NORWICH RECORD

THE MAGAZINE OF NORWICH UNIVERSITY

WINTER 2022

The Tech Issue

Nursing Lecturer
Sarah Manacek, MSN, RN

GRIT PRACTICE

Women's soccer team reserve goalie Rebbeca Karis '25 gives her all during a rainy preseason practice on Sabine Field. A first-year rook, Karis is a cybersecurity major from Fayetteville, N.C.

Photo by Mark Collier

FALL SPECTACULAR

A drone's-eye view of campus captures fall foliage approaching its peak on October 13.

Photo by Aram Boghosian

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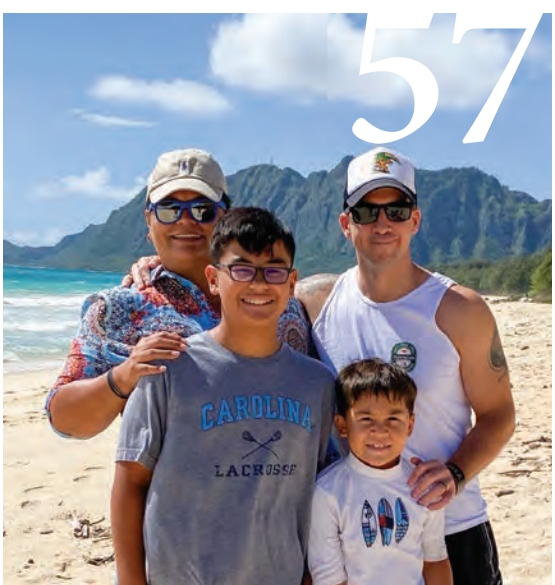

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Cover: School of Nursing lecturer and clinical instructor Sarah Manacek, MSN, RN. Photo by Aram Boghosian

V/R
LETTERS
FROM OUR READERS


Photo by Karen Kasmauski

Re: Giving His All, Dave Whaley's 40-Year NU Career (Fall 2021)

An Open Letter of Gratitude

Dave, as I read your [profile] in the latest *Norwich Record,* I got choked up, thinking what an outstanding, stand-up guy you are. One who credits his tremendous personal success and NU's excellence in fundraising to the team you built and to your family, who supported you and dealt with the absences as you traveled around the country selling and promoting the university you love so much.

Dave, you are an inspiration. I can remember clearly the day in March 2001 when you visited me at my home in Punta Gorda, Fla., and presented me with a framed picture of NU in honor of our giving for the *Leadership Campaign.*

You're a dynamic guy, and I am certain the void left [when you do retire] will be difficult to fill ... I wish you well. God bless you and your supportive and loving family. To me, you will always be Mr. Norwich.

P.S. Gen. Ernest Harmon would be proud of your traits, can-do attitude, leadership, courage, and loyalty to Norwich and family.

CHARLES A. BROX, JR. '57
(although it feels like 1857)

Editor's Note: *We're glad to note that Executive Vice President Dave Whaley has not yet retired and continues working on the Hill as chief of staff to Dr. Mark Anarumo, NU President.*

Re: A Silicon Valley Start-Up Aims High

Dear Editor: I always wanted to tell you how much I [still] enjoy your article. As a mom 3,000 miles away, you put me in the same room and allowed me to spend a day with my son [computer science major and start-up founder Saul Costa '14] ....

Lest we be deemed even greater ogres ... it was television and cable that were banned from our house [not movies] ... . We did have movie nights, especially during the winter months. I love recalling those times with all of us relaxing in front of a TV or, in later years, a monitor. (Dragging an old TV set in from the woodshed and watching fireworks emit from its back, due to condensation, has its own special place in those memories.) Saul put himself in charge of popcorn production; I should not be surprised now that he took over managing an important task.

I am so gratified to finally be able to tell you how much I enjoy your article. I still read it on a regular basis, and I am sure it is going to continue to be read by new viewers. I am just now realizing you captured a very special snapshot in time of Saul's and others' lives. Such is the power of words [from] a master craftsman.

God bless you,

ALLISON M. COSTA P'14
Waterville, Vt.

Editor's note: *Published five years ago in our Winter 2017 issue, the story chronicled the rollercoaster start-up experience of classmates Saul Costa '14 and Lauren Wyatt '14, the founders of a tech education platform called CodeEvolve. Renamed Next Tech, the company recently joined with PluralSight, a tech workforce development enterprise. An online version of the story is available on Medium.*

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CORRECTIONS

A photo caption on p. 38 in Class Notes in our Fall 2021 issue misidentified one Army Air Assault school graduate: it was Gabriel (not Alex) Gaetz '23. Also, on p. 23 we gave Jennifer Courneyer half the credit she deserves; she is the head coach of both the men's and women's swimming and diving team.

We regret the errors.

QUOTED

"What surprised me? The grass. I never thought it would be this green."

— Angel Rodriguez '25, architecture major, Marine ROTC scholar, and first-year rook from Manhattan, speaking on Rook Arrival Day in August.

"I owe everything good in my life to two entities—the military and higher education. Norwich represents the best of both. I believe sincerely it is my destiny to be here, at this very moment in time, to bring every lesson of my journey to positively influence who we are and where we are going as an institution."

—Retired Air Force colonel Dr. Mark Anarumo speaking at his inauguration ceremony as Norwich's 24th President on Sept. 22.

"Back in my day we had Tag-Along. He was a long, slow-moving basset hound .... He was around all the time. We never knew the owner, but he was well cared for by the Corps."

—Dominic Ruggerio '61 commenting on Facebook on Woodbury Hall's newly named presidential pup, Sally Rose.

"Learn the subjects of your classes, learn about character and leadership, and use that knowledge to learn about yourself and what you are going to stand for in life. That's why you are at Norwich."

—Col. William McCollough '91, USMC (Ret) recalling the advice his father gave him as a rook during a Sept. 14 speech celebrating his appointment as the 56th Commandant and Vice President of Student Affairs at Norwich.

"I AM GRATEFUL THAT THE NORWICH COMMUNITY STRIVES TO APPRECIATE THE DIFFERENT CULTURES THAT MAKE UP NORWICH'S STUDENT AND FACULTY POPULATION."

—Isabela G. Ferraro '22, international studies major and Army ROTC scholar from Wilbraham, Mass. Translated from the Spanish-language essay she published in the *Norwich Guidon* student newspaper on Sept. 30 while studying abroad at the University of Seville, Spain.

"Norwich University's selection to once again support the Department of Defense in a project to train the current and future generations of cyber professionals makes me proud as a Vermonter and as someone who has long seen the incredible things being done there."

—Sen. Patrick Leahy (Vt.), reflecting in September on the university's latest two-year, $18.5 million National Security Agency grant.

"[The] juxtaposition of environmental degradation and challenges to our security—national, physical, psychological, involving resources and beliefs—needs a careful study."

—Prof. Tara Kulkarni, chair of the Department of Civil and Environmental Engineering and director of the Center for Global Resilience and Security (CGRS) in an Oct. 13 blog post on the ongoing collaborations between CGRS, the NU Peace and War Center, and the Center for Cybersecurity and Forensics Education and Research.

THE PRESIDENT'S VIEW

FUTURE FOCUSED

Norwich is a "small school with a big impact," an identity developed over the 200-plus years of our storied existence. Our graduates rank among the most impactful leaders in the history of our nation and the world. The incredible success of our alumni and our university's sterling reputation can be attributed to many qualities, but for me our most remarkable characteristic is our devotion to being *relevant*. It is through this dedication we create impactful graduates.

The ways we have always committed to relevancy can be easily identified in our foundational programs; for example, we are proud to be the first private university in the country to teach civil engineering. Today, our highly regarded David Crawford School of Engineering continues to attract and prepare talented graduates in civil, electrical and computer, general, and mechanical engineering, along with construction management. Many alumni from these programs are highly sought after by established employers, while other graduates founded their own companies and are trailblazers in emerging industries.

Our School of Cybersecurity, Data Science, and Computing has been similarly impactful, with alumni likewise celebrated. Norwich recognized the nation's critical need for cybersecurity expertise decades ago, well before most other institutions of higher education. The foundation was laid "ahead of the curve" for what is today an internationally celebrated cybersecurity program.

We also celebrate our pioneering online College of Graduate and Continuing Studies. When launched in 1998, an online MBA program was considered a novelty; it is now ubiquitous across higher education. CGCS continues to innovate and create programs that meet demands for relevancy now and in the future.

These are just some of many examples that spotlight Norwich's historic role as a leader in higher education. It is from this foundation that we are now moving into a period of renewed focus on innovation and program review to ensure our relevance in a rapidly changing world. We must ensure our graduates are prepared to excel in the application of not only current technologies, but emerging ones. Through our rededication to future relevance, Norwich will not follow trends; we will set them.

There are several fields in which we will begin to apply significant energy—artificial intelligence, data analytics, and machine learning, to name a few. Through intense evaluation of these emerging areas, we will undoubtably find additional fields in which we will establish ourselves as leaders. This established "future-focus" will be positively transformational to our institution, nation, and the world.

Norwich is ready now to move aggressively. Our students, faculty, staff, and alumni are performing at the cutting edge of their disciplines. Many in our community are already adapting and applying new technologies to how they teach, create, build, and lead in new and more effective ways. This issue of the *Record* spotlights some of these influencers.

Photo by Mark Collier

Among them are David Toomey '85, a former Air Force Colonel who flew the F-117 Stealth before being asked to lead the USAF 688th Cyberspace Wing in San Antonio, Tex. Today, Toomey is an assistant vice president with SRC, Inc., a nonprofit research and development company that supports the Department of Defense. He also serves on the Board of Fellows for NU's School of Cybersecurity, Data Science, and Computing. Toomey and others on the board, such as Meta's Gunjan Shah '96 and Stephan Rockwell '96 of Palo Alto Networks, share their insights on realities of present and emerging technologies that will profoundly shape our world. Toomey, for example, offers a précis on the revolution of "edge computing" in space and neuromorphics, circuits modeled on the brain that require minimal power. Closer to home, nursing instructors Sarah Manacek, MSN (featured on the cover of this issue), and Prof. Llynne Kiernan, DNP, will soon incorporate virtual reality to enhance the learning environment and lab experience of students in the School of Nursing, an innovation that will ensure Norwich students remain highly prized upon graduation.

Several smaller-scale innovations are proving to have a big impact on our campus community. A fascinating example comes from Scott Caulfield, NU's newly hired Strength and Conditioning Program director, a creative force in his own right. Since joining the Norwich athletic program in August, Caulfield has transformed the conditioning experience for Norwich coaches and our 600+ student athletes. As you'll read in this issue, one of the tools Caulfield has introduced to campus is an AI-powered app, Volt Athletics, that lets him provide personalized, sport- and athlete-specific workouts at scale. Volt gathers real-time data on the physical metrics of our athletes and tailors workouts to achieve optimal individual effect. Men's lacrosse coach Neal Anderson uses similar methods to ensure his athletes are ready to perform at their peak, not only on the field, but in the classroom and at work. These creative applications of emerging technologies are preparing our students to perform at optimum levels, reducing injuries and providing a foun-

dation for a lifetime of health and fitness.

Wherever they work—on campus, in the private sector, our military, or elsewhere—Norwich students, alumni, staff, and faculty are exploring and applying new technologies. As we move forward as a university, we must leverage their insights to learn, adapt, and innovate. We are actively applying our core values and rich history to increase our organizational agility; we will become more tolerant of risk to achieve a state of perpetual innovation. We must be prepared to respond strategically and effectively to the emerging technologies that will transform the lives and careers of our graduates.

Norwich is reclaiming our identity as a future-focused university. This commitment is being formalized in the new strategic plan that will be implemented in Fall 2022, the pillars of which are innovation, relevancy, agility, and student success. We will be passionately focused on preparing our graduates to not just succeed, but to lead, in fields that do not yet even exist. Our proud history and legacy of excellence demand such boldness. We are excited to not just be part of the future, but to shape it, as the exceptional community that has earned the Norwich name.

Norwich Together, Norwich Forever!

Dr. Mark Anarumo
Colonel, USAF (Ret)
President

NEWS FROM THE HILL

Photos by Mark Collier (top); iStock

HONORING THE FALLEN

U.S. Army Gen. Michael X. Garrett visited the Hill in Nov. to speak with the Corps of Cadets and honor U.S. Army Sgt. Adam Kennedy '04, a Norwich graduate and former Mountain Cold Weather Company member, who died April 8, 2007, in Al Diwaniyah, Iraq.

Kennedy, 25, served in the Army's 25th Infantry Division's 4th Brigade Combat Team when he deployed to Iraq, and served on Garrett's security team. An enemy rocket hit and killed Kennedy as he drove Garrett's vehicle.

"He represented Norwich and lived by the values that each of you are carrying on today. He did so with exceptional pride," Garrett said. "Today's visit is something that has been prominent on my list of things to do since Adam died. Deeply personal to me, because I consider this a small way to honor him and his service."

FUN FACT

Barkitechture

Architecture students in Stephen Plunkard's Site Design class have been working with Northfield community members to design a dog park.

5 STORIES TO CATCH ON NORWICH.EDU

> 1. Engineering Accreditation

The David Crawford School of Engineering renewed its six-year accreditation from the Accreditation Board for Engineering and Technology (ABET) for three bachelor of science programs in civil engineering, electrical and computer engineering, and mechanical engineering. The approval follows a yearlong self-study and outside review process, which was completed in 2021.

> 2. Shipping Container Homes

Norwich students will develop a site plan with eight to ten cargo container units and a community building on a ten-acre site in Waitsfield, Vt. Three completed shipping container homes will be built on the site, a setting for an affordable housing community. Another home will house farm workers in Shelburne.

> 3. Korea Exchange

In Oct., NU formalized an exchange program with the Korea Military Academy in Seoul, South Korea. The five-year deal was signed during the International Symposium of Military Academies Conference hosted by Norwich. Lt. Gen. Jung Soo Kim, the Korea Military Academy's superintendent, joined Pres. Anarumo for the signing.

> 4. Class Rings

NU's ring tradition marks its centennial with the Class of 2023, a milestone noted in the NUCC ring, which features the date 1923 in a compass rose. The civilian ring includes a phoenix, notes Junior Ring Committee member, Renata De Paiva '23, a computer science major from Brazil. "We wanted something to represent COVID, because of how difficult it was for us, how it was unexpected and a challenge."

> 5. Presidential Pup

After adopting an eight-week-old, female brindle boxer, Pres. Anarumo and his family asked students to help pick a name. Online voting on the top picks from 117 suggestions narrowed the field to Rookie, Liberty, Cammie, Scout, and Ghillie, among others. The winner: Sally Rose.

NU ADVANCES IN U.S. NEWS & WORLD REPORT RANKINGS

Norwich has made the Best National Universities rankings compiled by national newsmagazine *U.S. News & World Report.*

For the fifth consecutive year, NU improved its rank as a regional university; as a school ranked highly for veterans; and as a top national undergraduate engineering program. Norwich also made the best value school and best undergraduate computer science program lists after being unranked in both in 2021.

Two years ago, a study by Georgetown University's Center on Education and the Workforce, *(A First Try at ROI),* ranked Norwich in the top 7% for best net value among the 4,529 schools ranked.

"Norwich University continues to climb college ranking lists, both nationally and regionally," Dr. Mark Anarumo, NU President, said. "I am especially proud to see us move into high ranking for categories in which we weren't even mentioned last year. That is an extraordinary accomplishment.

"The fact we have earned an elevated position among the best in the nation is very important to our students and families, including affordability, as an exemplar for veterans, and in multiple academic programs."

56TH COMMANDANT

Photo courtesy of USMC

Col. William McCollough '91, USMC (Ret.) was named in Sept. as the 56th Commandant of the Norwich University Corps of Cadets and vice president of Student Affairs. "I am humbled and excited to assume the duties of Commandant and Vice President of Student Affairs at my alma mater," McCollough said. "Norwich provided me with a firm foundation and prepared me well for the opportunities and challenges of the last 30 years. I look forward to paying that back by guiding and developing the next generation of outstanding military and citizen leaders we are known for producing." McCollough takes up the post in June 2022. For more on his distinguished career, visit www.norwich.edu/news.

"Norwich University continues to climb college ranking lists, both nationally and regionally."

DATA

THE CYBER LEADER DEVELOPMENT PROGRAM

Norwich is the lead grant investigator in a consortium of six senior military colleges designed to grow the nation's pipeline of cybersecurity talent filling crucial roles in the Department of Defense. Known as the DoD Senior Military College Cyber Institute, the pilot program formally launched one year ago with a $10 million grant from the Department of Defense and received a second $18.5 million, two-year grant in October. "Our Cyber Leader Development Programs provide military and civilian students with DoD-focused cyber experiential and immersive opportunities to include internships, research projects, competitions, and certifications to prepare for cyber work roles," says NU Associate Vice President for Strategic Partnerships Col. Sharon Hamilton, PhD, USA (Ret.). The foundation for the program was sparked four years ago. Hamilton (then based at the University of North Georgia), Phil Sussman '81, president of the Norwich University Applied Research Institutes, and colleagues at the other senior military colleges saw that they were uniquely positioned to work collaboratively to help fill the DoD's cybersecurity talent gap. "We saw there was a need … and proposed a team solution," Hamilton says.

Image by iStock

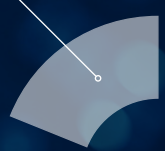
FUNDING

$18.5 MILLION

TWO-YEAR NATIONAL SECURITY AGENCY GRANT

Award shared among the nation's six senior military colleges: Norwich, Virginia Tech, Virginia Military Institute, The Citadel, University of North Georgia, and Texas A&M. Funds support fiscal year 2022 and 2023 programming.

18.68%



$4.25 MILLION

NU'S SHARE

Norwich serves as the grant's principal investigator. Campus programs are offered through the NU Cyber Institute based in the School of Cybersecurity, Data Science, and Computing (SCDC). "We're at a very critical juncture in cyber at Norwich because the [national] need is great at the same point in history when our programs are expanding to meet that need," says Cyber Institute and SCDC Director Prof. Michael Battig, PhD.

MISSION

Enhance cyber skills and expand the national cybersecurity talent pipeline to meet the high demand for DoD cyber professionals. Support undergraduate cybersecurity majors with real-world experiential learning and professional development opportunities. Outreach extends to K–12 schools, teachers, and students—especially middle schools in underserved and rural communities.

STUDENTS FIRST

"We very intentionally put very few dollars into overhead. We want to push everything down to the students," Hamilton says. Students are selected for paid internships and provided funds to cover related travel, food, and lodging costs as well as costs for academic conferences and competitions.

EXPERIENTIAL LEARNING

Classroom learning only goes so far. The Cyber Leader Development Program specifically aims to enhance student participation in cyber-related internships, competitions, conferences, student clubs and study groups, research projects, and capstone projects.

FACULTY SUPPORT

NU's School of Cybersecurity, Data Science, and Computing (SCDC) is home to the fastest-growing majors on campus. Grant dollars support cybersecurity faculty research, professional development, and certifications. They also support new SCDC faculty and Cyber Institute staff hires. Coming soon: faculty exchanges and joint summer programming for students among the six senior military colleges.

FUTURE PLANS

The Cyber Leadership Development Program at NU and its five SMC partners serve as models that can be shared more broadly. DoD designation as a program of record would allow support to other colleges and universities designated by the National Security Agency as academic centers of cybersecurity excellence.

FOCUS

FACULTY DREAM TEAM

Teamwork makes the dream work, as the saying goes—one that applies at the School of Cybersecurity, Data Science, and Computing. "As educators, we're telling our students that everything they do is teamwork," says Director Michael Battig, PhD. "We need to walk that talk." Fortunately, that's not a heavy lift. School faculty and staff make an extraordinary team. "Everybody has different strengths," Battig says. "Everybody is comfortable in their role, [and] they're really good at it." The clincher? "Everybody likes each other and gets along well and that makes for a well-oiled machine. Students figure that out."

1. Lauren Provost, PhD
Assistant Professor, *Computer Science and Cybersecurity*

2. Frank Vanecek, DBA
Professor, *Computer Science*; NU Senior Vice President

3. Matthew Bovee, PhD
Associate Professor, *Cybersecurity and Computer Science*

Photo by Aram Boghosian

4. Jonathan Adkins, PhD
Assistant Professor, *Cybersecurity and Digital Forensics*

5. Michael Battig, PhD
Professor, *Computer Science;*
Director, *School of Cybersecurity, Data Science, and Computing;*
Director, *Cyber Institute*

6. Kelli Sutton-Bosley, MMH '13, MAH '16
Assistant Director, *Cyber Institute*

7. Huw Reed, PhD
Professor, *Cybersecurity and Digital Forensics;*
Director, *Center for Cybersecurity and Forensics Education and Research;*
Director, *Global Cyber Threat Observatory*

8. Kris Rowley '01, M'06
Lecturer, *Computer Security and Information Assurance*

MORE MVPs (not pictured):

Ahmed Abdeen Hamed, PhD
Assistant Professor, *Computer Science*

Jeremy Hansen, PhD
Associate Professor, *Computer Science*

Charles Snow, PhD
Associate Professor, *Computer Science*

CAREERS

EXPERIENCE MATTERS

Internships help cybersecurity majors apply what they learn in the classroom to real-life work challenges

BY BETH LUBERECKI

Tyler C. Hayes '23 has been interested in the cyber world since he was a kid. He liked playing around with computers and solving his family's tech issues, and he built his first computer during his freshman year of high school.

The School of Cybersecurity, Data Science, and Computing was a primary reason why Hayes elected to attend Norwich, a designated Center of Academic Excellence in Cyber Defense Education by the U.S. National Security Agency. Also designated a Center of Digital Forensics Academic Excellence by the Defense of Cyber Crime Center of the U.S. Air Force Office of Special Operations, NU's cybersecurity programs are ranked among the nation's best.

As he works toward his bachelor's degree in computer security and information assurance, Hayes is learning about malware, forensics, and other cybersecurity fundamentals required in his chosen career field. But he's already had the chance to apply his academic knowledge outside the classroom through internships. "I'm very thankful for these internships, because they allowed me to see the real-world applicability of the classes I'm taking now," Hayes says.

Over the summer, the Army ROTC scholar interned at the Army Cyber Institute at West Point, researching cyberattacks on transportation and other critical infrastructure. He also interned with the Norwich University Applied Research Institutes (NUARI) as a security analyst, monitoring client network traffic for threats and researching current issues in cybersecurity.

NU's Cyber Institute Cyber Leader Development Program provided funding to make both internships possible for Hayes. (NU serves as the lead institution for the Department of Defense's Cyber Institute program at the nation's six senior military colleges, which aims to expand the country's cyber talent pipeline. *Related story p. 12.*)

"Being able to take what you've learned in class and apply it, practice it, and work with others who have similar interests and skills helps students build competencies and a much richer resume or portfolio prior to graduation," says retired U.S. Army Col. Sharon R. Hamilton, PhD, associate vice president of strategic partnerships at Norwich and the leader of the DoD Senior Military College Cyber Institute Program. "In our discussions with DoD hiring authorities and with private and defense industries, this is what they're looking for. They see that someone has a degree in cybersecurity, but what does that mean and what competencies do they possess?"

Henry C. Millar '24 recently began an internship through the NU Cyber Institute Cyber Leader Development Program conducting research with Associate Professor of Computer Science Matthew Bovee, PhD, to assess whether Vermont small businesses and local governments are prepared for and protected from cyberthreats.

That multi-semester project will complement the experience the cybersecurity and mathematics double major gained last summer when he upgraded the technology at his Virginia high school. For that project, Millar researched what worked and what didn't at other schools before installing new projectors, smartboards, and TVs and replacing the school's entire wireless network.

"It was a significant undertaking," Millar says. "You learn a lot about the physical infrastructure of a campus when you're fundamentally replacing it."

The sophomore says he understands the benefit of that first-hand experience. "There's a ton of value, especially at the undergraduate level, in being able to get real-world experience," he says. "It helps you make much better and more informed decisions about where you want your life to go." For Millar, those future plans include a PhD in computer science and a college professorship.

Internships and other experiential learning opportunities are all but a necessity for today's cyber majors.

"There's base knowledge that we're imparting," says Prof. Michael E. Battig, PhD, who directs the School of Cybersecurity, Data Science, and Computing and the Norwich Cyber Institute. "But the actual practice is a different beast. There's so much that we can't simulate and can't teach in higher education, even just simple things like office and company dynamics."

That's why internships that take students beyond the classroom are so vital. "Students are going to have a hard time differentiating themselves from other competitors for a job if they don't have at least one internship," Battig says. "If they have a degree but just worked at Starbucks for a few summers, they're just not going to get it. Employers go for students who showed the initiative and drive to go out and pursue things."

By doing so, students learn workplace skills that have nothing to do with a computer. Assistant Professor of Computer Science and Cybersecurity Lauren E. Provost, PhD, dubs skills like persistence and creativity "power skills."

"Recruiters like students who can come

CYBER DEFENDER

Army ROTC scholar Tyler C. Hayes '23 plans to commission into the Army after graduation, where he aims to work in cybersecurity.

in and get to work," Provost says. "They're looking for graduates to be ready to work and solve complex problems, and they look for that experiential learning piece as the skill building required to solve complex problems, which results in students who are not scared about ambiguity....It's building that confidence and persistence to say, 'That wasn't the solution right now, but let's pick ourselves up and keep going because we still have to solve this problem.' That persistence is something recruiters are really looking for that they feel is lacking a lot of times."

Provost is currently working with a number of student interns on research projects involving ethical hacking or leading student cybersecurity clubs and competitions. The internships, which support students in the Cyber Leader Development Program, are funded by the Norwich Cyber Institute.

As the DOD's Cyber Institute program at Norwich and other senior military colleges enters its second phase, Hamilton says she looks forward to providing even more opportunities for cybersecurity students to gain first-hand experience through internships, cyber competitions, and leadership development initiatives that will serve as stepping stones for their careers. "Our students are uniquely qualified," she says. "They come to a senior military college because they have interest in national service, want to be leaders, and want to learn and be the best in their academic programs. We build on that by providing lots of opportunities to gain experience." ■

Photo by Sean Markey

ESSAY

WIRED TOGETHER

Knowing what to let go of is just as important as knowing what to keep. Life lessons for students and alumni from the world of neuroscience

BY MEGAN DOCZI, PHD

Neuroscientist and biology professor Megan Doczi, PhD, received the 2021 Homer L. Dodge Award for Excellence in Teaching. The following essay is adapted from her September Convocation address to the Norwich community.

When I was a student, if someone asked me what I wanted to be when I grow up, I would often reply, "Oh, I don't know, a doctor, a scientist … but the *last* thing I want to do is teach." That final caveat was mainly due to my intense fear of public speaking. I'm sure some can relate to that feeling: The palms of your hands get sweaty, your breathing becomes rapid and shallow, your heart pounds out of your chest. In neuroscience, we refer to this as the fight-or-flight response, one often motivated by fear. It's the feeling we get when delivering a classroom presentation, defending our country, or falling in love. This involuntary part of our nervous system is in place to ensure that we respond effectively to external threats, protecting us in emergency situations.

Not everyone is interested in neuroscience. But we all have a brain, and the human brain is the only organ in our body that has the capacity to study itself. What if understanding the human brain could also help us understand more about the broader connections in the world around us?

Your brain is made up of approximately 86 *billion* neurons. (Yes, that's billion with a "b.") These neurons are the functional information-processing units of the brain. They are connected to each other via synapses, or junctions, where neurons can communicate with each other. These billions of neurons, connected by trillions of synapses, far outnumber the abundance of stars even in our own Milky Way galaxy. Right here, inside our own heads. And much like the universe around us, these connections in the human brain are constantly changing. Adapting. Learning. Dismantling.

Our human experience physically changes our brain and creates a phenomenon known as synaptic plasticity. But what do these synapses look like? Are they organized into seemingly endless arrays of parallel lines? Are they completely mismatched and random, zigzagging their way around our minds? Or is it something in-between? And more important, should we ask the question how do these synapses change?

In neuroscience, there is a widely held model that explains how neuronal circuits might refine their connectivity based on the patterned firing of brain cells. It goes something like this: *Neurons that fire together, wire together.* In the 1940s, neuropsychologist Donald Hebb used these words to describe how neuronal pathways in the brain could be formed and reinforced by repetitive firing of electrical signals. In other words, "Practice. Makes. Perfect." This model remains one of the most widely held theories of learning and memory, even today. *Neurons that fire together, wire together.* This means a neuron that fires at the same time as its neighbors will cooperatively form strong, stable connections onto its partner cells. Some of these connections are fleeting, but some may last an entire lifetime. Others may even survive longer than that.

For those of you just stepping foot onto campus, you will be bombarded with new experiences, new knowledge, new relationships. Rooks and cadets, when you march in formation on the Upper Parade Ground, your motor neurons are firing rhythmically, in unison, with those around you. One distraction and you are out of step with the crowd. In those moments, your brain is solidifying a pattern. The same pattern as the alumni who marched before you and the same pattern as generations yet to come. This is a collective connectivity that will unite you for a lifetime. Athletes, musicians, academics, you are all here building on the work of others, while leaving your own personal mark on the Norwich community. Freshmen, you now have four years to form new physical connections in your brain. Which ones will you choose to make stronger? Seniors in the Class of 2022, your time at Norwich is coming to a close, and the synapses that you formed here will propel you into your next chapter of life. Which connections will you choose to take with you?

You might wonder what happens to those neurons that don't fire together. Well, just as there is a need to strengthen the important connections in our lives, we also need to let go of the elements that are holding us back. *Neurons out of sync will lose their link.* A neuron that fires out of synchrony with its

Photo by Mark Collier

partner cells will actually weaken its linkages, thereby destabilizing and withdrawing its connections. Some of us might even say, "Use it or lose it," comparing synaptic strength to a daily exercise regimen, or a lack thereof. *Neurons out of sync will lose their link.* This allows the nervous system to be selective and efficient with its resources. Not everything you experience will stay with you. In fact, it is the pruning back of synapses in the human brain that helps facilitate the growth of other connections, much like pruning lilacs, or tomato plants, or apple trees. Detaching from the unfruitful components of your life will free up energy to establish more meaningful growth. For us to redirect this energy in a more positive way, we have to accept that it's OK to let go of things that aren't beneficial for us. In your time at Norwich, you may decide to change classes, change majors, or change your perspective of the world. This is your opportunity to embrace individuality. Knowing what to let go of is just as important as knowing what to keep.

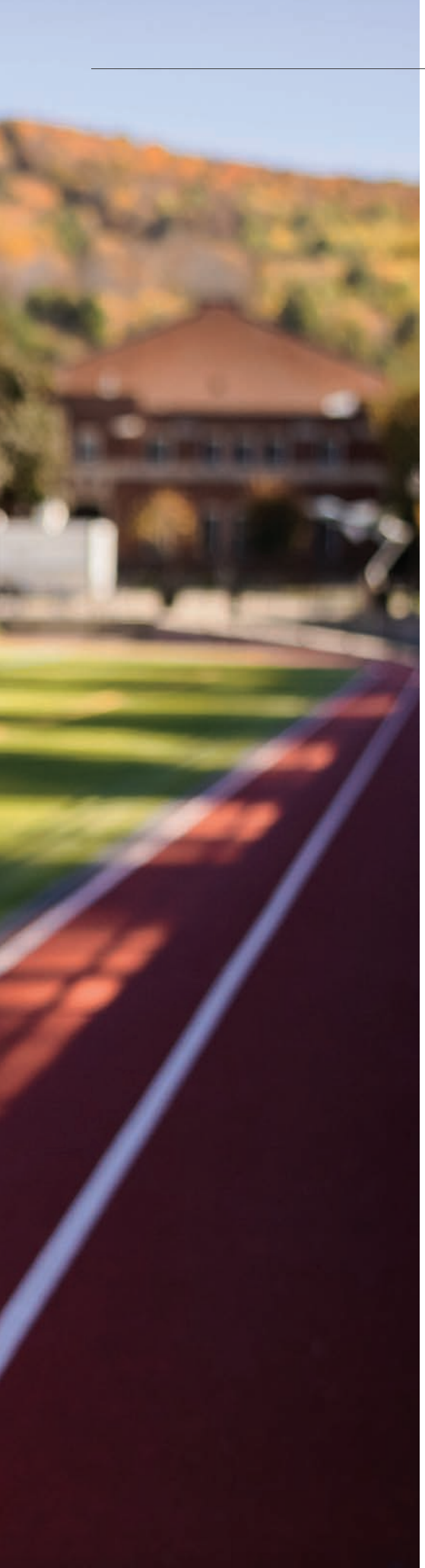
Let me share a personal example. Like many of you, I was a first-generation college student. While my parents didn't pursue higher education for themselves, they completely supported my love for learning and pushed me to go as far as knowledge would take me. By now it's no secret that my passion is the human brain—I knew this from my very first psychology class in high school. My obvious trajectory was always to become a doctor. When I learned how to drive, my parents even bought me a license plate that read "MD-MD," which stood for Megan Doczi, medical doctor. No pressure or anything! I shadowed in hospitals, I took the MCAT, but the whole time it just didn't feel right. It felt out of sync. I wanted to go to medical school, but I didn't want to be a medical doctor. I wanted to learn everything about the human body, but I wasn't confident I could shoulder the emotional responsibility of treating patients when something went wrong. So I taught myself how to let go of the world's expectations. I worked to prune back the ideas of what other people wanted me to be. I focused my energy on reinforcing the stable connections that would drive me in my own unique direction. Now that I'm all grown up, I find that those dreams I had as a student did come true. I am a doctor (of philosophy), I am a scientist, and the last thing I *want* to do ... is *teach.*

So when your hands get sweaty, your breathing becomes rapid, and your heart pounds out of your chest, realize that this fight-or-flight response is what makes you feel most alive. It's what forces you to fight for the things that matter most: your ideas, your freedom, the people you love. In the words of President Emeritus Richard Schneider, "We are one team, one fight." In the classroom and on the field, our neurons are firing together, wiring together, and this is our chance to build something so strong that it will transcend the boundaries of Norwich University. ■

Megan Doczi is an associate professor of biology and chair of the Biology Department. In her lab, she investigates the role of voltage-gated potassium channels in the developmental patterning of hypothalamic circuits governing food intake and energy expenditure.

POWER LIFT
Scott Caulfield (a.k.a. "Dr. Jacked") has worked with Division I college teams and athletes, as well as the gold-medal-winning 2014 U.S. Paralympic sled hockey team.

Photo by Aram Boghosian



ATHLETICS

STRONGER, FASTER, BETTER

How NU Strength and Conditioning Program Director Scott Caulfield is using training, tech, and social media to boost student-athletes

BY DEREK DUNNING

As fits go, newly arrived Strength and Condition Program Director Scott Caulfield and Norwich Athletics seem just about perfect. A central Vermont native and Navy veteran, Caulfield already had experience with Cadets athletics: His first job as a strength and conditioning coach was a part-time gig with the men's rugby team in 2003. As a boy, he even carved turns on the NU Ski Hill.

Today, Caulfield is a nationally recognized leader in the strength and conditioning community. His social media presence as "Dr. Jacked," a source of workout routines, technique, and endless positive motivation, also has a huge following.

Since taking the helm in August, Caulfield has invigorated Norwich's Strength and Conditioning Program, garnering buy-in among coaching staff and some 600 varsity student-athletes from the get-go. Step into the varsity weight room in Andrews Hall on any given day and the energy in the room is palpable.

"Coach Caulfield knows how to develop people to be the best version of themselves in the weight room, which transfers onto the ice," says Alexa Berg '22, goalie for the women's hockey team. She adds that Caulfield is present and committed to every weightlifting and conditioning session the team holds.

Before arriving at Norwich full-time, Caulfield spent a decade with the National Strength and Conditioning Association (NSCA) in Colorado Springs, Colo., where he became a face for the organization, speaking at strength and conditioning events around the country and connecting with collegiate coaches.

He also worked with China's national short-track speed skating team and the gold-medal-winning 2014 U.S. Paralympic sled hockey team. Beyond the rink, Caulfield has helped train tactical U.S. Special Forces units and the Colorado Springs Police SWAT team.

More recently, he spent two years directing strength and conditioning at Colorado College, working with the Tigers' Division I men's hockey and women's soccer teams and the college's 14 other NCAA Division III athletic programs.

At Norwich, Caulfield has already made an impact. Among his innovations is the introduction of an AI-powered app, Volt Athletics. The intelligent training platform helps Caulfield generate visually intuitive, sport- and athlete-specific workouts tailored to each student-athlete. Real-time data and feedback help athletes optimize their workout based on their body's condition at any given time and track progress over time.

Graduate student Scott Swanson, a men's hockey team captain, says the app has been "a game-changer" for his team. Workouts are "well thought out and prepare us

> “MANY OF OUR STUDENTS DO MORE BEFORE 6 A.M. THAN [OTHERS] DO IN THEIR ENTIRE DAY.”

for competition on and off the ice,” he says. Swanson and his teammates use the app to stay connected and track each other’s progress even when schedule conflicts prevent them from working out together.

“Today’s student-athletes are so in tune with technology that this app is second nature to them,” Caulfield says. “I have the ability to modify a workout [and] the app’s AI can adjust the workout depending on how the individual is feeling during the set and the movement or any injuries that might be preventing them from doing that exercise.”

Other Caulfield innovations that predate his arrival on the Hill include a specific variation of a preacher curl movement named the Caulfield Curl and savvy use of social media. His personal “Dr. Jacked” social media brand has more than 11,000 followers on Instagram and Twitter.

Caulfield has continued to use social media to build positive energy and culture by creating the Norwich Strength and Conditioning (@norwichsc) Instagram page, which in just a few months has already attracted nearly a 1,000 followers, many current student-athletes among them.

“For me, social media has been a way to connect and interact with more professionals,” Caulfield says. “It started with following NHL strength coaches that I admired and became a way to connect with people I didn’t know to growing pretty significantly from my time at the NSCA.”

“I also strongly believe [that] being ... a good representative of the profession helps connect with the student-athletes. Social media gives them a glimpse into our lives. I’m not just here to just do a job. This is what I live for every day.”

As problems go, Caulfield’s presence and energy in the Norwich weight room this fall have created a good kind to have—too many athletes to train and not enough hours in the day. He was able to recruit Maki Shuchuk ’18, a former women’s hockey standout and member of the 2018 NCAA Division III National Championship team.

Initially brought on as a part-timer in August, Shuchuk was since elevated to full-time staff in October, thanks to quickly developing her own strong rapport with student-athletes and teams.

“Maki is such a great fit to balance things as an assistant,” Caulfield says. “Having someone else who is not exactly like me is critical. The hype and buzz we have had is because each of us can connect with the student-athletes and teams in different ways.”

* * *

For Caulfield, a big draw in coming to Norwich was the type of students he gets to work with day to day. “The physical culture here is quite a bit higher than the average,” Caulfield says. “Many of our students do more before 6 a.m. than [others] do in their entire day. They want to be coached in the weight room, and you don’t have to tell them to do things. They just do them, because the attention to detail is engrained into them from the moment they set foot on campus.”

Caulfield says his next big goal is to work toward funding and building a multi-use athletic and recreational facility that can

HUMAN KANGAROO
Wide receiver Trevor Chase '23 does hurdle hops under the gaze of football teammate Zev Motew '22 (left), women's hockey goalie Alex Berg '22, and Scott Caulfield, shadowed by Alfie, Caulfield's miniature Australian shepherd.

Photo by Aram Boghosian

adequately support the entire Norwich community—from the Corps of Cadets to ROTC programs, as well as students, faculty, and staff.

It may be ambitious, but Caulfield brings experience to the job. He helped build a new weight room at Colorado College and saw that the fitness facility at NSCA headquarters was renovated.

"People are truly interested in fitness here, and we need the facilities to support that," Caulfield says. "We want to bring Norwich to the next level and be a championship contender in all of our conferences across every sport." Caulfield says he would also like to create and expand a graduate assistant program that leverages opportunities for NU's health and exercise science, physical education, and athletic training programs.

Caulfield speaks highly of the support he and Shuchuk have received not only from student-athletes but also NU coaches. "The culture has been supportive and not transactional," he says. "We're building relationships with the teams and coaches because they want to have us around."

He notes that Football Head Coach Mark Murnyack thanked him for coming to a game earlier in the year. "I've never had a coach thank me for coming to a game before," Caulfield says, "and that just speaks to what we've been building here."

NU President Dr. Mark Anarumo describes Caulfield as a "transformative" presence on campus who has enhanced the student experience. "He is a great influence that can benefit everyone on campus and build healthier lifestyles for not only our student-athletes but also the rest of our student population and staff."

As Caulfield observes, "This is the most hours I've been on the floor coaching, but it's the most fired-up and energized I've ever been in my career. It's the athletes, coaches, and the whole Norwich community. I want to see where we can take it now. It's been a such a great fit on both ends." ■

Virtual Reality

The School of Nursing takes simulation labs to the cutting edge

Professor Llynne Kiernan, DNP, MSN, RN-BC teaches in the School of Nursing. Half of her course load is devoted to simulation labs—a figure that conveys their importance. Sim labs give nursing majors essential hands-on practice in both fundamental skills, such as taking blood pressure readings and inserting catheters, and more advanced critical care responses. Typically much of this training is done using specialized mannequins and prerecorded videos.

But virtual reality and other new technologies are now pushing the boundaries of the sim lab experience. Kiernan and colleague Sarah Manacek, MSN, RN are currently trialing Oculus Daydream VR headsets and simulation software from Oxford Medical Simulation. Soon, NU nursing majors will use VR headsets to interact with virtual patients in vivid, immersive hospital environments exquisitely rendered in 3-D. Enveloped by surround sound, they will encounter patients and medical staff that make eye contact and evince emotion.

Mannequins remain useful for practicing tactile skills but are surprisingly expensive. VR headsets and related software, meanwhile, are relatively cheap. VR's other advantages include easy access, DIY practice, and a verisimilitude that can be emotional and stressful.

"Virtual reality is an active learning strategy that is grounded in the theory of situated cognition," Kiernan says. "It allows students to apply and practice learned content in very realistic environments .... [One] benefit of this is the concept of deliberate practice, where students can practice and practice and practice until they feel competent."

Manacek, a special surgery nurse who teaches medical surgical clinical rotations to NU nursing majors at the University of Vermont Medical Center, says VR offers extraordinary advances to the training experience.

"Patients are looking at you, freaked out. 'I can't breathe.'" Monitors beep. Alarms ring. "You feel like you're really in the environment. It makes your heart race. It makes you feel anxious, which is important," she says.

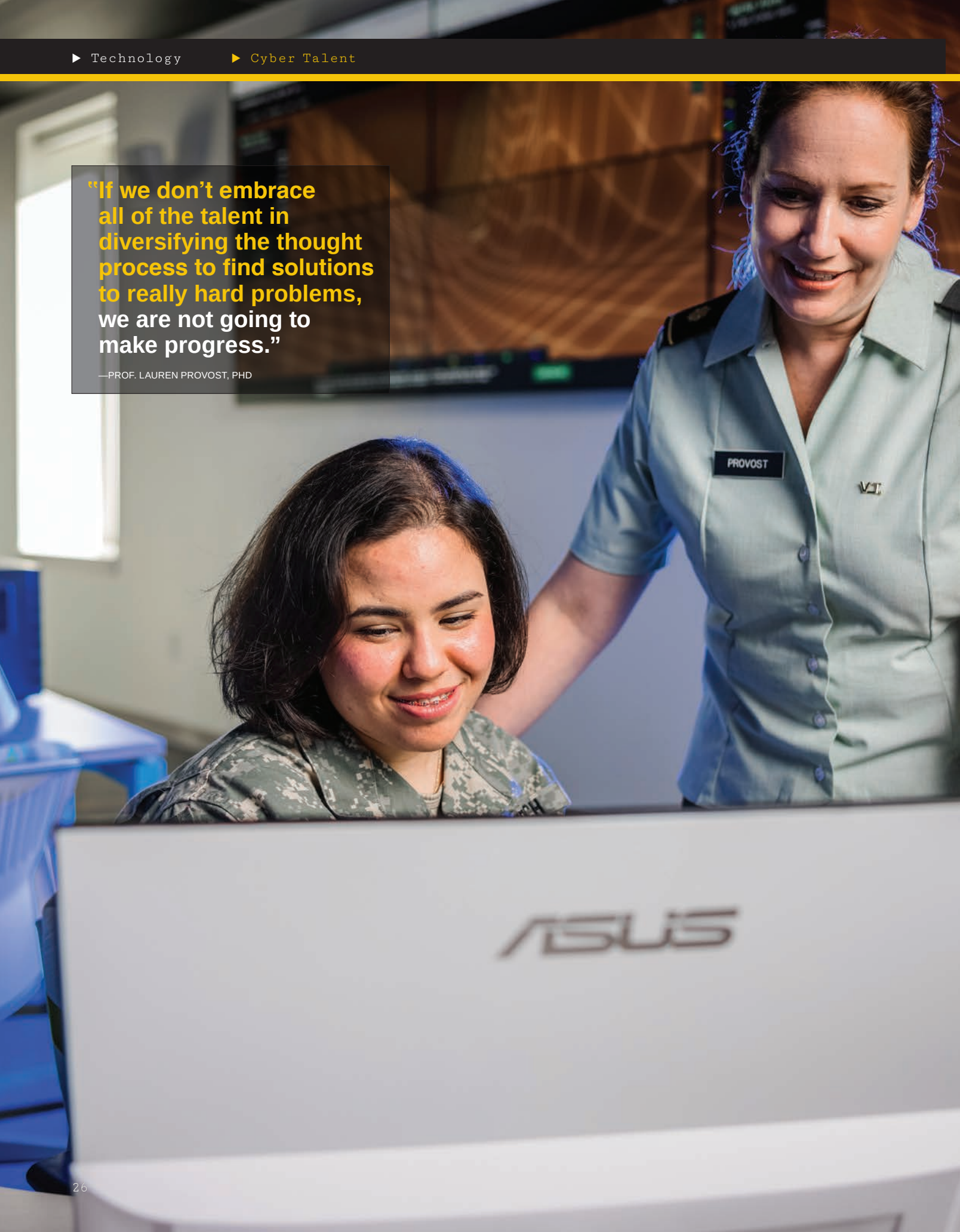
"People are looking at you for what to do, and you have to make those clinical decisions under that kind of pressure, which is very, very realistic," she says. "Just like in the hospital." ■

–SEAN MARKEY

VIRTUAL REALITY IRL

School of Nursing clinical instructor Sarah Manacek, MSN, RN (right) and Prof. Llynne Kiernan, DNP, MSN, RN-BC (left) are testing VR headsets and simulation laboratory software at the School of Nursing.

Photo by Aram Boghosian



"If we don't embrace all of the talent in diversifying the thought process to find solutions to really hard problems, we are not going to make progress."

—PROF. LAUREN PROVOST, PHD

Hacking Diversity

Assistant Professor Lauren Provost, PhD, on DEI as a cybersecurity force multiplier

The country needs all the cybersecurity talent it can get. It also needs a more diverse, equitable, and inclusive cyber workforce, says Assistant Professor of Computer Science and Cybersecurity Lauren Provost, PhD. Afterall, when it comes to cyber, DEI is a superpower. It not only broadens the talent pool, it boosts competitiveness.

"The diversity of thought in problem-solving is to me the most critical piece," says Provost, who serves on the NSA's Science of Security Group. "If we don't have a wide array of talent, we don't have those different ideas. And one of those ideas just might be the solution that we're looking for."

That need extends to leadership. "We still have some of the current problems in industry, where there's some lack of [diversity] in leadership. And when that happens, ideas from the non-leadership level can get lost and not necessarily valued."

With that in mind, Provost is mentoring the next generation of cybersecurity and computer science majors at Norwich. Since joining the faculty of the School of Cybersecurity, Data Science, and Computing in the fall, she has taught courses in data structures and information assurance, launched a Women in Cyber student club, and worked with two undergraduate research interns (both women) on projects involving ethical hacking and the security of cloud container data storage.

Provost is also collaborating with the school's DoD-funded Cyber Institute on outreach to K–12 schools to foster pathways for future careers in cybersecurity, something she has experience with as an educator and as policy advisor at the state and national levels.

As a first-generation college student herself, Provost knows that talent doesn't discriminate by zip code, gender, or race. But talent does need support.

Provost arrived at college as a freshman not understanding financial aid or knowing what a major was. But talent and luck prevailed. She excelled at math and her local college was the University of Texas at Austin. "What I didn't realize was, I was at a top 10 school at the time," says Provost, who double majored in math and computer science. "That department was ... very focused on supporting me and did everything they could to support my success."

At Norwich, Provost looks to return the favor. "I see support from faculty to students every day at Norwich." ■

–SEAN MARKEY

WOMEN IN CYBER

Assistant Professor of Computer Science and Cybersecurity Lauren Provost, PhD, works with Xioana Mejias '24, a cybersecurity major from Thornton, Colo. The pair collaborated last semester on a research project involving ethical hacking.

Photo by Aram Boghosian

Game On

Inside the burgeoning world of Norwich esports

BY SEAN MARKEY | PHOTOGRAPHY BY ARAM BOGHOSIAN

It's a Friday night in early November and five starters on NU's varsity Rainbow Six Siege team are warming up for an 8:30 p.m. match against the University of Central Florida. In the Esports Room in Mack Hall, co-captains Brennden Le '22 and Noah Hamilton '23 join teammates Andy Liriano '25, James Tate '24, and Matthew Flores '25 at a phalanx of kaleidoscopic gaming PCs. On edge in ergonomic seats, the players lean into their screens, frantically clicking keyboards and computer mice as all hell breaks loose.

Hamilton: "I hear a drone!"

Flores: "I got a drone!"

Hamilton: "What just blew up?"

Le: "The wall."

Hamilton: "They're getting ready to clear me!"

Fast and frantic, the action splits across five screens. Tate calls up a surveillance camera in the "jacuzzi room" of the three-story industrial building/Bond-on-a-budget dream fort, which the Cadets are defending.

"Swamp! Swamp! Swamp! Right now!" Hamilton urges. "Drop below and fight the garage—you've got to make something happen!"

Swiveling over gun sights, the outlandishly armed Special Forces-style fantasy team hold positions or press ahead. As the game clock ticks down the round's final seconds, Le is the last man standing against three oposing players. He prevents them from defusing a bomb to win the round. "Nice!" teammates shout as the game clock expires.

"That was so good. Good s--t!" Hamilton says. "That was a really nice clutch!"

Welcome to the wildly popular world of collegiate esports—21st-century sports competition, all-access adrenaline fix, social hangout, and admissions recruiting tool.

ESPORTS ELITE

Brennden Le '22, a cybersecurity major from South Burlington, Vt., co-captains NU's Rainbow Six Siege esports team. "Every match you play is different," he says.

* * *

Established just three years ago, interest in NU's esports program continues to soar. "It keeps getting bigger," says founder Jeremy Hansen, PhD, an associate professor of computer science and lifelong gamer. Working with Greg Matthews, NU's vice president of enrollment management, the two have shepherded the growth of NU eSports to its current roster of 86 players, who compete on varsity and junior varsity "A" and "B" teams across seven games: Rainbow Six Siege, Counter-Strike: Global Offensive, Overwatch, Valorant, Apex Legends, Rocket League, and League of Legends.

NU scrimmages and matches stream every day of the week on Twitch, the popular Amazon-owned live gaming streaming service.

"Esports is very quickly becoming a bigger thing than conventional sports," Hansen says. Viewership in the U.S. has now surpassed that of every professional sports league barring professional football, from Major League Baseball to the NBA.

Expanding into esports has been a savvy business move for college admissions programs. Teams and games offer a ready-made platform to recruit and retain students and engage in peer-to-peer marketing. At NU, the Admissions Office offers esports player scholarships of $500 (JV) and $1,500 (varsity) per semester to play for the Cadets.

Matt Brooks '25, a first-year mechanical engineering major from Grand Isle, Vt., captains NU's Rocket League B team. Brooks, who hopes to commission into the Air Force, says he chose Norwich for its ROTC programs and engineering school. But the chance to play his favorite esport was an added bonus. "When I found out I could play esports, I [was] like, that's amazing! I get paid to play video games—what more can I ask for, right?"

As team captain, the rook can practice leadership skills with older Corps of Cadets teammates who outrank him off the field. "It's a good thing to have the ability to switch on and off like that on a dime," Brooks says. "It shows professionalism."

Supporters cite other benefits, too. Hansen says the anecdotal evidence suggests esports is a boon for student retention. In the program's three-year history, he says, very few players have left Norwich. "It really has blossomed into a smaller family within the Norwich family," Hansen says. "This really connects people." That is especially helpful for incoming freshmen who might not be the most socially outgo-

RAINBOW SEVEN

Members of the NU Rainbow Six Siege esports team (left to right): Matthew Flores '25, Brennden Le '22, Noah Hamilton '23, Kieran Butler, Andy Liriano '25, James Tate '24, and Eli Benway '23.

ing, he says. "They have a built-in cohort, some comrades and friends that they can start playing with right away."

Esports at NU and beyond remain male-dominated. But Renata De Paiva '23 defies the stereotype. She is one of the small but growing number of Cadets women competitors. The computer science major from Rio De Janeiro, Brazil, plays on the Rocket League (think 3 vs. 3 soccer, only with ridiculously customized cars that jump and fly) B team. For De Paiva, an honors program student currently taking 19 credit hours who also works 20 hours a week part-time, esports offers an excuse to relax. "I really enjoy it," she says. "I'm extremely busy … . When we have practice time, I actually have time to play and that just makes me happy." The team practices for three hours on Monday and Wednesday nights and five hours on Saturdays.

It doesn't hurt that most of her friends play esports, too. "We're all tech nerds," she says. Playing computer games while growing up inspired De Paiva's ultimate career path. The junior says she took her first programming courses at Norwich and now plans to work as a computer scientist after graduation.

* * *

Back in the Mack Hall Esports Room, the Rainbow Six Siege team prepares for its match against the University of Central Florida. "The only way we lose this game is if we beat ourselves," Hamilton, the team co-captain, says. "Statistically, the majority of us are better than their team." Playing a favorite map, or scenario, the game starts and the Cadets run up the score in nearly straight rounds, winning the first match 7–1.

But the second match in the best of three contest is far tighter. Central Florida has home field advantage playing a favorite map and keeps the score neck and neck. In the end, a bold play and savvy strategy allow the Cadets to prevail in a decisive round and pull ahead 7–5, winning the match and the game 2–0.

The NU teammates whoop it up and celebrate. "I love the game," Hamilton says. "There's nothing like it." ■

Star Techs

From Meta to Microsoft, Norwich experts share insights on the emerging tech and cyber forces shaping our world

INTERVIEWS BY SEAN MARKEY

Photos by Sean Markey

Gunjan Shah ’96 Global Product Lead, *Meta Reality Labs*

CONNECTING HUMANITY

On his first job, at Raytheon: “I just kept on working, working and not worrying about who gets credit but just learning as much as I can.”

At Motorola, Shah helped build the first 3G and 4G phones and a 5G PC. “I stopped doing engineering about 10 years in and moved up to management teams.”

Photo by Sean Markey

"It's not about the pay. If you're passionate, pay will follow. My thing is, am I making a difference?"

"I've always been motivated by helping people. I'm a techy geek. I love education and learning. The intersection of those three … that's where I try to focus my career and my job."

When I interviewed at Facebook, something that really resonated with me was what society now needs to focus on is building communities. We also need to help each other ascend Maslow's hierarchy of needs. My mission is how to connect and build relationships in a world where we're always doing the smartphone prayer—always looking down, pressing buttons. How do you build relationships in this new world order? I'm leading a team to build a new category of products that help us connect in the digital realm so that humanity can improve from a relationship perspective.

If I can make technology where you and I can build trust, even though we haven't physically met, then the world is going to be a better place. The physical distance can be diminished by technology to bring more presence capability. Relationships are really based on trust, which happens when you can see another person and read each other's body language and other nonverbal cues. Think of a Facebook community, but one that's going to evolve in the digital realm. What does that world look like? Do we actually realize that we're not all that different? We all have the basic needs of connections and relationships. If I can bring that back into the physical world, then that is a good accomplishment. It will take 10, 15 years, but that's where I want to go. One of the things that I'm trying to solve is whether you can build strong relationships if you can learn how to teach at the communication frequency of the other person. That's a tough technology problem to solve.

The world is changing. We look at technology as utilitarian. I want to turn the view of technology into not a business builder, but a humanity builder. I think it's a nice intersection.

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In every technology leap forward, there've always been naysayers and critics. One of the things that Facebook has learned the hard way is, to use that line from *Spider-Man,* "With great power comes great responsibility."

When you create a platform, you just can't stand back and say, "Yeah, they bought ad space. They're doing their thing, so we're not going to police them." You have to police now. That is a very difficult task. So those critics are right. A knife can be used to cut a tomato. A knife can be used to kill somebody. It all depends on the user. So what we need to do as a society is to teach each other how to use the tools the right way, and that means also to understand the limitations of those tools.

Gunjan Shah was nine when his family emigrated from India to the United States, arriving with just $100 to their name. His high school principal, NU alum Francis Moran, opened a door to Norwich. "I got help along the way without even asking, and that is one of the things I see from Norwich graduates."

"My playbook is the same, which is you roll up your sleeves and you just start doing everything that your team is doing and lead by example."

Stephan Rockwell '96 Systems Engineer Director, *Palo Alto Networks*

CLOUD AND MACHINE LEARNING

"I love the fact in the private sector, you're rewarded for your efforts. Truly capitalism at its finest. The harder you work, the more success you find."

We as a human race need to figure out how to do things in a more automated fashion. We need to create leverage models that help us accomplish things that we do not do today. For decades, people have worried, "I'm going to lose my job to a robot." I don't believe that's true. The potential automation that's built into and delivered via machine learning is what's going to create entirely new industries. Take biofuels, solar energy, and electric cars, for example. There are all these things we need to figure out how to do efficiently and at lower cost so they truly can counter the lower cost of fossil fuels. I live in Manhattan. New York State has set a goal eliminating gas-powered consumer vehicles by 2035. That doesn't happen without machine learning and automation. It also doesn't happen without the cloud.

Neither do automated or self-driving cars, for example. You can't tether a car to a data center somewhere and say, "Just go" then drive from the east coast to the west coast. You're now trying to communicate with a data center on the east coast. That is not feasible.

I hate to use the term artificial intelligence or AI because it is a marketing term. But machine learning and cloud computing are the two technologies I believe are going to change the world. The cloud is very good at taking a dataset and making it globally available. There's no concept of, "Your data resides in place X." It resides everywhere you choose. Here in the U.S., the cloud service providers are a combination of Azure, a Microsoft product; AWS, an Amazon product; and GCP, a Google product. If I'm a research facility for a hospital and I need to model the genome, do I go build a new data center or should I essentially tell AWS to fire up a temporary data center, do my modeling, and then I tear it down? The dissolvability of cloud computing and the virtual limitless cloud compute is incredible for some use cases. The mapping of the human genome would never have happened without the cloud. There are hundreds of thousands of examples where the cloud has made things like this possible. There is just not enough compute elsewhere to do what some of these modeling and some of these computations require. Companies predominantly lean on AWS, Azure, and GCP to leverage all of the benefits of the cloud.

I think everyone knows the buzzwords, but I don't think they can appreciate the power and what it's going to replace. Jobs serve a purpose. They build, create, or serve something. If you can amplify what that something is—if it's a new energy source or a new way of transportation, something new that's different from what we're doing today—the likelihood of that increasing your number of jobs and, really, higher-paying jobs, is much more likely.

Cybersecurity expert Stephan Rockwell majored in electrical engineering at Norwich before serving four years as an officer in the U.S. Army Signal Corps. He now works as systems engineer director in New York City for Palo Alto Networks, the world's largest private cybersecurity firm. He is a member of the Norwich University Board of Fellows for the School of Cybersecurity, Data Science, and Computing.

"It's easy to say that [the Army] taught me how to lead, but what it taught me was that others need leadership .... Without strategy, everyone has their own plan. That doesn't work when you're trying to get to a common objective."

"I think it's important to show Norwich [cyber majors] that you don't have to work for DoD and NSA. There are plenty of other options out there for you, that the industry and the world are open to Norwich graduates."

"My [hope] is to make sure that the world is aware of Norwich and Norwich becomes a conduit [of talent] into the private sector, particularly my own company. I'd like to hire a bunch of Norwich graduates."

"With leadership, it kind of just hones that energy and hones everybody in the right direction .... [Hopefully] you end up where you're supposed to go."

Photo by Sean Markey

Phil Susmann '81 Vice President of Strategic Partnerships, *Norwich University;* President, *Norwich University Applied Research Institutes*

A CYBER PEARL HARBOR

"[NU] has been engaged with the NSA cyber programs for the past 20 years. On 9/11, we were at Fort Meade as our first meeting as a Center of Academic Excellence."

The exfiltration of intellectual property from the United States overseas has finally become recognized as a significant problem by the Department of Defense. A number of critical nation states have been able to traverse significant technological innovation without spending the time or effort necessary to build the capability. They obviously had to steal those capabilities and that innovation from our shores. In some cases, that took place without anyone noticing. We also know that, simultaneously, there are billions of dollars in ransomware being requested and services disrupted because of actors who are being harbored and protected, and possibly engaged, by significant nation-state adversaries.

As we stand here today, much of our supply chain is disrupted. We know that critical weapons platforms have been stolen. We've seen technology across all areas stolen from our defense contractors and the private sector to drive the central plan within China that they will be the leaders within all sectors of the global economy. When they can't innovate fast enough to beat us, then they actively employ thousands of people to steal that intellectual property. We have now a great power competition between China and the U.S.

I do not believe that, at the end of the day, China can defeat us if we allow our civil society to exist, because China can't innovate ahead of us. They must steal to run at parity, because they are not innovating in breakthroughs. Their society by construct is a surveillance society based on Big Brother from George Orwell's novel, *1984*. There is surveillance everywhere. Where ideas and concepts are ultimately prohibited, an innovative society cannot be created in that environment. You must steal the innovation. You may incrementally improve product. But you can't necessarily innovate, because you need that liberal-based educational environment to be able to make those great leaps. You need to be able to play and work with all kinds of ideas, which is what our society allows.

From a cybersecurity perspective here in the U.S., we find that the house is on fire, and we need to get some more firemen. Because there are not enough people to put it out or to save the structure at this time. We're engaged in building the next generation of firemen to take on the fire, but at the same time we're also engaged with figuring out the best way to respond to this fire.

My greatest fear is that the social media and activities being pushed by our adversaries within this environment are going to tear the fabric of our democracy, and eventually create a civil war within our society—unless we can understand and respond to what is obviously a very adversarial interaction within our civil society. In the words of art from Norwich University's mission statement, we should be able to "... tolerate all opinions when reason is left free to combat them" in our national discourse.

Yet in our society today, we are not accepting or, tolerating all opinions. We no longer allow that free and open discourse. Instead, we are yelling at each other. Adding the fuel to the fire that is driving this conversation—unbeknownst to the people who are becoming so angry about these activities and continuing to respond to them—are the very adversaries external who cannot meet us on the battlefield and defeat us. However, they're going to tear our society apart. Because we're in the front yard having a fistfight while the house is burning down, and we don't have enough firemen to put water on the fire.

The solution going forward will be based in an educated society, for us to be able to understand the pressures coming at us externally.

Phil Susmann '81, MBA, began teaching in the business school at Norwich in 1987 before becoming the university's first chief information officer in 1994. He was responsible for the development of the cybersecurity programs, National Security Agency certification, national Center for the Study of Counter Terrorism and Cybercrime at Norwich University, and the Department of Defense Senior Military Colleges Cyber Institutes at Norwich. He was appointed the president of NUARI in 2005 and balances the operation of this independent nonprofit research corporation with building partnerships for Norwich University.

"Norwich thinks about cybersecurity across the spectrum. Not just within the technical area of cyber, but we engage with the engineering program, and we work on control systems … all the way through to Prof. Travis Morris, working on things related to weaponizing ideas."

"We've been doing this for a very long time, and we've built academic programs at the undergraduate and the graduate level, now online, to be able to support the requirements of cybersecurity professionals."

"The way you tear the democracy apart is by using cyber and social media ... to weaponize ideas and create conflict."

"We are leading [an] effort with about 65 other schools to look carefully at how do you put evidencing competency into the curriculum? … That's a national lead for a small school."

File photo by Matthew Septimus

William Hayden '91 Senior Corporate Counsel, *Microsoft*

NATION-STATE CYBER WAR

In the past five or six years, I've focused on Microsoft's cloud computing and space initiatives work with the U.S. government, and for DoD or the intelligence community, as well as on cybersecurity.

A couple of years ago, I had the opportunity to be a part of a Microsoft team that went to Kiev in Ukraine to interview elected officials from the parliament, as well as IT leaders in Kiev, around the cybersecurity attacks called NotPetya, which was an attack by Russia on the Ukraine in 2017. People may not be aware of what's going on in Crimea and other parts of the eastern part of Ukraine. It's not really a cold war; it's not really a hot war either. But there are troop encampments along the eastern edge of Ukraine, and most Ukrainians feel as if they are at war with Russia. That NotPetya attack was interesting in how it impacted the economy and the people of Ukraine, the civilian population as well as military.

Here at home, one area that I really get concerned about is our critical infrastructure. If you look at the number of cyberattacks that have occurred over the past decade, there's been a marked increase in those attacks. There are various threat vectors: You've got individuals, who are very smart, and they want to just create havoc. Then you've got people doing malicious things, who may be nation-state backed. And then there is the ransomware category where malicious actors are looking to cash in.

We must be mindful of two facts. One, there are always going to be criminal and bad actors out there who try and take advantage of us. Two, cyberattacks are an element of warfare now. As we saw with the SolarWinds attack last December, that was the Russian equivalent of the CIA putting malware into the [Texas-based company's Orion software, which has 33,000 customers]. That can have ramifications across the energy sector, hospitals, and other critical infrastructure. With the Petya attacks (unrelated to "NotPetya") in the United Kingdom, there were patients on the operating table scheduled for surgery. Doctors had to stop those surgeries because their hospital IT systems had been taken over by bad actors.

While positive steps are being taken, at any given moment we're all at the mercy of state-sponsored groups or ransomware groups and hacktivists. Especially in this post-COVID environment, where we've been working from home, taking folks away from the secure environments they may have been in. We need to act immediately, and we need to be thoughtful and put the proper safeguards into effect. There have been some actions on the corporate side and on the government side. If you go back and look at critical infrastructure over the past three or four presidential administrations, there have been a number of presidential directives and mandates for the 13 or so sectors that the U.S. government designates as critical infrastructure. But if you look at what those different sectors have done, there's no repeatable process being used across the board. Corrective action is retroactive. Once something occurs, then they go and address it. But there's no holistic approach there.

We've got to think about it from two standpoints: One, a kind of traditional warfare scenario. But also two, how do we protect and ruggedize our critical infrastructure, so that we can keep the country going in the event of a widespread cyber event?

A lawyer and retired Navy officer, William Hayden has worked at Microsoft since 2006. As a company senior corporate counsel, he provides strategic and legal advice to senior executives regarding cloud and AI technologies supplied to the Department of Defense and the intelligence community.

After Norwich, Hayden commissioned as a Navy surface warfare officer. He went on to earn an MBA and a law degree, later working as corporate counsel for GE.

"I picked Norwich because it had the discipline and the structure outside of the classroom. It was really important to me."

"I often say 70 percent of my learning at Norwich was outside the classroom, because of the environment that it created."

On changing jobs: "GE was kind of like the Cadillac your grandfather has. It's a great solid car, but it's … not cutting edge. I had an opportunity to interview at Microsoft, and I got a job."

"Under Jack Welch as [General Electric] CEO, they knew junior military officers were great assets, because we're trainable. You just tell us to do something, we'll figure out how to do it and won't complain about it."

Photo courtesy William Hayden

Jeremy Hansen, PhD,
Associate Professor of Computer Science,
School of Cybersecurity, Data Science, and Computing

CYBER-RESILIENCE ISN'T ROCKET SCIENCE

No company spends enough resources on security. There are exceptions, but organizations typically see security as a cost. We often have a fortress mentality. (I wrote a chapter about this for the 2014 edition of Professor Emeritus Mich Kabay's *Computer Security Handbook*.) We all want to protect our data. We want to make sure that it's safe and that nobody gets in. What we do is we build taller walls, so people can't get it. We build a moat. We put sharks in the moat. We put lasers on the sharks in the moat. We put surface-to-air missile systems on the top of the walls. We drape the whole thing in magnetic shielding. We can build these beautiful, amazing, secure systems—which are still worthwhile, let me be clear. But it only takes one tiny chink in the armor for it all to fail.

Rather than thinking about, *How can we prevent somebody from getting in?* the better philosophy is, *How can we be secure and how can we be survivable when someone* does *get in?* It's a different posture. Any information system nowadays will be compromised. Will be. Not if. When. So how do we react? How do we design our systems so that when somebody breaks in, they don't get the keys to the entire castle—so that we can limit the damage and easily recover? Many organizations just don't know or don't care to do this.

Consider ransomware, which often start with attacks against people that trick them. Rarely are ransomware attacks a new attack that gets into a machine. The best way to recover from ransomware and to avoid having to pay the ransom involves having really good backups. Backups are not sexy. Backups are not encryption. I often ask my students when we talk about backups, "How many of you have a backup system that you would be comfortable relying on if your computer crashed?" Even among the computer security majors, only 10 to 30 percent raise their hand. This is not rocket science, and this is a problem.

Only rarely do organizations approach backups in such a way that they have some comfort knowing they will be able to recover from what is literally the number one threat in information security. How are you going to react when somebody says, "I've encrypted all of your files, send me three Bitcoin or you'll never get it back"? If you had a backup tape or a USB drive or your important stuff archived somewhere, you can say, "Oh, I have all my cat memes over here." You can just pull that up, give your favorite offensive gesture to the ransomware folks, and get back to work.

Jeremy Hansen, PhD, joined the Norwich faculty in 2010 after spending 10 years in information technology in the private sector. His research explores the social implications and applications of technology, from privacy and computational social choice to election auditing and election security, among other subjects.

NEITHER IS A KILL SWITCH FOR KILLER ROBOTS

"Lethal autonomous weapons systems (LAWS) aren't science fiction anymore. These systems exist, and they're powered by software to kill enemies."

"We've seen that AI systems do a really good job of reinforcing whatever biases we put into them. We get racist in, racist out. The software is not super trustworthy."

"I don't think that's even necessarily the biggest issue .... If you have an automated system, somebody can break it."

"Marketing folks will say otherwise, but if you ask a software engineer or security expert, the software that we have is really bad." Any system is vulnerable to hacking.

File photo by Sean Markey

Hansen aims to submit a proposal to the NU Faculty Senate banning LAWS research "in the same way that we wouldn't participate in the development of chemical weapons or land mines."

Col. David Toomey, USAF (Ret) '85 Assistant Vice President, *SRC, Inc.*

EDGE COMPUTING, NEUROMORPHICS & QUANTUM

Supercomputing skills and capability once required a mainframe or a big computer on the ground. In my company now, we're putting that in a container smaller than a shoebox and putting it up on an airplane to do edge computing. We're crunching numbers using highly advanced algorithms with sensors right there on the edge of the battlefield or up in space. Now we can start to analyze data right at its collection point—in a satellite, for example, rather than send it down to a data center, which takes a big pipe and requires a lot of infrastructure, time, and money. This is a big change.

Right behind that is neuromorphics. That's the ability to mimic the way the brain and the synapses in the brain process data and starting to do that on a computer at very, very low power. Think about how little the brain weighs. Three pounds. Think about the amount of data it collects and processes from the sensors in our body. It does that with no electrical power. It's all done by chemical reaction. Our brains store all this data and allow us to use it. How do we mimic that capability to develop an exceptionally low-power supercomputing capability? There are several companies that are building chips like that right now. If you want to do processing at the edge, there's usually not a lot of power available, especially in space. (Think of *Apollo 13*.) Neuromorphics allow you to do this.

It's funny. I recently sat down with my team just so that we could ask ourselves, What does the world look like in the 2030s? We spent two days analyzing the 2030s from our perspective—a DoD perspective, but also commercial industry. What are the Elon Musks, the Jeff Bezos, the Zuckerbergs of the world doing? We want to understand where the world and technology are going in order to make smart decisions and the right investments now so that in 2030 we have things ready to go.

Many of us believe that quantum computing is probably coming sooner than we think, in the next 10 years or so. That's going to fundamentally change the way we not only compute, but the way we encrypt data and our ability to encrypt data. You're going to start to see some really advanced quantum-like capabilities debut here in the 2030s. You're also going to have a lot of unmanned systems out there. We already have self-driving cars. We're going to see self-driving airplanes, unmanned aircraft, unmanned surface vehicles, unmanned undersea vehicles.

The reality is commercial technology is going to far outpace anything we ever do in the DoD. The rules are different in commercial. They're going to push to the edge as far as they can, hopefully making smart decisions on building security. Today everybody is talking about building in security to protect civil rights, to protect people from exploitation, to protect corporate or medical data. People are definitely much smarter. But there's a whole other group of people, the bad actors, whose job in life it is to take a look at that technology and break it. There's going to be some risk. But I'm of the opinion let's go for it and manage the risk along the way, because I think exciting things come out of it.

An electrical engineering major and former Air Force pilot, David Toomey manages the U.S. Air Force account for SRC, a nonprofit research and development company that supports the Department of Defense. He is a member of the Norwich University Board of Fellows for the School of Cybersecurity, Data Science, and Computing.

"The first time you fly it they take you into the hangar and the lights are all off. They turn the lights on. There's a Stealth sitting in the hangar with a huge American flag over it. You're looking at it and saying, This thing flies?"

After 23 years flying, the Air Force invited him to lead what is now the 688th Cyberspace Wing in San Antonio, telling him, "What you do on those airplanes is very similar to what these folks do in cyber, which is … understanding networks."

What he sees on the techno-horizon: "I see a lot of coolness."

"The world is changing, and the U.S. is leading in some places and lagging in others. We're going to have to figure that piece out."

Toomey trained as an Air Force pilot. "I spent my first 10 years flying Wild Weasels … doing a lot of electronic warfare stuff. Then, I switched over to stealth, and I flew the F-117 stealth fighter."

David Forbes '93 Principal, *Booz Allen Hamilton*

CYBER TALENT

"I realized about eight or nine years ago that not only was there significant requirement and demand for defensive cybersecurity, but it was really an avenue for me to continue to do something innovative and important and stimulate my own professional growth."

Forbes majored in international studies at NU. "I reinvented my career."

"My personal experience was an Army officer turned consultant turned data science leader."

I joined Booz Allen 17 years ago after serving 11 years in the Army, where I was a logistician. I started my career in the firm doing operations requirements analysis and eventually built a team and a business in advanced analytics and data science. About eight years ago, while leading Booz Allen's infrastructure business for the Navy and the Marine Corps, I developed a focused interest on our need as a firm to developed advanced capabilities in the area of industrial control systems cybersecurity. For the last six or seven years, I've been an integrated leader for defense, civil, and commercial. I focus on three areas: I'm innovating and validating our solutions as a firm. What do we provide to our clients? I also pursue business, leading and helping with proposals to win work. Third, I'm building a talented cadre of people who do the same thing—finding and hiring people out of school and people from different government agencies. It's building staff who want to learn. We really need people who are not just educated, but passionate about doing this.

As vice chair for the Board of Fellows for the School of Cybersecurity, Data Science, and Computing, I'm also trying to help Norwich stay connected to what's happening out here in the wild in the supply chain, defense, civil, government, this whole thing. My key insights? Number one, quality technical education, technical training, and technical certifications matter. Our ability to provide the highest-quality realistic technical training and certification experiences to our cadets and students at Norwich, that's how you make sure you're successful in the field. That's what employers are looking for.

Number two is that there are many different backgrounds that lead toward a career in cybersecurity. Engineers, social scientists, in some cases medical—different kinds of backgrounds can point you toward this field. You shouldn't feel like, "Well, I have to be a computer science major or I'll never do cybersecurity." Not necessarily. Most of our clients are not cybersecurity experts. They do need us to help them, but I would say there is a cross-section of skill sets and experiences and interests that are needed in the cybersecurity space.

The third thing is we need to instill in Norwich that a big differentiator for us is that operational-tested experience that we get on the Hill, whether you're wearing a uniform or you're a civilian student. Internships, testing, that rigorous life on the Hill makes a big difference in how you perform and how you're received in whatever organization you go to. I'm a big believer in that. Leadership matters. Work ethic matters. Dealing with tough times matters. Those intangible skills and training that you get beyond the classroom at Norwich are very valuable in the outside world.

Norwich is producing these majors that are in high demand not only from a technical perspective, but also with the leadership skills that Norwich brings. That, I think, enables a Norwich alum to take on stress a little bit faster, to organize, to meet high demands, to go to a Booz Allen or Deloitte with a pretty intense environment and excel, because they can handle day-one challenges and stress.

We have an opportunity here to stretch ourselves as an institution. I'm blown away with what we've accomplished so far. But how do we to push ourselves further? To be more relevant and really become a leader? There are going to be unbelievably challenging cybersecurity threats, and the pace will not stop. How do we make sure we're central to that work?

David Forbes '93 holds a master's degree in public policy with a concentration in science and technology from George Mason University. Before joining Booz Allen Hamilton, he served for 11 years as an Army officer and later worked as a strategic planner in the Office of the Secretary of Defense, Under Secretary of Defense for Policy.

Photo courtesy David Forbes

"People in my generation, we weren't trained in cybersecurity during our undergraduate education."

Deputy Commander, U.S. Strategic Command

Lt. Gen. Thomas A. Bussiere ’85, USAF

INTERVIEW BY SEAN MARKEY

PHOTO BY AIRMAN 1ST CLASS EMILY FARNSWORTH, USAF

Well before college, Lt. Gen. Thomas Bussiere'85, dreamed of becoming a military pilot. So much so that he turned down two ROTC scholarships (Army and Air Force) when he learned that neither service could guarantee a flying track after graduation. Instead, his father, who worked for a Vermont trucking company, took out a second mortgage on their family home to cover Bussiere's tuition at Norwich. "Looking back, that probably wasn't the wisest decision," Bussiere says. In the end, it all worked out. Now a three-star general with 3,405 flight hours under his wings, Bussiere serves as the deputy commander of U.S. Strategic Command (USSTRATCOM) at Offutt Air Force Base, Neb. As its second-ranking officer, Bussiere helps oversee strategic deterrence, nuclear operations, global strike, missile defense, joint electromagnetic spectrum operations, analysis, and targeting, and missile threat assessment while serving the 150,000 soldiers, sailors, airmen, Marines, guardians, and civilians spread across the globe carrying out USSTRATCOM's missions. During a recent two-day visit to campus, Bussiere sat down to discuss some of the nation's most pressing security challenges.

LAST FLIGHT

U.S. Air Force Lt. Gen. Thomas Bussiere beside his F-22A Raptor after his final flight at Joint Base Elmendorf-Richardson, Alaska, on March 20, 2020. Before moving to STRATCOM, Bussiere served as the Commander, Alaskan North American Aerospace Defense Command Region; Commander, Alaskan Command, U.S. Northern Command; and Commander, Eleventh Air Force, Pacific Air Forces.

> **"We have no treaty regimen with China.** To date, they have been unwilling to come to the negotiation table and have a conversation."

Not long ago, you said Russia remains the primary nuclear threat when it comes to deterrence strategy but that it will soon be eclipsed by China. You added that China is accelerating its capability across many domains, including nuclear weapons. Can you elaborate?

I think most people are familiar with the Cold War. They understand that we've had decades of experience with strategic stability talks and various treaty regimens with the Soviet Union, now Russians. We have a very long history of that with several mechanisms for communication and dialogue—mechanisms that are designed to alleviate confusion or misunderstandings—that have been developed over the decades. I think most people are [aware] that the United States just extended the New START Treaty with Russia for another five years, that will carry us through to 2026.

From a Russia perspective, this treaty regimen, which we wholeheartedly support, does not account for all the nuclear threats that Russia is developing. It doesn't account for over 2,000 and growing nontreaty-accountable nuclear weapons (which is publicly available information.). It also doesn't account for what has been termed as exotic or novel systems, which are unique. It's mind boggling as to why they're developing these capabilities. I challenge why they would sign a New START Treaty extension for strategic stability and then develop these weapons and expand their nontreaty accountable nuclear weapons stockpile. It's [incongruous] with the purpose of the arms control treaty.

We have no treaty regimen with China. To date, they have been unwilling to come to the negotiation table and have a conversation. Additionally, we don't have those decades of mechanisms to alleviate confusion and misunderstanding and such. You've probably seen in the open press over the last couple of months the open-source satellite discovery of a multitude of several ICBM capabilities [that China is] developing at a very rapid pace. Their glide path is pretty steep.

So the challenges we're looking at from a U.S. Strategic Command and from a [DoD] perspective are, how do you develop the proper force construct? How do you develop a new multi-part deterrence theory? We have pretty unique two-body deterrence models with a lot of academic and think tank experience over decades of thinking about how you are going to deter from a two-body perspective. Now we are dealing with a three-body [deterrence model]. How do you deter two different nations that have two different leadership structures and two different international and global aspirations? And that's going to be the challenge: How do we do that from a U.S. and allied perspective? [How do we] maintain strategic stability and convince both Russia and China without any hesitation that [they] don't want to challenge the stability that we've been maintaining from a global perspective for decades now. That's the challenge that the Command and the Department [of Defense] are working on.

You've referenced the amount of intellectual work that will be necessary to accomplish that. Explain what you mean. Is there a need for new thinking, better thinking, something else?

There are a multitude of books from the '60s and '70s [produced by] think tanks [and] academic institutions that have done great theoretical work and analysis on deterrence models and how that would work vis-à-vis the Soviets and now Russians. It's fairly well understood. That's not the world we're facing today. When the Cold War started, the nation approached [it] from a national perspective—[enlisting resources from a variety of] institutions, academia, think tanks, etc. We need that same level of intellectual curiosity and energy to approach the analysis and theoretical models to [address] the strategic stability challenges we're going to be facing in the next few decades.

Would you say the world today is more or less secure that it has been in the past five, ten, twenty years?

I'm not sure I'd characterize it as secure or less secure. It's definitely more challenging. The threats we see today and the threats developing in the future are going to be a challenge. Hopefully [we'll] be able to mitigate any potential national security interests with a combination of a strong and determined Department of Defense; along with the sound, verifiable, and enforceable treaty regimens; and an international community that holds to account those who don't follow it. I don't think there's one instrument of national power that's the right answer. We use the term "whole-of-government." This is really a whole-of-government issue. It's not something that just the Department of Defense is going to be able to fix or address.

The New START Treaty [lasts] another roughly four and a half years. In the interim, we need to develop a framework to account for the next version of whatever [treaty] is going to follow. [One] that accounts for all the national security threats and the nations that fall into those categories.

Whether it's two bilateral or one trilateral, multilateral treaty, that should be the foundation by which we provide more global stability. That's going to take a lot of work. A lot of both intellectual energy and time from the federal government, as well as those of our allies and partners, to be able to get the collective will of the international community to make sure it's done.

In a recent *Washington Post* op-ed, Air Force Chief Gen. Charles Brown argues the Air Force faces an urgent choice: accelerate change or lose advantage to our adversaries. What do you make of that?

Gen. Brown was my boss in my last job in Alaska; one of my command hats fell under Pacific Air Forces. He's obviously my big boss now. [His] concept of accelerate change or lose is multifaceted and specific to the Air Force. There's a tendency to hang on to legacy weapons systems at the expense of investment opportunities in future systems. It's not unique to the Air Force. But it's not always as easy as a service to do when it comes to organizing for the threats we face. The Air Force has to develop a force that is not only capable today of deterring our adversaries or prevailing in a conflict but also developing the future force. The chief believes that we have to accelerate our inventory and advancement into the next generation of X—whether that's a satellite or an aircraft or another weapons capability. There's an equipment piece, there's a force structure piece, and there's a human piece of it: How do you accelerate the professional development of our airmen to be able to intellectually address the threats today and in the future? And then there's an organization and a process piece to that, too.

Most large bureaucracies are encumbered by bureaucracy. So how do you encourage innovation within a bureaucracy that is encumbered by itself? I think every chief in the recent past has struggled with, to use the layman's term, "the frozen middle." You have senior leadership [at the top] that wants to move fast and innovate, and you have really talented young airmen [coming in at the bottom], and then there's a group [sandwiched in the middle] that is not interested in change. The chief's challenge is, how do you develop the incentives within the service to be able to accelerate that intellectual innovation and get a force that is capable of meeting the threats in the future?

Organizational change in bureaucracies is difficult. It's not only encumbered by history and tradition; it's encumbered by a cultural resistance to change. It's just a really tough thing to do.

So how do you do that as a leader?

I actually have some experience with that. I [wrote] my thesis on organizational change in leadership. I had the opportunity to do the largest combat reorganization in history in Iraq, under Gen. Raymond Odierno, who very sadly passed away [in Oct.]. Then I worked on a major reorganization for Gen. Hyten, when he was USSTRATCOM commander back in 2016.

In a very abbreviated format, you have to take the organization and fully understand its mission. What is its reason for being? Distill it down to missions, functions, and tasks. Then you come up with the organizational construct to effectively achieve that. That's the easy part. The hard part is transitioning from today to the [organization] to be, and then leading the human capital and changing the culture of an organization. That's really the long pole in the tent in any large bureaucracy: how to institute change and make it lasting when there's great human resistance to change in a lot of large bureaucracies. The key to that is getting the right people with the right skill sets with the right leadership in the right positions to be able to follow through. It's very achievable. It's just that sometimes the resistance to change is greater than the bow wave of change.

You've been an Air Force officer now for over 35 years. How has the job changed?

I don't think the job has changed. I think the Air Force and the Department [of Defense] at large in my 35 years have matured to different levels based on our experiences. I think the end of the Cold War, the transition to the War on Terror, the transition now back to great power competition or near peer competition depending on how you want to approach that challenge, and then the transition into a much more diverse force, have made an exponential improvement in our capability to address threats. But just from a mechanics perspective, I don't really think I can reflect back and say that the military is dramatically different in how it operates. New weapons, new weapons systems, new people—the only thing that really [strikes me] about what's really changed is [that] every generation gets much smarter. The talent that comes in every generation is just amazing. I'm just glad I'm old. I don't have to compete with the new generations, because they're amazing.

> **"The talent that comes in in every generation is just amazing. I'm just glad I'm old. I don't have to compete with the new generations, because they're amazing."**

Do you have a parting thought to share?

I think the long-standing, multidecade connection of Norwich grads is strong and sound. I can guarantee in the Department of Defense that Norwich graduates—officer, enlisted, civilian, Army, Air Force, Navy and Marines, and now [Space Force] Guardians—are connected and stay connected. Both from a professional development perspective and pride in our alma mater. I think most people realize that. But I just want to reaffirm the commitment to the institution. What the institution gave to everybody who serves is pretty strong. ■

SERVICE

In Tandem

Following unexpected loss, Robert and Lou-Ellen MacDonald P '06, jumped head-first into philanthropy

BY JANE DUNBAR

Robert ("Bob") MacDonald was cruising down Boston's Southeast Expressway one afternoon two years ago when a fellow motorist overtook his white Dodge Ram and showed him her finger. Like any self-respecting Bostonian, MacDonald returned the gesture. But there's a twist:

The other driver was Vice President for Development and Alumni Relations Liz Kennedy '01 and the finger in question, hers, bore a NUCC class ring. "I noticed the prominent Norwich branding on [Bob's] truck and figured it had to be a fellow staff member," Kennedy explains. "I held up my hand on my way by so he could see my Norwich ring." Not a week later, a window-sized maroon-and-gold decal just like Bob's was sitting on her desk.

This is typical M.O. for the 80-year-old Vietnam-era veteran from the 82nd Combat Engineers. Together with his wife of 48 years, Lou-Ellen (Rochow), Bob harbors an unabashed enthusiasm for Norwich that dates to 2002—when the couple's youngest son Brendan was a rook and budding athlete. After Brendan's unexpected passing in April 2003, the MacDonalds could have left the Hill behind. Instead, they intensified their commitment.

"Norwich was one of the best things that ever happened to Bren," Lou-Ellen says. "He loved everything about it, from

the Corps of Cadets to playing on the lacrosse team. We wanted other students to experience the same joy and opportunities he had."

The following year, Bob and Lou-Ellen established the Brendan MacDonald Memorial Scholarship, awarded annually to a sophomore, junior, or senior member of India Company with demonstrated financial need. They generously support the Brendan T. MacDonald '06 Memorial Alumni Game, held each fall to benefit NU's lacrosse team. On more than one occasion, Bob has skydived into the Jack Abare '57 Rook Dining Out event, his Norwich-themed parachute emblazoning the sky. And the duo continues to dedicate their time and talents to campus-related causes and events too numerous to count.

"If I don't give the MacDonalds things to do," Kennedy says, "Bob will make something up on his own."

He demurs: "Well, more people do more things for Norwich than we do."

That may be true. But Bob is likely the only one to repeatedly jump out of an airplane to raise money for the university.

Every five years since his 65th birthday—the year his son Brendan would have graduated—Bob completes a mission at Skydive Pepperell Airport in Massachusetts, where he bases his sport. In a single day, he makes as many jumps as his age, backed by pledges of a dollar or more for each jump. By last summer, when he completed his "80/80 Challenge" on August 7, Bob had cumulatively raised $XX for NU's lacrosse team.

"He can't sit still," his wife Lou-Ellen quips. Over the years, Bob has served as a Boy Scout leader and Little League coach for the couple's three sons; volunteered with the Massachusetts-based conservation nonprofit The Lincoln Institute of Land Policy; actively participated in his local Norwood, Mass., men's club; and always found time to squeeze in enough jumps to maintain his skydiving license. All this, Lou-Ellen points out, while working six days a week as owner and president of Unlimited Specialties, Inc., a supplier for commercial construction projects for the past 48 years.

For her part, Lou-Ellen prefers not to claim the spotlight—despite her own many accomplishments. After graduating with an English degree, Lou-Ellen earned a second degree in biology (her first love) in night school while working for a pharmaceutical company. She returned to college yet again to train as a physician assistant once their three children were grown. "She's the brains behind my brawn," Bob says. "Always has been." She also has more than her fair share of guts—the couple met as members of the same skydiving community.

While Lou-Ellen no longer jumps, her on-the-ground influence remains unmistakable to anyone who knows the MacDonalds' philanthropy. She says she and Bob have developed "wonderful relationships" with students, their parents, faculty, and staff that remain intact year after year. "They care about us, and we care about them," Lou-Ellen adds. "That's what it means to be a Norwich family."

In the future, Bob plans to visit Normandy, France, for a D-Day anniversary commemoration as a member of the Liberty Jump Team (LJT), a Texas-based organization that preserves the memory of WWII veterans with military-style parachute demonstrations at commemorative events in the U.S. and Europe.

Two years ago, an instructor at Skydive Pepperell introduced Bob to the founder of LJT and encouraged him to apply. After completing a refresher course in Texas and a barrage of medical tests, Bob earned his spot. Re-enacting D-Day is now a bucket-list goal that will be all the more special thanks to Kyle Rogers '07, one of Bob's LJT teammates.

A former NU lacrosse player, Kyle had been wounded during a helicopter insertion in Afghanistan. During that mission, he had been wearing Brendan's T-shirt and—for reasons he can't explain—escaped what should have been a catastrophic injury.

This summer, Bob and Kyle hope to jump together: to honor the troops who went before and the cadet they'll never forget. ■

HONORARY ALUMNI
Norwich President Dr. Mark Anarumo, Col USAF (Ret), conferred honorary alumni status on Robert and Lou-Ellen MacDonald during 2021 Homecoming Weekend.

Photos courtesy Robert MacDonald

PHILANTHROPY

New Coast Guard Scholarship

Members of the Class of 1968 have endowed the RADM Richard W. Schneider Coast Guard Scholarship for students seeking careers in the Coast Guard

It started with a gesture of appreciation four years ago. At their 50th reunion, NU's Class of 1968 named then-President Richard W. Schneider, himself a '68 Coast Guard Academy graduate, an honorary member of their class.

When President Emeritus Schneider retired in 2020, Jeff Holden '68 believed his class could do more to celebrate its honorary member's long and distinguished career. Holden called David Briggs '68 in White River Junction, and fellow Massachusetts resident Richard Hayden '68.

The three decided "if we're going to do something, we ought to do something that aligns with his whole career," Holden says, citing Schneider's long service in the U.S. Coast Guard, in which he rose to the rank of rear admiral in the Coast Guard Reserve, as well as his 28 years at Norwich.

The idea led to the question: What, exactly, was Norwich's Coast Guard connection? Closer than expected, it turns out.

"Lo and behold, we find out there have been between 20 and 30 cadets since 1990, who have gone on to have careers as commissioned officers in the Coast Guard," Holden says.

Unlike the Army, Air Force, Navy, and Marines, which offer ROTC programs at Norwich, there has been no easy path for Norwich undergraduates to join the Coast Guard.

"It's a very important service," Hayden says. "A lot of Norwich alums have gone into the Coast Guard. But you can't stand up at graduation and claim your Coast Guard commission."

The trio would like to see that change. The place to start, they decided, was by supporting students already at Norwich who aspired to join the Coast Guard, and the obvious way to support them was financially. Thus, the Rear Adm. Richard Schneider Coast Guard Scholarship was born.

Since its inception, other classmates have joined in. Hayden says they have exceeded their initial fundraising goal and Norwich has approved it as an endowed scholarship. "We agreed on the criteria for selection, and we've awarded our first recipient."

The goal now is to grow the scholarship, while administration staff explore ways to offer a direct path to the service via the Coast Guard's Auxiliary University Program.

"We see the scholarship as a first step in formalizing a Norwich-supported path for a cadet to become a Coast Guard officer," Briggs says. "We're building a path not only for students already at Norwich, but also for Admissions. They can say, 'You're interested in the Coast Guard? We've got a scholarship for you.' It opens up admission opportunities. Norwich can say it is providing a way to serve your country in another force, which is the Coast Guard."

Thanks to their leadership, the Class of 1968 satisfied their desire to do just a little more for President Emeritus Schneider. ■

—Ellen Bartlett

To learn more, visit alumni.norwich.edu/CGS.

SEMPER PARATUS
President Emeritus Richard W. Schneider and USCG Capt. Eric Doucette '92 at the June 11 announcement of the Rear Adm. Richard Schneider Coast Guard Scholarship at the U.S. Coast Guard base in Boston.

Photo by Mark Collier

CRAFT DISTILLERS
Matt P'24 and Keith Berg '89 at their bespoke distillery partner, Vermont Distillery, in Queechee, Vermont.

Photo by Sean Markey

PURSUITS

Entrepreneurial Spirits

Brothers Keith '89 and Matt Berg P'25 want to turn Vermont-based Stonecutter Gin into a global brand

Brothers Keith '89 and Matt P'25 Berg first tried Stonecutter Gin on a visit to the Vermont farm of their older brother, Chris. It was love at first sip—from the Vermont hands that made it to the stonecutting tools that decorated its label to the spirit's balanced flavor and distinct cardamom notes, a spice familiar to their Scandinavian roots.

When they learned the distiller was closing shop, Keith and Matt bought the brand in November 2020. The fans-turned-owners are now learning the intricacies of the business as they work to grow the spirit into a national and global brand.

One thing they will never tinker with is Stonecutter's formula. "The people who founded it and crafted it spent a lot of time going through a lot of recipes to get it right," Matt says. "They really cared."

For now, the enterprise is a part-time gig. Matt, who is the father of first-year cadet Thoren Berg '25, remains the CIO of a Boston patent law firm. Keith is a 30-year sales executive for SAP, the global software giant. Their goal, however, is "to make it into a full-time job," Keith says.

Their skills seem well-matched for the journey ahead. Matt is an Annapolis grad, who worked as a brewer and bartender during grad school. Keith is a master of marketing. "My job is to meet people and make connections every day." ■

—Sean Markey

PARTRIDGE SOCIETY MEMBERSHIP KEY

Chairman's Six Diamond Club
cumulative lifetime giving of $10,000,000 or more

Chairman's Five Diamond Club
cumulative lifetime giving of $8,000,000—$9,999,999

Chairman's Four Diamond Club
cumulative lifetime giving of $6,000,000—$7,999,999

Chairman's Three Diamond Club
cumulative lifetime giving of $4,000,000—$5,999,999

Chairman's Two Diamond Club
cumulative lifetime giving of $2,000,000—$3,999,999

Chairman's One Diamond Club
cumulative lifetime giving of $1,000,000—$1,999,999

Five-Star General
cumulative lifetime giving of $750,000—$999,999

Four-Star General
cumulative lifetime giving of $500,000—$749,999

Three-Star General
cumulative lifetime giving of $250,000—$499,999

Two-Star General
cumulative lifetime giving of $100,000—$249,999

One-Star General
cumulative lifetime giving of $50,000—$99,999

Lifetime Level
cumulative lifetime giving of $20,000—$49,999

Annual Membership
fiscal year gift of $1,000 or more

1819 Circle Membership
planned or deferred gift to the university

Garrison Associates Membership
consecutive annual giving in five-year increments

THE PARTRIDGE SOCIETY

The mission of the Partridge Society is to encourage alumni, parents, and friends of Norwich University to help the university achieve its financial goals and to formally recognize those who do so.

The Partridge Society Board of Directors welcomes the following new and promoted Lifetime and 1819 Circle Members and acknowledges new levels achieved between June 1, 2021 and September 30, 2021.

Five-Star General Members
Mr. & Mrs. Jeffrey Hannon '86

Four-Star General Members
RADM & Mrs. Richard W. Schneider, USCGR (Ret.) H'20

Three-Star General Members
Matthew & Teresa Andresen P'23
Mark Thompson '79

Two-Star General Members
H. Douglas '71 & Margaret Hinkle P'99
Byron S. Jervis '71
John '64 & Katie Manchester
Mr. & Mrs. William N. Priesmeyer '67

One-Star General Members
Phil '66 & Jane '66 Ackley
Bertram '74 & Andrea Armstrong
Brian '68 & Virginia Austin
Francis V. Bliss, Jr. '66
Clark '71 & Colleen Hicks
G. Burton Mullen '62
Yash Jay Patel

Lifetime Members
Anonymous
Richard Carolan
William D. Clark '71
Mr. & Mrs. John P. Collins '90
Roger H. Cox '54
Mark '82 & Kimberly Dalzell
Roger B. Frey '68
Carl Holden, III '70
William '61 & Christine Jones
Andrew Jost '74
Henry '93 & Tracy Lutz, III
Michael J. Marcel '70
Jon '65 & Carol Morse
Lee '66 & Nancy '67 Robbins
Kurt E. Schlotterbeck '66
Gunjan M. Shah '96
Mr. & Mrs. Kevin Spaulding '94
Mr. & Mrs. Eric Wohltjen '81

1819 Circle Members
Michael '66 & Susan Anderson
Charles '71 & Michele Butson
Joseph A. '66 & Jill K. '66 Milano, Jr.
Joseph '67 & Judith Roy

ALUMNI NEWS

Norwich University Alumni Association Update

Homecoming 2021 marked the first in-person meeting of the NU Alumni Association Board of Directors in 18 months. The board welcomed five new members: Richard Prevost '76, Robert Hackett '90, George Hasselback '97, Justina George '17 & M'20, and Jennifer Zarycki '20. NUAA President Colm Walker '05 kicked off a busy week for the board, emceeing the Inauguration Luncheon celebrating Dr. Mark Anarumo's Presidential Inauguration. The 4th annual Alumni Dog River Run was led by NUAA Vice President Brian Gibbons '99 and drew 75 participants representing six decades of alumni. The board also hosted the Class of 2022 Networking Social, providing an opportunity for the current senior class to connect with alumni as they prepare for life post-graduation. Fifteen alumni were nominated to receive the NUAA's prestigious Alumni Awards, which were presented at Saturday's Alumni Parade. Joe Reagan '04 moderated the Legacy of Learning: NU Women Kicking Glass presentation featuring Annette (LaCasse) Redmond '83 and Tina (Judd) Stevens '83, while several directors volunteered time to support staff at "Homecoming Headquarters" in Plumley Armory.

We are grateful to thank these dedicated volunteers for contributing their time, talent, and resources in support of our alumni and students.

Norwich Forever!

EDDIE HABECK '99 & M'10
Senior Director of Alumni and Family Engagement

To learn more about the NU Alumni Association, visit alumni.norwich.edu/NUAA.

ROLL OF HONOR

The following list reflects notifications of deceased Norwich family members received by the university from July 23, 2021 to October 14, 2021. Full obituaries, when available, can be viewed online at alumni.norwich.edu/obituaries. To inform the university of the passing of a member of the Norwich family, please contact the Alumni Office at (802) 485-2100 or inmemoriam@norwich.edu.

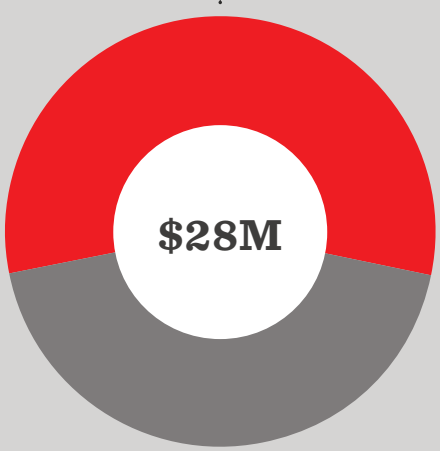
1944 **Basil S. Burrell,** 97, 7/29/2020
1945 **Marshall W. Elman,** 99, 8/15/2021
1954 **Sherman A. Cowdrey,** 89, 9/29/2021
1954 **Charles G. Pulsford,** 92, 7/22/2021
1955 **Edward J. Maculiewicz,** 87, 9/1/2021
1955 **Eric R. Mortenson,** 88, 9/25/2021
1956 **Peter J. Georges,** 87, 7/18/2021
1956 **Joseph M. Healy,** 88, 9/29/2021
1957 **Waldo H. Hazen,** 85, 9/21/2021
1958 **Ronald D. Howard,** 85, 8/28/2021
1958 **Robert S. Zambon,** 85, 10/10/2021
1961 **Albert L. Winkler,** 84, 9/20/2021
1964 **John A. Van Lund,** 78, 9/5/2021
1965 **Gordon E. Nicholson,** 78, 7/26/2021
1966 **Arthur Kramer,** 78, 9/8/2021
1966 **Carolyn (Smith) Robinson,** 76, 8/11/2021, *Vermont College*
1967 **Timothy J. Messler,** 76, 7/21/2021
1967 **Gail Becker Saldarini,** 76, 8/21/2021, *Spouse of Robert A. Saldarini '67*
1968 **Janis L. Kudla,** 72, 9/14/2021, *Vermont College*
1969 **Bernard Beaudoin,** 75, 9/17/2021
1970 **Joseph E. Gregoire,** 73, 7/18/2021
1973 **Emerick P. Nelson,** 70, 8/25/2021
1976 **Byron H. Angell,** 93, 7/25/2021
1977 **Scott O. Junge,** 66, 8/20/2021
1983 **Wesley Collins,** 60, 4/26/2021, *Spouse of Susan (Robert) Collins, VC '82, son of Nicholas Collins '55, brother-in-law of Norman Robert '84, and cousin of Teigh Southworth '82*
1987 **Susan E. Robertson,** 75, 9/17/2021, *Master's Vermont College*
1987 **Donna R. Warner,** 86, 7/24/2021, *Vermont College*
1990 **Ann Cail,** 87, 7/10/2021
1998 **Jessie L. Lamarre,** 55, 9/13/2021, *Vermont College*
William L. Asbell, 81, 8/8/2021, *Staff*

PROGRESS REPORT

The Shoulder-to-Shoulder Fundraising Initiative

GOAL: $28M BY MAY 31, 2023

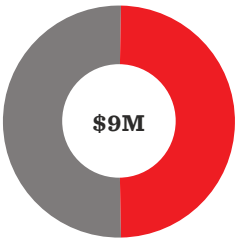
$15,752,122
56.3%



PROGRESS AS OF SEPTEMBER 30, 2021

GIFTS RECEIVED
GOAL REMAINING

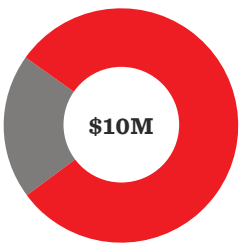
SHOULDER-TO-SHOULDER PRIORITIES



$4,009,937
49.55%

THE NORWICH FUND

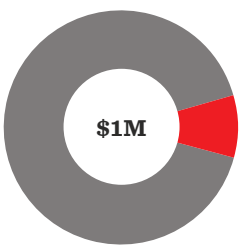
Provides the university with the flexibility to address its top priorities, funding everything from core operations to innovative opportunities and strategic initiatives.



$8,018,452
80.18%

SCHOLARSHIPS

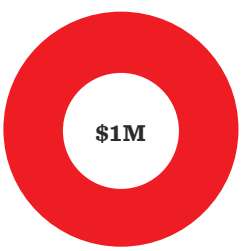
Helps alleviate the cost of a Norwich education in order to attract and retain the most deserving students.



$87,558
8.76%

TECHNOLOGY ENDOWMENT

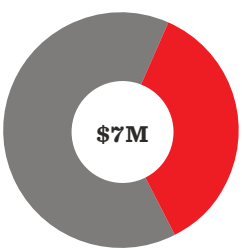
A reservoir of support to maintain and update campus technology and provide access to top-of-the-line systems and equipment.



$1,109,518
110.9%

ACADEMIC ENHANCEMENT

Enables hands-on experiential learning opportunities that take students out of the classroom and into the world.



$2,526,657
36.10%

PLANNED GIVING

Whether through gifts of bequests, annuities, or trusts, planned gifts provide a reliable and thoughtful source of support that nurtures the university's future.

NORWICH FAMILY
Christinas '01 and Jason '99 Balgos with their two boys, Gabriel and Michael. Jason is currently stationed at Fort Shafter in Honolulu, Hawaii.

Photo courtesy Christinas Balgos

PHILANTHROPY

Why We Give

BY CHRISTINAS BALGOS '01

My family taught me about respect and hard work. Norwich taught me how to climb mountains. Our Corps of Cadets/undergraduate experience is really the first stage of a lifetime relationship with the university. NU gave so much to my husband and me that we feel drawn to somehow repay it. I hope our involvement and giving back to the university will help instill the same spirit of service in the next generation. This year being our big 20th Reunion, we are raising money for a new scholarship that honors our classmates Mark Dooley '01 and Amy (Dunn) Veilleux '01. As you get older, you realize how important family is, and that's what Norwich is for us.

Christinas Balgos '01 and her husband, Army Maj. Jason Balgos '99, are Annual and 5-Year Garrison Associates members of The Partridge Society.

For more information on the 1LT Mark H. Dooley '01 Memorial Scholarship[1] and the Amy Dunn Veilleux '01 Scholarship[2], scan the following QR codes with your smartphone:

[1] [2]

Help Support the
DENNIS E. SHOWALTER RESEARCH FELLOWSHIP

"Most of us who write and teach knew a great gentleman historian with the booming voice. The late Dr. Dennis Showalter left his mark on each of us. Now is the time to respond in support of a research fellowship at Norwich University in his honor. I urge each of you to give what you can to this worthy memorial."

—John F. Votaw, Sr.,
Temple University PhD, 1991

The Dennis E. Showalter Research Fellowship at the Norwich University College of Graduate and Continuing Studies seeks to honor Prof. Dennis Showalter's contributions to the military history field, its junior scholars, and especially in the online M.A. in Military History Program at Norwich University.

The Showalter Fellowship will support the research efforts of Norwich graduate students writing their capstones or theses in military history. The first fellow will be named in 2022 and invited to present their findings at the Norwich University Military Writers' Symposium in Vermont each autumn.

Please give here:

alumni.norwich.edu/give/showalterfellowship

Scan for information

NORWICH UNIVERSITY

Female cadets in 1979 hold their own in a tug-of-war competition on Disney Field. Photo by George R. Turner courtesy NU Archives.

Class Notes

Class of 1960

From **Victor L. Kim:** Recently I was invited to visit the American Heritage Museum in Hudson, Mass. A beautiful museum filled with all types of armor that some of us might have had to use to go to war during the time of the Cold War. Now they are museum pieces. I was greeted by a volunteer at the museum by the name of **Jim Bagdon** '75, a Norwich graduate, but I was not aware of that until the end of our conversation.

Jim: "I was in the 3rd Armored Division, Germany."
Me: "I was too."
Jim: "I was at the Rock in Kirchgoens."
Me: "I was too."
Jim: "I was with the 2nd Battalion, 32nd Armor."
Me: "I was with the 2nd Battalion, 33rd Armor, the Tiger Battalion."
Jim: "I was there from 1975 until 1978."
Me: "I was there from 1974 until 1975 and then was moved to Division HQ in Frankfurt."
Jim: "Where did you receive your commission?"
Me: "Norwich University with the class of 1960."
Jim: "OMG, me too at Norwich University with the class of 1975."

We were now joined at the hip in front of the tank for our picture. Jim on the right and me on the left. Norwich Forever. *See Photo 1.*

Jim Bagdon '75 and Victor L. Kim '60

1

Class of 1967

Vermont College alumna **Katherine McFarlin McCullough** shared news this spring about her sideline career in Tinseltown. "My move to the Los Angeles area allowed me to pursue work in Hollywood for close to 23 years as a movie background extra (anyone seen in film or TV who has no dialogue) working in film, TV, commercials, and voiceovers. My biggest claim to fame was portraying JonBenet Ramsey's mother, Patsy Ramsey, in an episode of *America's Most Wanted.* I believe it was the first time they had produced a show where they didn't know the murderer's identity.

"I also worked in the (original) *Men in Black* movie, as an MiB agent in Headquarters, which filmed at Sony Studios (formerly MGM). While there, I met up with Norwich grad **Richard Branca** '78, who was at that time VP of sound and production facilities, video and projection operations, at Sony Studios.

"I simultaneously worked at the Port of Los Angeles (San Pedro) as a cruise ship agent for just about every ship that passed through that port. It was always exciting when the *Queen Elizabeth II* docked and embarked passengers for her annual around-the-world cruise. I may have, unknowingly, checked in some NU alumni for a Princess or Royal Caribbean cruise to Mexico or Hawaii!"

Class of 1972

Don Lewis writes, "When I retired from my regular 9-to-5 full-time job in 2011, I needed something to occupy some time and bring in a little extra money. There has been a chronic shortage of school bus drivers, and I thought it would be fun to follow in my father's footsteps. So I received training for a class B commercial driver's license, the endorsements to carry passengers, and school bus authorization. Now I drive school buses for high school and middle school athletics. What makes this job extra special is having five grandsons, who have played football, basketball, lacrosse, and baseball in the school system where I drive buses. I get paid to drive my grandsons' teams to games. It doesn't get any better than that."

Class of 1974

Gregory Jackson shared the following letter with the Hill. "I'd just like to report that while I have not financially contributed much to Norwich, the Norwich experience has had a profound impact on how I have lived my life. I am 69 now and have dedicated my life to volunteering. I started volunteering in 1966 (age 14) when I took a first-aid course so I could become a Ski Patrol [member] at Jay Peak. I volunteered as a ski patrolman for 26 years, including four years at NU. I was also certified as a first-aid instructor in 1966, and taught first aid at NU, as well as skiing during my four years. Norwich Mountain Cold Weather energized me to become a Senior National Ski Patrol[er], [and] achieve avalanche and mountaineering instructor status. We taught many Vermont State Police in off-trail rescue techniques in Bolton. I was married at the end of my junior year at NU and ultimately raised three boys. I continued volunteering as a Little League and soccer coach, plus 12 years as [a] Cub Scout cubmaster. When my youngest son was in 8th grade, his school required an '8th grade challenge.' I had volunteered a couple of times for Habitat for Humanity and suggested he solicit donations for them. On his own, he contacted a company in Minnesota that made vinyl siding for homes and convinced them to donate siding for an entire house in Williston, Vt. As a result, I stepped up my volunteering with Habitat for Humanity. When Katrina hit New Orleans, I found myself with several weeks of vacation that I needed to take or lose. I decided to take two weeks and volunteer my services in 2006. That year, I met hundreds of like-minded individuals and ended up organizing 40 of them to return the following three years. In 2009, I lost my job in Vermont but got picked up by Duke Health in Durham, N.C. After relocating ... a tornado in Raleigh [and a] hurricane in northeastern North Carolina found me volunteering with [the nonprofit organizations] North Carolina Baptist Men and good ole Habitat for Humanity. In March 2012, I started volunteering with [the] Durham [chapter of] Habitat for Humanity. In December 2014 I retired, and my Habitat for Humanity volunteering took off. Since then, I have worked over 8,000 hours and earned two Presidential Volunteer Service Lifetime Achievement Awards. I was also selected, by Cabot Cheese, as a 'Community Celebrity' and received an all-expenses-paid cruise.

"The bottom line is that even though I have not significantly contributed financially to NU, I have given myself in service to the benefit of society with the spirit that Norwich fostered .... I am not looking for accolades. Rather, I only wish to humbly touch base with my alma mater and the institution that has indelibly influenced my life."

Class of 1977

Greg Curtis M'07 writes, "I haven't retired yet and if things stay this fun, I'll probably never retire. I'm back in school again now on the teaching end. I'm a professor at the University of Maine at Augusta on the Brunswick campus (the former NAS Brunswick when the Navy was here). I'm teaching courses on small Unmanned Aircraft Systems, drones in layperson terms. Additionally, I'm working with another pilot professor (also a former Air Force C-130 pilot) finalizing the work to bring flight training under the UMA umbrella so veterans can apply and get all

of their pilot certifications using money from their GI Bills. We have the Part 141 certificate to teach the ground school for the Private Pilot Certificate. Now adding the flight portion for Private Pilot using Cirrus SR20 aircraft. I have been asked to assist with the development of the Part 147 program to train aircraft mechanics. And in my spare time, I'm also teaching a lady on instrument flying so she can get her Instrument Rating. I also have a Civil Air Patrol cadet student pilot working towards his Private Pilot Certificate. So it is like going full circle in my career prior to being a member of the Old Guard. Maybe they'll let me fly to the next reunion."

Class of 1986

After almost 35 years at UPS, **Mark Young** retired as director of financial systems. He and his wife, Michelle, recently relocated from New York to an active adult community in Georgia.

Class of 1989

Peter Lee is now the chief financial officer at New York–based strategic communications advisory firm Abernathy MacGregor. Peter has over 25 years of financial leadership experience in a variety of industries, including strategic communications, marketing and advertising, manufacturing, banking, and logistics. Prior to joining Abernathy, he spent nearly 10 years as the controller for Publicis Groupe Americas. During his tenure there, he was instrumental in building out the finance business support capabilities and function at their information technology and shared services center. Prior to that, he spent over nine years in banking at JPMorgan Chase and Bank of America. Peter also has over nine years of distinguished service as an officer in the United States Navy.

Class of 1990

Sean P. O'Brian was recently featured in a *Forbes* article about diversity and inclusion. A civil engineer with more than 20 years of experience, Sean serves as the president and CEO of BSC Group, a leading Boston engineering, planning, and environmental firm with 160 employees across six offices. When he joined BSC in 2017, Sean told *Forbes,* "We were holding ourselves back and we needed to change." You can read the full story at

www.forbes.com/sites/robertsher/2021/07/01/embracing-the-change-solving-the-di-challenge/?sh=6e5d90cd2906

Class of 1992

In September, Col. **Michael P. Shoen** retired from the Army National Guard with 33 years of service. Michael enlisted in the Vermont National Guard as a rook in 1988. His career included three years of enlisted service, 30 years as an officer, and eight years of active service. Over the course of his career, he served in the Vermont, Texas, and Michigan National Guard.

2

3

2. Michael P. Shoen '92.

3. Randall Miller '93 and M'07 at the NUCC Class of 2022 Junior Ring Dinner.

Deployments included Operation Hurricane Katrina, Operation Iraqi Freedom, Operation Enduring Freedom (twice), and Operation COVID Relief. *See Photo 2.*

Class of 1993

The coronavirus pandemic derailed many traditional activities on the Hill last year, including dinners to celebrate the awarding of class rings. Not this year. In October, Class of 2022 Corps of Cadets members convened at Plumley Armory for a celebratory dinner. **Randall Miller** '93 and M'07 served as the class guest of honor and featured speaker. As many know, Randy is the author of seven books, including the history book *Norwich Matters,* and the host of the *Second Mess,* a Norwich University–oriented podcast. While on the Hill as a cadet, "Randy" rose from Regimental Command Sergeants Major to Regimental Commander. After graduation, Randy served in the U.S. Army's 82nd Airborne and 2nd Infantry divisions. He later earned his master's degree in diplomacy, focusing on international terrorism, in 2007 from the College of Graduate and Continuing Studies, where he later served as an adjunct professor from 2009 to 2015.

4. *From left:* Matt Stavro '94, Brett '94 and Rea '96 Colby, Marj Frasier '94.
5. Right: Maine Trooper Abbe (Voss) Chabot '96
6. Army Col. Daniel Bidetti '99 (left) at his recent promotion ceremony.
7. Kevin Hicks '02 (TC front left) in Syria.
8. Zoey Lynn Tiersch and her new baby brother KJ.
9. Devon Linder '17 and Zachary Alder '18 (center) celebrate their recent wedding in N.H.

Randy has served on the Board of Directors for the Partridge Society and the Norwich University Alumni Association. Of Randy's contributions to NU, Hugh McLaughlin '87 has said, "It's my belief that Randy Miller's passion for Norwich, and consistent voice, has made him one of the more influential alumni of our times. His ability to connect with other graduates, distill their experiences in earnest, and share them with the rest of us is profound. As a result, his podcast *Second Mess* has become the go-to for Norwich networking." *See Photo 3.*

Class of 1994

Matt Stavro writes, "At Homecoming 2019, a group of Band Company alumni decided that we needed a weekend vacation together. We had hoped for the summer of 2020, but that fell through with COVID. In August, my wife and I headed to the Pocono Mountains of Pennsylvania for a weekend with **Brett and Rea** '96 **Colby** and **Marj Frasier.** The weekend was full of stories, laughs, food, and drinks!" *See Photo 4.*

Class of 1996

Abbe (Voss) Chabot was named Maine State Police Trooper of the Year 2020 at a ceremony in July 2021. Abbe is a detective with the Major Crimes Unit South, where her diligence and depth of knowledge have been a tremendous influence and resource to new detectives. In addition to her primary duties, Abbe has also been a K-9 handler since 2000. She and her cadaver K-9s, Pivot and Steve, have collectively assisted in the recovery of almost three dozen murder and suicide victims and lost persons. *See Photo 5.*

Class of 1999

U.S. Army officer **Daniel Bidetti** was recently promoted to the rank of colonel. He currently serves as a military assistant in the Office of the Undersecretary of Defense for Acquisitions and Sustainment at the Pentagon. He recently earned a master's in science in national resource strategy from the Eisenhower School for National Security and Resource Strategy. He previously served as sustainment chief (G4), for the 1st Calvary Division at Fort Hood. *See Photo 6.*

Class of 2002

Earlier this year, **Kevin Hicks** shared a photo of his MATV and crew in Syria, where he was deployed with the Louisiana National Guard. It marked his fourth combat deployment. He previously served in Afghanistan in 2005 and Iraq in 2009 and 2011. He expected to stay in Syria for at least nine months. On the home front, Kevin had good news to share: His first child, son Garrett James Hicks, was born in September 2019. At the time of his writing, Kevin and his wife Christina were also expecting a little girl. Kevin earned his law degree from Loyola University

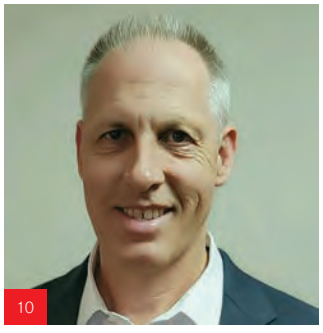
College of Law and previously worked for Louisiana Gov. John Bel Edwards in the governor's Homeland Security and Emergency Preparedness legal section, helping ensure Louisiana citizens received FEMA assistance after disasters. He subsequently moved to the Department of Homeland Security's U.S. Citizenship and Immigration Services working on asylum adjudications in New Orleans. Well done, Kevin! *See Photo 7.*

Class of 2006

James Lewandowski '08 wrote to share news that **John Rindt** was promoted to 1st Sergeant on September 11. "He is now responsible for C/3-126th AVN (Patriot DUSTOFF) and will be deploying with the unit next year." Charlie Company 3-126th Aviation Air Ambulance is an Army Medical Evacuation unit located at Burlington International Airport.

Class of 2008

AFCEA International appointed Brig. Gen. **Paul H. Fredenburgh III** '08, USA (Ret.) as executive vice president for defense in August 2021. In this capacity, Paul will develop and promote vital engagements and conversations within and across the military, government, academic, and business communities. AFCEA International is a 501(c)(6) nonprofit international professional association that connects people, ideas, and solutions globally. "Paul is a visionary and an indispensable innovator with organizational and operational experience vital for our association," AFCEA International president and CEO, Lt. Gen. Robert Shea, USMC (Ret.), said. "He is a leader by every measure." *See Photo 10.*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Class of 2013

James "Robert" Brown M'13 was named assistant director of the Operational Technology Division at FBI Headquarters in Washington, D.C. Robert had served as the special agent in charge of the Louisville Field Office in Kentucky since 2018. The Operational Technology Division provides technology-based solutions to enable and enhance the FBI's intelligence, national security, and law enforcement operations.

Following graduation from NU's College of Graduate and Continuing Studies Master's in Military History program in 2013, **Jamie Slaughter** rolled straight into a PhD program in history at the University of Wolverhampton in England. "I completed my PhD in February 2020, and now I teach for Norwich's MAH and MMH programs. It doesn't get any better than this!"

Seven Norwich alumni currently assigned to Headquarters U.S. Strategic Command at Offutt AFB, Nebraska, gathered for a group photo earlier this year. *Left to right:* Kirk Pridell '82, Walt Moynihan '87, Chip Stuart '77, Lt. Gen. Tom Bussiere USAF '85, John Evans '85, Glenn Walsh '88, and LT Tim Fontana '12, USN.

Steven Tiersch and his wife, Sari, grew their family by two this year. Zoey Lynn was officially adopted in May after having been a part of their family since October 2019. They also welcomed a baby boy, Karl Josef "KJ" Tiersch, born August 18th. Zoey has already developed a love for playing hockey at Norwich and plans to attend Norwich in the NU Class of 2038. KJ will follow close behind in the Class of 2043.

Class of 2014

Earlier this year, **Jon Gravely** wrote to say he was finishing up his master's degree in epidemiology at the University of Arkansas for Medical Sciences. "I am currently interning for the [Arkansas] Department of Health. As part of my capstone for my master's, I am helping them do analysis to help with [COVID] vaccine distribution throughout the state." Jon enlisted in the National Guard as an Army medic after graduating from Norwich.

Class of 2017

Norwich Air Force ROTC administrative assistant and proud mom Shelley Lindner P'17 wrote to share news that her daughter **Devon Linder** and **Zachary Alder** '18 were recently married at Zach's parents' lake house in Alexandria, N.H. Devon is a biochemist. Zach is a 1st Lt. with the U.S. Marine Corps Combat Engineers stationed in Camp Pendleton, Calif. The couple live in Oceanside. *See Photo 9.*

NU'S FIRST COMPUTER

Mathematics and computer science Prof. Jane Wehe Bonnette uses Norwich University's first computer, an IBM 1620 Model I, in an undated photo from the 1960s. The machines, which cost upwards of $85,000, used paper tape (left) for input and output. Unlike a later punch-card version, the Model I couldn't add or subtract, earning it the regrettable nickname CADET (Can't Add, Doesn't Even Try).

Photo courtesy NU Archives

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Two tax-smart ways to support Norwich using non-cash assets

The increase of the standard deduction limits the tax impact from charitable gifts of cash for donors who itemize. But, did you know you may still get major tax savings if you donate non-cash assets?

1. Your required minimum distribution from your IRA (all or part) can be donated to Norwich and will not be included in your adjusted gross income.
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By using this strategy, your gift can help reduce taxes and, most importantly, help support the mission of Norwich University – teaching the students of today to be the leaders of tomorrow.

If you would like more information, please contact Megann O'Malley at (802) 485-2282 or momalley@norwich.edu. You may also find more information online at Norwichgiftplans.org

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USSTRATCOM Deputy Commander Lt. Gen. Thomas Bussiere '85, USAF during a visit to the Norwich campus in October. Photo by Aram Boghosian