

THE GEORGE WASHINGTON UNIVERSITY
SYNERGY

SCHOOL OF
ENGINEERING
& APPLIED SCIENCE



A Journey

Dr. Serena Auñón-Chancellor's Odyssey

First Words



FROM THE INTERIM DEAN

Rumana Riffat

This has been a year of change for SEAS. On August 31, 2018, after leading SEAS for 10 years, Dr. David Dolling stepped down as dean. I have served as the school's interim dean since then, while GW undertakes a national search for the next dean. The search is well underway, and we expect to welcome the next dean of SEAS to campus by the start of the fall semester.

My mission during this transition is to protect and further strengthen the very solid foundation that Dr. Dolling established for SEAS during his tenure. It is a foundation built on our excellent faculty, the commitment of our alumni partners, and student involvement. In this issue of *Synergy* magazine, some of our faculty, staff, students, and alumni who worked closely with Dr. Dolling over the years pay tribute to him and his leadership. I encourage you to read the article, beginning on page 12.

Research productivity has increased at SEAS over the past year, as have the number of honors awarded to SEAS faculty. Two faculty members, Dr. Chung Hyuk Park and Dr. Ekundayo Shittu, recently received the National Science Foundation's highly prestigious CAREER awards. Undergraduate research is growing, too. You can read a wonderful example of this in the article on Brianna Cathey and Sofian Obaid on page 26.

During the academic year, SEAS provided a breadth of opportunities for students to learn outside the classrooms and labs. A few examples include our NASA downlink with astronaut and SEAS alumna Dr. Serena Auñón-Chancellor (*page 20*); an on-campus talk by Dr. Vint Cerf, a "father of the Internet" (*page 21*); and a site visit to Rajasthan, India, by GW's Engineers Without Borders student chapter (*page 22*).

Another aspect of the school's strength has been the continued growth of women in engineering at SEAS. This year we welcomed a freshman class comprised of approximately 48 percent women. On April 26, we launched the SEAS Center for Women in Engineering. The event included an introduction by the center director, Dr. Rachelle Heller, and a keynote address by Ms. Cecilia Kang, a technology correspondent for the *New York Times*.

SEAS alumni have also been active this year, and their commitment to the school remains as important as ever. I recommend reading the letter from National Advisory Council chair Aran Hegarty on page 29 to find out more about ways to become involved with SEAS.

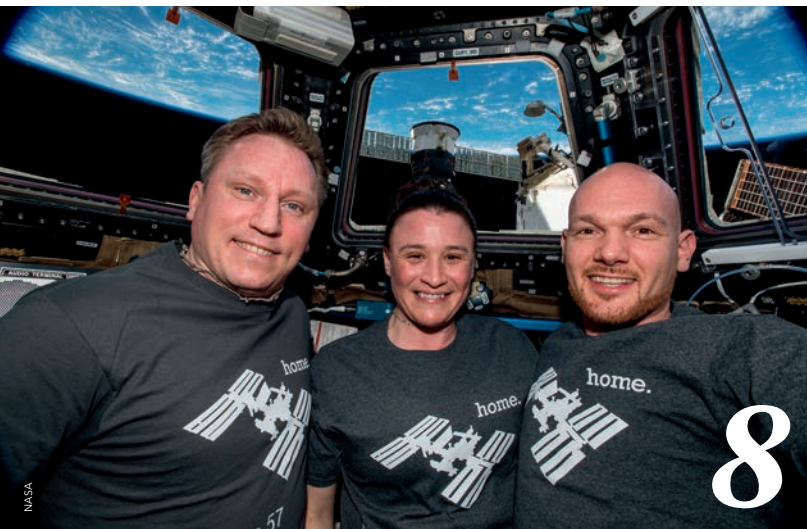
I am delighted to have had the opportunity to meet so many alumni at various events across the university, and I thank you for staying involved with SEAS and remaining an active part of the SEAS family!

With best wishes,

A handwritten signature in black ink that reads "R. Riffat". The signature is written in a cursive, flowing style.

Rumana Riffat
Interim Dean

Contents



SYNERGY

SPRING 2019

EDITOR
Joanne Welsh

DESIGN
Brian Cox - Brian Cox Design Service

PHOTOGRAPHY
Eleanor Kaufman Khan

SYNERGY IS PUBLISHED BY
THE GEORGE WASHINGTON UNIVERSITY'S
SCHOOL OF ENGINEERING AND APPLIED SCIENCE
Science and Engineering Hall, 2885
800 22nd Street, NW
202-994-6080 • www.seas.gwu.edu

PRESIDENT OF THE UNIVERSITY
Thomas J. LeBlanc

INTERIM DEAN
Rumana Riffat

INTERIM ASSOCIATE DEAN FOR ACADEMIC AFFAIRS
Yin-Lin Shen

ASSOCIATE DEAN FOR RESEARCH AND GRADUATE STUDIES
Can E. Korman

**ASSOCIATE DEAN FOR UNDERGRADUATE AFFAIRS
& PROGRAMS**
Bhagirath Narahari

DEPARTMENT OF BIOMEDICAL ENGINEERING
Igor Efimov, Chair

DEPARTMENT OF CIVIL & ENVIRONMENTAL ENGINEERING
Majid T. Manzari, Chair

DEPARTMENT OF COMPUTER SCIENCE
Robert Pless, Chair

DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING
Suresh Subramaniam, Chair

**DEPARTMENT OF ENGINEERING MANAGEMENT
& SYSTEMS ENGINEERING**
Thomas A. Mazzuchi, Chair

DEPARTMENT OF MECHANICAL & AEROSPACE ENGINEERING
Michael W. Plesniak, Chair

8

12

2

18

19

20

24

26

28

33

COVER STORY:

A Journey

Dr. Serena Auñón-Chancellor's Odyssey

TRIBUTE:

Thank you, David Dolling

Alumni, Faculty, Staff & Students Salute Former
SEAS Dean David S. Dolling

SEAS DEPARTMENTS

STUDENT PROFILE: Conor Gillespie & Andrew Edzenga

ALUMNI PROFILE: Aran Hegarty

NEWS

FACULTY

STUDENTS

ALUMNI

CLASS NOTES

FRONT COVER PHOTO:
ROCKY KNETEN

PROFILE

Chair: Igor Efimov
202-994-3740

www.bme.seas.gwu.edu

Undergraduate students: 222

Graduate students: 63

Annual research expenditures: \$2.3 million

FACULTY

Igor Efimov, **PROFESSOR AND FELLOW OF HRS, AHA, AND AIMBE**

Emilia Entcheva, **PROFESSOR AND FELLOW OF AIMBE**

Matthew Kay, **PROFESSOR**

David Lee, **ASSOCIATE PROFESSOR**

Zhenyu Li, **ASSOCIATE PROFESSOR**

Murray Loew, **PROFESSOR AND FELLOW OF IEEE AND AIMBE**

Luyao Lu, **ASSISTANT PROFESSOR**

Anne-Laure Papa, **ASSISTANT PROFESSOR**

Chung Hyuk Park, **ASSISTANT PROFESSOR**

Jason Zara, **ASSOCIATE PROFESSOR**

Vesna Zderic, **ASSOCIATE PROFESSOR**

RESEARCH AREAS**BIOMEDICAL IMAGING**

Efimov, Entcheva, Kay, Li, Loew, Lu, Zara, Zderic

CARDIOVASCULAR ENGINEERING

Efimov, Entcheva, Kay

CELL AND TISSUE ENGINEERING

Entcheva, Lee, Papa

MEDICAL INSTRUMENTATION

Efimov, Entcheva, Li, Lu, Zara, Zderic

ROBOTICS AND AUTOMATION

Entcheva, Li, Park

THERAPEUTICS AND DIAGNOSTICS

Papa

Digging Deeper

Engineers have contributed to great advances in the neuroscience field over the past several decades by using electrical tools to help understand how neurons work and how the brain functions. But even very successful approaches have their limitations, so new approaches may provide new opportunities to dig deeper and learn more.

Dr. Luyao Lu thinks so. He's intrigued by the possibilities of optogenetics, which use light to control cells—particularly neurons—in living tissue to better study their functions. He specializes in creating bioelectronic devices that use light to study and measure cell functions.

“The ultimate goal is to provide better tools to understand how the brain functions and provide treatment for neurological diseases like Parkinson’s,” says Dr. Lu.

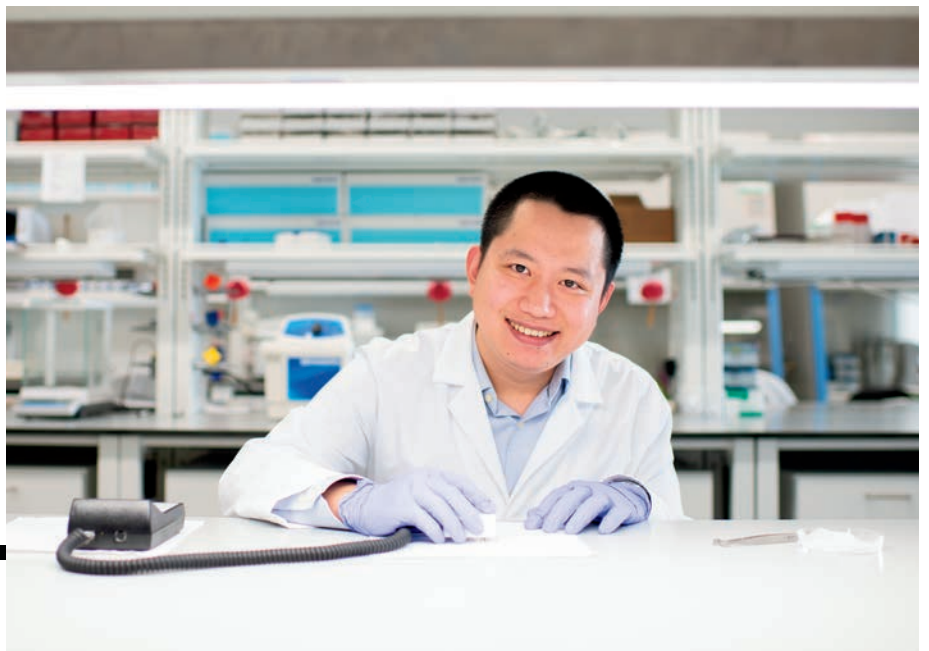
To accomplish this, he's trying to create bioelectronic devices that use two types of sensors. The first sensor uses light emitting diodes that stimulate and deliver light to the cells he is interested in studying, and the second sensor uses light sensing devices to record the optical signals from the cells of the biological tissues to see whether they are active in a particular brain function. While traditional electrical stimulation and recording tools record activity in the area of the brain being studied, they lack the specific cell resolution that optical tools provide. With optical tools, researchers can go deeper and tell whether particular subgroups of neurons are active in the brain function being studied.

Other researchers are also developing bioelectronic tools to study optogenetics, but Dr. Lu uses wireless electronics for his, which sets him apart from most of his peers, who use wired optical fibers and deliver the light through the fiber to the living tissues and to the camera or recording hardware.

“Using a wired connection is not ideal for animal studies. We integrate the light emitting diodes and light sensing devices and use wireless electronics to operate the devices and transmit the signals to the recording hardware, and these will enable us to study animals in a more freely moving manner and to generate fewer defects in the recorded signals,” he explains.

As a post-doctoral fellow at the Center for Bio-Integrated Electronics at Northwestern University, Dr. Lu and his team developed the world's first miniaturized wireless optical recording device, and he plans to design more advanced bioelectronic systems at GW.

“The current state-of-the-art wireless platform allows us to do optical stimulation or optical recording but we can't do them simultaneously. That's our short term goal at GW, to fabricate and test these platforms,” he notes.





Creating Better Models

Like many of us, Dr. Leila Farhadi enjoys a challenge. In fact, through her current research, she's trying to contribute to an understanding of one of the grand challenges of the hydrology field: constructing models that can accurately quantify and map components of the Earth's water/hydrological cycle and predict the hydrological impacts of climate change.

Many researchers in the scientific community believe that climate change—the change in the Earth's energy and carbon cycle—may intensify the Earth's water cycle, the cycle in which water evaporates from the surface of the Earth, cools and condenses to form clouds, and then returns to the surface as precipitation. Understanding the Earth's water cycle and predicting the impact of climate change on this cycle requires models that can accurately quantify and map its components. This is Dr. Farhadi's challenge.

Her approach to this task is to combine optimization and numerical modeling techniques with information that satellites provide of the state of the Earth's surface in order to estimate and map the water cycle components, including evapotranspiration (water that is evaporated from soil or vegetation) and recharge (water that is drained into the subsurface and feeds our aquifers).

Dr. Farhadi explains that due to the complexities and interrelation of Earth's processes, physical modeling through numerical techniques alone has not been successful in realistically quantifying the water cycle. Using traditional big data techniques alone also has not proved successful, so she has looked for techniques to combine the results of numerical modeling with observational data from remote sensing to produce an optimal estimate of the Earth's water cycle.

“The uniqueness of our approach is that in improving the models, I am considering the linkage between the water, energy, and carbon cycles through the evapotranspiration flux. This is usually ignored in other studies to avoid the complexity of these computational techniques,” she states.

Last year, Dr. Farhadi received a prestigious NASA New Investigator (CAREER) Award in Earth Science to further investigate this approach. These awards are given to encourage innovative research initiatives and to support outstanding scientific research of scientists and engineers at the early stage of their professional careers.

The results of Dr. Farhadi's research could contribute to a wide range of important water resources applications, such as monitoring surface water bodies, maintaining the sustainability of aquifers, and developing flood forecasting and drought hazard mitigation strategies. In the process, her research may also help others better understand how climate change might impact communities through changes in the water cycle.

PROFILE

Chair: Majid Manzari
202-994-4901

www.cee.seas.gwu.edu

Undergraduate students: 106

Graduate students: 48

Annual research expenditures: \$1.7 Million

FACULTY

Arzhang Angoshtari, **ASSISTANT PROFESSOR**

Sameh Badie, **PROFESSOR**

Leila Farhadi, **ASSISTANT PROFESSOR**

Samer Hamdar, **ASSOCIATE PROFESSOR**

Russell Hemley, **RESEARCH PROFESSOR**

Tianshu Li, **ASSOCIATE PROFESSOR**

Majid Manzari, **PROFESSOR**

Rumana Riffat, **PROFESSOR**

Kim Roddis, **PROFESSOR**

Danmeng Shuai, **ASSISTANT PROFESSOR**

Pedro Silva, **ASSOCIATE PROFESSOR**

RESEARCH AREAS

ENVIRONMENTAL AND WATER RESOURCES ENGINEERING

Farhadi, Riffat, Shuai

MATERIALS

Hemley, Li

MECHANICS

Angoshtari, Manzari

STRUCTURAL/GEOTECHNICAL/EARTHQUAKE ENGINEERING

Badie, Manzari, Roddis, Silva

TRANSPORTATION SAFETY ENGINEERING

Hamdar

PROFILE

Chair: Robert Pless
202-994-7181

www.cs.seas.gwu.edu

Undergraduate students: 233

Graduate students: 433

Annual research expenditures: \$4 million

FACULTY

Aylin Caliskan, **ASSISTANT PROFESSOR**

Xiuzhen "Susan" Cheng, **PROFESSOR**

Hyeong-Ah Choi, **PROFESSOR**

Mona Diab, **PROFESSOR**

James Hahn, **PROFESSOR**

Rachelle Heller, **PROFESSOR**

Lance Hoffman, **DISTINGUISHED RESEARCH PROFESSOR**

AND FELLOW OF ACM

Bhagirath Narahari, **PROFESSOR**

Gabriel Parmer, **ASSOCIATE PROFESSOR**

Robert Pless, **PROFESSOR**

Rahul Simha, **PROFESSOR**

Poorvi Vora, **PROFESSOR**

Timothy Wood, **ASSOCIATE PROFESSOR**

Arkady Yerukhimovich, **ASSISTANT PROFESSOR**

Abdou Youssef, **PROFESSOR**

RESEARCH AREAS**ALGORITHMS AND THEORY**

Cheng, Choi, Yerukhimovich, Youssef

ARTIFICIAL INTELLIGENCE AND ROBOTICS

Caliskan, Cheng, Diab, Pless

BIOINFORMATICS AND BIOMEDICAL COMPUTING

Cheng, Hahn, Simha

COMPUTER SECURITY AND INFORMATION ASSURANCE

Cheng, Choi, Hoffman, Narahari, Simha, Vora, Yerukhimovich

DIGITAL MEDIA

Hahn, Heller, Pless, Vora, Youssef

NETWORKING AND MOBILE COMPUTING

Cheng, Choi, Narahari, Simha

PERVASIVE COMPUTING AND EMBEDDED SYSTEMS

Cheng, Narahari, Simha

SEARCH AND DATA MINING

Youssef

SOFTWARE ENGINEERING AND SYSTEMS

Narahari, Parmer, Wood



Collaborating Without Sharing

As businesses, governments, and even private individuals create and store increasing amounts of sensitive data, how do we balance the growing and competing demands for data sharing and privacy? How do we find ways that allow various parties to protect the privacy of their data but share it in encrypted forms to achieve a common goal?

These are the questions that motivate Dr. Arkady Yerukhimovich. He works to build secure computer protocols that will preserve data privacy and allow distrusting parties to collaborate and derive global results from their private data.

"Secure computation allows parties to compute without actually sharing the data," Dr. Yerukhimovich states. "That's the beauty of it. It allows you in an almost magical way to compute the output based on private inputs without actually learning anything about those inputs or having to 'share' those inputs with anyone else."

Imagine, for example, how businesses and governments would benefit if they could share information on malware attacks with each other. Right now, each of them has its own list of malwares they have seen, but they can't share this with each other because doing so would expose their own vulnerabilities.

"But wouldn't it be nice if they could somehow combine that knowledge and figure out a global set of attacks without disclosing their vulnerabilities to each other?" asks Dr. Yerukhimovich.

Another application for secure computation is Tor, a network of relays that enables anonymous browsing and communication. Tor protects users from traffic analysis and censoring, like that of the Chinese firewall, which tries to block access to various websites. However, little is known about how many people are using it, or for what purposes, and this is a problem that limits Tor operators' ability to fine-tune and optimize their services. Dr. Yerukhimovich is working with others on a project to enable the Tor relays to use secure computation to compute some of these global statistics of Tor usage and at the same time preserve the privacy of those using it.

While he enjoys this and other applied projects, Dr. Yerukhimovich's research tends to focus a bit more on the cryptographic theory behind secure computing. He enjoys looking at ways to expand the scope of what computer scientists can do with secure computing, asking himself, for example, how secure computing could be run Internet-wide.

"Recent breakthroughs in the efficiency of secure computation have allowed this beautiful theory to have impact in the real world, and I am very excited to see the theoretical breakthroughs in this field turn into the powerful security tools of tomorrow," he says.

A Better Artificial Synapse

Dr. Gina Adam is developing novel electronic devices that can act as artificial synapses in a compact and energy-efficient way for artificial neural network hardware.

Her current research focus is on a type of electronic device called a memristor. It has a programmable state that can be retained without any extra power consumption, which makes it adjustable and energy-efficient. State programmability and retention are the two main characteristics of a biological synapse, which provides learning and memory capabilities to the brain. The memristor also has these two characteristics, and that makes it ideal for implementing artificial synapses in artificial neural networks.

Using these memristive networks, researchers hope to build hardware that can perform complex computations as efficiently as the human brain. These energy-efficient computing technologies could be used in applications ranging from self-driving cars to handwriting recognition and image classification. But this is an emerging field, and researchers still have a long way to go.

“We have self-driving cars and handwriting recognition, but our current implementations consume a lot of power,” Dr. Adam contends. “A human eats a burger, and with the calories supplied by that burger, can classify images, understand speech, and produce language. But farms of servers would take kilowatts of power to compute a small fraction of what the human brain does. This shows how efficient biology is and how inefficient existing computing technology is.”

Dr. Adam believes that memristor devices can tackle this limitation of current artificial neural networks. Other researchers are also working on this challenge but their approach has been to use many devices—as many as 20 transistors to implement one synapse. This consumes a lot of power and physical space, thus limiting the complexity of the circuits they can build. Ideally, only one memristor device would be needed to implement an artificial synapse. Because synapses are so numerous in a neural network, the memristor hardware would be more compact and more energy-efficient than its existing counterparts.

According to Dr. Adam, another big obstacle is that the memristive technology is still very young and researchers can't yet fabricate any two devices alike. “I think that this device variability is one of the grand challenges preventing memristor technology from being adopted by industry,” she argues. She hopes that her lab's research, enabled by the Science and Engineering Hall's state-of-the-art Nanofabrication and Imaging Center (GWINC), will address this issue.

“Such a facility can be used for very transformative research,” she remarks. “I personally like being in a university where I can see a trajectory for growth, and the fact that the clean room is new gives me the opportunity to have my research be part of that growth.”



PROFILE

Chair: Suresh Subramaniam
202-994-6083

www.ece.seas.gwu.edu

Undergraduate students: 90

Graduate students: 301

Annual research expenditures: \$3.3 million

FACULTY

Gina Adam, **ASSISTANT PROFESSOR**

Shahrokh Ahmadi, **TEACHING PROFESSOR**

Amir Aslani, **ASSISTANT PROFESSOR OF PRACTICE**

Lawrence Bennett, **RESEARCH PROFESSOR AND FELLOW OF APS**

Payman Dehghanian, **ASSISTANT PROFESSOR**

Milos Doroslovacki, **ASSOCIATE PROFESSOR**

Tarek El-Ghazawi, **PROFESSOR AND FELLOW OF IEEE**

Kie-Bum Eom, **PROFESSOR**

Robert Harrington, **PROFESSOR AND FELLOW OF IEEE**

Hermann Helgert, **PROFESSOR**

Howie Huang, **PROFESSOR**

Can Korman, **PROFESSOR**

Tian Lan, **ASSOCIATE PROFESSOR**

Roger Lang, **PROFESSOR AND FELLOW OF IEEE**

Ahmed Louri, **PROFESSOR AND FELLOW OF IEEE**

David Nagel, **RESEARCH PROFESSOR**

Omur Ozel, **ASSISTANT PROFESSOR**

Volker Sorger, **ASSOCIATE PROFESSOR**

Suresh Subramaniam, **PROFESSOR AND FELLOW OF IEEE**

Guru Venkataramani, **ASSOCIATE PROFESSOR**

Mona Zaghloul, **PROFESSOR AND FELLOW OF IEEE**

RESEARCH AREAS

APPLIED ELECTROMAGNETICS

Bennett, Korman, Lang, Sorger

COMMUNICATIONS AND NETWORKS

Doroslovacki, Helgert, Lan, Ozel, Subramaniam

COMPUTER ARCHITECTURE AND HIGH-PERFORMANCE COMPUTING

El-Ghazawi, Huang, Louri, Venkataramani

ELECTRIC POWER AND ENERGY

Dehghanian, Harrington

MEMS/NEMS, ELECTRONICS, AND PHOTONICS

Adam, Ahmadi, Korman, Louri, Nagel, Sorger, Zaghloul

SIGNAL AND IMAGE PROCESSING, SYSTEMS, AND CONTROLS

Doroslovacki, Eom, Harrington, Ozel

PROFILE

Chair: Thomas Mazzuchi
202-994-2353

www.emse.seas.gwu.edu

Undergraduate students: 94

Graduate students: 1094

Annual research expenditures: \$1.5 million

FACULTY

Hernan Abeledo, **ASSOCIATE PROFESSOR**
Joseph Barbera, **ASSOCIATE PROFESSOR**
David Broniatowski, **ASSISTANT PROFESSOR**
Jonathan Deason, **PROFESSOR**
Royce Francis, **ASSOCIATE PROFESSOR**
Erica Gralla, **ASSISTANT PROFESSOR**
John Helveston, **ASSISTANT PROFESSOR**
Thomas Mazzuchi, **PROFESSOR**
Joost Reyes Santos, **ASSOCIATE PROFESSOR**
Shahram Sarkani, **PROFESSOR**
Ekundayo Shittu, **ASSISTANT PROFESSOR**
Zoe Szajnfarber, **ASSOCIATE PROFESSOR**
J. Rene van Dorp, **PROFESSOR**

RESEARCH AREAS**CRISIS, EMERGENCY, AND RISK MANAGEMENT**

Barbera, Broniatowski, Gralla, Santos, van Dorp

ECONOMICS, FINANCE, AND COST ENGINEERING

Helveston, Santos, Shittu, van Dorp

ENGINEERING AND TECHNOLOGY MANAGEMENT

Deason, Helveston, Sarkani, Shittu, Szajnfarber

ENVIRONMENTAL AND ENERGY MANAGEMENT

Deason, Francis, Helveston, Shittu

KNOWLEDGE AND INFORMATION MANAGEMENT

Broniatowski

OPERATIONS RESEARCH

Abeledo, Gralla, Mazzuchi, Sarkani,
Shittu, van Dorp

SYSTEMS ENGINEERING

Broniatowski, Gralla, Mazzuchi, Santos,
Sarkani, Shittu, Szajnfarber, van Dorp

**Leveraging His Experience**

Dr. John Helveston speaks Mandarin and previously lived in China for several years. As it turns out, his language skills and experience in China come in very handy for the engineering research he conducts.

Broadly speaking, Dr. Helveston is interested in understanding the factors that shape technological change toward more sustainable and energy-saving technologies. He studies consumer preferences and market demand for new technologies, as well as relationships between innovation, industry structure, and technology policy.

More specifically, his focus these days is on electric vehicles and the transition from an oil-based to an electric-based transportation system. Much of his work is focused on this transition in China, the world's largest electric vehicle market, and also the world's largest carbon emitter.

"I can leverage my experience to try to tackle one of the biggest problems in the world. Essentially, if the whole world reduces their emissions but China doesn't, we won't solve the problem of climate change," he contends.

Toward that end, Dr. Helveston is trying to understand how to measure and model both the demand and supply sides of electric vehicle adoption in order to influence and incentivize both consumers and producers to make more sustainable choices. On the demand side, he wants to learn more about what kinds of cars consumers want and how their preferences influence technological change. On the supply side, he'd like to know more specifically what motivates companies to innovate and how national and local institutions and regulations affect the decisions that car manufacturers and technology companies make.

Most of Dr. Helveston's peers in his field focus on one side of the equation or use one type of method to learn about a particular market, but he prefers to combine multiple types of data sources to model consumer and producer preferences. He believes that the mixture of methods helps create a fuller picture of the industry.

Dr. Helveston is excited about continuing his research and working with colleagues across the university on it.

"The types of questions I'm asking could be asked by faculty in a number of different departments," he states. "There's no reason that this work needs to be done only by engineers, but it's one that engineers are good at, because we're trained in statistics and experimental design. My work lends itself to collaboration across departments, and there are lots of opportunities to collaborate across the university on these broad questions. I'm excited about that."

Tailor-Made

Dr. Michael Keidar studies plasma engineering. He's already had a good deal of success developing plasma propulsion technologies, but when he saw opportunities a decade ago to use plasma in biomedical applications, he embarked on a new and very fruitful research direction.

Typically plasma has a very high temperature—tens of thousands of degrees and higher—but cold plasma can be produced even at room temperature, and this lower temperature allows cold plasma to be directly applied to cells and tissues. As Dr. Keidar and his team began working with cold plasma and looking at its interaction with cells, they discovered that very short duration plasma application leads to a reduction of cell migration or spreading. And that's when they made a significant breakthrough.

"We thought at that time that cold plasma might be useful for preventing metastasis or propagation of the cancer cells," Dr. Keidar recalls, "so we started to treat cancer cells and we found that the plasma treatment is extremely selective toward the cancer cells. It kills them, and it spares the normal cells. It doesn't do damage to normal cells."

Following their discovery and their success in establishing the idea of adaptive plasma, his team began seeking an understanding of why plasma is selective in its interactions with cancer cells. Since every cancer cell is different and every patient has a different genomic composition, predicting the recipe for the chemistry that will be necessary in every case is very difficult, according to Dr. Keidar.

"The uniqueness of plasma is that the chemistry can be tailored simply by changing some of the plasma parameters; therefore, plasma can be viewed as a kind of drug that can be tailored on the fly to a specific goal," he says. "So our focus is now on how to couple the plasma treatment with monitoring a real time response from cells and the tissue so we can create optimal outcomes."

To achieve these optimal outcomes, Dr. Keidar hopes to build adaptive plasma platforms that involve a very efficient control system through a feedback mechanism. For this, he's working with his department colleague, Dr. Taeyoung Lee, who is an expert on controls. He's not stopping there, however. What is even more intriguing to him, and much more advanced, is the fact that the plasma can self-organize in the presence of different cells.

"We discovered that the plasma organized differently near the cancer cells and near the normal cells, so by guiding this process we can potentially create self-adaptive plasma therapy where we will not need a complicated feedback mechanism, but we will let the plasma adjust itself and target only cancer cells. That's my research highlight these days," he says modestly.



PROFILE

Chair: Michael Plesniak
202-994-6749

www.mae.seas.gwu.edu

Undergraduate students: 220

Graduate students: 129

Annual research expenditures: \$4.6 million

FACULTY

Elias Balaras, **PROFESSOR**

Lorena Barba, **ASSOCIATE PROFESSOR**

Philippe Bardet, **ASSOCIATE PROFESSOR**

Kartik Bulusu, **ASSISTANT RESEARCH PROFESSOR**

Ken Chong, **RESEARCH PROFESSOR AND FELLOW OF ASME, AAM AND SEM**

Andrew Cutler, **PROFESSOR**

David Dolling, **PROFESSOR AND FELLOW OF AIAA AND ROYAL AERONAUTICAL SOCIETY (UK)**

Charles Garris, **PROFESSOR AND FELLOW OF ASME**

Stephen Hsu, **PROFESSOR AND FELLOW OF ASME**

M. Ashraf Imam, **RESEARCH PROFESSOR AND**

FELLOW OF ASM INTERNATIONAL

Michael Keidar, **A. JAMES CLARK PROFESSOR OF ENGINEERING AND FELLOW OF APS**

Saniya LeBlanc, **ASSISTANT PROFESSOR**

James Lee, **PROFESSOR AND FELLOW OF ASME**

Taeyoung Lee, **ASSOCIATE PROFESSOR**

Megan Leftwich, **ASSOCIATE PROFESSOR**

Yongsheng Leng, **PROFESSOR**

Chunlei Liang, **ASSOCIATE PROFESSOR**

Michael Plesniak, **PROFESSOR AND FELLOW OF ASME, AIAA, AAAS, AIMBE AND APS**

Kausik Sarkar, **PROFESSOR AND FELLOW OF ASME, ASA, AIMBE AND APS**

Yin-Lin Shen, **PROFESSOR**

Murray Snyder, **PROFESSOR**

Santiago Solares, **PROFESSOR**

Lijie "Grace" Zhang, **ASSOCIATE PROFESSOR**

AND FELLOW OF AIMBE

RESEARCH AREAS

AEROSPACE ENGINEERING

Cutler, Dolling, Garris, Keidar, T. Lee, Plesniak

BIOMEDICAL ENGINEERING

Balaras, Bulusu, Keidar, J. Lee, Leftwich, Liang, Plesniak, Sarkar, Zhang

DESIGN AND MANUFACTURING OF MECHANICAL AND AEROSPACE SYSTEMS

Garris, Leng, Shen

FLUID MECHANICS, THERMAL SCIENCE, AND ENERGY

Balaras, Barba, Bardet, Bulusu, Cutler, Dolling, Garris, Hsu, Keidar, LeBlanc, Leftwich, Liang, Plesniak, Sarkar, Snyder

MECHATRONICS, ROBOTICS, AND CONTROLS

J. Lee, T. Lee

SOLID MECHANICS AND MATERIALS SCIENCE

Chong, Hsu, Imam, LeBlanc, J. Lee, Leng, Solares, Zhang



A JOURNEY

Dr. Serena Auñón-Chancellor's Odyssey

*“Not I, nor anyone else
can travel that road for you.
You must travel it by yourself.
It is not far. It is within reach.
Perhaps you have been on it since
you were born, and did not know.
Perhaps it is everywhere -
on water and land.”*

—Walt Whitman

Leaves of Grass

Maybe Walt Whitman is right: maybe the road we travel—the journey—is everywhere. If so, then for Dr. Serena Auñón-Chancellor, it extends beyond water and land to include low Earth orbit.

Dr. Auñón-Chancellor, or simply “Serena,” as she is known around SEAS, is a NASA astronaut and SEAS alumna who lived for 197 days last year aboard the International Space Station (ISS). She launched for the ISS on June 6 from the Baikonur Cosmodrome in Kazakhstan, and returned to Earth on December 20, landing again in Kazakhstan.

Not three months later, on a rainy day in early March, Serena sat down with two SEAS staff members to answer questions about her recent mission aboard the ISS, her readjustment since the mission, and the decisions over the course of her life that led to a spot on the NASA astronaut corps.

Setting Out for the Journey

As Serena recalls it, her interest in space and the US space program began at around eight or nine years of age, when she became intrigued by shuttle launches and would watch them on television, over and over again.

“We had two small televisions in the house at the time and I would always try and commandeer one to watch any program I could about the space program,” she says.

Her parents noticed how intrigued she was by the launches and realized even

then that she was developing a genuine interest in becoming an astronaut. And she certainly was, but her story is not one of a girl-turned-young-woman with a “NASA or Bust” mindset.

On the contrary, actually. As Serena speaks, it becomes clear that putting NASA front and center at various key decision points in her life was not her way. Becoming a NASA astronaut may have been her goal and her dream, but she was determined first and foremost to make education and career choices that fed her interests and brought her joy.

“The decisions I made in my career, in my education, were not solely because I wanted to end up at NASA,” she contends. “I knew I did at some point, but I didn’t let it influence me so heavily that I turned away from a path that looked interesting.”

Preparing for college in 1993, Serena wasn’t initially certain of what to study. Like many kids who choose engineering, she loved the sciences and was very good at math. She and her father had discussed engineering as a field, and she liked the fact that engineers are problem-solvers. Perhaps following somewhat in her parents’ footsteps, she chose to study at GW. Her mother had studied journalism at GW and her father is a triple SEAS alumnus with a bachelor’s, a master’s, and a doctoral degree, all in electrical engineering.

Serena selected electrical engineering and, once in the program, started becoming aware of all the career paths open to her. She credits her engineering friends with planting the idea of medicine in her mind. They thought she had the right attributes to be a good doctor and they pushed her to consider it.

“I went home between sophomore and junior year and talked to my parents about it and they thought, ‘Okay, great, if this is what you want to do, no problem.’ And my path was kind of set at that point once I became pre-med,” she recalls.

Serena received her bachelor’s degree in 1997 and enrolled in medical school at the University of Texas-Health Science Center at Houston. She says that once she started medical school, she knew it was the right choice for her.

“The first time I saw a patient and I spent time with the patient, I realized that this is exactly where I was supposed to be, no question,” she notes emphatically.

Near the end of her program she discovered the field of aerospace medicine. She had to choose a field of residency, and she already knew that internal medicine would be her primary specialty. It was the field she loved and still does. She learned, however, that the University of Texas Medical Branch offered a combined residency in both internal medicine and aerospace medicine, and she decided, “Well, this is the field for me.” The program had one open spot. Serena got it.

She completed her three-year residency in internal medicine first, followed by an extra year as chief resident, and then completed an additional aerospace medicine residency in 2007. Just prior to that, in 2006, she had started working at Johnson Space Center as a flight surgeon, a civilian physician who looks after the members of the astronaut corps and their families. She continued working in that capacity until July 2009, when she was selected to the NASA astronaut corps as one of 14 members of its 20th astronaut class.

ROCKY INETEN





Attired in a training version of her Extravehicular Mobility Unit spacesuit, Dr. Auñón-Chancellor awaits the start of a spacewalk training session.

She had made it into the astronaut corps, but she did so by listening to herself—and others—not by following a checklist of what she thought NASA wanted.

“So it was this very circuitous route. Some people call it coincidence. I call it kind of visualizing your path and then defining it and living it, and taking advantage of open doors and opportunities. It all ended up working out just fine, as it usually does,” she concludes.

A Mission

If Serena would agree with Walt Whitman that we’re all on our own journeys, she likely would disagree with his notion that we travel by ourselves. That’s not her way—and it’s not NASA’s way. For her, and for NASA, it’s about being part of a team.

She speaks repeatedly of the role of teamwork aboard the ISS, and when asked what sorts of people NASA likes to recruit, she mentions the ability to work as part of a team as the first criterion. Humor is pretty important, too.

While speaking of the close living conditions on the ISS, she adds, “We love folks with a sense of humor. I think that’s important, because if you’re going on a vacation in a tent with five of your closest buddies, you want to make sure that you find a lot of things funny—because that’s what’s going to happen up there.”

But first and foremost, what happens “up there” is science. The ISS is a national

laboratory that maintains a range of international experiments at all times. During her mission, Serena was involved in experiments on treatments for Parkinson’s and Alzheimer’s Diseases, on cancer therapy treatments, and on oceanic science and other topics. The experiments the astronauts conduct are those that can be done only in micro-gravity. For example, on Serena’s mission they studied new ways to deliver antibiotics directly to a wound site using special hydrogels, because in micro-gravity they can watch the way antibiotics migrate through that gel. In oceanic science studies, they looked at the way cohesive forces act in micro-gravity; on the ground they can’t measure cohesive forces, because gravity is an overwhelming force that won’t allow for such measurements.

“I guess the thing I’d like folks to take away most from our mission,” she states, “is that the science we’re doing on the station is really very high caliber science and it’s science that impacts people down here. We did a tremendous amount of science up there that cannot be done anywhere else on this planet.”

She’s quick to note, however, that as a physician on board the ISS, she wasn’t the lead on all the medical studies. It’s a common misconception that she would like to clear up.

“A lot of folks assume, ‘Oh, you were the physician on the mission.’ Nope, I was the *astronaut* on the mission with the physician background,” she asserts. We had geophysicists, we had a geologist, we had a test pilot . . . we’re all trained equally across the board. There is no difference.”

Time is allotted on the space station for more than science, however. In addition to system maintenance to keep the ISS operating properly and daily physical conditioning to keep the body healthy, astronauts can make time for star-gazing and Earth-gazing. Floating in micro-gravity was Serena’s favorite activity, but looking out the station’s cupola was a close second.

“The cupola’s our window to the Earth. Looking out the cupola at night was probably one of my favorite times,” she says.

The ISS orbits the Earth every 90 minutes, so she was able to see “night,” followed by “day,” every 45 minutes. She also was able to see entire continents rotating toward her, and massive thunderstorms looming along the coastlines of continents. Serena says it was the chance to see nature at its finest. The big attraction for the crew was the Northern Lights. “We would all come and gather in the cupola to watch the station pass through [them],” she recalls.

Dr. Auñón-Chancellor helps conduct research on protein crystal growth aboard the space station.





(Top left) The Expedition 56 crew members pose for a portrait in the International Space Station's Harmony module.
 (Top right) Dr. Auñón-Chancellor speaks to a crowd at NASA's Johnson Space Center.



Serena also enjoyed “people-watching” from afar, as it were. She couldn’t see individual people, of course, but she did think about them—a lot.

“Watching the sun rise over the planet’s surface and thinking about all those continents where people are just waking up, and wondering what those people are doing that morning wherever they are is what I spent my time doing looking out the window. My thoughts looking out that window were never vague and generic; they were always very specific,” she says.

When pressed for more explanations of the experience of looking out the cupola, she returns to her roots as an engineer and speaks wistfully about watching cargo vehicles approach the space station to dock.

“To watch those vehicles launch and pull up next to the space station like it was everyday business, no problem, and then watch it perform its maneuver and approach station slowly was just one of the most magnificent things I’ve seen,” she remarks. “A lot of folks would ask me, ‘What’s the neatest thing you’ve seen out of the cupola?’ and, really, it’s that. It’s progress and it’s technology and it’s human engineering at its finest.”

Returning Home

Back on Earth, Serena’s initial concern was not with engineering but with bringing her body back to an Earth-normal state. Astronauts’ bodies are still strong when they return to Earth, but their brains haven’t had to tell their bodies how to move, or walk, or balance for months, so their bodies must relearn these operations. That was her primary task for the first 45 days.

“It’s like parts of your brain that you actively utilize on the ground go to sleep while you’re up there and then they have to wake back up, but it’s amazing to see how fast [it] wakes back up, she muses.”

NASA will soon assign Serena to her next position, which she envisions will be working with other physicians in the astronaut corps as they grapple with medical concerns for future missions, whether to the ISS or even as NASA plans for eventual Moon and Mars missions.

She still loves being a physician, but she also has another love. Serena’s very drawn to spending time with students, teaching and encouraging them. She recognizes the perception that others may have of her and her achievements, and she wants

to remove that in order to persuade them to “shoot for the stars,” too.

“I don’t want them to think of me as some, you know, superhuman person; I’m not. I’m a normal person who was in the right place at the right time and worked hard to achieve what I’d always dreamed about. I think it’s important for people to know that you can achieve whatever you want to achieve. Really, anything’s possible, but you have to create it in your mind first and see it and then let it happen,” she counsels.

She keeps this in mind as she travels the country visiting schools and universities. She maintains a very busy schedule, but draws on the work ethic she says she learned from both of her parents to keep up the pace. She also tries to draw on the graciousness they taught her in giving their time to others.

“Looking at that, I try to give back as much as possible, because you do realize that your time is probably the most precious thing you can give somebody, period,” she states. “Nothing else. Not a shirt, not a sticker, not a signature.”



Dean Dolling with SEAS Faculty Awards winners

The Dean's Excellence Fund supports extraordinary opportunities for SEAS students.



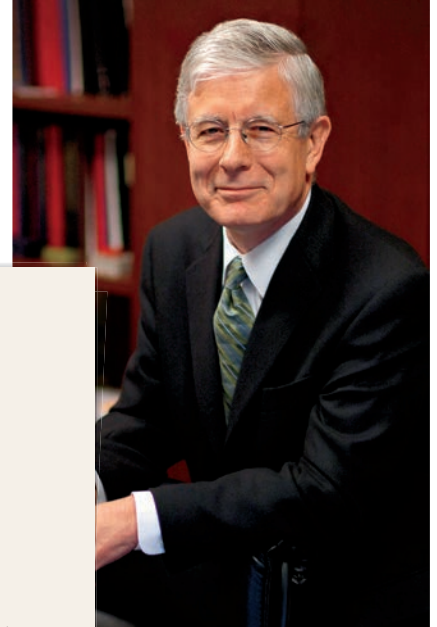
COURTESY OF NASA MICROGRAVITY UNIVERSITY

Thank you, David Dolling

A TRIBUTE

On August 31, 2018, Dr. David Dolling stepped down as dean of SEAS—almost 10 years to the day he took the helm of the school. He is still active at SEAS but is no longer the conductor of what he likes to call the “SEAS symphony.”

With gratitude and respect for what he accomplished at SEAS during his tenure as dean, SEAS faculty, staff, students, and alumni pay tribute in these pages to David Dolling. Interspersed among the tributes are the words of Dr. Dolling himself, words he wrote in 2009 when he introduced himself to SEAS alumni in that issue of *Synergy*.



Dean Dolling studies the Science and Engineering Hall construction.

A look back at the start of the journey

“It has been a long journey from being an English schoolboy in the large but sleepy coastal town of Bournemouth in the south west of England to becoming an American citizen and now dean of SEAS.”

David Dolling, 2009



“Ten years ago I served on the selection committee for the new dean of the GW School of Engineering and Applied Science. David Dolling was our unanimous choice for this important position. We had high expectations. Dean Dolling well exceeded those expectations. Over the past ten years, SEAS has grown substantially in student body, faculty, research, and national recognition. David was instrumental in establishing our world-class Science and Engineering Hall. I am honored to call him a good friend. Thank you, David Dolling.”

David Karlgard (DSc '74)

“Through his vision, dedication, and hard work, Dean Dolling elevated SEAS into a world-class engineering program for the students and faculty of GW. I am honored to have worked closely with him for the last 10 years to establish the GW/Korea University Student Exchange Program and Faculty Research Collaboration Program. Without his leadership and keen understanding of the complex international challenges facing the world, this highly successful student exchange program and the research collaboration symposia would have never gotten off the ground.

David is a man of great wisdom, passion, and integrity and I deeply appreciate all he has done for me, and GW, and Korea University. We are all better students, faculty, and people as a result of his tireless efforts.”

Simon Lee (MS '05)



“As the chair of the Department of Mechanical and Aerospace Engineering, I was fortunate to be a part of the SEAS leadership team under the direction of Dean Dolling for 10 years. One of his first actions was to articulate core values that he hoped would be adopted by SEAS: Innovation, Collaboration, Integrity. These are core values that he believed in and that guided him, and they proved invaluable in piloting SEAS through various opportunities and challenges. Dean Dolling provided steady and motivational leadership that resulted in a transformation of SEAS into the successful and vibrant school that it is today.”

Michael Plesniak, Chair
MAE



“I had the unique opportunity to learn from and work with Dean Dolling throughout my time at GW as a student and as the Dean's Fellow. I was continually impressed by his visionary influence on the school and its students. Dean Dolling was the reason I felt confident in my decision to attend GW. At Admitted Students Day he pledged to do everything he could to help me and my fellow incoming students make it through the SEAS program, even if it meant having to tutor us in calculus himself. I have never known SEAS without Dean Dolling at the helm, but I am excited for what is yet to come based on the tremendous positive impact and legacy left by the famous 'DSD.'”

Elizabeth Hubler (BS '14, MS '16)

Accepting the challenge and the chance to grow

“On the airplane back to Austin after my third and final [SEAS dean candidate] visit, I recall thinking that a once-in-a-lifetime opportunity was presenting itself, to me and to SEAS, and it could not be turned down. There was a perfect alignment of chance and choice. The chance to grow, to improve, was being offered. We have chosen to embrace that chance.”

David Dolling, 2009

“Dean Dolling: quiet, polite, bright, determined, strong—a leader. These are just a few of the words that come to mind when I think about David.

I first met David when he came to SEAS 10 years ago. After losing touch for a few years, we reconnected and met for dinner. This became an annual event. At these dinners, David took the opportunity to brief me on all of the progress that the school was making: new faculty, growth in research funding, new programs, and of course the ambitious decision to build a new science and engineering building. Over these dinners, I increasingly grew to admire, respect, and like David and all that he was doing at SEAS.

At one of our annual get-togethers, David shared with me his challenge in attracting first-rate computer science faculty. David, responding to my question about the barriers he needed to overcome, said that a computer science chair would be critical. I quickly agreed to fund the chair. It was one of the best investments I’ve made.”

Pat Martin (DSc '72)

“I was impressed by his dedication and the effort he put into recruiting strong, research-active faculty to SEAS. He spent many, many hours listening to faculty candidate seminars and meeting with each and every candidate, and he worked very closely with the department chairs to ensure that the best candidates were recruited and given all the resources they needed to succeed. This is obviously paying off now as can be seen from the growth in SEAS research over the past few years. My interactions with him have also helped me grow professionally as a department chair.”

**Suresh Subramaniam, Chair
ECE**



“Dean Dolling cared greatly about creating a lasting impact on both the SEAS and DC community. He generously allocated money to the SEAS student-run, volunteer program Atoms to Astronauts to support STEM education at elementary schools in the DC area. This helped advance the program and led to even more schools, students, and volunteers getting involved. The program is still ongoing and thriving, and our members are very grateful for Dean Dolling’s support.”

**Caitlin Carfano, Junior
Clark Scholar**



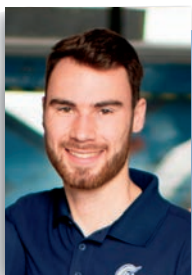
“When Dean Dolling asked me to take over undergraduate recruiting for SEAS, he told me two things: ‘Don’t do anything just because it is what we have always done,’ and ‘If it is going to cost SEAS money, let me know.’ This freedom allowed us to be creative and know that we had full support. Dean Dolling was excellent at finding the right people for a job and giving them the tools to succeed.”

**Jason Zara, Professor
BME**



“Throughout my four years at GW, I attended many events with Dean Dolling, and he was always quick to ask how the Baja SAE vehicle was coming along. The team would send him several highlight videos each year documenting manufacturing, testing, and racing the car. Dean Dolling was super supportive of the projects that students were working on, and he would make sure that they had all the proper resources to ensure maximum success.”

**Conor Gillespie, Senior
Clark Scholar**



“Dean Dolling will be dearly missed for his valuable contribution to SEAS, his sense of humor, and his humility. Amongst many other achievements, his vision of attracting more women to engineering increased female enrollment at SEAS dramatically. Most notable are his mesmerizing talks and engagement with the alumni community, staff, and students. He is always approachable and respectful of all. I wish Dean Dolling continued success and happiness.”

Sana Al-Hajj (MS '92, DSc '95)



“Dean Dolling allowed me, as the Clark Scholars Program director, to ‘run’ with the program. He never micromanaged things, but rather offered constructive feedback on how to make the program more effective and more efficient. Dean Dolling’s leadership style is like that of the most accomplished symphony conductors; he kept everyone in SEAS working together and in tune, but never played any of the instruments himself.”

**Murray Snyder, Professor
MAE**

“Working with Dean Dolling was one of the highlights of my career. He trusted me, supported me, and inspired me on a daily basis. Much of the success I have had in my role can be attributed to him and the partnership we formed. He remained level-headed at all times and helped me to not sweat the small stuff. He was a role model to both faculty and staff, and because of him, we all strived to be the best versions of ourselves.”

**Allison Benner, Senior Finance Director
SEAS**

Transformation doesn’t come from doing easy things

“This [transformation] will be a stretch for us; but that’s okay. I learned that lesson—that stretching is a good thing—at Princeton, where I was fortunate to work [as a post-doctoral fellow] under the late Professor Seymour Bogdonoff. He gave me responsibilities and made me stretch, often beyond my comfort zone. He understood that a sense of achievement, building inner confidence, does not come from doing easy things; it evolves out of struggle and hard work.”

David Dolling, 2009

Dean Dolling (4th from left) at the Science and Engineering Hall Groundbreaking ceremony



“David Dolling is one of those rare and special academic leaders who inspire the respect of everyone he meets, including faculty, administration, staff, students, and alumni. During his tenure as dean, he absolutely transformed SEAS from being good, but underappreciated, into a jewel in the crown of GW and a rising star among national schools of engineering. He has recruited the majority of the school’s outstanding faculty; increased the number and quality of students, including a rising proportion of women engineers; and led the effort to provide the most magnificent facility for engineering in the university’s history. We will forever be grateful for his service to GW. Thank you, David!”

Mark Hughes (BA '69, MS '77)



“GW was fortunate to have David Dolling as dean of the engineering school during a crucial time in its history. His leadership during his tenure was critical in the creation of the new, spectacular Science and Engineering Hall. His steady hand, enthusiasm, and vision were important factors in the new building’s reality, and the excellent faculty he recruited is a direct result of the building’s existence. Current and future students are the beneficiaries. Congratulations, David, and thank you.”

Nicholas Paleologos (BS '69)

“Dean Dolling’s patient, persistent leadership was the key to moving SEAS forward in obtaining outstanding new junior faculty.”

Randy Graves (DSc '78)



“Thank you, Dean Dolling, for your challenge that SEAS be Number One in the country based on the percentage of women undergraduates in engineering. *We will* be Number One!”

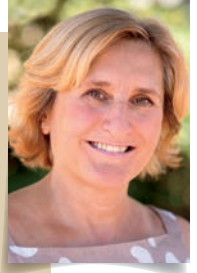
**Rachelle Heller, Professor
CS**

“What impressed me most about Dean Dolling is that he always kept his composure under the most challenging circumstances. I learned from him that no matter how unreasonable the argument against you is, by being patient and responding calmly with facts, you can always increase your chances of eventually securing a solution.”

Can Korman, Associate Dean SEAS

“Dean Dolling is extremely dedicated and passionate about SEAS—one could tell that this was not just a job for him; this was an integral part of his life. It was not uncommon to exchange emails close to midnight. He cared about students, faculty, and staff, and worked relentlessly to elevate our prestige. I was one of Dean Dolling’s many new recruits to GW, and from our first interaction, he inspired great respect as a fellow scholar and as a leader with a mission. He brought out the best in all of us.”

Emilia Entcheva, Professor BME



Dean Dolling participates in the annual Order of the Engineer ceremony.



“David has been an amazingly strong proponent of women in engineering. As dean, he worked very hard to increase our numbers among faculty, as well as among students. On a personal level, he’s also been a great mentor.”

Rumana Riffat, Interim Dean SEAS

“One sunny afternoon in Spring 2017, I had an impromptu discussion during a walk with Dean Dolling around the Science and Engineering Hall. His words of guidance and encouragement that day catalyzed many of my endeavors. The discussion with Dean Dolling was about the dwindling number of funding sources and how those that are available are fiercely competitive. His piece of advice led me to explore a territory that I never would have considered. To cut a long story short, I received my first NSF funding as a Principal Investigator because he shed light on how that specific aspect of my research could attract external support.”

Ekundayo Shittu, Professor EMSE

“When I first met Dean Dolling, he seemed to be an exceptional person. Easy to talk to and lots of energy. He is soft spoken and very articulate, and he had a way of attracting talent, and the right talent. I knew that he was building a quality engineering school. As an example, one of his targets was the Biomedical Engineering Department. He quickly brought on Igor Efimov to lead the department and started recruiting top talent. The department is still very young, but its reputation is continuing to grow rapidly. David is an extraordinary man, and he taught me a lot.”

Terry Collins (DSc '76)



A call to action to SEAS alumni

“Above all of this, I urge you to get involved, because unanticipated and interesting forks in the road appear on every journey; people come into your life and change what you think and who you are, and from this, opportunities arise that you would never have imagined. As a SEAS stakeholder, I ask you to take the on-ramp onto the SEAS highway and join us in the work ahead.”

David Dolling, 2009

“Dean Dolling convinced me to come to GW in 2015 by his inspiring vision of the newly-created GW Department of Biomedical Engineering [BME]. His leadership style was exceptionally helpful in growing BME over the last four years. He provided the resources, helped recruit excellent faculty, and generously invested his time and effort into building a donor network that supported our newly-created BME department from its birth. I cannot imagine how we would have achieved what we’ve achieved without his steady and visionary stewardship of SEAS: we doubled the faculty, quadrupled extramural funding, and increased undergraduate enrollment by half.”

**Igor Efimov, Chair
BME**

“When I think of Dean Dolling, I think of a leader who has conviction, is able to set a clear and robust vision, and is able to mobilize and encourage stakeholders to join him in making a difference. These qualities in and of themselves are admirable, but the thing I admire most about Dean Dolling is how much of himself he gave to SEAS. He is a genuine and thoughtful person, and we are all that much better for knowing him.”

**Deanah McLeod, Assistant Vice-President
Development, SEAS**



“Dean Dolling is my friend. At least I would consider him as such. I don’t know that I’ve ever had that same sentiment for another academic dean or principal. He has a unique charm and a way of endearing himself to people in a manner that is never saccharine or phony. When he speaks, I always listen intently to his remarks. They are like free lessons that I seek to adopt and build upon for when I have the occasion of addressing a crowd. Although I was not a student once Dean Dolling took over, in a way, he adopted me into a sort of informal mentorship. We often were speakers at the same gatherings, and after I would finish speaking, he would acknowledge me in a way that made me feel as if he was proud of me. I’m a 36-year-old man, and I still find myself getting a bit choked up thinking about the impact his leadership has had on me even as an adult. SEAS students were very fortunate to have had a leader like Dean Dolling at the helm of the school. And I feel very fortunate to have known him and befriended him over the years.”

Will Alexander (BS '04, MBA '06)

“It was a privilege and a pleasure to work with Dean Dolling over the past 10 years and witness first-hand all the hard work and dedication he put into making SEAS great. In every speech or presentation he always mentioned all of us involved in SEAS’ transformation: staff, faculty, students, alumni, and friends. He truly believed everyone could make a difference, and he inspired us all to do so. Dean Dolling is patient but persistent and always maintains his sense of humor. He has left his mark on SEAS, and whatever his title or position moving forward, he will always be ‘Dean Dolling’ to me.”

**Sandra Little
Special Assistant to Dean Dolling**



**Dean Dolling and
Will Alexander**



When David Dolling wrote the 2009 *Synergy* article to introduce himself to the far-flung SEAS community, he wanted to set the expectations for his tenure. He wanted a title for the article that would reflect those expectations, and his choice was “Transformation: Engineers Do That.” He chose well. David Dolling, an engineer and dean, led the transformation of SEAS.

Conor Gillespie & Andrew Edzenga

Common Interests, **UNCOMMON EXPERIENCES**

When they met at GW's orientation program in the summer before their freshman year, Conor Gillespie (*left*) and Andrew Edzenga (*right*) discovered that they shared an interest in cars. Over their four years at SEAS, the two friends have discovered a number of common interests and shared a number of uncommon experiences.

When the fall semester started their freshman year, Andrew and Conor both attended the first meeting of the SEAS Baja SAE team. By their sophomore year, they were nominated to lead the SEAS team as co-captains, a role they've held since then.

The Baja SAE is an international, intercollegiate design competition in which teams of university students design and build small off-road cars. The competition is intense, as are the preparations for it.

"It's basically a full-time job at this point," says Conor, noting that he and Andrew often spend 40 hours per week in the Science and Engineering Hall machine shop.

But so much more is involved than making parts for the car. Conor and Andrew are responsible for managing the team's budget, discerning how best to utilize the talents of all the team members, and leading the team of 15-20 students through the complete vehicle design, manufacturing, and competition processes.

"It's incredible to share the experience with a team, because you watch everyone grow throughout the season and when you're finally at competition and something breaks, you have this team that you can wholeheartedly rely on. It's almost like you don't even need to speak in order to fix something," Andrew adds. "Everyone has their tools ready; everyone knows exactly what to do."

They are quick to give credit to the team's faculty advisor, Dr. Murray Snyder, who meets with them weekly and mentors the team. "We want to thank Professor



Snyder, Dean Dolling [former dean of SEAS], and Dean Riffat for providing us with this opportunity to go above and beyond in our education," says Andrew.

And that's exactly what they have done. Their sophomore year, both Andrew and Conor went beyond the borders of the US, studying abroad in Australia and Ireland, respectively. For Conor, studying in Ireland was a chance to learn more about his heritage, himself, and the world. "It was an amazing experience. I would do it again in a heartbeat," he says enthusiastically.

Andrew used his time in Australia to observe the similarities and differences between Australia and the US, and to keep up with his interest in cars, joining the University of Technology Sydney's electric race car team.

Junior year brought new adventures for them, as both landed summer internships at Tesla. Conor worked as a design engineering intern in the company's headquarters in Palo Alto, CA, while Andrew worked in the company's Fremont, CA, facility as a manufacturing facilities mechanical engineering intern. Six months after their internships ended, they still speak exuberantly about their experiences.

"I fell in love with [the company]. I woke up at six a.m. every morning and would get to work as fast as I could. You get to work with incredibly intelligent people solving impossible problems. Tesla's energy and passion are enthralling," says Andrew.

Conor adds, "Innovation was endless. The people you work with are the smartest people you'll meet. They don't feel held back by anything, and there's a 'never say no' mentality."

Conor and Andrew are both interested in returning to Tesla to work, but they're exploring other options, too. That's not surprising: these two young men who led a team as sophomores, explored other countries, and wrangled internships from a top technology company will make other opportunities for themselves as they grow into their careers.

Aran Hegarty

Making Connections, **MAKING OPPORTUNITIES**



Aran Hegarty sees a pattern in his life. The connections he has made with people, whether social or professional, have often been a key unlocking opportunities for him. In turn, he wants to unlock opportunities for others, particularly for students whose families don't have the financial means to pay for their college education.

"Our country is blessed with so many smart, capable, and intellectually curious young people," he says. "We can't afford financial barriers that squander their vital intellectual capital."

Aran understands the struggle to be able to afford college. Although he grew up in what he calls "an intellectually rich environment," his mother didn't have the means to pay for his school, so he decided to enter the US Marine Corps after high school to earn the money he would need to go to college. With the help of a Veteran's Scholarship from the State of Illinois, he enrolled in the electrical engineering program at University of Illinois at Urbana-Champaign (UIUC) after finishing his military service.

Aran's first job out of college was with Allied Signal Aerospace. During the job interview, his interviewer asked him if he had taken a nuclear engineering course at UIUC. When Aran said yes and told him how much he enjoyed the "awesome" lectures of a young professor there, his interviewer responded, "I'm glad you liked him. He's my son-in-law." The connection was established, and Aran thinks it helped him get the job.

He believes that his two subsequent job offers also came, in part, from forming connections with people. In one instance, he wrote a letter to compliment an engineer who had published a research article he enjoyed reading. A professional relationship—and ultimately a job offer—grew from that. In the other instance, he struck up a conversation at a dinner party with a gentleman wearing a military pin that Aran didn't recognize. Within a few months Aran was working at TASC, the same company as his conversation partner.

Aran had been taking night classes at SEAS during that time to earn his master's degree in engineering management, and he took a course in technical enterprises that led him to think about starting his own company. He says that he wishes SEAS

had had the incubator programs then that it has now, because it would have saved him a lot of headaches along the way as he learned how to start his company.

After graduating in 1997, Aran continued working at TASC, and later at AT&T, and STG, Inc., before launching Hegarty Research LLC in 2006. He finally grew tired of "the churn in the marketplace with all the mergers and acquisitions" and decided to invest his time in building his own company.

Hegarty Research is a small company with approximately 25 employees and \$6 million in revenue. Its engineers and analysts assist government customers in the purchase and acquisition of complex cyber systems.

"We help with idea generation and requirements development and are part of the design and test of the systems. We focus on the interface between radios and computers," he explains.

Over the years, Aran has been an active volunteer, first with his alma mater, UIUC, and in more recent years with SEAS. At SEAS, he's the chair of the National Advisory Council, a member of the GW Council of Chairs, a former member of GW's *Making History* Campaign Steering Committee, and the founding chair of the SEAS Entrepreneurship and Innovation Task Force.

His motivation for staying involved with SEAS and his alma mater continues to be his desire to help students create the sorts of connections he's been able to create and to promote philanthropy so more young people can attend college and graduate with less debt. "My whole career has been about connections and people," he says.

News



A Blast of a Time

NASA astronaut and SEAS alumna Dr. Serena Auñón-Chancellor (BS '97) enthralled a GW audience during a NASA downlink with the International Space Station (ISS) hosted by SEAS on September 18, 2018. Dr. Auñón-Chancellor was three months into her six-month mission aboard the ISS when she spoke to the audience gathered in GW's Jack Morton Auditorium and to others watching via a live stream link.

More than 100 guests from six local elementary and secondary schools and a Hanover, PA, Lego team joined the GW audience. Several lucky attendees, ranging from elementary school children to GW students, were selected to ask Dr. Auñón-Chancellor questions about her life aboard the ISS and her preparations for the mission.

The questions ranged from issues of daily life—"What do you eat in space?" and "How do you sleep in space?"—to the more philosophical—"How does creativity come into play as an astronaut?"—to the thrill of the experience, "How did it feel when you blasted off to get to the ISS?"

"That day of launch was absolutely an amazing day," Dr. Auñón-Chancellor replied. "... It was about eight-and-a-half minutes that it took us to get into orbit, and the entire time you feel the engines beneath you. You know that when those engines light

on the ground, you are going somewhere, and really, really quickly, so it was a blast, literally."

Throughout the downlink, Dr. Auñón-Chancellor delighted the audience with her demonstrations of living in a micro-gravity environment, as she floated sideways, launched sealed meal pouches through the air, and even descended headfirst into the module at the beginning of the downlink.

Dr. David Dolling moderated the downlink and then hosted a conversation on stage with SEAS alumnus and former astronaut, Dr. Charles Camarda (MS '80), who was present in the Jack Morton Auditorium for the event. Dr. Camarda flew on the Return to Flight mission STS-114 Discovery in July 2015, logging 333 hours in space.

He recalled some of his memories from his time aboard the Space Shuttle Discovery, and he and Dr. Dolling discussed the challenges of deep space exploration. Dr. Camarda spoke to a range of issues, everything from the technical challenges of getting people and equipment into deep space, to the physical safety of the crew and the sustainability of living conditions for them, to the unique psychological stresses under which they would live on a deep space mission.

Referring to the technical challenges, Dr. Camarda said, "Some of the biggest challenges are space radiation and protecting humans when we go outside the magnetosphere... How do we survive that? How does it affect the body? And from a mechanical engineering/aerospace engineering point of view, how do we land that tonnage going through the atmosphere of Mars? These are some issues that we have to struggle with and think about right now."

Dr. Camarda also fielded several questions from the audience, including one from a young student who asked him about re-acclimating to life on Earth. Recalling his "zero-g moment" on Earth after returning from the space shuttle, he described what can happen when a person forgets he no longer is living in zero-gravity.

"You get used to floating in space. I was in my home and my daughter came home late and the alarm went off in the house. I had to rush to see who was coming in the house and I tried going like that [he mimicked propelling himself forward as in zero-gravity]. I luckily caught myself before I hit the floor, but I was thinking I was flying out of my little sleeping bag back in space," he said to laughter from the audience.



Dr. Charles Camarda (left) and Dr. David Dolling

WILLIAM ATKINS/GW



Dr. Igor Efimov

Mission Accomplished

Dr. Igor Efimov was given a mission when he joined SEAS in January 2015 as the inaugural chair of the newly established Department of Biomedical Engineering (BME): build a solid foundation for the department's growth. Four years later, he rightfully can claim "mission accomplished."

In these four years, the number of BME faculty has doubled and research grant expenditures have quadrupled. The faculty's research collaborations across the university are growing steadily, as are their collaborations with colleagues at other universities across the country and around the world. They are initiating new research directions with the GW Medical School and the GW Cancer Center, and forming new companies to develop and commercialize their research.

"The confluence of all of these factors has led to the success of several labs at the same time," claimed Dr. Efimov. This was apparent in January of this year, when Dr. Efimov, Dr. Emilia Entcheva, and Dr. Matthew Kay won three separate research grants from the National Institutes of Health (NIH) totaling \$7.5 million.

Dr. Efimov also acknowledged the role of Dr. David Dolling, former dean of SEAS, in the new department's growth, and he praised his commitment to the department. "He put every resource he had at his disposal to the growth of BME at this school, and he delivered. Everything he promised, he delivered," said Dr. Efimov.

"We now are on the map on the *US News & World Report* rankings," he stated. "We're one of the best programs in the region, which is good for being such a young department, but we need to continue growing our strength in research and education. We need institutes and centers, and we have several areas in which we can build those."

One of those areas coincides with Dr. Efimov's own research interest. He announced earlier this semester that he plans to step down as chair of the department next January and concentrate on building a new institute at GW, the Human Artificial Intelligence Interface Institute, or HAI³. The institute will focus on breakthrough bioelectronics and imaging technologies that can bridge the gap between human biology and physiology and artificial intelligence (AI).

He's excited about the prospects for AI to change the practice of medicine and disease diagnosis, and he believes that the BME department is in a strong position to develop new technologies to help revolutionize the practice of disease diagnosis. Citing a combination of factors—the newly recruited researchers hired by SEAS, BME's existing expertise in cardiovascular neural engineering, the Science and Engineering Hall's clean room, and the department's proximity to the US Patent and Trademark Office, NIH, and the National Institute of Standards and Technology—Dr. Efimov concluded, "We have all the pieces in place

so now we just need to build the structure for 21st century medicine, where artificial intelligence will assist physicians with a deeper understanding of disease."

Vint Cerf Kicks Off Computer Science Speaker Series

From long-term preservation of digital records to the spread of misinformation, Vint Cerf sees modern computing as rife with challenges. Dr. Cerf, vice president and chief Internet evangelist for Google, kicked off the Computer Science Department's Internet Distinguished Speaker Series in March, telling the crowd assembled at the Jack Morton Auditorium that he's eager to see the next generation of innovators pick up the torch.

"I'm hoping, frankly, that some of the problems I will describe will grab someone's attention who will want to go out and do a dissertation on the topic or maybe start a business to solve the problem, because these really do need solutions," he said.

Dr. Cerf is widely known for his role in designing the architecture of the modern Internet and has been dubbed a "father of the Internet." President Bill Clinton awarded him and his colleague Robert Kahn with the US National Medal of Technology in 1997, and President George W. Bush presented him with the Presidential Medal of Freedom in 2005. He was also awarded the Turing Award in 2004, one of the highest honors in the computing field.

Dr. Cerf encourages the field to consider how to best preserve digital records when media used to store information has shorter



and shorter lifetimes. Five-thousand years ago humans stored information on clay tablets that can still be deciphered, but today it's a challenge for anyone to read files stored on an old floppy disk.

"It is important to recognize our increased dependence on digital materials," Dr. Cerf said. "Even the active effort to take existing works of art and digitize them, thinking that the bits will last forever, is very wrong."

As more of the world moves online, it's also important to promote critical thinking and digital literacy where misinformation and disinformation are rampant. When they encounter new information online, users need to ask themselves where information comes from, who put it online, and why.

"It takes work to try to figure out what to accept and what to reject," Dr. Cerf said.

Another challenge computer scientists need to deal with is the pervasiveness of software bugs. It is risky to allow software that has bugs to make decisions for humans, he said. Errors are expected in software development, but if the software used to control self-driving cars is flawed, these mistakes can be fatal. Dr. Cerf also addressed the need for artificial intelligence (AI) systems to become more ethical, transparent, trainable, and human-led as AI penetrates our world.

"We are using computers to do things to augment our intellect," he said. "Yet if we're not careful about things like this, we will allow ourselves to be beguiled by the power of computers and their apparent depth."

Dr. Cerf's talk was held in collaboration with the GW chapter of ACM (the Association for Computing Machinery) and organized by computer science senior Samsara Counts.

EDITOR'S NOTE: This article is adapted from the *GW Today* article "The Future of the Internet."



Members of the EWB travel team at the Jagran Jan Vikas Samiti site in Rajasthan, India

Help Wanted: Partnering with EWB

After successfully completing a multi-year water and sanitation project in La Peña, El Salvador, GW's student-run chapter of Engineers Without Borders (EWB) has begun preparations to develop and implement a water project in Rajasthan, India. They welcome SEAS alumni to join them.

Recognizing that the project will require a range of skills and experience, the group seeks support from professionals across a number of disciplines, said Sophia Ertel, the project co-lead and a junior civil and environmental engineering major.

The idea for the project began in fall 2016 when Sophia, then a freshman, recommended working with the Bhootiya community in Rajasthan to help meet some of their water needs. She had established relationships with members of the community and with Jagran Jan Vikas Samiti, a local non-governmental organization (NGO), during a gap year internship the prior year.

The GW chapter accepted the challenge of working on a water project in Rajasthan, and in June 2017, Sophia and her co-lead, Madison Haley, began preparations. During the 2017-2018 academic year they formed a team, conducted research on potential solutions to the community's water needs, raised funds, and gained approval from the national organization, EWB-USA.

Their work culminated in the group's first formal assessment trip, which they made this past January. Sophia, Madison, and SEAS students Justin Gurry, Khyati Patel, Meghana Tallum, and Lobna Youssef traveled to India, accompanied by professional engineer Grace Richardson. During the trip the students conducted household surveys, tested community water sources, and entered into a formal partnership with the local government.

"We learned that there's plenty of drinking water in Bhootiya, but agricultural practices need to be changed," Sophia remarked. "So, we're looking at water management efficiency, and we'd welcome help from industry professionals with experience in international development, microfinance implementation, water resource management, and civil or environmental engineering."

The GW chapter expects to finish its assessment report and have project options to offer the NGO and local council by the end of this semester. The team plans to travel to Bhootiya next January to begin a project prototype.

Sophia encourages alumni or friends who can lend expertise or financial support to the project to visit <http://ewb.seas.gwu.edu> or contact the chapter at ewbgwu@gmail.com.

She and her project mates are thrilled with their progress so far and with the experience. "It's so direct. It's exactly what I'm learning in my classes," she concluded.

A Thriving Innovation Center

Now in its second year, the GW Innovation Center (GWIC) is a hive of activity and ideas. With a range of initiatives that cover the learning cycle—from bringing experienced innovators to campus to sending budding GW innovators out to local middle and high schools—GWIC gives students the chance to learn, develop, and even teach skills in human-centered design thinking and social impact innovation.

Among the GWIC initiatives is an effort to teach Nordic innovation principles here on campus. Last May, Mr. Andras Simonyi, a former Hungarian ambassador to the US (2002-2007), joined GWIC to help build the initiative. He has extensive connections to the five Nordic countries (Denmark, Finland, Iceland, Norway, and Sweden) and has helped create collaborations for GWIC.

One of these is with Nordic Edge, a smart city accelerator that promotes smarter, safer, and greener cities. Working with Nordic Edge, GWIC plans to host a one-day, Nordic-USA conference next academic year to bring together experts in sustainability and smart cities and to create a platform for participants from the US to develop contacts with Nordic innovators.

“One of the fundamental principles for us is how the Nordics innovate and how we can learn from them and bring those skills into our curriculum and teach them to our faculty and students,” said Ms. Annamaria Konya Tannon, the GWIC founder and director.

Another innovator invited to campus is Dr. Jane Goodall, the English primatologist and anthropologist. As *Synergy* magazine goes to press, GWIC is bringing Dr. Goodall to GW to talk to students and to capture her voice, image, and gestures in Dr. James Hahn’s Motion Capture Laboratory. GWIC will use the captured images, voice, and gestures to create a free, virtual reality education platform that they hope eventually to deploy worldwide as part of a larger educational curriculum to teach conservation.

“This will allow us to create messaging in the future for the Jane Goodall project, which is an effort to support conservation and service-based learning in young people,” explained Ms. Konya Tannon.

As these projects are being developed, students at GWIC continue to work on various hackathons. This academic year alone, the student-run hackathons targeted issues such as sustainability, affordable medical devices, and the student experience at GW.

In the classroom, GWIC worked with the Washington Metropolitan Area Transit Authority (Metro) to develop engineering challenges for the SEAS introduction to engineering course for freshmen. They created a challenge topic for each major offered at SEAS, and at the end of the semester, the students generated a proposed project for the Metro representatives. According to Ms. Konya Tannon, Metro is looking into piloting one of the technologies proposed by the students.

“We’re hoping to work with a different client each year to do this sort of project

for undecided engineering majors to show them how they can apply engineering in different disciplines,” she remarked.

GWIC also plans to take its show on the road, so to speak, with a new project to create a STEAM (science, technology, engineering, art, and math) bus that will visit middle and high schools in underserved communities in Washington, DC. The bus will have toolkits to expose girls at the schools to STEAM activities, and it will be staffed by GW students. Ms. Konya Tannon compares it to a mobile maker space and explains that its purpose is to help girls in middle and high school maintain an interest in STEAM subjects.

As the list of activities at GWIC grows, so does the need for mentors, speakers, and donors. Alumni or friends who are interested in helping GWIC should email Ms. Konya Tannon at annamaria@gwu.edu.



Dr. Park



Dr. Shittu

SEAS Faculty Receive NSF CAREER Awards

SEAS congratulates Dr. Chung Hyuk Park and Dr. Ekundayo Shittu on their recent National Science Foundation (NSF) Faculty Early Career Development (CAREER) grants. CAREER grants are the most prestigious awards given by NSF to junior faculty. They are offered to faculty who excel at both research and teaching.

Dr. Park, a faculty member of the Department of Biomedical Engineering, received a grant award for his project “CAREER: Social Intelligence with Contextual Ambidexterity for Long-Term Human-Robot Interaction and Intervention.” Dr. Shittu, a faculty member of the Department of Engineering Management and Systems Engineering, won his award for the project “CAREER: Adaptive Investments into Resilient Electricity Infrastructure Systems.”

Student members of GWIC work to create an exchange program between GW and a Norwegian university.



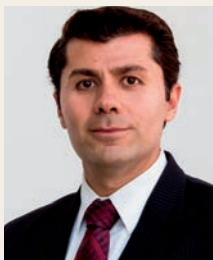
New Faculty



Dr. Gina Adam

Gina Adam is an assistant professor in the Department of Electrical and Computer Engineering. Dr. Adam previously was

a research scientist with the Romanian National Institute for Research and Development in Microtechnologies in Bucharest, Romania. She also held the post of visiting scholar at the Swiss Federal Institute of Technology Lausanne. Her research interests are in the broad field of building artificial neuronal networks that mimic their biological counterparts. Over the past few years she has been studying emerging resistive switching technology. Dr. Adam holds a PhD in electrical and computer engineering from the University of California, Santa Barbara.



Dr. Amir Aslani

Amir Aslani is an assistant professor of practice in the Department of Electrical and Computer Engineering. Dr. Aslani's

primary research interests are in the areas of electromagnetics and nanotechnology. His current research spans magnetic materials and nanoparticles, magnetic devices, MEMS/NEMS, magnetic refrigeration, and magneto-optical Kerr effect. Dr. Aslani received his PhD in electrical engineering from the George Washington University.



Dr. Aylin Caliskan

Aylin Caliskan is an assistant professor in the Department of Computer Science. Dr. Caliskan previously was

a Center for Information Technology Policy Fellow and postdoctoral researcher at Princeton University. Her research involves machine learning, natural language

processing, and computer vision in novel ways to interpret big data, develop privacy attacks with security implications, and gain insights about machines, humans, and society. She specializes in privacy attacks, privacy enhancing technologies, ethics of machine learning, and fairness in AI. Dr. Caliskan received her PhD in computer science from Drexel University.



Dr. John Helveston

John Helveston is an assistant professor in the Department of Engineering Management and Systems

Engineering. He previously was a postdoctoral associate at the Institute for Sustainable Energy at Boston University. His primary research attempts to understand the factors that shape technology change, with a particular focus on transitioning to environmentally sustainable and energy-saving technologies. Within this broader category, he studies consumer preferences and market demand for new technologies as well as relationships between firm innovation, industry structure, and technology policy. Dr. Helveston holds a PhD in engineering and public policy from Carnegie Mellon University.



Dr. Luyao Lu

Luyao Lu is an assistant professor in the Department of Biomedical Engineering. He previously was a postdoctoral fellow at the Center for

Bio-Integrated Electronics at Northwestern University. Dr. Lu's research involves developing unconventional, lightweight, conformal, and soft optoelectronic systems with high performance for advanced healthcare. He focuses on creating organic and inorganic classes of optoelectronic materials and devices such as solar cells, photodetectors, light emitting diodes, and diagnostic devices for various applications. Dr. Lu holds a PhD in chemistry from the University of Chicago.



Dr. Omur Ozel

Omur Ozel is an assistant professor in the Department of Electrical and Computer Engineering. He previously was a postdoctoral

research associate in the Department of Electrical and Computer Engineering at Carnegie Mellon University. Before that, he was a postdoctoral researcher at Berkeley. His dissertation research focused on communication and information theoretic models to understand the role of intermittency and management of energy expenditure in energy harvesting communication systems. At Carnegie Mellon he focused on resilient estimation and control of cyber-attack detection in cyber-physical control systems. Dr. Ozel holds a PhD in electrical and computer engineering from the University of Maryland.



Dr. Arkady Yerukhimovich

Arkady Yerukhimovich is an assistant professor in the Department of Computer Science. He previously

was a research scientist in the Secure Resilient Systems and Technology Group at MIT Lincoln Laboratory. His research focuses on bringing tools from theoretical cryptography into practice, including using techniques such as secure multi-party computation, functional encryption, and cryptographically protected search to build practical, provably secure solutions for real-world applications. Dr. Yerukhimovich received his PhD in computer science from the University of Maryland.

Faculty Excellence

Spring 2018 marked the tenth anniversary of the SEAS Faculty Research and Teaching Awards Celebration, a tradition begun by former SEAS Dean David Dolling during his inaugural year heading the school. SEAS celebrated last year, as it has each year since 2008, with a ceremony to honor the faculty selected for their excellence in teaching and research. Five faculty were chosen to receive awards in 2018.

Dr. Igor Efimov, Alisann and Terry Collins Professor and the chair of the Department of Biomedical Engineering, was named the SEAS Distinguished Researcher. Dr. Efimov is an internationally-recognized scholar in the field of cardiac electrophysiology, and he has been an exceptionally successful researcher. In addition to winning highly competitive grants for his research—including five National Institutes of Health grants, among others—he has led his department to achieve substantial growth in its research scope. He has achieved a prolific publication record and has been very successful in creating startup companies and intellectual property.

The SEAS Outstanding Junior Researcher Award was presented to **Dr. Danmeng Shuai** of the Department of Civil and Environmental Engineering. Although still in the early stages of his career, Dr. Shuai has built a strong research program focused on using innovative advanced materials to address grand challenges at the interface of water, energy, and public health. One of his current research projects involves developing a carbon- and nitrogen-based material that could be used to purify water, improve food safety, and sanitize hospital surfaces.

Dr. Jason Zara of the Department of Biomedical Engineering was recognized

for teaching excellence with the SEAS Distinguished Teacher Award. Dr. Zara is known throughout SEAS, and beyond, as a dedicated and talented teacher. For 15 years, he has acted as the architect and driving force behind the development of GW's biomedical engineering curriculum, and he has a strong record of service to SEAS and actively participates in national efforts to improve engineering education.

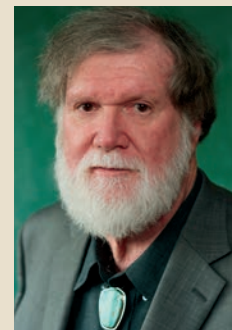
The SEAS Outstanding Junior Teacher Award was shared by two faculty members in 2018, **Dr. Leila Farhadi** of the Department of Civil and Environmental Engineering, and **Dr. Ekundayo Shittu** of the Department of Engineering Management and Systems Engineering. Dr. Farhadi was honored for the commitment she shows to helping her students succeed, both academically and professionally, making herself available to them outside of the classroom, as well as in it.

Dr. Shittu was selected for the enthusiasm and passion he brings to his teaching, an enthusiasm that others refer to as “infectious.” He is known for his commitment to mentoring students, and outside of the classroom he works to bring underrepresented populations into the STEM (science, technology, engineering, and math) fields. He also established the Nanotechnology Fellows Program at SEAS as the co-principal investigator on a National Science Foundation-funded grant.

Congratulating the award winners on their accomplishments, Dr. Dolling remarked that it is important to remind the GW community “of the tremendous impact that our faculty have at SEAS, both in the research realm and in teaching, mentoring, and inspiring the next generation of engineers and computer scientists.”



Dr. Kyriakopoulos



Dr. Carroll

Transitions

SEAS salutes **Dr. Nicholas Kyriakopoulos** and **Dr. Robert Carroll**, who retired in 2018 as full-time faculty members of the Department of Electrical and Computer Engineering. Dr. Kyriakopoulos received his DSc from GW in 1968 and remained at SEAS, joining the faculty. Dr. Carroll joined SEAS in 1979. He completed his PhD from the University of Connecticut in 1973, and then worked in both industry and academia before moving to SEAS.



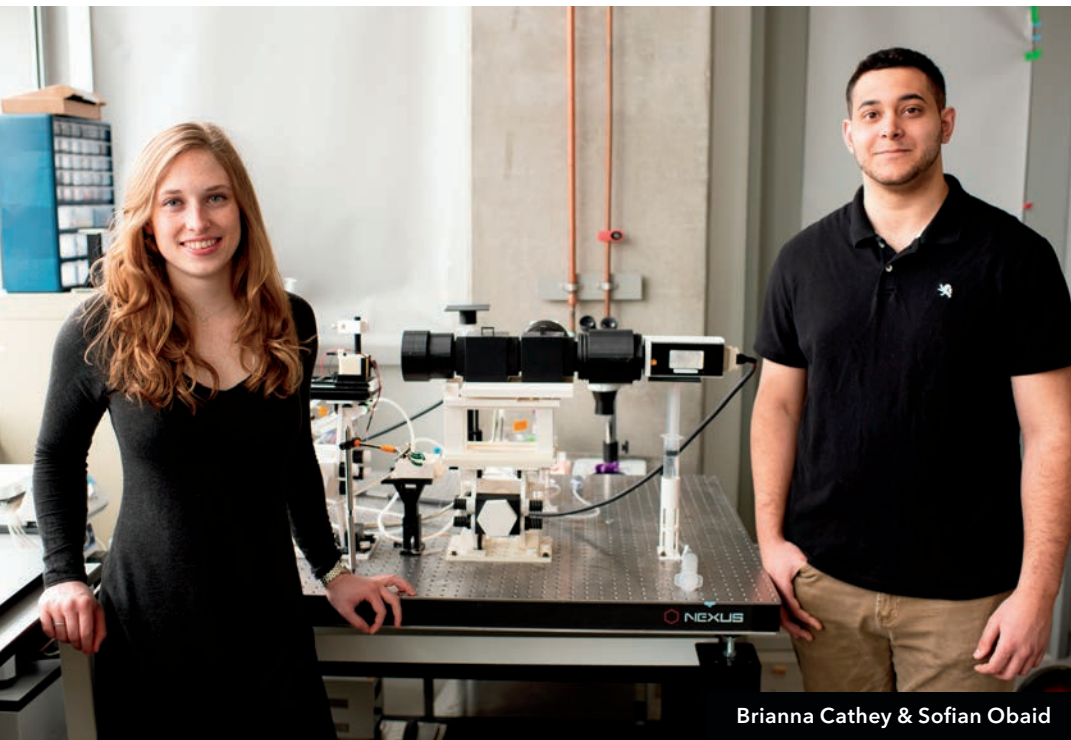
In Memoriam

Dr. Edward Della Torre, a longtime faculty member of the Department of Electrical and Computer Engineering, has passed away. Dr. Della Torre spent virtually all of his professional life in academia, serving at several universities in both the US and Canada before joining SEAS in 1982 as a full professor. At SEAS, he served as the director of the Institute for Magnetics Research and achieved national and international recognition as a scholar and researcher in the field of magnetic material behavior and modeling.

Left to right: Former SEAS Dean David Dolling and Drs. Ekundayo Shittu, Leila Farhadi, Danmeng Shuai, Igor Efimov, and Jason Zara



Achievement



Brianna Cathey & Sofian Obaid

A Rare Achievement

SEAS students Brianna Cathey and Sofian Obaid have achieved something rather rare for undergraduate students: they are the co-first authors of a research article recently published in a highly regarded, peer-reviewed research journal.

Undergraduate engineering students at most universities don't typically participate in research, much less get published as the lead authors on a research paper. SEAS encourages its undergraduates to get involved in research with their professors, and in the case of Brianna and Sofian, their work resulted in the article "Open-Source Multiparametric Optocardiography," which was published in *Scientific Reports* last January. The article details a 3D-printed optical mapping system they designed that gives researchers the option to customize and implement low-cost hardware to conduct studies in cardiac electrophysiology and other specialties.

Optical mapping is a powerful tool for studying cardiac arrhythmias, but the current commercial cost for a system is approximately \$180,000. The 3D system that Brianna and Sofian developed

will allow researchers at cardiac electrophysiology labs to 3D-print the parts for the tool, saving nearly \$20,000 per system. Other benefits of using their 3D-printed parts include increased rapid prototyping and customizability of the parts to accommodate specialized optics.

"Since this optical mapping technique is the leading tool for investigating cardiac electrical activity, it's really important that scientists have a feasible way to implement that technology to study as much as they can," explains Brianna. "Our system lowers the cost barrier and increases the flexibility so researchers can customize it for whatever their study calls for."

The idea for the project came, as many ideas do, out of need. Brianna and Sofian were working in Dr. Igor Efimov's cardiac engineering lab in the Biomedical Engineering Department, and as the lab expanded and needed more experimental set-ups, its researchers decided to 3D print the setups to save on costs. "This turned into an understanding that we could 3D print almost any part that we need," recalls Brianna.

She and Sofian applied that thinking to the optical mapping system, spending untold hours on the project. "My favorite part of this project is that I would come to our meetings with an idea, and Brianna would have another idea, and we'd build upon it," says Sofian.

They presented their work at a couple of conferences and received such positive feedback from other researchers that they decided to try to publish it. They submitted the paper for publication last May, when Brianna was a junior and Sofian was a graduating senior.

Both recall it as a long and humbling journey, but they're grateful for what they learned through the research and publication process and for the support of their lab mentors, Dr. Sharon George and Dr. Kedar Aras. Brianna credits Dr. Aras, her initial mentor, with teaching her by his own example of dedication to his work, and Sofian thanks Dr. George for her caring and patient approach and for introducing him to the idea that initial failure in the lab is okay and expected.

Now a graduating senior and a doctoral student, respectively, Brianna and Sofian are turning to new projects. Brianna plans to take a year out and then begin medical school in 2020, and Sofian is working with his PhD advisor, Dr. Luyao Lu, in his Bio-integrated Electronics Lab.

Both Brianna and Sofian will bring the same dedication and work ethic to their next endeavors that they honed in their optical mapping project in Dr. Efimov's lab. As Sofian notes, "My mom told me, 'Anything worth doing is worth doing well,' and I always think about that. In college it really helped me out a lot."

Oh, the Possibilities

Madison Haley remembers her visit to GW as a high school student. She remembers seeing the nearby Peace Corps headquarters and saying to her mom, "What if I could work at the Peace Corps in college?" During that visit, she also remembers saying, "What if I joined Engineers Without Borders?" As it turns out, she did both—and more.

Madison tutored at School Without Walls, a secondary school adjacent to GW's Foggy Bottom campus, during her

first three semesters at SEAS and then studied abroad in South Korea during the spring semester of her sophomore year. During her junior year she worked as a research assistant in Dr. Samer Hamdar's Transportation Engineering Laboratory, and last fall, she served as a teaching assistant (TA) in a civil engineering course taught by Dr. Sameh Badie.

"Being a TA was one of the most rewarding experiences, because I was given a lot of responsibility. I wanted to make the professor proud and make sure the students succeeded," Madison says. "Professor Badie was really incredible in that he challenged me to work hard, but he was very supportive, too."

Madison rounded out these experiences with a range of other activities that all relate to her primary interest, engineering and public health. First among them has been Engineers Without Borders (EWB). She's been involved with it throughout her four years, and in January, she participated in a project assessment trip to India, which she and junior Sophia Ertel co-led (*see story on page 22*).

Most of Madison's other college activities contributed to her work on the EWB team by giving her supporting knowledge and

Madison Haley



experiences. From a summer internship with a county department of health office and a job working for a water resources engineering firm, to an alternative break trip to Puerto Rico to learn about sustainable agriculture, Madison built on her understanding of public health and the impact engineers can have on it.

Reflecting on what she's been able to accomplish during these four years, she notes, "I came to GW; I worked at Peace Corps for a year; and I led a group of students to a brand new EWB project in India. I never thought that would all be possible coming into college."

Be Ready to Go

Jackie Bellefeuille has been interested in engineering and science for as long as she can remember. Coming into college, she knew she wanted to study engineering, but she wasn't sure which discipline was right for her. She found the answer in the SEAS introduction to engineering course her freshman year.

Jackie selected systems engineering as her major and is excited about the possibilities it has opened up for her. Last summer, in fact, she used her systems engineering knowledge while working as an intern with CAE, Inc., a manufacturer of simulation technologies, modeling technologies, and training services. Jackie was a member of a team that worked on design thinking problems, trying to find ways to improve training program processes for a CAE client.

"It was so much fun," she says. "It was different from any other internship I've had. Design thinking is much more creative and you get to look at all the different problems and solutions and make judgments to try to create a cohesive plan of action to fix the problems."

Jackie served as an intern at CAE through the Clark Engineering Scholars Program. As a Clark Scholar she found internships, worked with an alumni mentor, and even participated in a study abroad semester. During the fall of her junior year, she and three other GW students studied at Korea University. She found it both difficult and rewarding. "I usually think I'm pretty independent, but that was definitely a challenge," she recalls. "It was such a mind opening experience."



Jackie Bellefeuille

Jackie also credits other SEAS experiences with opening her mind and teaching her new skills. She's been involved in a number of activities during college, most notably the GW Robotics Team, the GW chapter of the Society of Women Engineers, and the SEAS peer mentor program. She co-founded the GW Robotics Team her freshman year, building the membership base, getting funding for the team, and leading the team to its first competition, where it won a design excellence award.

Jackie believes she learned valuable teamwork skills from the robotics team and important lessons from other experiences she has had at SEAS. And she very succinctly sums up the philosophy that has served her so well as a student. "Always take the opportunities that are given to you and be ready to go," she advises.

Long Term Thinking

SEAS benefits greatly from gifts that alumni and friends choose to make through planned gifts. We thank our bequest benefactors who made bequest intentions this fiscal year, as well as the families of benefactors who previously made commitments to SEAS that were realized this fiscal year upon the benefactors' passing.

This year, **Mr. Gennaro Colabatistto (MS '96) and his wife, Constance**, made a bequest intention to add to their scholarship that supports a student who is an active military member or veteran. **Dr. Rachelle Heller**, professor of computer science at SEAS, also made a bequest intention that will support the SEAS general fund and the new SEAS Center for Women in Engineering.

Dr. Heller says, "I'm pleased to be able to make a bequest that will be used toward something that is important to me. While computer science has changed over my lifetime, what has not changed is the

obligation I feel to make the path welcoming for the women who will come after me. My bequest can contribute to that goal."

Realized planned gifts this year came from a number of alumni and friends. The estate of **Emanuel Beck (BS '48)** augmented the Emanuel A. Beck Endowed Scholarship in electrical engineering, while the estate of **Mary Shepard (CCAS, BA '64)** made a generous bequest to support undergraduate scholarships for SEAS students. The estate of **Samuel Einfrank (BS '51)** made a charitable bequest to support the SEAS Dean's Fund, and the estate of **Edwin Henry Copenhaver, III (MS '75)** endowed a fund for graduate fellowships made in memory of Dr. Preston Shane, a former professor in the Department of Engineering Management and Systems Engineering. Finally, the estate of **Eleanor Chew, wife of Bernard Chew (BS '40)**, made a gift to establish the Bernard B. Chew Endowed Scholarship Fund to benefit undergraduate students pursuing a degree in mechanical engineering.

Bequest intentions are a good option for donors who wish to make a substantial gift to SEAS. In many cases, such as several of those mentioned in this article, donors choose to create a named, endowed fund that will last in perpetuity at GW. Bequest intentions also allow donors to have a bigger impact on SEAS than they otherwise would, because they give donors the option of making a larger gift than they are able to make with their current financial resources.

Planned gifts can be made through a will, trust, retirement account, Individual Retirement Accounts (IRAs), or other means.

If you would like to learn more about making a planned gift to SEAS, please contact Ms. Deanah McLeod, assistant vice president of development for SEAS, at deanahmcleod@gwu.edu.

GW Legacy
CHALLENGE
2019

Participate in the 2019 GW Legacy Challenge and give 110% to GW!

The 2019 GW Legacy Challenge provides an immediate cash match for donors who document new or increased planned gift commitments to the School of Engineering and Applied Science, such as gifts by will, trust, or IRA beneficiary designation. As a planned giving donor, you can direct matching funds to your area of interest (equal to 10% of the value of your planned gift, up to \$10,000).



You document your planned gift using the Legacy Challenge Gift Confirmation Form

+



10% Legacy Challenge Match Funds are directed where you specify

=



Immediate impact to your area of interest at GW

x



Future impact with your planned gift

Visit go.gwu.edu/give110SEAS to learn more.

THE GEORGE WASHINGTON UNIVERSITY
WASHINGTON, DC

DAR3550

News

Supporting the SEAS Transformation

SEAS thanks our alumni and friends whose generous gifts support new funds or programs that are helping to further the SEAS transformation. The following list includes those gifts received since April 1, 2017:

W. Scott Amey (MS '75) and his wife, Deborah, made an additional gift to support the Knowledge in Action Career Intern Fund (KACIF) at SEAS. KACIF is a highly competitive program that provides grants of up to \$3,000 to GW undergraduate and graduate students pursuing internships that are necessarily unpaid. Scott and Deborah also augmented their scholarship, which was initially created to support scholarships for children and grandchildren of veterans killed in action. Scott is a member of the GW Board of Trustees and the GW Engineering Hall of Fame.

The **Anthropocene Institute** made a gift to support Dr. David Nagel's research on Low Energy Nuclear Reactions.

David Berg (BS '68) and his wife, Diane, augmented their endowed scholarship with an additional gift of real estate. The David W. Berg Scholarship provides support for undergraduate civil engineering students at SEAS.

The **Nelson & Michele Carbonell Family Foundation** continued its support this year of the Nelson & Michele Carbonell Engineering Endowed Scholarship for students at SEAS. Nelson (BS '85) is the chair of the GW Board of Trustees and a member of the GW Engineering Hall of Fame.

Gennaro Colabatistto (MS '96) and his wife, Constance, added to their scholarship to support a student who is an active military member or veteran. Gene is a member of the SEAS National Advisory Council and the GW Engineering Hall of Fame.

Terry Collins (DSc '76) made a generous gift to create a biomedical engineering graduate fellowship at SEAS. Terry is a member of the SEAS

National Advisory Council and the GW Engineering Hall of Fame.

Mark Hughes, III (BA '69, MS '77) and his wife, Susan, continued their support of SEAS with a gift for the Marvin Dekelbaum Scholarship. Mark is a member of the SEAS National Advisory Council and the GW Engineering Hall of Fame.

David Martin and Jacqueline Martin each gave a gift to the GW Power and Promise Fund to support a scholarship for SEAS students.

Gerald McNichols (DSc '76) and his wife, Paula, endowed a merit- and need-based scholarship for a female undergraduate student in SEAS who is pursuing an engineering major. Gerald is a member of the GW Engineering Hall of Fame.

Nicholas Paleologos (BS '69) and his wife, Suellen, augmented their support of the Paleologos Scholarship Fund with a generous gift to support scholarship awards for undergraduate students pursuing a degree in civil engineering. Nick is a member of the SEAS National Advisory Council and the GW Engineering Hall of Fame.

Artie Polk (MEA '79) established a need-based scholarship for an undergraduate student at SEAS who is a graduate of an inner city public high school.

Structural Technologies made a gift to support Dr. Pedro Silva's research on column lap-splice confinement using a V-Wrap composite system.

Lin Weng (DSc '94) established the Lin Weng Scholarship for graduate students.

Chris Wiernicki (MS '83) and his wife, Joan, established the Chris and Joan Wiernicki Scholarship for undergraduate students. Chris is a member of the SEAS National Advisory Council and the GW Engineering Hall of Fame.

FRITZ PARTLOW DESIGN



Aran Hegarty

NAC Update

Fellow Colonials,

I am excited to begin serving in my new role as chair of the Dean's National Advisory Council (NAC). The School of Engineering and Applied Science started in 1884 as the Corcoran Scientific School, and I am happy to report that the state of our school is stronger than ever. Our strength as a school is not just that we are the leading engineering institution in the nation's capital, or that we are ensconced in the wonderful Science and Engineering Hall. It's also the strength that all of us as Colonials, both past and present, contribute to growing our legacy of engineering research, learning, and innovation.

I ask all of you to join me in supporting and growing the legacy of SEAS. What can our alumni do? The answer is quite simply to become engaged. Heed the call of "Colonials Helping Colonials." Take a student to lunch, answer a student's email or phone call, become a mentor, host a student tour at your company, bring on SEAS students as interns or employees, serve as a judge on campus, join a speaking panel, sponsor student and faculty research, collaborate with our faculty experts, attend a hiring fair, join a departmental council, sponsor an on-campus event, wear your SEAS apparel, and visit the campus and meet the dedicated and hardworking development staff at SEAS to learn more about how you can support your individual passion through a transformational gift of philanthropy. If you are already engaged with the SEAS community – thank you!

What sets us apart at SEAS is people. Visit the SEAS Engineering Hall of Fame and read the achievements of our alumni! Come to campus and meet our SEAS faculty. Leveraging the great achievements of these world-class academic leaders with the success of our alumni and students is part of the mission of those of us serving on the NAC.

I want to thank our past NAC chair, Kevin Kelly, for his steady leadership, and our new vice chair, Gene Colabatistto, who has heeded the call to serve with me in leading the NAC. There are so many past NAC members who have been friends and role models to me as I have become more involved with SEAS over the past decade. I thank Randy Graves, Mark Hughes, Terry Collins, Howard Tischler, Scott Amey, and Dave Karlgaard, who have done so much for the school.

To all my fellow NAC members and NAC emeritus members – thank you. So many people contribute their time and energy to make SEAS a better place, and I am grateful to serve with them. Finally, I want to thank the one person who has had the most profound impact on my experience of service at SEAS, our former dean, David Dolling. His decade of leadership was transformational.

Raise High,
Aran Hegarty

Celebrating Success

SEAS celebrated the successes of several alumni and friends last October at its annual GW Engineering Hall of Fame ceremony. SEAS Interim Dean Rumana Riffat welcomed five new members to the Hall of Fame and honored Leidos with the 2018 Distinguished Industry Partner Award.

SEAS congratulates the newest Hall of Fame members:

Karl (BS '92) and Vicki (BS '91) Gumtow are the founders of CyberPoint, a cyber security company that provides technical consulting and services to clients worldwide. Karl is the firm's chief executive officer, and Vicki is the director of shared services. They met at SEAS as undergraduates studying computer engineering and electrical engineering, respectively.

In 2009, the Gumtows launched CyberPoint with three employees and operated out of their condo in downtown Baltimore. Since then, they have created hundreds of jobs and have clients in several regions throughout the world. In 2015, *Inc. Magazine* named CyberPoint to its list of 5,000 fast growing privately held companies, and in 2011, 2012, and 2013, *Baltimore Magazine* named CyberPoint among its "Best Places to Work." To date, the Gumtows have created six companies and also have been generous philanthropists, dedicating themselves to building the Baltimore community. In 2017, they received GW's 2017 Distinguished Entrepreneurial Achievement Award, which is given annually to individuals who have been notably successful as entrepreneurs.

Anirudh Kulkarni (BS '86, MS '88) is the founder and chief executive officer of CVP. With operations research and analytics at its core, the company helps clients navigate change in areas of organization and culture, process innovation, and cyber security. He founded CVP in 2002, and the company now has more than 300 employees and a client list that includes the Centers for Medicare & Medicaid, the Department of Homeland Security, the Department of State, Blue Cross and Blue Shield, and many more. CVP was named in 2017 to the *Washington Post's* "Top Workplaces" list, the *Washington Business Journal's* "Fastest Growing Companies" list, and *Inc. Magazine's* "Inc. 5000" list.

Anirudh is active in the GW and SEAS community, where he is an annual sponsor of the Technology Prize at the GW New Venture Competition and a member of the SEAS National Advisory Council. He also serves as a mentor in the Clark Engineering Scholars Program, and he has endowed a new speaker series, the CVP Speaker Series at GW.

Dov (MS '83) and Elma Levy are the co-founders of Dovel Technologies, a government contracting IT company. Dov is the company's chief technologist, and Elma is the chair of the Board. In 1987, they founded Integrated Data Corporation, the predecessor to Dovel Technologies, as a two-person, at-home start-up.

Today, Dovel Technologies has more than 1,300 full-time equivalent employees and \$200 million in annual revenue. Currently, Dovel Technologies manages the FDA's Emergency Operations Network Incident Management System and the development of grantsolutions.gov, which manages \$80 billion in grants for the federal government. In 2015, 2016, and 2017, the company was listed on the *Washington Business Journal's* "50 Fastest Growing Companies" list.

The Levys are members of the SEAS National Advisory Council and have participated as hosts for GW's Dinner with Alumni Program and as mentors for the New Venture Competition. Elma has

DAVE SCAVONE/SCAVONE PHOTOGRAPHY

Left to right: Karl Gumtow, Anirudh Kulkarni, Julie Rosen (Leidos), SEAS Interim Dean Rumana Riffat, Jim Cantor (Leidos), Elma Levy, and Dov Levy (Not pictured: Vicki Gumtow)



served as a mentor for a Clark Engineering Scholar, a mentor for the National Science Foundation I-Corps program at GW, and a mentor-in-residence for GW's Office of Innovation & Entrepreneurship.

Following the Hall of Fame inductions, Dean Riffat presented the 2018 Distinguished Industry Partner Award to Leidos. Since joining the SEAS Industry Partner Program in 2014, Leidos has provided support for student and faculty research, alumni and student programming, and onsite recruitment activities at SEAS.

For three years, Leidos has been a lead sponsor of the SEAS Student Research and Development Showcase and has supported a number of mentoring and professional development opportunities for SEAS students, including the SEAS New Student Getaway, the Order of the Engineer Ceremony, and the GW chapters of the Society of American Military Engineers, the Association for Computing Machinery, the National Society of Black Engineers, and the Society of Women Engineers.

"SEAS is grateful for our partnership with Leidos," said Dean Riffat, "and we thank them for working jointly with us on our mutual goal of training dynamic and innovative future engineers and scientists."

SEAS Alumni Shine at Alumni Awards Ceremony

During Colonials Weekend 2018, GW honored nine alumni for their achievements and their service to GW and their communities. Three of those alumni call SEAS their home.

Nelson Carbonell (BS '85) was recognized with a Distinguished Alumni Achievement Award at the celebration. Nelson is an entrepreneur with more than 30 years of experience. He has founded several companies over the course of his career, beginning with Cysive in 1993. After growing the company from a basement start-up to a successful public company, he launched his next company, Snowbird Capital, in 2004. And in 2010, he founded his current company, Nelson Carbonell and Associates, to assist companies with strategy, financing, operations, and technology.

Nelson is an active member of both the GW community and the broader community.

ABBY GREENAWALT



Renee Lewis, Nelson Carbonell, and Mischel Kwon

At GW, he has served on the university's Board of Trustees for 18 years, the last six of those as chair of the Board. During this time, he has served on and chaired a number of committees, most notably for SEAS, the committee that led the full Board to approve the construction of the Science and Engineering Hall.

GW also recognized the accomplishments of **Mischel Kwon (CERT '04)** with a Distinguished Alumni Achievement Award. Mischel worked for many years in the computer programming field before earning her bachelor's and master's degrees in computer science. In 2004, she completed a graduate certificate in computer security and information assurance from GW, and from 2005 to 2012, she served as an adjunct professor at GW, teaching graduate-level computer science courses and running the GW Cyber Defense Lab.

In 2005, she was named deputy director for information technology security staff at the US Department of Justice, where she built the first Justice Security Operations Center to monitor and defend the department against cyber threats. During her career, Mischel also served as the director of the Department of Homeland Security's US Computer Emergency Readiness Team, and as vice president for public sector security solutions at RSA Security.

In 2016, Mischel founded her own company, MKACyber, as well as the

Cybersecurity Diversity Foundation. Recognizing her outstanding contributions to cybersecurity, the National Science Foundation's CyberCorps inducted Mischel into its Scholarships for Service Program Hall of Fame last year.

GW honored **Renee Lewis (MS '90)** for her contributions to the university with an Alumni Outstanding Service Award. Renee has been a passionate volunteer for GW for 18 years, with involvement that spans everything from hosting dinners for students to council membership.

Renee jumped into her first leadership role in 2000, as a member of the National Council for Education and Human Development. For 12 years, she leveraged her background in consulting to help devise strategies to enhance communications for GW's Graduate School of Education and Human Development, and then she began volunteering at SEAS and for various other programs at GW.

Since 2012, Renee has been a panelist, judge, and mentor for the Office of Innovation and Entrepreneurship; she has hosted students for the Dinner with Alumni Program; and she has served as a mentor, judge, and speaker for various SEAS student programs. She also served as the SEAS representative on the GW Alumni Association board from 2013 to 2018, and she acts as a mentor to a student in the Clark Engineering Scholars Program.

Thank You

SEAS thanks our alumni who donated their time to GW during calendar year 2018. The following alumni volunteered on campus or throughout the country or world during 2018:

Aftab Ahmad
William Alexander
Sana Al-Hajj
Beverly Allen
Rodolfo Alvarez
W. Scott Amey
Sairan Aqrawi
Sofia Aschettino
Huda Asfour
Paige Atkins
Thomas Beaulieu
Abdelghani Bellaachia
Rachael Bevill Burns
Yuanfei Bi
Zoe Bilis
Mary Brigden
William Brittle
Deborah Butterfly
Francesco Calabrese
Nelson Carbonell
Alicia Chau
Edward Chesnut
Dean Coclin
Alix Cohen
Nancy Cohen
Gennaro Colabatistto
Gregory Colevas
Terry Collins
Emma Crockett
Michael Cross
Elizabeth D'Andrea
Christine Darden
Aleksandra Desansky
Kristina Dibenedetto
Thomas Doherty
Shuqi Dong
Lindsey Draper
Carine Dumit
William Edison
Ana Maria Eigen
Amr El Sawy
Hatem Elbidweihy
Loretta Evans
Jose Febres
Xiaofan Feng
Barbara Fleming
Michael Fleming
Sukhdeep Gambhir
Beshoi Genidy
Andrew Goodman
Randolph Graves
Karl Gumtow
Vicki Gumtow
Sajjad Haider

Jon Halpern
Alexandra Halvordson
Shuye Han
Mahmudul Hasan
Zahin Hasan
Gazelle Hashemian
Aran Hegarty
Charles Hickey
John Holmblad
Katherine Horvath
Mamoud Hosseini
Elizabeth Hubler
Mark Hughes
Naeem Hussain
Amer Islam
Maher Itani
Douglas Jamieson
Kumar Jeev
Ashok Jha
Christyl Johnson
Shraddha Kale
Nada Kamona
David Karlgaard
Kevin Kelly
Issa Khozeimh
Sassan Kimiavi
Matthew Knouse
Anirudh Kulkarni
Nikhil Hanumantrao Kulkarni
Mischel Kwon
Andrew Lacher
Maryline Lamborn
Simon Lee
Chelsea Lenhart
Melissa Lesner
Dov Levy
Elma Levy
Renato Levy
Renee Lewis
Yaraslau Loban
Anna Long
Toma Taylor Makoundou
Arvin Malkani
Joseph Mancuso
Patrick Marolda
Lataunja Martin
Esther Massimini
Sonya Mazumdar
Kate McNally
Abdullah Meajil
Samia Melhem
Erin Mignano
Jillian Miles
Toebagoes Moetawakkil
Donna Mones
Kenise Morris
Asghar Mostafa
Matthew Mostafaei
Hongdi Mou
William Murphy
Mark Mykityshyn

Mitchell Narins
Richard Norman
Kristy Ortiz
Nicholas Paleologos
Enrique Pardo
Ricardo Parra
Mary Pastel
Akash Patel
Hetal Patel
Ketan Patel
Morteza Rahimi-Abkenar
Anushka Rai
George Reynolds
Monica Rigucci
Andre Rogers
Matthew Rogers
Jelena Roljevic
Rhiannon Scanlon
Brian Schmanske
Kassidy Schmitz
Claire Smith
Traci Smith
Shannon Solis
Richard Spires
Clifford Stearns
Lolita Street
T. Richard Stroupe
Michael Suder
Rajakumari Sudeswaran
Can Suer
Patrawoot Suesatayasilp
Kuanysh Taishibekov
Jing Tao
Shravalya Tirumala-Valet
Howard Tischler
Bentz Tozer
Comfort Uduebholo
Dipali Unadkat
L. William Varner
Jan Visintainer
Indrajeet Viswanathan
Ashley Wain
Kiersten Washle
Alexander Washofsky
Mandisa Watkins
Charles Watt
Alex Weller
Bradley Whittington
Carl Wick
Christopher Wiernicki
Kristen Wigglesworth
David Wilson
Christian Yip
Elvin Yüzügüllü
Bin Zhang
Yucheng Zhou
Tai Sen Zhuang
Mary Zikria

Happenings

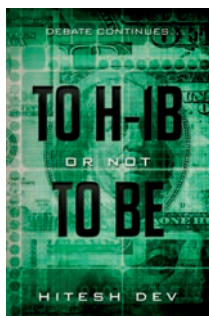


This past February, **Will Alexander, BS '04 (mechanical engineering), MBA '06**, faced off against four other contestants in the History Channel's "Truck Night in America" (Season 2, Episode 4). The show pits five contestants against one another and man-made obstacles in an off-road competition for \$10,000 and the title of "Truck Night Champion." Each season draws 50+ competitors from across the country. Will competed in his modified 2011 Nissan Frontier pickup truck named V.E.R.O.N.I.C.A.

In October 2018, XPrize Foundation named **Anousheh Ansari, MS '92 (electrical engineering)**, as its new CEO. XPrize is the world's leader in designing and operating incentive competitions to solve humanity's grand challenges.

Amrinder Arora, MS '01, DSc '06 (computer science), has recently published a second book, *101 Algorithms Questions You Must Know: Tricky Questions. Fun Solutions.* Amrinder is also an adjunct faculty member at SEAS.

James Boswell, MS '10 (systems engineering), is in need of a donor for a new kidney. If you know of someone who may be interested in being a donor to him, please contact his Living Donor Coordinator, Kirsten Greeley at Kirsten.Greeley@inova.org.



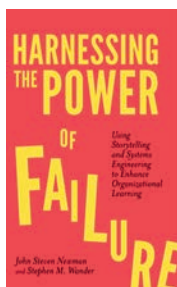
Hitesh Dev, MS '02 (computer science), has published *To H-1B or Not To Be: Debate Continues*, a fictional account of a young Indian boy who comes to work in the US. The book contains references to GW and Gelman Library.

Last February, **Aicha Evans, BS '96 (computer engineering)**, joined Zoox, a self-driving car company, as its CEO. Aicha previously was Intel's senior vice president and chief strategy officer.

Danny Georgiadis, PhD '13 (systems engineering), received the District of Columbia Council of Engineering and Architectural Societies' 2019 Engineer of the Year Award. He was nominated by the American Society of Naval Engineers and received the award at a banquet this past February.

Elliott Kugel, MS '83 (computer science), was nationally recognized in the September 30 issue of *Forbes* magazine as one of "America's Top 250 Wealth Advisors." He has been on the list each year since *Forbes* began the ranking three years ago. Elliott is a managing director of investments at Merrill Lynch in Bridgewater, NJ, and resides in Skillman, NJ.

This past April, **Renee Lewis, MS '90 (engineering management)**, received a 2019 Enterprising Women of the Year Award from *Enterprising Women* magazine. Renee is the president of Pensare Group/Leading Change Academy.



John Steven Newman, DSc '02 (systems engineering), and **Stephen M. Wander, MS '80 (engineering management)**, have published the book *Harnessing the Power of Failure: Using Storytelling and Systems Engineering to Enhance Organizational Learning*. The book explores a select handful of sensational failure events, illuminating the web of causes underlying each and highlighting the lessons applicable to a broad range of organizations.

Raymond O'Toole, Jr., PhD '19 (systems engineering), was selected this past February to the Senior Executive Service and to the position of deputy director for naval warfare, within the Office of the Director, Operational Test and Evaluation, Office of the Secretary of Defense.

The University of North Carolina at Chapel Hill named **Randa Radwan, PhD '15 (transportation safety engineering)**, its director of the Highway Safety Research Center in November 2018. She began her new position in December of last year.

Sarah Staab, MS '07 (systems engineering), is CEO and director of operations at DTIS, LLC, an award-winning government consulting firm headquartered in Washington, DC. DTIS has been steadily growing since Ms. Staab founded the company in 2008. She is always looking for excellent systems engineers to join the team, especially SEAS alumni.

Muhammad Zahid, MS '03 (telecomm & computers), retired from the Pakistan Air Force in 2013 and now works in academia, teaching at the Institute of Space Technology in Islamabad, Pakistan.

In May 2018, Analog Devices, Inc. awarded **Sam Zhang, MS '03 (mechanical engineering)**, the title of Analog Devices Fellow, a distinguished technical position given to engineers who contribute significantly to the company's success through exceptional innovation, leadership, and an unparalleled ability to unite and mentor others.



In Memoriam

George Reynolds, MS '73 (engineering management), passed away on July 22, 2018. A 45-year veteran of Northrop Grumman, George was responsible for developing strategies in partnership with key universities to recruit students. At SEAS, George served on the National Advisory Council, participated in the Engineer Mentor Fair, served on the Engineer Alumni Association Scholarship Committee, and spoke to the Clark Engineering Scholars.

Contact Us

SEAS ADMINISTRATION

Rumana Riffat
Interim Dean
202-994-6080

Yin-Lin Shen
Interim Associate Dean
for Academic Affairs
202-994-8591

Can E. Korman
Associate Dean for Research
and Graduate Studies
202-994-2245

Bhagirath Narahari
Associate Dean for Undergraduate
Affairs and Programs
202-994-6719

GW SERVICES
Alumni House
1-800-ALUMNI-7

SEAS SUPPORT SERVICES

Deanah McLeod
Assistant Vice President
Development and
Alumni Relations, SEAS
202-994-6059

Buthaina Shukri
Senior Associate Director of
Development, SEAS
202-994-4121

Durriyyah Jackson
Associate Director, Development
& Alumni Relations, SEAS
202-994-4036

Joanne Welsh
Director
Communications
202-994-2050

Chalvonna Smith
Director
SEAS Career Services Office
202-994-4205

Jonathan Ragone
Director
Undergraduate Advising
and Student Services
202-994-7133

Brittany Wright
Director
Graduate Admissions
202-994-6158

ACADEMIC PROGRAMS

Applied Science & Technology
202-994-2353
www.emse.seas.gwu.edu

Biomedical Engineering
202-994-3740
www.bme.seas.gwu.edu

Civil & Environmental Engineering
202-994-4901
www.cee.seas.gwu.edu

Computer Engineering
202-994-6083
www.ece.seas.gwu.edu

Computer Science
202-994-7181
www.cs.seas.gwu.edu

Cybersecurity
202-994-7181
www.cs.seas.gwu.edu

Electrical Engineering
202-994-6083
www.ece.seas.gwu.edu

Engineering Management
202-994-2353
www.emse.seas.gwu.edu

Mechanical & Aerospace Engineering

202-994-6749
www.mae.seas.gwu.edu

Systems Engineering
202-994-2353
www.emse.seas.gwu.edu

Telecommunications & Computers
202-994-6083
www.ece.seas.gwu.edu