PennState
College of Information
Sciences and Technology

iConnect

Spring/Summer 2020

HAIL TO THE LION!

For the last three years, a recent College of IST graduate held one of the most prestigious—and secretive—jobs on campus: the Nittany Lion.

Challenge and Change

Last year, we marked twenty years since the College of IST welcomed its first students, collectively reflecting on how much the world can change in this relatively short time.

Now, as we face the unknowns of a global pandemic and a long overdue confrontation with the systemic racial and societal injustices in our country, we are reminded daily of the speed at which change occurs and the magnitude of its impact.

When remote learning was initiated by the University in early March amid the novel coronavirus outbreak, I was heartened by how the IST community responded. Faculty and supporting staff moved thousands of students and hundreds of courses to a synchronous online environment in a matter of days. Front-line staff met virtually with students to provide guidance and support for an unknown future. Those behind the scenes in IT, finance, research, faculty affairs, and academic services–the list goes on–have been invaluable in moving us forward. We continue these efforts as we adjust in the summer and prepare for the fall semester.

Students showed flexibility and resiliency to maintain their commitments, with more than 500 earning their degrees in the University's first-ever virtual commencement in May. Alumni and friends stepped up to offer remote internships and make gifts to the University's Student Care & Advocacy Emergency Fund. These acts represent the best in our community, and we are forever grateful.

We are now called to an additional challenge, new in its urgency but not in its necessity. We are witness to how the pandemic disproportionately affects Black communities and communities of color, further exacerbating the social inequities that for more than 400 years have permeated and been tacitly accepted by our society. These perpetual injustices were laid bare when we witnessed the horrific killing of George Floyd, igniting a powder keg and once again exposing the active and passive racism that stands as our country's oldest and deepest wound, held together tenuously only by the stitches of incremental progress and hope.

We, as a college and as a collection of individuals, denounce messages of hate and the sanctioned violence against the Black community. We express our support for the marginalized, overlooked, forgotten, and unjustly victimized. We educate ourselves on these injustices, believing this can serve as the bridge to guarantee the dignity and humanity of those who have yet to receive it. We recommit to recruiting more students and hiring more faculty and staff from underrepresented backgrounds.

These are important steps, but they merely serve as the foundation for the more challenging actions that must be taken. We must listen to the frustration, pain, and anger from all communities of color and find pathways for meaningful change. We must be willing to be uncomfortable as we examine our own roles in these systems of oppression. We must acknowledge and work harder to address these disparities as they exist within our college, and use our position as a leading information school to fight for change in our broader field. We must balance honest and transparent communication with decisive action. We affirm that Black Lives Matter. Now, we must prove it.

We are sharing this issue as originally planned – the timeline to produce a printed magazine requires it. But in the issues ahead, I'm eager to share the progress we are making to affect positive change in these areas. I encourage you to use your voice to ensure that we are living up to these ideals.

As I write this message in early June, the world could look much different by the time you read it. I call on you to join us in making certain that it does.

Andrew Sears, Dean
College of Information Sciences and Technology

MICHELLE BIXBY/PENN STATE

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ON THE COVER

Spring 2020 graduate Zach Sowa sits on the steps of Old Main for a rare picture of the Nittany Lion mascot out of costume, shortly after his identity was revealed at the 2019 Senior Day football game.

With remote learning in place and most buildings closed after spring break, it wasn't hard for the few students who had to stay in town to maintain social distance while looking for an outdoor study spot on campus.

iConnect

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Opinions expressed are not necessarily shared by the University, college, or editorial staff.

PennState
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U.Ed. IST 20-29

Ensuring the thoughtful application of AI

IST leads University-wide effort to consider broad implications of artificial intelligence development

Housed administratively in the College of IST, a new multi-unit research center is positioning Penn State to recognize and interpret the social implications of artificial intelligence.

The Penn State Center for Socially Responsible Artificial Intelligence, launched this spring, promotes the thoughtful development and application of AI and studies its impact on all areas of human endeavor. In addition to supporting research focused explicitly on AI for social good and mitigating threats from its misuse, the effort encourages that all AI research and development activities consider social and ethical implications as well as intended and possible unintended consequences.

"Given the rapid expansion and progression of interdisciplinary research and the wide-ranging impact of artificial intelligence on society, this center will engage and enable Penn State scholars and educators to work together and use AI to address the grand challenges of our time," said Andrew Sears, dean of IST, who led the founding of the center.

The center will organize around specific topics and academic disciplines to enable multidisciplinary research and educational programs that will shape the future of AI.

Initial participating units include the colleges of Earth and Mineral Sciences, Engineering, Health and Human Development, IST, Liberal Arts, and Medicine; Bellisario College of Communications; Smeal College of Business; Penn State Law at University Park; Penn State Outreach; all Commonwealth Campuses; Rock Ethics Institue, Social Science Research Institute; and the Institute for Computational and Data Sciences. Prasenjit Mitra, IST's associate dean of research and a co-founder of the center, is serving as inaugural director.

"We're looking at creation of AI-based technologies and the implications of their use," said Mitra. "For example, the internet was initially used by professors to share publications; commerce wasn't allowed, so no one was really thinking about security. This time we cannot make the same mistake of thinking in silos. Now, we must think about how we can advance new technology while also taking into effect its full societal impacts."

Ultimately, the center will allow Penn State to take on large-scale projects that are too complex for an individual unit to manage alone and that need the active collaboration of researchers from several disciplines using cutting-edge AI tools to solve.

"Penn State has the expertise and resources to grasp the near-infinite opportunities and ever-evolving nature of AI," explained Sears. "This center demonstrates the University's commitment and our collective responsibility to not only continue our pursuit of innovation but also ensure the thoughtful application of what we are creating."

ALEX/ADOBE STOCK

Strength in Community

IST's reputation—built through our world-class education, research, and alumni network—is reinforced by the diversity of our people and their backgrounds and experiences. Meet a few of them here and visit **ist.psu.edu/meet-our-people** to learn more about the individuals who comprise our strong community.

At IST I was pushed out of my comfort zone, which has been beneficial to me at the start of my career.

Annie Schoen '19
Emerging Leader 1, GEICO

The broad spectrum of faculty backgrounds at IST leads to many different types of research across a wide array of disciplines.

Rahul Emani, Class of 2022
Undergraduate Researcher
Schreyer Scholar

The biggest excitement is when students come in and find their confidence. It's powerful to be able to help them believe in themselves.

Rita Griffith
Assistant Director of
Professional Development

CATCHING UP

AMAZON RESEARCH

IST faculty members James Wang and Xinyu Xing are among 51 computing experts representing 39 universities worldwide to receive 2019 Amazon Research Awards. The award program provides funding at academic institutions around the world for research in a variety of computing domains. Wang, who also received the award in 2018, was the first Penn State researcher to earn the recognition.

FULBRIGHT AWARDS

Two associate professors recently received prestigious and competitive Fulbright recognitions. Anna Squicciarini's Cyber Security Award will aid her research on cloud computing security, particularly as it relates to end-user perspectives. With a Global Scholar Award, Carleen Maitland will compare dynamic aspects of platform use in refugee crises in Uganda and Panama.

GETTING CONNECTED

Students looking to make the most of their time on campus now have a resource and advocate within the College of IST. Steve Babb joined the college last year as IST's first assistant director of student engagement. In this new role, Babb works to strengthen IST student organizations' engagement and grow partnerships throughout the college.

Meeting Industry Demand

Three new degree programs prepare graduates for diverse and emerging careers

Ever-evolving to meet the needs of the Information Age, the College of IST will enroll its first students in three new degree programs this fall.

An outgrowth of the integration and application option in the IST major, a new bachelor's degree in enterprise technology integration will prepare professionals to solve organizational problems through technology systems solutions.

Directed primarily at students seeking careers in systems integration and IT and business consulting, the program will provide students with expanded knowledge in cloud computing and database technologies combined with business concepts. Students will gain skills in analyzing needs, formulating and implementing technology-based solutions, and evaluating outcomes that stretch within and across organizations.

Following the success of the college's undergraduate cybersecurity program (pg. 20), an online bachelor's degree and a residential master's degree in cybersecurity analytics and operations will prepare the next generation of professionals for a rapidly growing industry.

The bachelor's degree program, offered through Penn State World Campus, highlights the skills emerging professionals need to recognize, analyze, manage, and eliminate risks from a variety of threats. The coursework builds on a foundation of mathematics and computer programming while addressing the critical areas of technical cyberdefense strategies, risk management, and cybersecurity analytics.

The research-oriented master's program will ready the next generation of professionals by emphasizing the larger context of organizations and countries and their influences, as well as the business reasoning needed for communication, analysis, and management of detected cyber risks.

The college's online MPS degree in information sciences—cybersecurity and information assurance option was also renamed to cybersecurity analytics and operations.

Guided by feedback from corporate partners, alumni, and current students, each program strengthens the college's standing and aligns its academic offerings with global strategic needs.

Improving image classification for disaster response

Data sciences capstone students made cutting-edge contributions to improve image classification for disaster response, working with a group of MIT Lincoln Laboratory Beaver Works researchers led by alumnus Andrew Weinert.

Through the project, the students analyzed and tagged images in a dataset of aerial photographs taken above disaster scenes. They then developed a computer model, creating an augmented way to classify the images.

"Say you have a picture of what looks like a lake," said assistant teaching professor Marc Rigas. "Then you see trees sticking out of it and realize it's a flood zone. The computer has to know that and be able to distinguish what is a lake and what isn't."

The students' continued work has led to a trained model that can classify images with 79% accuracy.

"[This could] potentially be performing better than what some commercial services are offering for this specific use case," Weinert said, noting that the improved accuracy could lead to shortened response times in a disaster.

VLADIMIR MELNIKOV/ADOBE STOCK (BOTTOM)

Remote Controlled

When Penn State shifted to remote learning this spring, IST's Office of Teaching, Learning, and Assessment spearheaded the effort to ensure that faculty and students were ready. **Lisa Lenze**, who leads the team, shared her perspective on how the college adapted to—and thrived in—the virtual environment.

Q: How did IST shift to remote learning?
A: We had to pivot our perspective to provide synchronous classes remotely. It's an entirely new challenge that requires different assumptions and support structures than preparing for a residential synchronous or an online asynchronous environment. We also had to marshal our resources to shift our teaching in a matter of days. Led by Amy Garbrick, our amazing Learning Design team shared resources and met with faculty to make sure they had the knowledge and tools to make remote learning work for our students. And our Learning Enhancement group quickly shifted materials online and prepared student assistants to support classes remotely.

Q: What helped IST to be successful in this shift?
A: First, experienced faculty stepped up to share expertise for teaching at a distance, and the ingenuity of our staff was key in supporting the move. Second, we helped more faculty than ever access materials from the college's strong World Campus portfolio to demonstrate how their courses could be delivered remotely. And third, our students—including those on our Learning Enhancement team—showed their propensity for technology and adapted quickly. It was a monumental, all-hands-on-deck effort.

Q: What will you carry forward from this experience?
A: The target keeps moving so it's hard to know what the future looks like, but we've identified some ideas to maintain when normal operations resume. For example, many faculty plan to use remote learning tools to support in-residence learning, and we hope to continue offering virtual tutoring sessions for University Park students when needed. The Learning Design team is also thinking about how we can repurpose synchronous lectures to make designing online courses more efficient. There have been big challenges, but we've been able to overcome them because the entire college has come together to make this period successful for our students.

A résumé-building spring break

Earlier this year, a group of first-year students traveled to Raleigh, North Carolina, as part of IST's annual alternative spring break trip. Students were exposed to top tech companies, including IBM and Fidelity Investments; networked with alumni; and gained professional insight to guide their careers.

"The PLA is teaching me to be more confident and more assertive."

Lessons in leadership from President Barron

Tiffany Bass was unsure of what career path she wanted to pursue when she arrived at Penn State, but she knew she wanted to make the most of her time on campus. Then, a mentor recommended her for the Presidential Leadership Academy (PLA), a Penn State program led by University President Eric Barron with the goal of enhancing students' critical thinking and leadership skills.

Now a rising junior, Bass is one of 90 students working with President Barron to learn what it means to be a leader in their personal and professional lives, as well as in their individual and shared communities. She was one of 30 students selected from across the University for the program last year.

Although Bass didn't know what to expect initially of her weekly interactions with President Barron, she said that one of his first lessons was to inspire active participation in each class. This, she said, has carried over to other aspects of her education.

"Most of my classes have a lot of group work in them, and being not only a woman but also a woman of color is intimidating sometimes in that environment," Bass said. "The PLA is teaching me to be more confident and more assertive."

The support network Bass has built within the College of IST has also proven to be invaluable to her academic and professional development within PLA.

"IST has given me a great support system I can use in PLA when I'm in lectures," she said. "The staff supports me with everything I do, and they want to help me get involved."

Doctoral students earn prestigious fellowships

Yueqi Chen (top) and Wenbo Guo are among 24 doctoral students worldwide who have been awarded 2020 IBM Ph.D. Fellowships.

The highly competitive program recognizes exceptional doctoral students who want to make their mark in promising and disruptive technologies. At Penn State, Chen and Guo's research interests are focused on computer security.

"This is a signal that IST's doctoral program is among the top-tier for the cybersecurity track."

"[I am honored that IBM] sees the value of my research on exploitability escalation and exploitability assessment," said Chen. "These groundbreaking works offer a new perspective of building more secure software systems, which is very promising and aligns with IBM's interests."

"This is a signal that IST's doctoral program is among the top-tier for the cybersecurity track," said Guo. "Our Ph.D. students are of high quality that is comparable with the top Ph.D. students from top universities."

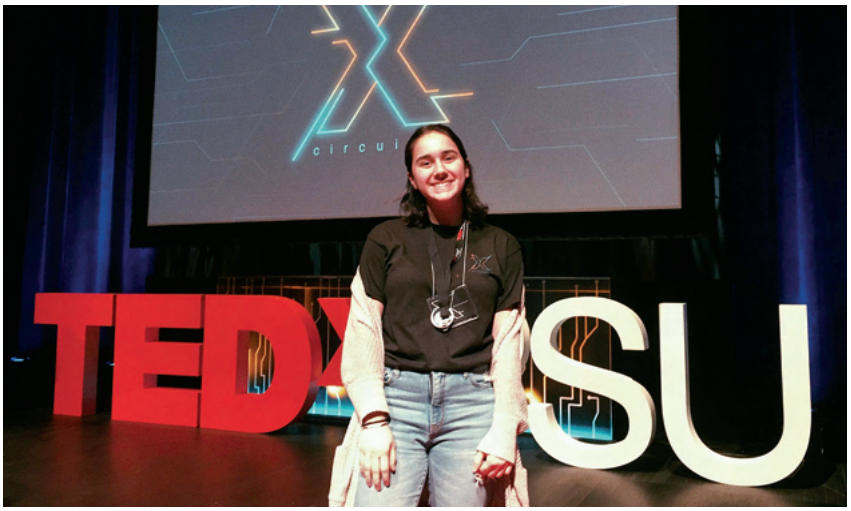
At the top of a global hacking community

IST students Michael Cao (left) and Kathyleen O'Leary were named to Major League Hacking's list of Top 50 Hackers of 2020. The list recognizes students and recent graduates who have impacted and inspired the hacking community.

"To me, hacking is the process of innovating and building new things to hone your programming and computing skills—especially through creating something new using a programming language or tool you've never used before," said Cao.

Both students said they are proud to represent Penn State and the College of IST on this year's list.

"Overall, being named in the top 50 is very humbling," O'Leary said. "A lot of people I really deeply respect are included, and the list doesn't even show an eighth of all the passionate and high-achieving people in the community."



Ideas Worth Spreading

This year, IST student Leah Miller took on one of the most prominent leadership roles at Penn State: curator and president of TEDxPSU. Held Feb. 16, Miller led 12 subcommittees to host researchers, artists, advocates, and other prominent speakers during the University's annual version of the world-renowned TED Talks.

"TED is all about sparking ideas and spreading knowledge," said Miller. "For both roles in TEDxPSU and my internship [with IST's Office of Undergraduate Recruiting], the goal is to give enough to people so that they can get that spark and grow their interest in the subject at hand."

EMILY AKERS/MAJOR LEAGUE HACKING (TOP)

RECENTLY ENGAGED

Five IST student organizations launched this year, adding to the list of engagement opportunities for students to enhance learning, build networks, and prepare for life after graduation.

CODEvelop
Offers peer-to-peer educational programs focused on leading industry coding languages

Cyber Certifications Club
Prepares students to pass exams for industry-leading cyber certifications

Emerging Technologies Club
Presents student-led labs using Raspberry Pi to explore creative uses of the accessible tech

National Security Club
Prepares students for federal careers through information sessions, workshops, and job fairs

User Experience Professionals Association
Partners with the national organization to provide UX workshops and professional development

Improving maternal and fetal health with AI

AI-driven placental analysis could improve testing efficiency with fewer resources

Placentas provide critical information about maternal and infant health, but only 20% of placentas in the U.S.—and fewer globally—are assessed by pathology exams.

James Wang, professor of IST, is part of a multidisciplinary team of researchers that has developed patent-pending technology that uses artificial intelligence to analyze an image of each side of the placenta after delivery and then produce accurate, automated, and near-immediate diagnostic reports.

These reports could provide critical information that may impact the clinical care of the mother and baby, such as whether the fetus was getting enough oxygen in the womb or if there is a risk of infection or bleeding.

The team, which includes Alison Gernand, assistant professor of nutritional sciences at Penn State; Jeffery Goldstein, assistant professor of pathology at Northwestern University; and IST doctoral students Yukun Chen, Dolzodmaa Davaasuren, Chenyan Wu, and Zhuomin Zhang, analyzed and labeled thousands of placental images and corresponding pathology reports from Northwestern Memorial Hospital in Chicago. These images were used to train neural networks that could detect features linked to abnormalities and potential health risks with accuracy comparable to the original pathology reports.

"Past analyses have typically examined features independently and used a limited number of images," said Wang. "Our tool leverages AI and a large and comprehensive dataset to make multiple decisions at the same time by treating the different parts of the placenta as complementary."

Ultimately, their research could allow for complete placental analysis using fewer resources, which may help researchers better understand the connection between placentas and maternal and infant health outcomes.

"We don't want to replace pathologists, but rather we want to provide physicians with more information right at birth so they can make an efficient and informed decision about how to care for the mother and child," concluded Wang.

Volunteer engagement could improve access to clean water

Thousands of volunteer groups monitor U.S. water quality to inform the public of clean water practices and environmental impacts, but their efforts are not well known. IST researchers hope to change that.

"We wondered, how could we help to make this important work more visible, which might make it more effective, even more fun, and improve recruiting efforts and sustainability?" said Jack Carroll, Distinguished Professor of IST.

Carroll and IST doctoral students Shipi Dhanorkar and Srishti Gupta studied 13 citizen groups that monitor water quality—mainly in streams—in central Pennsylvania. The researchers found that raising awareness of these efforts and offering technological tools could help community leaders engage volunteers to improve community access to clean water and possibly avoid water-related crises.

"Many groups have a lot of valuable data, but the data is underutilized because of cumbersome and inappropriate tools," said Carroll.

The researchers are now working with a team of students, mentored by assistant research professor Chun-Hua Tsai, as part of an IST data sciences capstone course to design database support for these groups.

KIEFERPIX/ADOBE STOCK (BOTTOM); CCPASEC (TOP)

Experts and students aid NATO in counterterrorism training

Peter Forster, associate teaching professor who retired this spring, led IST undergraduate and graduate students and Penn State experts in contributing to a new international publication that will be used as a framework for counterterrorism training by organizations around the world.

As chair of the Partnership for Peace Consortium's Combating Terrorism Working Group, Forster served as co-chair of the publication, titled "The Counterterrorism Reference Curriculum." It was produced by a multinational team of researchers, government officials, and military and law enforcement personnel.

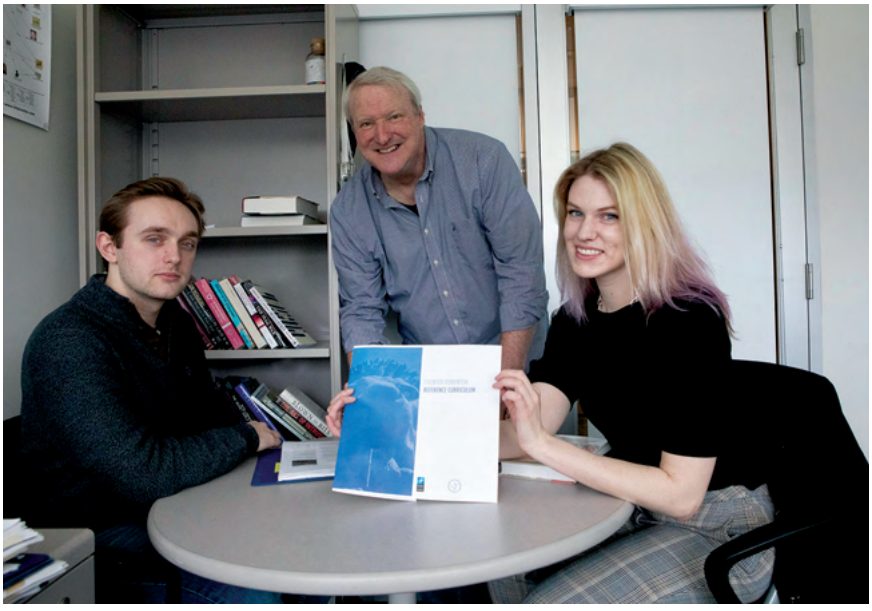
NATO will use the document—which examines past problems in counterterrorism to help anticipate and mitigate future potential threats—to train NATO members and partners, as well as government organizations, in tactics and strategies that could combat or prevent terrorism.

"This is an internationally-reviewed publication, so to have Penn State involved from an institutional perspective is quite an honor," said Forster. "It demonstrates the expertise that is here, the quality of students that are here, and our commitment to engaged scholarship and internationalization."

IST students Trisha Miller, Cara Schwartz, Peregrin Summers, Austin Thoet, and Samantha Weirman contributed to the curriculum.

"[Participating in this project] was an invitation to an open door," said Summers. "I got to experience something beyond the borders of the college, as well as various international cultures as far as my career and professionalism are concerned. That means more to me than any grade."

Forster added, "I'm very proud to engage some of our best students and get them to focus on specific parts of the curriculum. From their perspective, this is engaged scholarship at the highest level, because what they are doing now is going to be translated globally."



(L to R): Peregrin Summers, Peter Forster, and Trisha Miller display the cover of "The Counterterrorism Reference Curriculum."

RESEARCH BRIEFS

ONE-ON-ONE MATCHUP

This summer, nine undergraduate students from across the country have been paired with IST faculty experts to participate in machine learning in cybersecurity research activities, through a new Research Experiences for Undergraduates (REU) Site program. Funded by the National Science Foundation, the intensive 10-week virtual program at IST enables each student to focus on an individual topic, such as fake news mitigation, smart contract fraud, and privacy in conversational agents.

CAREER AWARD

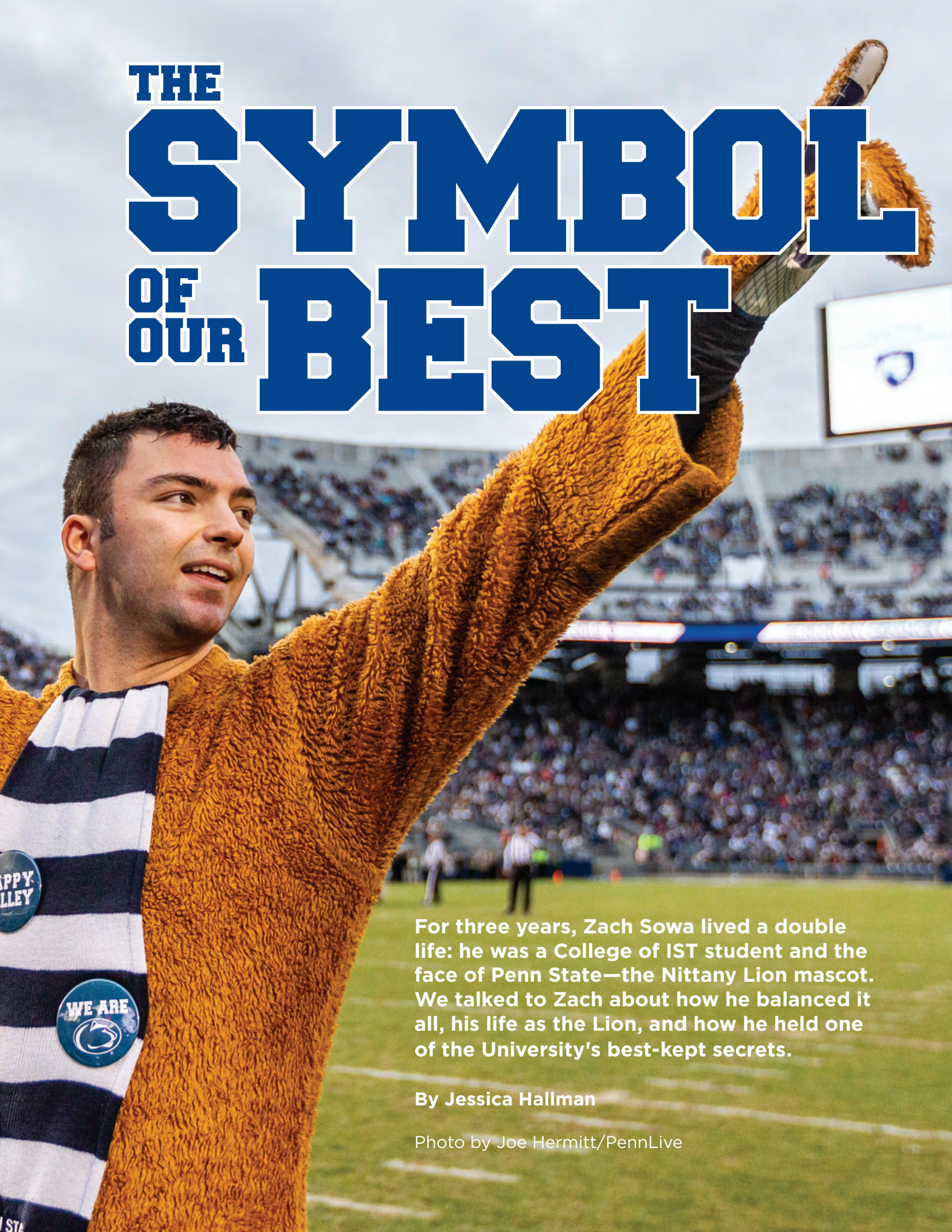
Ben Hanrahan, assistant professor, received a five-year, $485,000 National Science Foundation Faculty Early Career Development (CAREER) award—one of the NSF's most prestigious recognitions. His project explores how digital tools that automate and remotely manage workers may negatively impact those workers and their rights—specifically in ride-sharing platforms, which use algorithmic management to assign and evaluate work.

INCLUSIVE RESEARCH

Undergraduates Adanna Nedd and Courtney Smith presented research posters at the virtual iConference 2020 in March. Nedd, whose team was a finalist for the Best Poster Award, explored self-representation in video games. Smith's team studied how queer people use information communication technologies to cope with stigma. Both completed the research as part of the iSchool Inclusion Institute, which engages underrepresented students from institutions across the U.S.


HAPPY VALLEY

THE SYMBOL OF OUR BEST



For three years, Zach Sowa lived a double life: he was a College of IST student and the face of Penn State—the Nittany Lion mascot. We talked to Zach about how he balanced it all, his life as the Lion, and how he held one of the University's best-kept secrets.

By Jessica Hallman

Photo by Joe Hermitt/PennLive

During his time at Penn State, Zach Sowa

was one of the most popular students on campus. Everywhere he went, he was stopped for photos with adoring fans of all ages. His schedule was filled with events and celebrations at which he connected with thousands of members of the Penn State community. And on fall Saturdays he took center stage in front of 107,000 fans at Beaver Stadium.

But despite his fame, nobody knew who he was. That's because for the majority of his college career he held one of Penn State's best-kept secrets.

As the Nittany Lion mascot from April 2017 through February 2020, Zach suited up and rallied fans at more than 350 University and community events each year. He recently earned a degree in cybersecurity analytics and operations in the College of IST, balancing a heavy course load with one of the most demanding student mascot schedules in the country. Unlike at most other Division 1 schools, Penn State reserves the honor of being the mascot for a single individual.

"That is one of our strongest traditions," said Zach. "And while the majority of people know that there's only one student in the role, there are a significant amount of people that assume, just because of how many places the Lion appears, that there's no way one person does all that."

But Zach did. Every day, he transformed from a typical college student into the symbol of our best, then back again.

"It very quickly became like flipping a switch," Zach said. "When I put on the costume I had no urge to talk. I had no urge to act normally. You literally just flip a switch, think like a 5-year-old, and act on everything you think."

As the Lion, Zach got into character for a variety of events, from early morning ROTC drills to late-night photo shoots with fans after basketball games—and plenty of things in between. While he said that every opportunity to entertain fans was a great one, there was one particular experience that was especially impactful.

"I can't point to a single greatest moment as being the Lion, but what I'll tell you is the most emotionally moving that there ever will be is THON," he said. "There are times when you just knew that your effect meant so much more, and THON was a 46-hour reminder of that."

He added, "When I put on that costume and put on that persona, I could walk into a room and see so many faces brighten by my presence as the Lion. Just being able to walk into a room and know that you've positively affected the lives of that many people is the greatest feeling in the world."

A Day in the Life of the Nittany Lion

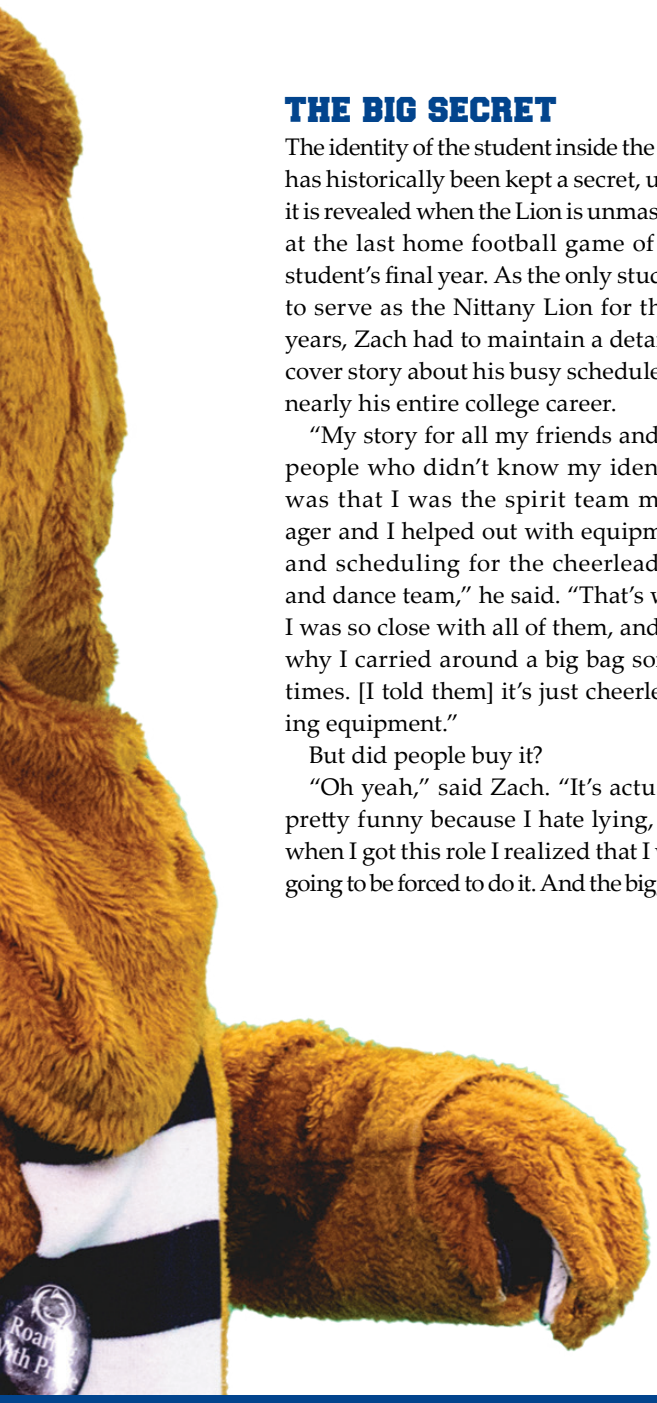
Wednesday, Nov. 13, 2019

We tagged along with Zach Sowa last fall to see what a typical day looks like for the Penn State mascot.

6 a.m.
Wake up and have breakfast.

7-10:30 a.m.
Do homework, review applications for the next mascot, and talk to employers about job opportunities.

11 a.m.
Drive to HUB for mascot appearance.



THE BIG SECRET

The identity of the student inside the suit has historically been kept a secret, until it is revealed when the Lion is unmasked at the last home football game of the student's final year. As the only student to serve as the Nittany Lion for three years, Zach had to maintain a detailed cover story about his busy schedule for nearly his entire college career.

"My story for all my friends and for people who didn't know my identity was that I was the spirit team manager and I helped out with equipment and scheduling for the cheerleading and dance team," he said. "That's why I was so close with all of them, and it's why I carried around a big bag sometimes. [I told them] it's just cheerleading equipment."

But did people buy it?

"Oh yeah," said Zach. "It's actually pretty funny because I hate lying, but when I got this role I realized that I was going to be forced to do it. And the biggest thing that I hate about lying is that you'll always get caught. You just continue to lie and then your lies overlap and you just dig yourself into a big ditch. But I knew I would have to lie, so I said 'let's make one big lie that I know everything about.' "

"When I put on that costume and put on that persona, I could walk into a room and see so many faces brighten by my presence as the Lion."

Another secretive aspect of being the Lion is managing the costume. Not only did Zach keep it well-hidden in a duffel bag when traveling to and from events, he was also responsible for washing and drying the suit at the end of each day.

"You get unbelievably sweaty as a mascot, especially during football games," he said. "I would literally lose 10, sometimes even 15, pounds of sweat."

With all of that sweat—and all of the Lion's appearances—Zach says that he averaged doing laundry more than once a day. And, living in an on-campus apartment, he had to stake his claim of the communal laundry room to secretly wash the precious cargo.

"There were a number of times that you can imagine that I was caught," he said. "There are glass windows, and people check laundry frequently. So there were times when someone would walk in when I was literally holding the costume with the scarf and everything."

And that's when he resorted to his well-rehearsed, comprehensive lie.

"I'd say, 'I'm the spirit team manager. There's no way the Lion has time to wash the costume. As part of my responsibility, I have to wash it. It's so disgusting.' I would just go off about how gross it was and how I hated doing it," he said.

According to Zach, he got to the point where he could tell anyone everything there is to know about his job as the "spirit team manager" with a straight face.

"If you ask me, it was bulletproof," he said.

11:30 a.m.-12:00 p.m.
Suit up and rally fans at "100 Days 'til THON."

12:05-12:55 p.m.
Attend Computer and Cyber Forensics class in Keller Building.

1:10-1:45 p.m.
Grab lunch with friends at Panda Express, with a typical 1,500 calorie triple order of orange chicken and fried rice.

Zach Sowa takes a break from dancing to entertain the crowd at THON 2020.

A BALANCING ACT

When he earned his degree this spring, Zach became one of the first graduates of the College of IST's cybersecurity analytics and operations major—which he said has prepared him well for his career.

"I'm incredibly excited about the skills that I learned in the cyber major," said Zach. "We received a lot of hands-on experience doing malware analysis and machine learning. And we were able to do penetration testing, which is rare as an in-class experience."

Averaging 17 credits while simultaneously serving as the Lion, Zach learned early on in his mascot career that he had to figure out how to balance his time as a student with his time behind the mask.

"The only way to really tackle it is to know your priorities," he said. "The primary reason I was at Penn State was as a student, getting an education. So whatever I did, I couldn't let that slip."

He added, "But I also had the opportunity to serve the University in a very rare and extremely exciting capacity. So I prioritized academics, and otherwise just did whatever it took."

More than with just his friends, Zach had to keep his identity a secret from most of his instructors and classmates. With his "spirit team manager" job duties, he had to miss quite a bit of class time and needed flexibility with assignment deadlines. Nonetheless, he stayed on top of his schoolwork, even while filling one of the most prestigious roles at Penn State.

"Most classwork was due on Sundays, and when I was traveling during football season, Friday and Sunday were travel days and Saturdays were filled with game day activities," he said. "It was really difficult to get work done while traveling. So if I wasn't ahead, I'd fall behind."

Now an alumnus, Zach is working as a cyber advisory analyst at Deloitte—one of four job offers he received. He credits his time at the University for helping him to build a solid foundation for career success.

"Penn State is a fantastic name to have on your degree, and the programs at IST are so well-known and respected," he said. "Between the prestige of the education and the character that comes along with the Penn State values, I'm incredibly proud to have it on my diploma."

But, Zach says his work as the Nittany Lion has also played a role in his professional development.

"For a long time I would put the Nittany Lion as the first thing on my résumé, and that was very deliberate because my experience as the Lion has developed me more as a person than anything else in my life," he said. "Between professional skills of time management and communication, those are things that you would obviously understand are heightened by how much of it I had to do."

JOE HERMITT/PENNLIVE (TOP)

2-5:30 p.m.
Appear in the annual Penn State year-end video shoot with President Barron.

6-10 p.m.
Eat dinner, then mascot duties at a women's basketball game and photos with fans afterward.

> "The Lion's been shaped into this incredible character that I'm the lucky guy who has had the honor of portraying."

SAYING FAREWELL

A new student is now behind the mask, carrying on the tradition that 52 former students once held. Zach was heavily involved in the selection process for his successor and is uniquely positioned to ensure that the persona that has been developed over the past 116 years lives on.

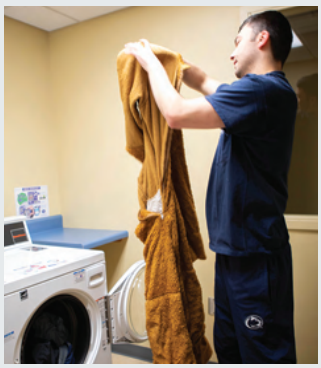
"I'd like to thank the 51 people before me who have played the role," said Zach. "The Lion's been shaped into this incredible character that I'm the lucky guy who has had the honor of portraying."

Zach's final appearance as the Lion was during THON 2020. Throughout THON weekend, as was the case throughout his time on campus, he played a dual role—dancing as himself as part of an independent dancer couple and entertaining the crowd as the Lion. At the end of that 46-hour stretch, when dancers were given the announcement to sit, Zach, still in costume, plopped down on the stage with bittersweet emotion. It was the end of his era.

"THON was a poetic end to my career as the Lion. My whole career focused around making an impact, and I made my biggest impact ever in THON 2020 by dancing 46 hours and fundraising over $50,000 for the kids—all through the incredible power of the Penn State community."

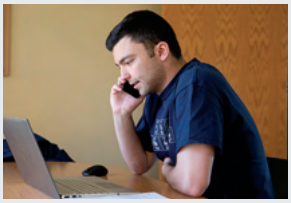
Looking back on the last three years as one of the most recognizable mascots in sports, Zach said he would do it all again in a heartbeat.

"Overall, it's heightened my sense of meaning and purpose for life," he said.



10:30 p.m.
Wash the suit, then start homework.

11 p.m. - 1 a.m.
Call girlfriend, finish homework, and look over tomorrow's schedule.



1:00 a.m.
Go to bed.

THE LION'S SHARE

As the Nittany Lion, Zach posted some impressive stats.

15

Typical number of pounds lost during a football game

40+

Average weekly hours as the Nittanly Lion

460

Most one-handed pushups in a game (vs. Idaho, 2019)

1,200+

Mascot appearances over 3-year career

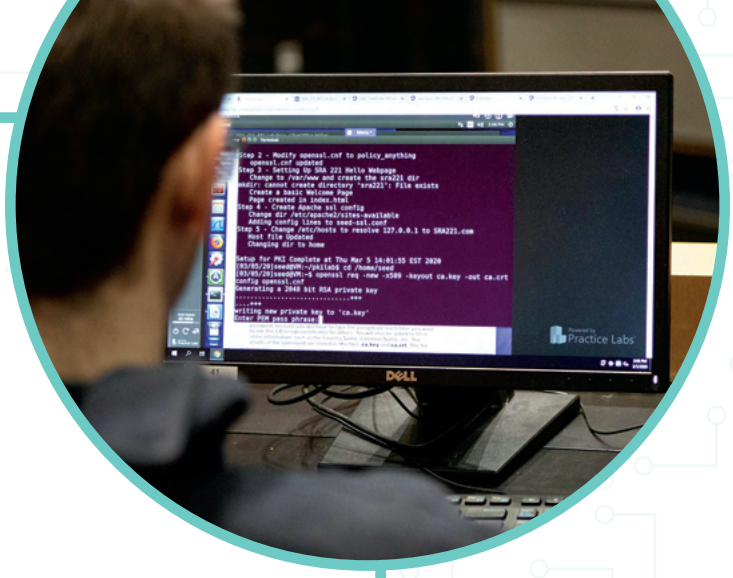
5,000+

Daily calorie intake

MEETING A GLOBAL SECURITY DEMAND

COLLEGE OF IST ADVANCES PROGRAMS AND RESEARCH, CONFERS FIRST BACHELOR'S DEGREES IN CYBERSECURITY

BY JESSICA HALLMAN



The statistics are staggering:

A cyberattack occurs in the U.S. every 39 seconds[1]. The average cost of a data breach in 2020 is expected to exceed $150 million[2]. The average amount of time it takes for a company to find a data breach is six months[3].

And by next year, there will be a projected 3.5 million unfulfilled cybersecurity jobs[4] to protect against these attacks.

The College of IST is helping to fill this global demand through the cybersecurity analytics and operations bachelor's degree program, launched in 2017. Its first class of graduates, having earned their degrees this spring, are ready to tackle cybersecurity challenges that individuals and organizations around the world face.

Sarah Hume is one of those graduates.

"The demand is crazy right now, and the unemployment rate is close to zero," she said. "It's really exciting that Penn State is one of the leaders in terms of universities offering cybersecurity education."

Hume enrolled at Penn State in part due to the University's designation as a National Center of Academic Excellence in Cyber Defense by the NSA and the Department of Homeland Security. Now, as she enters the workforce, Hume feels that having cybersecurity experience on her resume helped her stand apart from other candidates—leading to her current role on the technical assessments team at Security Risk Advisors, a firm at which she completed two internships.

"The name of the degree is pretty unique and implies a much more technical background," she said. "That intrigues an employer and shows them that the candidate has the skills they're looking for."

Alyssa Stackpole agrees. While she earned her degree in security and risk analysis before the launch of the cybersecurity program, she has been working in the industry since she graduated in 2017. Today, she is employed as a cyber engineering consultant at Coalfire Systems, a firm in that deploys system information and event management tools for clients to monitor their environments to meet compliance standards.

"While many people are trying to enter the field to ensure job security, many still lack the technical skills to fill many positions in the industry," said Stackpole. "I am very excited about the independent degree so students can focus on expanding the technical skills that are currently needed in the cybersecurity field [in addition to building] communication skills with end users and clients."

TRANSFORMING A PROGRAM

Cybersecurity training isn't a new concept within the college.

"We've been teaching cyber since the early days," said Nick Giacobe, assistant teaching professor and director of undergraduate programs. "We've had courses in network security, cyber forensics, and security management [since the college was founded]."

Giacobe explained that as the original information sciences and technology coursework became more focused on security topics, and as homeland security issues increased following 9/11, the security and risk analysis bachelor's degree was established in 2006. Under that major, students could choose an information and cybersecurity option.

"There have been advances in the internet and development of things being connected and online at the same time," he said. "We've begun to carry phones in our pockets that are little computers, and we bring IoT devices into our homes. Meanwhile, many high profile, worldwide catastrophic events were happening. That has driven students to want more of a technically-oriented cybersecurity degree program."

That drive, combined with industry insight, is what prompted the college to develop a standalone technical cybersecurity program. Giacobe was among the faculty, administrators, and industry partners who helped to get the new degree off the ground.

"We had noticed that many of the top performing students in the college were in dual majors," he said. "They got the context and tools capability of the SRA program, and software development and programming skills from the IST design and development option."

He added, "We looked and said 'let's put those two things together as part of the foundation in the new major.' "

1 A. James Clark School of Engineering, University of Maryland
2 Juniper Research
3 Ponemon Institute
4 Cybersecurity Ventures
Photos: Maj. Christine Pierce/U.S. Army (pages 20, 23)

ENRICHING EXPERIENCES

While students enrolled in the cybersecurity program are receiving a state-of-the-art education, they also have ample opportunities to enrich their learning experiences outside of the classroom.

“There are some things that you have to learn by actually doing rather than reading about it or attending lectures,” said rising senior Cole Daubenspeck. “Cybersecurity is one of those things because it relies on critical thinking and problem-solving skills.”

Daubenspeck is president of the Competitive Cyber Security Organization (CCSO), a student organization through which members master cybersecurity skills and participate in local and national competitions.

A University team including CCSO members recently advanced to the regional finals of the Mid-Atlantic Cyber Defense Competition—the farthest a Penn State student team has ever gone in the national competition. The rigorous competition provides hands-on cyber defense skills where students defend computers against a live red team of penetration testers. This enhances students' understanding of theory and practice.

“You are getting real-world experience and you actually get to defend a company network against an advanced team of hackers,” said 2020 graduate Mark Wallace. “I also got to connect with a lot of professionals in the industry and have already received emails asking me to look at their company’s job openings.”

Another experience was held last fall, when the PA National Guard's Army/Air Joint Cyber Team hosted a Cyber Wi-Fighter Hacking Challenge at the college. Alumnus Captain Sean Smith was among the National Guard members leading the activity.

"I was blown away,” said Capt. Smith. “The students who participated were completely focused on the exercise and had the technical acumen to complete some pretty challenging tasks in an impressively short period of time.”

He added, “They were skilled team players that were able to confidently and professionally interact with senior military leadership, and demonstrated that they will be the future star employees in tomorrow's workforce."

Experiential opportunities take place across the country and the world. Rahul Walia, a class of 2020 graduate, was one of two Penn State students selected as security scholars to attend the RSA Conference in San Francisco earlier this year. The program nurtures the professional growth of 80 students, enabling them to network with industry thought leaders and gain insights on global trends.

There, Walia met with seasoned veterans in the security industry who are guiding the next generation.

"It was a great opportunity to network with security experts and learn from what they have seen change in the last two decades of security," said Walia. “It changes every day, so I can only imagine what they've seen."

EXPANDING THE REACH

Upon the successful launch of the cybersecurity bachelor’s degree at University Park, Penn State is expanding its offerings in the program. To date, several Penn State campuses have also begun to offer all four years of the bachelor's degree in cybersecurity analytics and operations, while numerous others provide the necessary coursework for students to begin the program before transitioning to University Park to complete their education.

This fall, the college will launch a cybersecurity analytics and operations master’s degree at University Park and bachelor’s degree through World Campus—further expanding the program’s reach around the world.

“As technology advances rapidly and more vulnerabilities are realized, the opportunity to now offer these in-demand credentials online through World Campus will aid in enhancing the global response to cyber threats and strengthening a highly trained workforce to protect information, systems, and organizations,” said

> **"You have to be able to stay relevant; you have to always be teaching yourself. And that's one thing the college focuses on: learning how to learn."**

Dave Fusco, associate dean for undergraduate and graduate studies.

The online program will also provide adult and distance learners with the opportunity to develop necessary skills for the growing industry.

"Many World Campus students are career changers," said Amy Stever, director of academic services operations. "Offering this degree online offers many more opportunities for prospective students from all backgrounds as they explore a career change and available jobs."

CUTTING-EDGE RESEARCH

More than a quarter of the college's full-time faculty members focus their work in the areas of privacy and security, leading groups such as the Software Systems Security Lab and the Algorithmic Learning, Privacy and Security Laboratory. Internationally-acclaimed faculty experts conduct cutting-edge research that aims to solve information security problems across the globe.

Some of the problems these researchers tackle involve detecting threats of information misuse, privacy protection in social networks, exploring malware behaviors, and developing innovative software analysis and verification technologies.

"Our researchers are constantly designing technologies that prevent attacks to vital cybersecurity infrastructure that not only protect our computers at home and work but also vital infrastructure such as the IoT, energy grid, self-driving cars, city infrastructure, and computers that ensure our water supply, using machine learning and other intrusion detection technologies," said Prasenjit Mitra, associate dean for research.

In 2018, the college's first Raymond G. Tronzo, MD Professorship in Cybersecurity was awarded to professor Peng Liu, who was instrumental in developing the curriculum for the new cybersecurity program and serves as director of the University's Center for Cybersecurity, Information Privacy and Trust. The professorship is the third in the College of IST, and the first established since 1999.

Liu is pioneering research in two areas: applying deep learning to make the asymmetric battle between malware and security analysts significantly more symmetric; and making cyber-physical worlds—like city infrastructures and intelligent transportation systems—more observable, secure, and manageable.

"Dr. Liu has had significant success in obtaining external funding to support his work and students engaged in cybersecurity research, which has produced numerous insights as well as publications in important venues that allow him to share his work with other researchers and practitioners," said Andrew Sears, dean.

LOOKING AHEAD

As the class of 2020 enters the workforce, they will be met with evolving and challenging threats. Something, Hume says, for which the College of IST prepared them well.

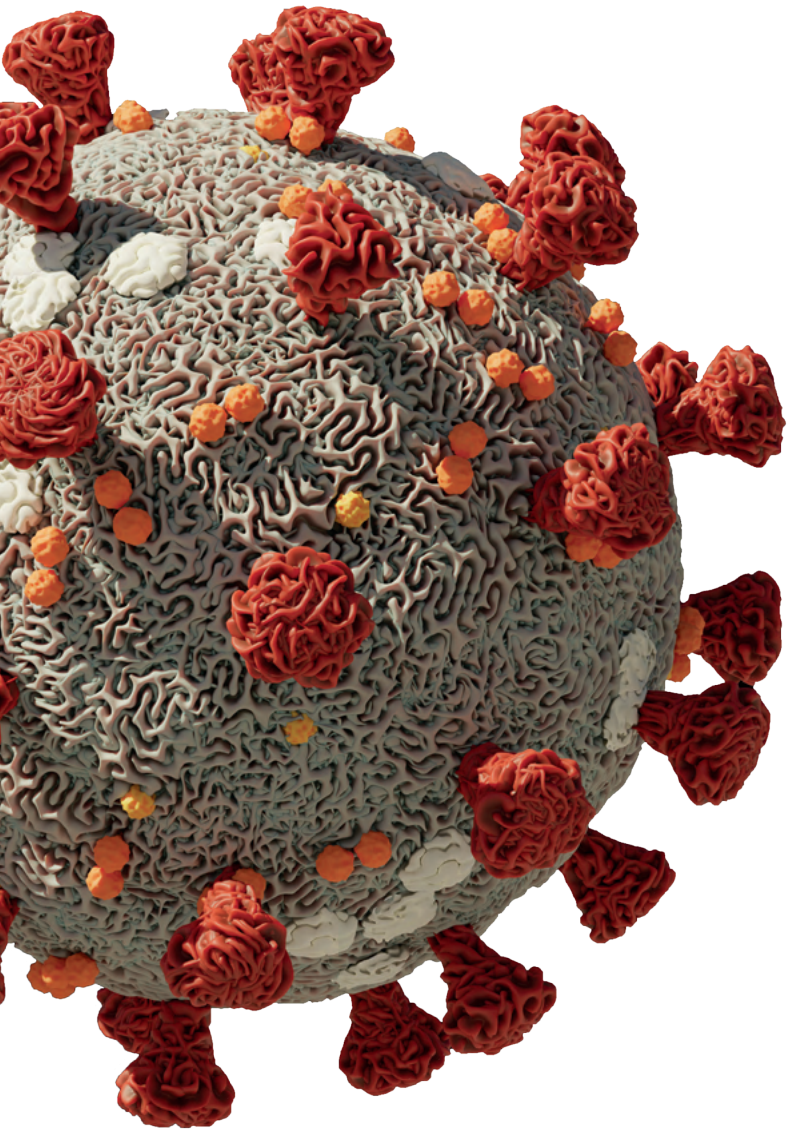
"One thing with cybersecurity is that it's always changing," she said. "You have to be able to stay relevant; you have to always be teaching yourself. And that's one thing that the college focuses on: learning how to learn."

She concluded, "The College of IST focuses a lot on the foundational knowledge, and that's important to have at your core. Having that knowledge will allow you to adapt to anything new, because you'll be able to more easily understand how it works."

UNDERSTANDING A PANDEMIC

BY JORDAN FORD

Since the novel coronavirus began its spread earlier this year, IST faculty and students have been innovative in addressing a variety of challenges related to COVID-19, including how to equip researchers with the most up-to-date information, how to educate the public about mitigation tactics, and how more online interactions put our privacy at risk. The pandemic has inflicted a massive and tragic toll, but it has also mobilized new efforts—including those highlighted here—to better understand this pandemic, inform future emergency management efforts, and remain connected as a global community.



DOTTEDYETI/ADOBE STOCK

INFORMING DECISION-MAKING

Led by assistant teaching professor Nick Giacobe, IST student teams tracked the actions of 800 U.S. colleges and universities to build a database of their responses to the global coronavirus outbreak, such as each institution's move to remote learning, commencement modifications, and plans for upcoming semesters.

Emergency managers from across the country, including those at Penn State, use this data to benchmark their school's action plans against the activities of peer institutions, with results reported daily to the FEMA Disaster Resistant Universities Working Group.

"[Our work] allows decisions to be made with the best interests of the health and well-being of students, faculty, and staff at the forefront," said Timothy Nevil, an IST student participating in the project. "The building of the national list is also allowing us to assist institutions nationwide by providing information as to what other schools in their regions and across the country are doing through the Disaster Resistant University system."

In addition to building the database, students researched the impact of coronavirus on national and international perspectives, misinformation, and cybersecurity. Collectively, students prepared bottom line up front—or BLUF—reports, which helped Penn State administrators make more informed and efficient decisions by incorporating recommendations at the beginning of the text.

"Having all of this information in one place is invaluable," said Pamela Soule, planning manager at the office of emergency management and planning at Penn State. "The database saves time in gathering decision-making information and the BLUFs are an excellent resource for our daily situation reports."

Social distancing has pushed more people online to build connections and find support, but it's also leaving individuals open to digital vulnerabilities.

PHOTOSBYSABKAPL/ADOBE STOCK

UNDERSTANDING PRIVACY

The novel coronavirus outbreak has led to a surge in online activity as users turn to the internet to support routine social activities. These activities help individuals seek support and build community, but they also leave them vulnerable to oversharing personal information that could be used against them.

Now, with a study funded by the National Science Foundation, IST researchers are exploring how users' attitudes toward privacy change during times of crises, and whether oversharing has been expedited or even encouraged during the coronavirus pandemic.

"People voluntarily self-disclose information in part to build their social support structures, so it's natural during this crisis, where physical social distancing measures are in place, that we'd see an increase in self-disclosure as people look online to feel more socially connected," explained Anna Squicciarini, associate professor of IST and co-investigator on the project. "But this connectedness can come at a cost."

The cost? While individuals may be finding more community, they're also leaving themselves open to harassment, identity theft, or even discrimination by employers and creditors.

The team—which includes assistant professor of IST and co-investigator Sarah Rajtmajer, as well as IST doctoral students Taylor Blose and Prasanna Umar—is analyzing and comparing millions of online comments reporting on COVID-19 to trends of social disclosure seen during other crises. The team will also analyze posts in Italian through a collaboration with The University of Insubria in Italy, allowing them to evaluate cultural and infrastructural differences at varying points during the pandemic lifecycle.

"If we can understand these relationships, we can understand more about whether individuals are more susceptible to deviant actors or general privacy breaches," said Rajtmajer.

> **"[Online] connectedness can come at a cost."**

IMPROVING SEARCH QUERIES

Led by Lee Giles, David Reese Professor of IST, a team of researchers created a search engine that sorts through the COVID-19 Open Research Dataset—called CORD-19—a free resource of tens of thousands of scholarly articles that are focused on COVID-19. The project aims to help researchers better understand—and potentially stop—the spread of the novel coronavirus.

"When the dataset was first announced, we immediately thought a worthwhile project to pursue would be to create a search engine because any effort focused on the virus could be useful," said Giles. "We did this in a week. Now we are going after more aspects of the data to better visualize it and make it available. While the site already has a search engine, we wanted to see if we could build one that might have improved performance."

He hopes the tool, called COVIDSeer, will provide researchers with quick access to needed peer-reviewed publications on the virus that could help them advance their research.

Compared to other datasets, Giles said that this set is relatively small and, therefore, easier to index. The data is drawn from research sites, such as bioRxiv and MedRxiv. COVIDSeer is listed in the search engine list of AllenAI, a non-profit research institute that uses AI and engineering in service of the common good.

Other teams are integrating the search engine into their own applications, and Giles' team is reaching out to build more partnerships in the battle against COVID-19. The database is updated each week, and the team plans to continue to add new features.

The team includes Giles; Penn State students Jason Chhay, Shaurya Rohatgi, Arjun Menon, and Zeba Karishma; and collaborators from Old Dominion University and the University of Illinois, Chicago.

> **"We are going after more aspects of the data to better visualize it and make it available."**

PARILOV EGENIY/ADOBE STOCK

COVIDSeer helps researchers identify the most up-to-date scientific information related to COVID-19, helping to drive medical discovery and social interventions.

An online tutor is helping to educate the public on how practices like social distancing can mitigate the spread of the novel coronavirus.

ELDAR NURKOVIC/ADOBE STOCK

EDUCATING TO STOP THE SPREAD

Practicing physical distancing, wearing a face mask, and handwashing have been suggested or required to help mitigate the spread of novel coronavirus. While these concepts seem easy to understand, they can be difficult for people to operationalize and maintain.

To help individuals put these ideas into practice, Penn State researchers developed an intelligent online tutor aimed at educating the public about the science behind COVID-19 and appropriate steps to reduce its transmission.

"Everyone knows you're supposed to wash your hands, but when? You're supposed to use soap, but which kinds work effectively and what other methods like baby wipes or Vaseline may be less effective?" described Frank Ritter, professor of IST and the tutor's team leader. "Public health information needs to be practiced for it to be effective."

> **“Public health information needs to be practiced for it to be effective.”**

Titled "Skills To Obstruct Pandemics," or STOP, and available at StopTheSpread.health with a free account, the tutor guides the user through lessons and quizzes about how the virus is transmitted and what actions individuals can take to mitigate its spread.

The tutor covers a wide range of topics, including the basic microbiology of COVID-19, the benefits of herd immunity, and the differences between quarantine and isolation. While the tutor focuses specifically on the novel coronavirus, nearly all of the concepts are applicable to other respiratory pathogens.

"We're all focused on flattening the curve and keeping it flat, but it takes small, daily actions from a tremendous number of people to do that. Understanding the virus, how it's transmitted, and how you can protect yourself and others is critical until a pharmaceutical intervention is available," said Ritter.

The team includes members from Penn State's Applied Research Laboratory, College of Nursing, and the Huck institutes for Life Sciences, and is advised by outside experts from the Society for Disaster Medicine and Public Health. Funding for the project was provided by the Office of Naval Research, Applied Research Laboratory, and the College of IST.

IST AWARDS COVID-19 SEED FUNDS

Six projects were recently awarded College of IST seed funding to tackle various challenges related to the novel coronavirus pandemic. The college's seed grant program is designed to jump start critical research projects that explore innovative ideas that have a short-term impact, as well as those that will position researchers to secure external funding to further advance their work.

AI Methods and Tools in Response to the COVID-19 Open Research Dataset
Prasenjit Mitra, *associate dean for research*
C. Lee Giles, *David Reese Professor of Information Sciences and Technology*
Sharon Huang, *associate professor*

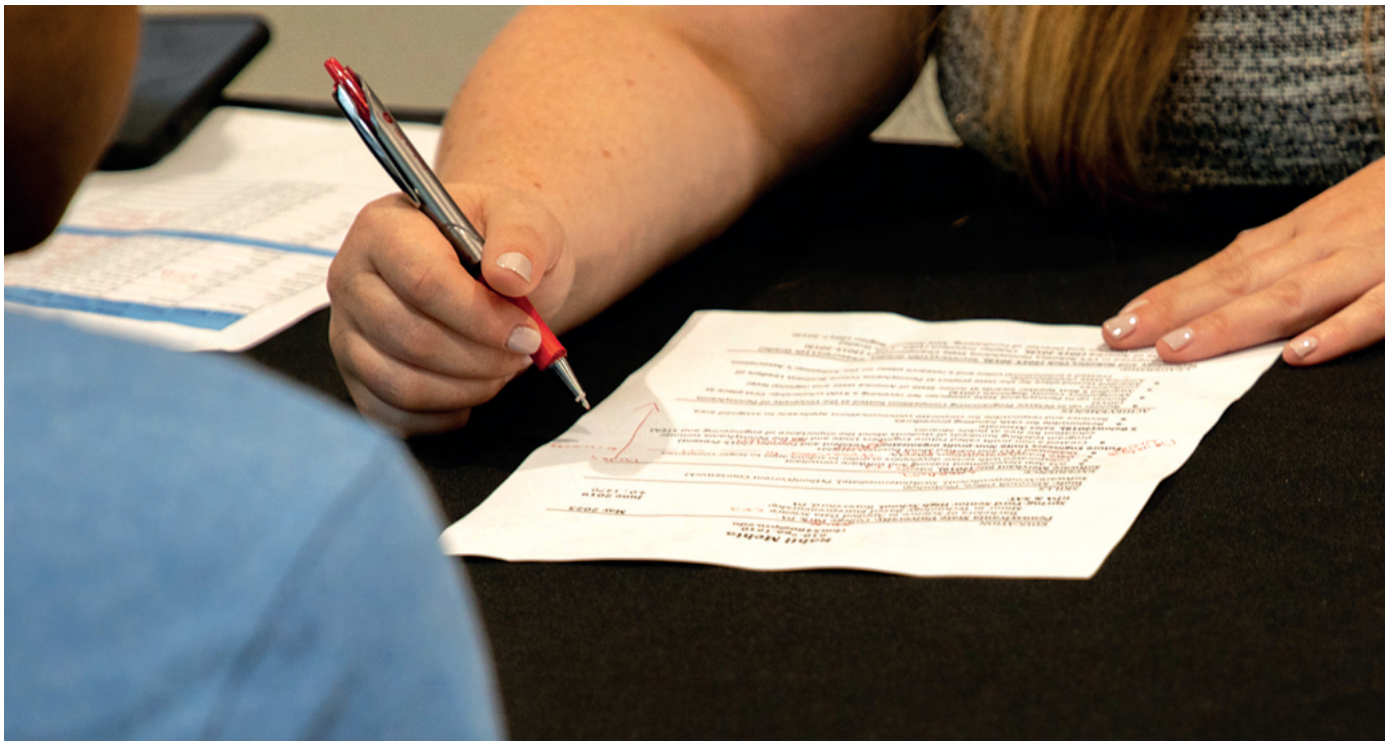
Annotating COVID-19 Papers Rapidly Using Non-Expert Crowd
Ting-Hao Huang, *assistant professor*
C. Lee Giles, *David Reese Professor of Information Sciences and Technology*

Civic Capacity and ICTs during the COVID-19 Pandemic
Xinning Gui, *assistant professor*

Emergency Management in the Time of Pandemic
Andrea Tapia, *professor*
Jamie Reep, *doctoral student and lecturer*
Nick Giacobe, *assistant teaching professor*

Informed Social Distancing: An AI Approach to Prevent Future Waves of COVID-19
Amulya Yadav, *assistant professor*
Dongwon Lee, *associate professor*
Aiping Xiong, *assistant professor*

Reconstructing Local Community in a World of Physical Separation
John M. Carroll, *Distinguished Professor of Information Sciences and Technology*
Chun-Hua Tsai, *assistant research professor*



Mentorship program strengthens professional network for IST students

Sometimes, the greatest lessons come from someone who has lived them.

That's why the College of IST has revitalized its alumni mentorship program: to give students meaningful, real-world advice and professional guidance from alumni who have experience in the industry.

The program matches alumni with students based on their professional areas of interest. Through regular meetings and conversations, students gain a mentor who provides first-hand advice about careers in IST-related fields and feedback on the student's path.

For rising junior Cassidy DiPaola, the mentorship program has been an invaluable way to build her network and receive advice and guidance on her academic and professional life.

"Since the beginning of the program, my mentor and I have scheduled monthly calls to discuss topics such as internships, IST classes, and the transition from student or intern to full-time employee," she said.

DiPaola's mentor, 2017 alumna Sarah Moore, recognized the value in mentoring students because of the relationships she formed during her time at IST.

"I have had my fair share of mentors to get to the place I am professionally, and I thought that I would be able to provide useful advice to others based off my experiences," said Moore, who works as a senior technical consultant at IBM. "I was then selected and paired with my mentee based off common career interests and we have been talking ever since."

In addition to gaining advice from alumni in the program, students often form close professional relationships with their mentors. For rising junior Michael Jasper, his mentor has been able to help him in many ways.

"One of the biggest takeaways I've gotten is to not be afraid to be open with your mentor; they really are there to help you in any way they can," he said. "It's not just strictly educational help all the time, and the relationship I've created with my mentor is very open and straightforward."

Jasper's mentor has asked to remain anonymous due to the nature of his profession. However, he said that the rewards of helping Jasper develop into a successful student and professional have been personally meaningful.

"I feel as Penn Staters it's within our culture to provide a selfless service to our alma mater, whether it be through mentoring; donating to various funds, endowments, or scholarships; or just [through] any other way they can," Jasper's mentor said. "The most rewarding part of being a mentor is being able to use my experiences and life lessons as an exemplar to help guide students that can be used to put them on a path to success."

To learn more about the college's mentorship program, visit ist.psu.edu/alumni-donors/mentoring.

Alumnus uses data to maximize hospital resources

As a student in the College of IST, Steve Ney '10 learned critical skills, from coding to data design and architecture. Today, he applies that foundation in his "dream job" as a health care data analyst for Geisinger Health, where he produces visual outputs for doctors and staff to use in caring for patients. That work is especially important in the middle of the coronavirus outbreak.

"Our team has been instrumental in producing data accurately and timely to our leadership to enable them to make the best decisions possible," he said. "Data is the engine that drives the business logistics and has been vital in ensuring that the hospital's resources have been—or will be—maximized during the pandemic."

Ney, who currently serves on the IST Alumni Society Board, says that he fondly remembers his Database Fundamentals course, where he fell in love with how databases operate and what they can be used for.

"Data is the engine that drives the business logistics and has been vital in ensuring that the hospital's resources have been—or will be—maximized during the pandemic."

The course, along with many others in the College of IST, has given Ney the skills he needs to succeed in his role today.

"I have been working and striving for many years to be able to find myself in such a wonderful position," he said. "I use various IST skills daily: project management, data design and architecture, problem solving, technical skills, coding, and many more."

A GREATER PENN STATE

IST alumni and friends have contributed nearly $14 million toward the college's $20 million goal for "A Greater Penn State For 21st Century Excellence." Launched in 2016, the University-wide campaign concludes on June 30, 2022, and aims to raise $2.1 billion in support of three core imperatives: Open Doors, Create Transformative Experiences, and Impact the World. In line with the University's goal to keep Penn State affordable and accessible, a top priority for the college is funding undergraduate scholarships.

Contact us to learn more about giving opportunities—including initiatives for young alumni to make meaningful contributions on an annual basis.

Office of Development and Alumni Relations
ist.psu.edu/give or call **814-865-6459**

Welcome back

Nearly 40 IST alumni returned to campus this spring to recruit students for internships and full-time positions during the college's Future Forum career fair in January. They ranged from members of the college's first graduating class to its most recent, and represented one-third of the recruiters in attendance looking for top talent from IST to join their organizations.

MICHELLE BIXBY/PENN STATE (TOP RIGHT)

Alumni-driven startup aids IST students seeking internship experiences

When the coronavirus pandemic struck, and a number of IST students faced challenges in securing summer internships due to public health guidelines, a former IST student rose to the occasion.

Alumnus Shawn Thompson founded a company called Solve Tomorrow, with the goal of providing meaningful internship experiences to students seeking careers in the technology industry. With many opportunities diminished due to the pandemic, and since Thompson was familiar with the skills IST students bring to the workplace, he decided to pilot the first cohort solely with the college's students. Forty-three IST students are virtually participating in the program this summer.

According to Thompson, Solve Tomorrow partners with universities and startup companies to provide real-world experiences to students and make a positive impact on the startups.

Through the 12-week program this summer, teams of students are working to solve problems that small startup companies face. Each student team is going through two design thinking sprints for two separate startups using frameworks learned in the IST classroom. Industry mentors from top tech companies have also been assigned to each team to coach and guide the students throughout the design thinking sprints. At the end of each sprint, student teams will pitch their solutions back to the startups.

"We strongly believe these students will create innovative solutions for them and the startup companies believe strongly in this as well," said Thompson.

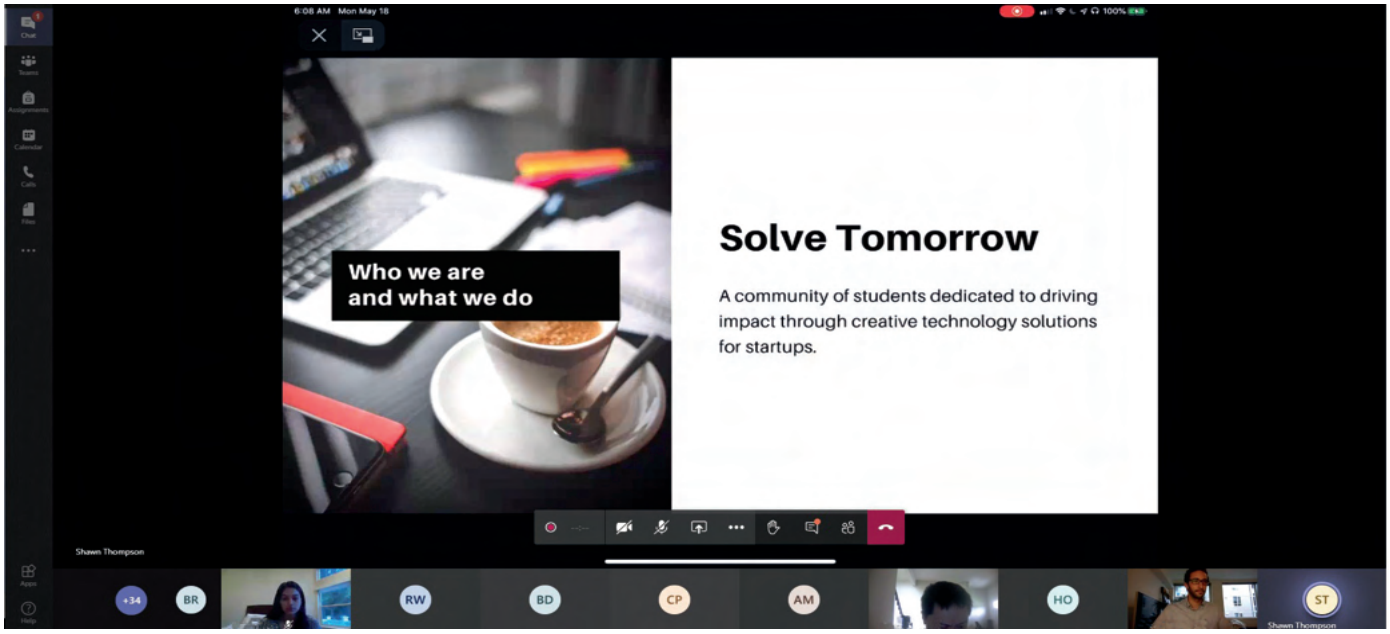
With stay-at-home orders causing some internships to be canceled or moved virtually, this collaboration is just one example of how IST alumni, faculty, staff, and corporate partners are developing creative opportunities to help students earn real-world experience. This includes offering alternative virtual pathways for students graduating in the coming semesters to fulfill the internship requirement, such as supporting faculty with research or participating in professional development courses.

"The College of IST firmly believes that the best option for an internship experience involves real-world engagement," said Brianne Lippert, assistant director of corporate engagement. "During this unprecedented time, as many students will not have the opportunity to leverage such an experience at its fullest, we are thankful to the many individuals and corporations that are providing our students with meaningful out-of-the-classroom experiences to help them to sharpen their skills in preparation for their careers."

Thompson added, "I was an IST student. I empathize with them and understand that gaining real-world experience is extremely important. I really care about supporting students and helping them identify their career paths; that is the core mission Solve Tomorrow was founded on."

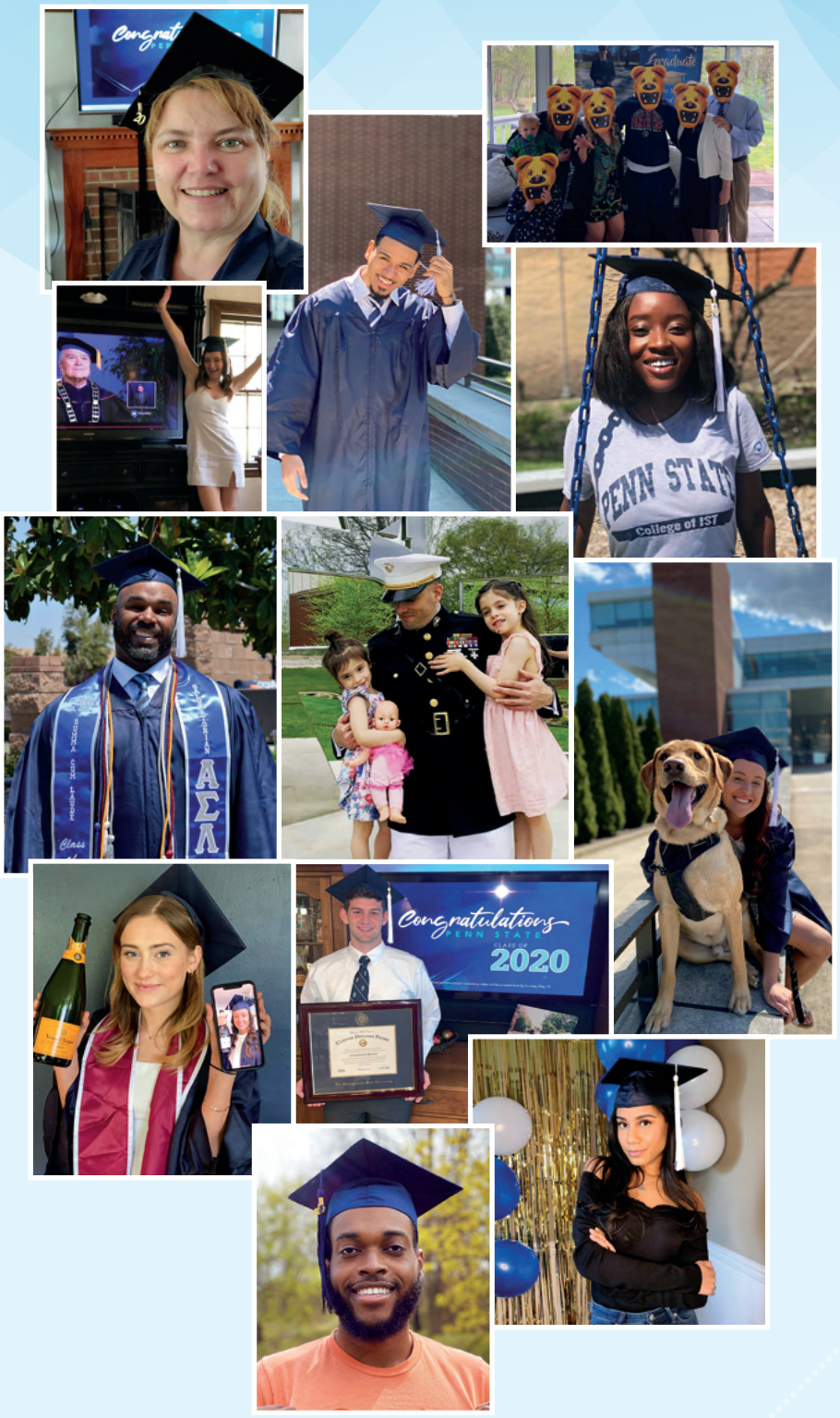
While the primary focus of Solve Tomorrow is to provide meaningful real-world experience to students, the opportunities would not be possible without the partnership of participating startups, said Thompson.

"We want students to go through our program feeling like they have the power to make a real impact on these startups, and gain the experience needed to guide them towards a career path they love," he said.



A screenshot from the virtual Solve Tomorrow intern orientation in May 2020.

Congratulations Class of 2020



To our newest graduates:
Congratulations on earning your Penn State degree, and welcome to the College of IST alumni community! No one could have expected how your final semester would end, but we are proud of the dedication, flexibility, and patience you showed to reach the finish line.

You are now part of a network of nearly 700,000 Penn State alumni who share a responsibility to ensure the future of IST and Penn State. Like those who came before you, take advantage of opportunities to make a difference at the University.

Promote internship and career openings within your organization. Speak loud and proud about your IST experience to help recruit new students. Mentor students. Give your time, talent, and treasure to support the college and areas of the University that mean the most to you. And, of course, stay connected to your peers and mentors.

Whatever you do, we hope your connection to our college continues to grow.

From the entire College of IST community, congratulations and good luck!

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Save The Date

IST ALUMNI TAILGATE

Saturday, October 17

To be held at University Park
or virtually, details to follow.

Stay connected @ISTatPennState

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