D.Sc. ’90) is the president of Baidu Corporation, a leading Internet company based in Beijing, China, with more than 40,000 employees. He joined Baidu from Microsoft, where he most recently served as corporate vice president and chairman of its Asia R&D Group, leading Microsoft’s overall research and development efforts in Asia-Pacific. In 1997, at age 31, he became the youngest ever Fellow of the Institute of Electrical and Electronics Engineers (IEEE).

The 2014 Hall of Fame ceremony also included a new award, the Distinguished Industry Partner Award, which Dean Dolling presented to Clark Construction Group, LLC. SEAS initiated the award this year to recognize a company that is playing an important role in supporting the school’s growth and transformation. Dean Dolling thanked Clark Construction Group for its commitment to engineering education at SEAS, mentioning some of its various initiatives such as the Clark Engineering Scholars program and the professorship in civil and environmental engineering endowed by Mr. A. James Clark in 1986.

Will Alexander Receives GWAA Service Award

Will Alexander (SEAS BS ’04, GWSB MBA ’06) was one of seven GW alumni honored with the Alumni Outstanding Service Award last April by the university and the GW Alumni Association. The annual award recognizes alumni who generously volunteer their time and talent to GW and their communities.

Will Alexander, recipient of the GWAA Outstanding Service Award.
Since leaving campus in 2006, Mr. Alexander has prioritized service to GW. He is an active member of the SEAS National Advisory Council and of the Engineer Alumni Association (EAA). He previously served for two years as the EAA chairman. In addition, he has advised students through a variety of roles he has taken, including as a mentor for the Clark Engineering Scholars Program.

As a student, Mr. Alexander was recruited for a job by a GW alumnus, and now he strives to pay that kindness forward to current SEAS students by assisting them in finding industry jobs and by promoting the “HireGW” initiative.

He volunteers his time to several other communities across the university, too, including the Black Student Union, Alpha Psi Alpha fraternity, National Society for Black Engineers, and the Spirit Program, a co-ed cheer program.

The double alumnus attributes his success to the help of others. He first attended SEAS as a Stephen Joel Trachtenberg Scholarship recipient, and then pursued his master’s degree in the GW School of Business as a Presidential Administrative Fellow.

“I didn’t do what I’ve done alone. I had help. I had life-changing, trajectory-altering help,” he said, “Although I’ve given many, many thanks over the years I resolved some years ago to committing myself in whatever ways great or small that I could possibly manage to do the same.”

National Advisory Council Update from Mark Hughes
At the spring 2014 SEAS National Advisory Council (NAC) meeting, Randy Graves (D.Sc. ‘78) concluded his term as NAC chairman, and the gavel was passed to me. As the current chairman, I have the pleasure of welcoming three new members to the council:

Gene Colabatistto is group president for military simulation products, training, and services for Canadian Aviation Electronics, Inc. He is a 1996 SEAS graduate with a master’s degree in electrical engineering and has more than 25 years experience in the global defense industry.

S. Gulu Gambhir is chief technology officer and a senior vice president of Leidos. He also serves as a professorial lecturer at SEAS, having done so since 1998. Gulu holds a master’s degree in operations research and a doctoral degree in systems engineering, which he received from GW in 1992 and 1998, respectively.

Naeem Hussain is the co-founder and managing partner of AgileTrailblazers and has more than 15 years of IT experience in the healthcare, banking, telecommunications, and education industries. He received his master’s degree in telecommunications and computers from GW in 1999.

Gene, Gulu, and Naeem join the NAC as it focuses on three key issues that our members recently identified as areas in which we can best provide advice and assistance to Dean Dolling and the SEAS faculty: promoting entrepreneurship and innovation, facilitating industry and government partnerships, and developing and attracting leaders in engineering. NAC members participated in three task forces aligned with those areas during the 2013-2014 academic year, and we will continue to work on all three throughout the coming year.

Engineer Alumni Association Holiday Gathering
December 18, 2014
6:30 – 8:30 pm
Alumni House
1918 F Street, NW

Engineer Alumni Association Spring Meeting
January 29, 2015
6:30 – 8:30 pm
Science and Engineering Hall
800 22nd Street, NW

SEAS Student Research and Development Showcase
Wednesday and Thursday, February 18 and 19, 2015
Science and Engineering Hall
800 22nd Street, NW

Pelton Senior Design Competition and Senior-Alumni BBQ
May 13, 2015
5:00 – 9:00 pm
Marvin Center, Grand Ballroom
800 21st Street, NW

Engineer Alumni Association Dinner Meeting
June 2, 2015
6:30 – 8:30 pm
City View Room
1957 E Street, NW
Happenings

Abdullah Alabbas, D.Sc. ‘92 (electrical engineering), has joined University of Hail, Saudi Arabia as a professor of electrical engineering.

Paige Atkins, MS ‘89 (engineering administration), accepted a new position as deputy associate administrator for spectrum planning and policy within the Office of Spectrum Management at the National Telecommunications and Information Administration in the U.S. Department of Commerce.

William Austen, MS ‘84 (engineering administration), was elected president and CEO of Bemis Company Inc. in Neenah, WI in August 2014.

David Austin, BS ‘08, MS ‘09 (civil engineering), recently passed his PE exam and registered as a professional engineer in the state of Nebraska.

Troy Caver, D.Sc. ’91 (engineering management), served as professor of engineering management at Defense Systems Management College (government), and formed and ran a company teaching and consulting to government and aerospace on systems engineering and program management for 20 years. He also authored 20 articles published in nationally distributed professional magazines. Troy is now retired and lives in Woodbridge, VA.

Bruce Cazenave, MS ‘79 (engineering management), is the CEO of Nautilus, Inc., based in Vancouver, WA.

Moinak Chakravorty, MS ’11 (computer science), will marry his fiancée, Anuja Sarkar, on January 29, 2015.

Norvic Chicchon-Ugarte, MS ‘06 (engineering management), lives in Lima, Peru and is a professor of power generation at Peru’s UTEC.

Damon Coppola, BS ‘95 (CCAS), MS ‘03 (engineering management), has three books coming out in the new year. The first of the three, Introduction to International Disaster Management, 3rd Edition (Butterworth Heinemann Press), is due to be released in the spring.

Freddie de Sibert, BA ‘08 (computer science), is a vice president in the Investment Banking Division of Goldman Sachs. Based out of New York and occasionally in places as far apart as Seattle, London, and Hong Kong, Freddie is always looking for new team members and to talk tech, ideas, and life.

Kristin Deason, Ph.D. ‘09 (systems engineering), is an associate with Booz Allen Hamilton, where she works in implementing large-scale renewable energy projects for the U.S. government. She also recently gained her certification from the Arlington Energy Masters program, a volunteer program in which she was trained to make energy efficiency and water improvements in low income housing.

Reggie Haseltine, MS ‘09 (computer science), retired last June after 42-plus years in IT. He now is teaching as an adjunct professor, mostly online.

Henry Herz, MS ‘09 (operations research), has edited a fantasy anthology, Beyond the Pale, which features 11 short stories and was published in August 2014 by Birch Tree Publishing.

Jill Hottel, MS ‘14 (engineering management), works for a non-profit that recently took five wounded warriors to Grand Cayman to go diving.

William Hunley, BS ‘55 (mechanical engineering), retired as the chief naval architect and technical director for ship design at the Naval Sea Systems Command, and now lives at Trouble Enough Indeed, the log house that he built in odd hours while designing ships for the Navy.

Elliott Kugel, MS ‘83 (computer science), was named in the February 24, 2014, issue of Barron’s magazine as one of the “Top 1200 Advisors in America” and also was ranked #19 in the state of New Jersey. This is his 5th year in a row being recognized on the Barron’s list. He also was recognized by the Financial Times in its FT 400 ranking for 2014 as one of the top 400 advisers in the U.S. Kugel is a managing director of investments at Merrill Lynch in Bridgewater, NJ, and resides in Skillman, NJ.

Dr. Chung-Shing Lee, D.Sc. ‘97 (engineering management), was promoted to associate dean of the School of Business at Pacific Lutheran University (Tacoma, WA) on June 1, 2014.

Renee Lewis, MS. ’90, was honored with the 2014 Woman of Distinction Award by the National Association of Women Business Owners, Greater DC.

Greg May, BA ‘03 (computer science), and three other GW alumni—Keith Bishop, Phillip Hughes, and Jeff Cassin—started Manhattan’s only board game cafe, The Uncommons, and recently celebrated a year in business and some coverage in the New York Times.

Mitch Narins, MS ‘89 (engineering management), was named a Fellow of the Royal Institute of Navigation last June.
Class Notes

Rachel Bevill, ‘15 (expected); Alex Palson, ‘13; Felipe Zambrano, ‘13; Andy Colburn, ‘11; Michael Livingston, ‘92; Joey Burns, ‘14. (Photo courtesy of Sean Walsh)

Sean Walsh, BS ’76 (mechanical engineering), has a new position as the technical director for NAVSEA programs for TASC’s Defense Sector at their Washington Navy Yard office. Sean also is active in alumni and professional societies, serving as the alumni advisor for Theta Tau Professional Engineering Fraternity Gamma Beta Chapter at SEAS and as the chair of the Lisnyk Ship Design Competition sponsored by the Society of Naval Architects and Marine Engineers (SNAME) and the American Society of Naval Engineers (ASNE).

E. A. (Bud) Wareham 3rd, BS ’53 (electrical engineering), is still providing consulting engineering services to his old clients in Florida with help from his stepson, Chris Corcoran.

Charisma Williams, MS ’14 (engineering management), has published her fifth article in Emergency Management Magazine, “There Are No Victims Here: Creating an Empowered Survivor Culture.”

In Memoriam:
Marshall A. Levitan, BS ’64, MS ’73, passed away March 7, 2014.

Omar A. Omar, BS ’09 (mechanical engineering), works for StrataGen as a hydraulic fracturing consultant engineer out of San Antonio, TX.

Norman O’Meara, D.Sc. ’88 (operations research), is a senior fellow at LMI and currently serves on a National Academy of Sciences committee on the study of FAA air traffic controller staffing.

Ron Sasiela, MS ’00 (engineering management), acted recently as the vice-principal of a California high school in the yet-released film Gratuitous Violence, which portrays the escalation of tragic shootings seen over the last two decades. Ron also won the bronze prize last summer in the “Best Dill Pickle in Beverly Hills” contest. Finally, his younger daughter, Christy Sasiela, was married on May 31, 2014, in Santa Barbara, CA.

Brian Preston Smith, MS ’05 (engineering management), founded a business in 2008 called Geavista group, which helped its utility and corporate clients achieve energy efficiency and sustainability goals. They successfully grew the business, which was acquired by Clearesult about two years ago.

David Rosenberg, BS ’09 (mechanical engineering), was married to Jessica Young, on May 18, 2014, at the Maritime Aquarium at Norwalk in Norwalk, CT.

Benjamin Rosenfeld, BS ’08 (electrical engineering), received his PE license in the state of California in 2014.

John A. Sporidis, BS ’74, MS ’81 (electrical engineering), has completed 40 years in the field of consulting engineering and four years as managing principal of Vanderweil Engineers in the Washington, DC Metro area. His office has completed major projects for GW both at the DC and Ashburn campuses and currently is involved as mechanical-electrical engineers in the new District House (super-dorm) student housing project currently in construction.

Several current SEAS students and alumni attended the 2014 Theta Tau Professional Engineering Fraternity National Convention in Fort Worth, TX, held last July. From left to right: Sean Walsh ’76; Emma Fletcher, ’13;
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