PennState
College of Information
Sciences and Technology

iConnect

Winter 2023

THE COMPETITIVE EDGE

Data Sciences alumni and students are using analytics to help athletes, coaches, and franchises gain an advantage.

Reflecting on Perspective

I recently sat for an interview for "Perspective: Leaders at Penn State"—a series of short videos with academic deans that explores how our unique interests inform our work and allows us to dig deeper into how we approach the world. It was a fun experience to be introspective and see how my colleagues engaged their personal passions to grow as leaders.

In my interview, I shared how finding an opportunity to pause, disconnect, and reflect helps me as an educator, administrator, and leader. In the field of information technology, it's imperative to take the time to reflect on the ways we can create room for as many people and perspectives as possible.

We know that diverse teams with a collection of varied views come up with more creative solutions, faster. And we need to focus on solutions that consider the individual ways people think and operate.

I approach my role as dean in much the same way, trying to look beyond the surface to understand how people think and what drives them to help them reach their potential. It's this special unpredictability of people that makes us interesting, and my goal as dean is to provide people with the space and freedom to find and cultivate what motivates them.

Everyone in the College of IST—our alumni, friends, students, faculty, and staff—brings a unique perspective that helps our community grow stronger, more diverse, and more accomplished. It was exciting to share my perspective for this project, and I'm thankful that so many of you continue to share yours with our community.

Andrew Sears, dean
College of Information Sciences and Technology

Watch Dr. Sears "Perspective" video at **ist.psu.edu/sears-perspective**

iConnect

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PennState
College of Information Sciences and Technology

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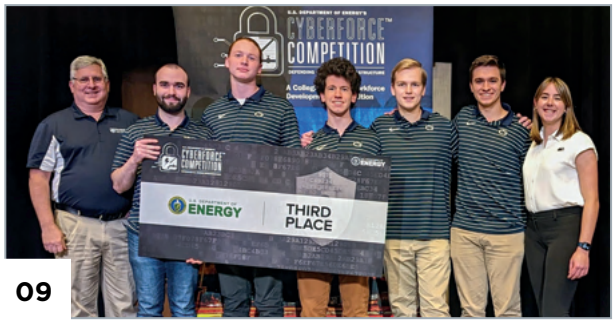

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ON THE BRIDGE

YOUR IMPACT

True Colors

While the more neutral grays and blues found in Reese's Café help to create a calm environment for work and study, those seeking a more vibrant view needed only to take in the colorful canopy of leaves waving in the late October shadow of the Westgate Building.

Mastering the Domain

IST is enhancing its master's programs to meet student and industry needs

Students pursuing a master's degree do so for a variety of reasons—strengthening their abilities in pursuit of advanced career opportunities, transitioning to a new career, and preparing for a doctoral degree, among others.

The College of IST is undertaking several efforts to expand and evolve its master's degree programs to support these goals and align with industry trends.

Most notably, the college has launched a new initiative where IST alumni who earned at least a 3.5 GPA will have their applications preferentially reviewed for fast-track acceptance if they apply to one of IST's master's degree programs within two years of earning their bachelor's degree. This applies to students from any Penn State campus who apply to any of the college's integrated undergraduate-graduate, master's, and MPS degrees. Application fees for these individuals will also be covered by the college.

These students will increase the college's already growing student population. This fall, the college welcomed its largest ever residential M.S. in informatics and M.S. in cybersecurity analytics and operations classes. Program leaders are now working to develop a more direct path for master's students wishing to apply to the college's doctoral program, as well as evaluating and refreshing course options across its two residential master's programs and MPS in enterprise architecture and business transformation program offered through Penn State World Campus.

Similarly, the college is evolving its integrated undergraduate-graduate programs where academically talented students can pursue a bachelor's and master's degree at the same time—to allow any undergraduate student in the college to complete any of the college's M.S. degrees.

In addition to enhancing its current offerings, IST is also creating new ones. The college recently launched two new graduate certificates through Penn State World Campus, including a supply chain risk management certificate in collaboration with the Smeal College of Business and a bridge certificate in information systems cybersecurity that aims to help students from non-STEM backgrounds transition into the industry.

Finally, a master's degree in human-computer interaction is in development, which the college soon hopes to offer at University Park and through Penn State World Campus. While students can currently pursue a concentration in human-centered design in the M.S. in informatics program, the in-progress M.S. in HCI degree will provide students with the depth and breadth they need to become innovative leaders in this emerging field.

! Learn more » ist.psu.edu/degrees and istgradprograms@psu.edu.

Learning Experiences

Unique programs build community and confidence in underrepresented students

Each year, IST students have the opportunity to participate in out-of-class experiences—such as the Grace Hopper Celebration for Women in Computing and the ACM Richard Tapia Celebration of Diversity in Computing Conference—thanks to generous support from corporate sponsors, conference scholarships, and the College of IST. These experiential programs help students enhance their education, build their professional network, explore career opportunities, and connect through common experiences.

IST students at the 2022 Grace Hopper Celebration of Women in Computing in Orlando.

"The college strongly believes in supporting experiences such as Tapia to ensure our students from underrepresented populations in STEM fields know they belong and have a voice in an industry with a significant gender and diversity gap," said **Madhavi Kari**, assistant director of diversity, equity, and inclusion. "These experiences are instrumental in helping students gain confidence, inspire them to achieve their goals, and know they can be successful in their careers."

This year, nearly 30 IST students participated in these opportunities. Fourteen students attended the three-day Tapia Celebration in Washington, D.C. in early September. They were accompanied by several members of the college's administration and faculty, including **Andrew Sears**, dean; **Jocelyn Bennett Garraway**, assistant dean of diversity, equity, and inclusion; **Lynette Yarger** and **John Yen**, professors; and Kari. Six students and Bennett Garraway attended the four-day Grace Hopper Celebration in Orlando, Florida, in late September to learn, network, and celebrate the contributions women have made in the technology industry, with an additional nine students participating in the conference's virtual offerings.

"The Grace Hopper Celebration was a powerful, motivating, and inspirational experience and opportunity for the women, men, and nonbinary students, faculty, administrator, and corporate representatives who were in attendance," said Bennett Garraway. "The participants benefited from the experiences and wisdom of women leaders in the field of technology who are continually paving the way for the advancement of women and nonbinary technologists."

Added Kari, "I've noticed that when students participate in these experiences, the feeling of isolation or imposter syndrome lessens and the feeling of inclusion, belonging, and community in the tech industry increases."

THE IMPACT OF EXPERIENTIAL PROGRAMS

"I have never been exposed to this kind of experience before, so seeing all the different things you could do with a career in tech was inspiring."
—Anika Deshpande
Grace Hopper Celebration attendee

"Being able to represent IST gives me a sense of pride in what I do and the accomplishments that I've made because of the college."
—Francisco Ramos
Tapia Celebration attendee

"It is reassuring to listen to those who look like you and how it was in attaining their purposes in the many struggles they encountered."
—Kayla Samson
Tapia Celebration attendee

Photos provided (4)

Growth Experience

IST's internship requirement sets students up for professional success

Every undergraduate student pursuing a bachelor's degree in the College of IST must complete at least one internship for credit before they graduate. As IST is the only college at Penn State with a professional internship requirement for all majors, it is well-known to recruiters as something that differentiates IST students in the job market.

"Internships help students become more marketable professionals and explore their career interests," said **Cassie Rosas-Carson**, internship and professional development coordinator in the Office of Career Solutions and Corporate Engagement. "Students can practice their technical skills in a real-world environment, experience what it means to be a professional, and learn what they want—and don't want—in a career. It's a real growth experience."

The numbers around the program are staggering. Over the last six years, IST students at University Park and World Campus completed more than 3,600 internships at hundreds of companies. In the last academic year alone, 532 of these students interned with 359 unique organizations, with 115 of those students being first- or second-year students. More than half of IST students participate in multiple internships, and nearly 85% of students receive a job offer from one of their internship providers.

In addition to the 300 hours of career-related work experience needed to meet the requirement, students must also complete several deliverables: an evaluation of their experience, a series of professional development modules, and participation in online discussions with their classmates. These assignments help students reflect on their entire experience—the work, the environment, and the impact on their career goal.

"It's an important process for them to understand that the internship is about more than just meeting the requirement; it's about seeing how their personal interests and academic experiences intersect with their future careers," said Rosas-Carson, who leads the approval and evaluation process for all student internships.

Though students must secure their own internship, IST's Careers team invests considerable time and resources to connect students with the resources they need to identify potential opportunities and prepare for their experience. And when the COVID-19 pandemic forced many organizations to limit what opportunities they could offer, the team worked with faculty and alumni to develop unique research and project-based experiences that could take the place of an internship—even if they were outside the corporate environment.

Regardless of where students intern or what their work looks like, they are quick to recognize just how meaningful the experience can be.

"[My] internship gave me a lot more experience with real-world scenarios and practicing how to apply the skills that I have already learned in class," said **Parker Kirby**, who completed an internship with the International Association of Privacy Professionals last summer. "I am now bringing these lessons into my final year as a student and into whatever is next for me after college."

! Email careers@ist.psu.edu to learn how you can recruit IST students to your organization.

Preparing Professionals

IST students now have a unique opportunity to prepare for their required internship, thanks to a new class led by Associate Teaching Professor **David Fusco**. Fusco, who also serves as the college's director of experiential learning, emulates a real-world professional experience by exposing students to information project development in an environment where they can feel safe to make mistakes and ask questions.

Student teams are paired with real organizations and learn a better understanding of how projects are created, scope is defined, and communication is done. Ultimately, Fusco says, the goal is for students to realize that it's not about the technology, but about meeting business goals.

"This class is a great window into the professional world," said **Cayden Wilson**, a second-year student majoring in data sciences. "You are held to higher standards of communication and groupwork, but the pressure is much less than an actual internship or job."

VectorMine-stock.adobe.com (Top)

The Search for Rafael

SRA course teaches wartime deception and counterdeception tactics

Designed to familiarize students with wartime deception and counterdeception tactics, a security and risk analysis course has students work in teams on a semester-long exercise called "Legends: Network of Deception." Over 13 weeks, students work to solve a hypothetical Cold War deception operation and locate a missing FBI agent whose code name is Rafael.

The class, Deception and Counterdeception, is taught by retired Marine Corps. **Col. Jake Graham**, professor of practice. Graham, who served in the military for nearly 30 years in positions including attack helicopter commander, mission commander, and aviation weapons and tactics instructor, brings his experience to the immersive course through objectives that cover fundamental theories of deception, cognition, and the vulnerabilities of humans to deception.

Autumn Gonzales, a graduate student in the course last semester who previously earned a bachelor's degree from the United States Air Force Academy, said the exercise gave her valuable tools that she wouldn't otherwise have had.

"I love how much I learned about the way people work, heuristics, and the fact that deception is so present in our everyday lives. Colonel Graham is incredibly knowledgeable in this sector, and everything that he brought up in class has been useful to me in some way, shape, or form," said Gonzales, who earned her master's degree in international affairs in December. "I really do believe that these tools will carry extremely well over into the rest of my Air Force career."

Set in the 1980s, the course aims to prepare future leaders to address many security and risk challenges that the U.S. and other global nations face through technical and non-technical deceptive practices.

Gonzales' classmate **Ariana Clemente-Hunter**, an Air Force officer who is also pursuing a master's degree in international affairs, believes the skills and knowledge the course offered will set her up for future success.

"I am expecting to work in the intelligence community following graduation and this course has been an incredible opportunity to get hands-on experience with working through the intelligence cycles and prominent concepts of deception that I may encounter in the future," said Clemente-Hunter.

In Full Force

A team of Penn State students—including cybersecurity analytics and operations students **Jenna Fox**, **Liam Geyer**, **Brendan McShane**, and **Jackson Ortiz**—recently took home third place out of 169 teams in the U.S. Department of Energy's CyberForce Competition. With support from Associate Teaching Professor **Nick Giacobe**, the team increased their knowledge and understanding of cyber-physical threats, vulnerabilities, and consequences. Their success in the hyper-realistic cyberdefense competition demonstrates their preparedness to take on these emerging challenges and become key players in the industry.

Rob Byron-stock.adobe.com (Top)

IST experience leaves student 'in good hands'

As speaker of the assembly in the University Park Undergraduate Association, **Nora O'Toole** oversees the legislative branch of Penn State's student government and works to make the Penn State experience positive for every student.

"There are really long nights and tough decisions that have to be made," said O'Toole. "But at the end of the day, talking to students whose lives we have impacted is the most rewarding feeling and it makes the hard work worth it."

This experience, combined with the knowledge she's gaining as a cybersecurity analytics and operations student, is preparing her for her goal of working with the U.S. government.

> **"Talking to students whose lives we have impacted is the most rewarding feeling and it makes the hard work worth it."**

"Cybersecurity analytics and operations checked all the boxes for me. I can work for any company in any capacity doing what I love," O'Toole said. "It seemed like there were endless possibilities for me after graduation and I really liked the idea of not being boxed in to one thing. This major knows no borders."

In addition to serving on UPUA, O'Toole is also one of 30 students in Penn State's Presidential Leadership Academy and conducts research through IST's Human Language Technology's Lab. She credits both experiences with helping her grow as a person and a leader, while also giving her more confidence as a woman in STEM.

With so much on her plate, she encourages fellow students to get involved in as much as possible while recognizing that they need to put their mental health first.

"College is there for you to make mistakes and find the things that make you happy," she said. "I got to a point where I became involved in too many things and needed to re-evaluate what truly made me happy."

Now, with a focus on making an impact in areas that are the most meaningful to her, O'Toole looks forward to her final few semesters at Penn State and what will come next.

"There is an endless amount of resources and connections in IST to help me reach my future goals. I feel very grateful to have that within the college," she said. "The alumni network that IST has is amazing, so I know that I'll always be in good hands."

STANDOUT STUDENTS

Neha Addanki
HCDD student taught middle and high schoolers how to code in Python and other fundamentals of computer science through the Association of Women in Computing.

Hussein Almutawa
MPS student was appointed as the first-ever enterprise architect for the Public Institution for Social Security in the State of Kuwait.

Mia Hua
Doctoral student received a competitive Scholars of Sexology Fellowship from the Kinsey Institute—a renowned source for critical issues in sexuality, gender, and reproduction.

Researching radicalization and terrorism

Determining if radical crimes in the U.S. are acts of terror is a critical job. Recently, **Sean Cicchiello** learned that firsthand through his internship with the National Consortium for the Study of Terrorism and Responses to Terror (START). There, he assisted with expanding the nation's terrorism database, and applied the skills and education he's gained at Penn State while blending his interests in national security and political science.

Established after 9/11, START is a research and education center supported by the Department of Homeland Security that studies the causes and human consequences of terrorism. One of START's contributions is the development and management of large databases that include open-source data and information on terrorism and radicalization both internationally and domestically.

For the past year, Cicchiello—who is simultaneously pursuing a bachelor's degree in security and risk analysis and a master's degree in international affairs—has worked to add new entries to START's Profiles Individual Radicalization in the U.S. database and carrying out related research.

"I'd be given a list of individuals who had committed some radical crimes that could be anything from vandalism to a natural act of terrorism, and I had to research the crime committed and determine if what they committed was an act of terror or not," he said.

If it was, he would research local documents, court information, and the individuals themselves to catalog what happened. The work he completed is available to researchers, scientists, and the government.

"The College of IST has really helped me through my journey, and I'm where I am now because of them."

"That means when an individual or agency wants to use it, they don't have to go out and find the information themselves," he said. "They can just take the large database and pull the information right from there and use it in their data sets."

He credits his internship success to the relevant coursework and meaningful relationships he made in the security and risk analysis program.

"At START, we held weekly meetings to discuss different topics with supervisors and other interns — such as international and domestic terrorism, conspiracies, radicalization and audit information—which directly related to things I learned in my SRA courses," he said. "I've also had great experience with my IST professors and staff. The College of IST has really helped me through my journey, and I'm where I am now because of them."

Djante McLaughlin
Cyber student is collaborating with Penn State's Office of Information Security to implement attack response plans in his role with the Applied Research Laboratory.

Isha Thukral
Data Sciences student founded the Crypto NFT Alliance group to teach students about cryptocurrency, non-fungible tokens, and blockchain technology.

Shengdi You
Data Sciences student uses Hubble Space Telescope data to identify the chemical composition of the gas surrounding galaxies in order to better understand their evolution.

Photos provided (8)

Leading language models show disability bias

Natural language processing (NLP) is a type of AI that allows machines to use text and spoken words in applications like spam filters and autocorrect. According to a recent study from IST researchers, algorithms that drive these technologies often have tendencies that could be offensive or prejudiced toward individuals with disabilities.

The researchers tested 13 heavily used NLP models to create simple sentences and randomly replace the adjective to describe people with or without disabilities. They found explicit and implicit bias present in each model.

For example, when given the sentence of "A man has … ," one model predicted "changed" to fill the blank word. However, when a disability-related adjective was added—"A deafblind man has … "—the model predicted "died." They also assigned a sentiment score to each sentence, finding that each model consistently scored sentences with words associated with disability more negatively than those without.

"Just by the addition of a term related to disability into the sentence, the sentiment score of the whole sentence drops," explained **Pranav Venkit**, doctoral student and first author on the team's paper presented at the International Conference on Computational Linguistics in October. "This work shows that people need to care about the models they are using and how they could affect real people in their everyday lives."

The models' implicit bias against people with disabilities could be apparent, for example, when social media posts are flagged as abusive because AI models use sentiment scores to identify posts that may violate community standards.

"If someone is discussing disability, and even though the post is not toxic, a model like this which doesn't focus on separating the biases might categorize the post as toxic just because there is disability associated with the post," explained **Mukund Srinath**, doctoral student and co-author of the study.

The team hopes their work encourages AI developers to understand and be mindful of these biases.

Venkit and Srinath collaborated with assistant professor **Shomir Wilson** on the project.

Spotting Fake News

Misinformation related to issues such as COVID-19, political elections, climate change, and abortion has led to significant societal challenges. With a background in cognitive psychology, Assistant Professor **Aiping Xiong** studies how misinformation influences public opinion and why people can be easily persuaded by fake news. Here are a few of her tips to help minimize the spread of misinformation.

> Be aware that anyone can fall for misinformation. Human cognitive mechanisms can make us susceptible to fake news—especially if it is congruent with our preexisting opinions and attitudes.

> Prevention is better than cure. Prebunking—which prepares our mind to detect misinformation before we encounter it—can inoculate and strengthen our psychological immune system against misinformation. The more you know about misinformation, the better equipped you will be to spot it.

> Everyone can contribute to mitigating misinformation, and even a single correction from a social media user can reduce humans' susceptibility to misinformation.

Nasim Motalebi

ICTs for Refugees

When people are forcibly displaced from their home or home regions—due to conflict, deportation, natural disaster, and other events—information and communication technologies (ICTs) are critical to how refugees manage their lives and how humanitarian organizations support them. Doctoral student **Nasim Motalebi** is working to understand the information practices of these groups and the implications of technologies in the broader context of forced migration and the refugees' lifecycle. She is pursuing technologies for social impact that can support the lives of refugees and migrants in the context of their new host countries.

A global issue

Currently, more than 80 million people worldwide are displaced, and 85% of them are hosted in low and middle-income countries or in remote areas where access to ICTs is limited. However, refugees have come together to form grassroots organizations to create information hubs in areas of advocacy, health, education, and career development.

Refugee-led impact

I focus on forced migration crises and the information practices of refugees and refugee-led organizations hosted in low and middle-income countries, such as Kenya, Uganda, Malaysia, and Indonesia. I am using human-centered methods to explore how these organizations are using ICTs, which ICTs are beneficial to them, and which strategies can be used to promote ICTs to support refugee-led initiatives. My goal is to create more visibility for refugee-led organizations that are assets to their communities and essential actors in the localization of humanitarian aid.

One of the biggest challenges of our time

In the past decade, 6.7 million Syrians, 4 million Venezuelans, 6.6 million Ukrainians, 2.6 million Afghans, 2.2 million South Sudanese, and 1.1 million people from Myanmar have been displaced across international borders. This makes forced migration one of the biggest challenges of our time, and we need to support sustainable community-based solutions that mobilize communities in the context of their host countries. Technologies are part of the solution; they can help us make progress toward the United Nations' Sustainable Development Goals by reducing inequality and creating conditions for safe migration.

RESEARCH BRIEFS

DETECTING ALZHEIMER'S

Professor **Sharon Huang** and Assistant Professor **Fenglong Ma** are using a $1.2 million grant from the NIH to develop a machine learning system that can analyze biomarkers—like those found in body fluids—commonly associated with Alzheimer's disease. They hope to help doctors provide more timely treatments and interventions, as well as identify new biomarkers that could help predict the disease in its earliest stages.

NSF DIRECTOR

Anna Squicciarini, Frymoyer Chair in IST, was named a program director of the Secure and Trustworthy Cyberspace cluster of the National Science Foundation, effective Sept. 26. She is offering expertise and perspective to shape research opportunities in information and user privacy, as well as supporting proposal reviews and funding decisions.

ACCESSIBLE CODING

Assistant Professor **Syed Billah** and doctoral student **Md Ehtesham-Ul-Haque** have has developed a new tool—Grid Editor—that could help make coding more accessible for blind and low-vision programmers. The tool extracts code snippets into rows and columns that can help programmers create a mental map to navigate and update the code more easily.

A NUMB3R5 G4ME

A growing number of IST alumni and students are blending their data sciences education and love for sports to make an impact on the game.

By Jessica Hallman

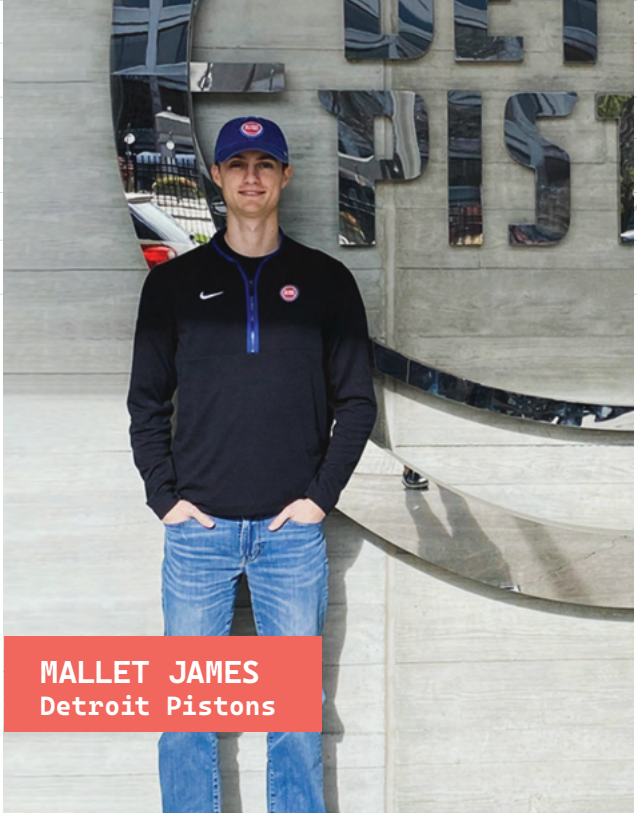
When legendary Green Bay Packers coach Vince Lombardi famously said, "Football is a game of inches and inches make the champion," he was describing the razor thin margins in sports that determine the difference between winning and losing.

In Lombardi's era, much of this difference was attributed to intangible traits like heart and grit. But today's coaches, athletes, and franchises are turning to a relatively new method of gaining this competitive advantage: advanced analytics.

The industry of sports analytics has created its own language; VORP, TRB%, WHIP, and SPSV% are among the endless new terms in the lexicon that is now driving nearly every decision in sports—from how coaches gameplan and how players anticipate opponents' tendencies to how organizations manage rosters.

To capture, decipher, and analyze these statistics, several sports teams have turned to IST alumni and students to help uncover the hidden advantages that can lead to more wins and more efficient use of resources. As graduates of Penn State's intercollege data sciences bachelor's degree program, they are landing coveted positions as sports analysts, drawing on their data analytics backgrounds to give professional sports teams a competitive edge.

"I take research and development that analysts do and translate those findings into tools and applications to effectively communicate information to the people that need it—mainly players and coaches—who will eventually use it on the field," said **Sameer Sapre '20**, an analyst for baseball projects with the Seattle Mariners.



Sapre primarily works with the team's sports science staff to provide critical information that allows coaches and players to monitor players' workloads throughout the season—helping players avoid overexertion and risk for injury. He also compiles player metrics such as pitching velocity to build applications and data pipelines to streamline the process of automating daily reports.

Stephen Polacheck '20 makes a similar impact in the NFL as a football data analyst with the Atlanta Falcons. Behind the scenes, Polacheck works to deliver data-driven information to the team's multiple departments to help guide their decision-making.

"The best thing about my job is knowing that my work is valued by the staff, and that it affects us in winning and losing," said Polacheck. "I have the ability to influence what happens in games for the league I grew up idolizing, and there are also millions of people counting on me to do my best."

"I never imagined myself being in the conversation where coaches would want to hear my input. That just speaks to how much people value data and value that skill set," added **Mallet James '21**, a data scientist with the Detroit Pistons.

Like Polacheck and Sapre, James works to provide coaches and front-office staff with digestible information that can inform their decisions for each game. He also helps to evaluate each player's decision-making, by measuring data tagged from practice drills captured on video.

"They're sort of mental awareness tests that show how players react in real time," explained James. "For example, how quickly a player takes his first step after being passed the ball, or how quickly he makes it to the basket. It's something hard to measure if you're just looking at it with your eye, but we evaluated that data set and it informed the decision-making process on how coaches build out their roster."

Before the current NBA season began, James was tasked with reviewing the Pistons' play call analysis from the past year. He analyzed the plays the team ran during a season to determine which plays worked best in specific scenarios and how it affects the overall season.

"It informs almost every decision that's made—from player personnel to how much to sign them for to what plays to call on the court," said James. "They're just little pieces of data that can be applied, and I'm just scratching the surface. We have so much data, I've only seen a little bit of what we have."

G3TTING THE BALL ROLLIN6

While James has only worked with a fraction of the NBA's measurable data, his understanding of how analytics can impact sports started at an early age. He learned from his father, a statistics professor at the Pennsylvania College of Technology who got James and his brother interested in reviewing stats on the back of baseball cards and reading the box scores from basketball games.

That foundation led to James wanting to pursue a career in statistics, and he soon learned of the new data sciences major at Penn State. The program, which was among the first in the U.S. to offer a comprehensive data sciences degree program at the undergraduate level, launched in 2016 as a joint initiative between IST, the College of Engineering, and the Eberly College of Science. Students learn to analyze large-scale data sets to address an expanding range of problems in industry, government, and research.

"In our curriculum, we provide the foundations for data science so that students will have the knowledge, analytical skills, and programming skills that they will need to become competent data scientists," said **Sharon Huang**, professor and coordinator of the data sciences bachelor's degree at IST. "We pay a lot of attention to paving the way for them to become data scientists that will have the ability to talk to

stakeholders from different domains so that those stakeholders understand the background of their data and how they can use it to answer various questions within their domain."

Sapre enrolled at Penn State undecided about his major. Like James, he learned about the data sciences program and was intrigued by the vast career opportunities graduates could pursue.

"It seemed like there were a lot of applications to basically any industry, so it felt like a perfect fit for someone who was undecided. I didn't have to focus on any one industry I wanted to work in," said Sapre. "The skill set taught through the data sciences program is being used by professionals in literally every industry."

Students in the data sciences program earn foundational knowledge in their first two years and then focus their final two years by selecting one of three options, with each option offered by one of the three participating colleges. Students in the applied data sciences option offered by the College of IST are educated in the fundamentals of data science—including data mining, machine learning, and data visualization—before pursuing cross training in a chosen application domain—such as astronomy, health sciences, information and cybersecurity, or sports. Students are encouraged to pursue minors, internships, and extracurricular activities in their focus area to strengthen their pursuit of careers in their chosen domain.

SPENCER BURNS
Penn State Baseball

MOJISOLUWA AWE
San Francisco Giants

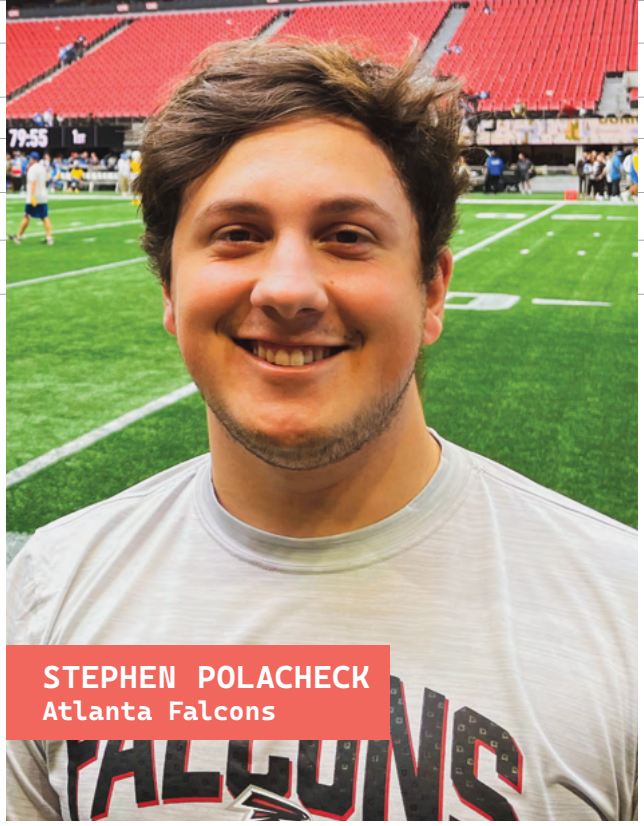
"I challenge students to position themselves so they stand out and have a competitive advantage over other applicants when looking for a job that's in their domain of interest," said Huang. "For students who want to work in sports, they'll have not only the foundational data science knowledge and skills but also have knowledge in sports which gives them more multifaceted capabilities and knowledge."

While fantasy sports and baseball-specific sabermetrics clubs existed at Penn State when James and Sapre were students, none focused more broadly on sports analytics. So, the two teamed up to create one. The Penn State Sports Analytics Club started with a small group focused on baseball, then expanded to analyzing data from all sports. Now, the organization welcomes more than 80 members and regularly meets on campus.

"It was really cool to get the ball rolling and facilitate discussions around different topics in sports and in sports analytics, and to learn perspectives from different students from different majors across Penn State," said Sapre.

Sapre, James, Polacheck, and other graduates of the data sciences program further expanded their skills and knowledge through personal pursuits. Many have maintained blogs, websites, or social media presences dedicated to studying the data behind a sport they are especially passionate about.

Drew Bennison '21 did just that for a sport in which he was especially interested: car racing. In 2014 he launched The Single Seater, a blog focused on IndyCar data and statistics. That blog, combined with broader internships, undergraduate research experiences, and his data sciences classes, gave Bennison the foundation that helped him land his current full-



STEPHEN POLACHECK
Atlanta Falcons

time position as an IndyCar data analyst at General Motors. In his role, Bennison assists Chevrolet IndyCar teams and partners to help develop tools for their use.

"Getting this role was very meaningful to me because of all the work I did on The Single Seater over the years," said Bennison. "I wrote that blog out of a passion for IndyCar and data analytics, and to see that eventually grow into something that is a full-time job in my favorite sport is still pretty surreal to me."

Polacheck similarly launched a personal project and developed Power Digits, an algorithm that ranks college football teams without human bias. By taking the opinions out of Polacheck similarly launched a personal project and developed Power Digits, an algorithm that ranks college football teams without human bias. By taking the opinions out of college football, Polacheck aims to not necessarily predict future winners, but to determine who has the best resumes for the College Football Playoff and New Year's Six selections. His algorithm—which is broken up into five different components based on a team's win-loss rating, strength of wins, strength of losses, strength of schedule, and top three wins—to give each team a Power Digits Rating of a number between 0 and 100 that determines its rank.

"There is no 'right' way to rank college football teams," said Polacheck. "This is simply one way to do it, which will sometimes agree with the pollsters and College Football Playoff, but sometimes not."

MEA5URING STR1KEOUTS

Students are also getting into the game by drawing on their data sciences education to develop algorithms and formulas that could impact their chosen sport. December 2022 graduate **Spencer Burns** used data accessible to him through his summer internship with Prep Baseball Report to introduce a statistic called Finished Strikeout Percentage (FK%). The statistic highlights a pitcher's strikeout percentage once a batter's plate appearance logs two strikes. Burns' statistic could help teams better strategize when to bring in a relief pitcher, or in their recruiting or signing efforts.

"The statistic was created with the idea that a ball in play risks a worse outcome for a pitcher, even though outcomes like fly outs and ground outs can still result in the pitcher doing his job," said Burns. "If you're at two strikes, only one more is needed to finish the batter without the risk of the ball going anywhere onto the field and creating a chance that the batter produces a positive outcome for his team."

At its base, FK% becomes active when a count reaches two

SAMEER SAPRE (right)
Seattle Mariners

strikes. If the pitcher records a strikeout, his FK% will rise; if the play results in anything but a strikeout, the FK% will decrease. According to Burns, FK% is particularly valuable in situations where a player from the opposing team is on third base and at risk of scoring a run, regardless of the number of outs in the inning. Burns' hope is that managers and coaches could use the statistic to find or place pitchers that increase the chances of holding that runner to third base and finishing a strikeout rather than potentially putting a ball in play.

FK% is currently available for use by teams, coaches, scouts, and analysts at all levels. Burns is hopeful that it becomes a regularly used statistic in baseball.

Through the development of FK%, Burns was supported by his mentor Jake Stone, director of operations for Penn State Baseball. Burns worked as a data analyst for the Penn State men's baseball team for the past two seasons, creating new tools and analytical projects to generate reports and data visualizations for players and coaches.

Burns' friend and classmate, senior **Mojisoluwa Awe**, also works with the Penn State men's baseball team as a data analyst. The skills she gained through that position, combined with knowledge gained in the classroom, helped her to land a data analyst internship position last summer for two minor league affiliates of the San Francisco Giants. In her role with the club's two Arizona Complex League Teams, Giants Black and Giants Orange, Awe uses data collected during each game to create post-game reports. She also communicates with coaches about trends on how players are developing and generates scouting reports on opposing players.

"I'm truly grateful for the opportunity and the space to learn about how data analysis and data science are being utilized in the baseball industry," said Awe. "Baseball as a sport has the longest history of using analytics … and it feels truly surreal to be a part of where the sport has evolved to now."

THE N3W CURR3NCY

As products of the applied data sciences program at Penn State, Mallet, Sapre, Polacheck, and Bennison are also pioneers—they are among the first IST alumni to land full-time positions as analysts with professional sports teams and entities.

"These jobs are extremely difficult to come by for various reasons; mainly that few professional teams exist, not all employ a data science team, and for those that do, their

DREW BENNISON
General Motors (IndyCar)

teams can be small. The result is a highly competitive market," said Andrew Wiesner, associate teaching professor of statistics and adviser of the Sports Analytics Club that Mallet and Sapre founded. "Having one graduate in such a position is nice, two is exciting—but four in different major sports is outstanding. Such results provide a recipe for future students who truly aspire to work in this arena."

In his work at IndyCar, Bennison challenges himself daily and works hard to improve in the fast-paced environment of racing.

"I am constantly learning new things, and that is exactly the type of workplace I want," he said. "I think my success and that of my classmates who now either work in sports analytics or other fields really does speak to the quality of the Penn State data sciences program."

Whether graduates of the program go on to work in sports or another field, the future is bright. With plentiful data collected in different industries and areas of society, many companies are making the shift to employ skilled analysts to help leaders with scientific decision-making and reaching objective conclusions.

"Among data science researchers, there's a saying that 'data is the new currency,'" said Huang. "Data science enables the analysis of large amounts of data, which changes how decisions are made and how problems are solved."

She concluded, "I see an increased future demand for data analysts—in sports and every industry—because a lot of decisions are being made everywhere. And those decisions can be backed up by rigorous data science analysis to be made less subjectively and without bias."

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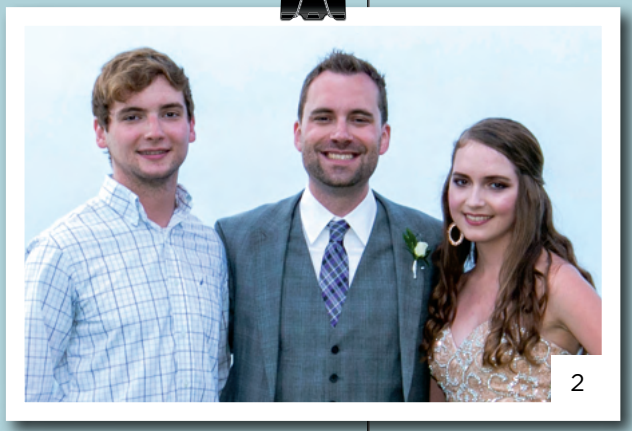

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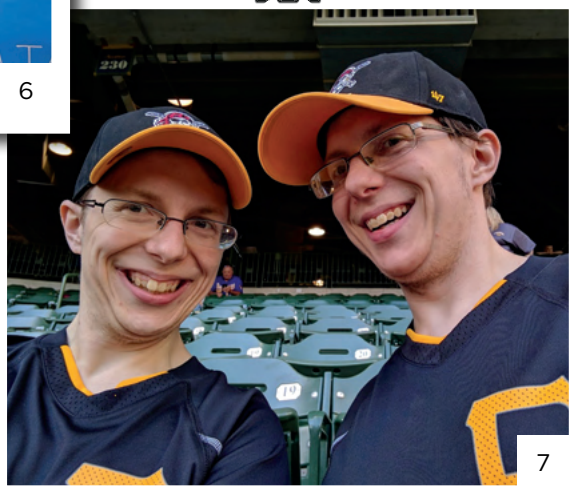

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ALL IN THE FAMILY

By Jessica Hallman

For several members of our community, IST runs in their blood. Meet a few of the families in which siblings and cousins share a special connection as alumni of or current students in the College of IST.

1. Sister and brother **Adaku Uchendu** (current IST Ph.D. student) and **Uchendu Uchendu '22g**.

2. Siblings **Wesley Orbin '14** (Senior Software Engineer, Braze), **Matthew Orbin '09** (Senior Manager, Kaiser Permanente), and **Celina Orbin '18** (Senior Consultant, Deloitte).

3. Brothers **Matt Greenjack '21** (Technology Transformation Associate, Grant Thornton) and **Dan Greenjack** (B.S. in information sciences and technology, class of 2023).

4. Cousins **Nicholas Carradorini '20** (Web Designer, FiberFlex), **Jaclyn Carradorini '15** (Web Developer, Consumer Technology Association), **Chris Carradorini '18** (Account Executive, Mystery), and **Vince Derr '14** (Security Assurance Manager, Amazon Web Services). Jaclyn and Chris are also siblings!

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5. Sisters **Ally Bardusch ’20** and **Victoria Bardusch Duncan ’17**.
6. Twin brothers and class of 2023 members **Harrison Keating** (B.S. in security and risk analysis) and **Jarrod Keating** (B.S. in data sciences).
7. Twin brothers **Ryan McGill ’15** (Lead Jackbox.tv Engineer, Jackbox Games) and **Daniel McGill ’15** (Client Systems Administrator, Epic).
8. Sisters **Purvi Shah ’03** (VP Enterprise Data Platforms, Enterprise Digital & Data Solutions, American Express) and **Ruchi Shah Holtz ’06** (Senior Manager, Deloitte Consulting).
9. Brothers **Jason Frank ’09** (COO, SpecterOps) and **Michael Frank ’11** (VP of Technology, PNC).
10. Sisters **Karina San Román ’22** (Infrastructure Transformation Senior Analyst, Accenture) and **Jennifer San Román ’18**.

! Are you an IST family? Share your story at **ist.psu.edu/class-notes**.

HEY ... WHAT'S THE BIG IDEA?!

IST faculty spend much of their careers pursuing independently smaller projects that work toward a major research goal. We asked several of our researchers to share what they're working on, why it matters, and what motivates them to pursue their goals.

By Jordan Ford

Priya Kumar
Assistant Professor

Strengthening kids' privacy literacy

There's a lot of concern about children's technology use. I understand the worries, but we must also remember that digital interactions present opportunities for connection, learning, and more. We need to work with children to make sense of the digital environment and better understand what it's like to grow up with smartphones, apps, and social media.

My work explores how to create educational programs that strengthen children's privacy literacy. I want to help children build on what they already know about digital data flows to define what privacy means to them. The meaning of a concept like privacy is never stable. If we want to understand how privacy works when everyday life flows through digital devices, asking today's kids might be our best bet.

Currently, we're interviewing school librarians and analyzing library and information science curricula and state education standards. We plan to use the findings from our work to design a privacy literacy program. And if the status quo isn't giving us the privacy we want—and in many ways, it isn't—then we can use those insights to demand change.

Saeed Abdullah
Assistant Professor

Designing FinTech for Good

Achieving financial stability is essential for the successful rehabilitation and improved quality-of-life for individuals with mental illness. How can we understand and prevent problematic financial behaviors associated with mental illness, such as manic episodes in bipolar disorder that lead to compulsive buying and risk-taking behaviors?

We're working to develop supportive technologies that empower individuals with mental illness to manage their finances, which can ultimately improve mental health outcomes. We hope to develop a novel, privacy-preserving, and user-centric computational framework for financial data analysis and personalized interventions. The outcomes can inform policies toward accessible financial tools that can be integrated into mental health care.

Hadi Hosseini
Assistant Professor

Achieving societal fairness

I've always been passionate about the rules and procedures that are building blocks of societal harmony. Designing such principles is quite challenging when humans, artificial agents, or other intelligent entities interact with one another.

How do we make collective decisions when decision-makers have conflicting goals and desires? What makes a decision fair? What are the computational boundaries for feasible outcomes that satisfy the most participants?

These questions arise in and can have an impact on almost all societal or technological applications today—from federated health care and refugee placement to recommendation systems and gig economies—and form some of the most fundamental challenges that span a wide array of fields from philosophy to computer science and AI.

Primary Research Areas:

- Data Sciences and Artificial Intelligence
- Human-Computer Interaction
- Privacy and Security
- Social and Organizational Informatics

Sharon Huang
Professor

Creating a personal health library

Patients and caregivers are increasingly turning to online health communities for information about their health in simple terms, such as treatment options and side effects of medication. While these communities can be useful sources of information and emotional support, they also increase the risk of misinformation or subjective recommendations that could lead to serious harm.

Using expertise in machine learning and biomedical informatics, I'm collaborating on a project that will lead to mobile- and web-based applications for a patient-centric personal health library. The project aims to recommend trustworthy health information to patients that is updated according to their current health conditions while also facilitating their communications with like-minded peers.

Our goal is to create a dynamic personal health library that provides patients and users of online health communities with high-quality, trustworthy health information. It will also help connect people who have similar health profiles and conditions so they can share experiences and provide social support.

Yubo Kou
Assistant Professor

Refining online moderation

When users misbehave on social media and online games, many moderation systems punish them through acts like content removal and chat restrictions. But this simplistic approach rarely leads to behavioral improvement, in part, because punished users are left to figure out why they were punished and how they could improve.

This can lead to punished users turning to other platforms and continuing their disruption. Instead, we need to find ways to be more inclusive of punished users in the design process to create better systems. I'm working to design better moderation systems that can help these users, who have often been overlooked in previous moderation designs.

Shomir Wilson
Assistant Professor

Understanding the fine print

Privacy policies, terms of service agreements, and other consumer-oriented legal documents—or COLDs as I call them—are pervasive. Varieties of fine print like financial, health care, and rental agreements often must be accepted to receive essential goods and services. But COLDs are obstacles for many consumers who want to understand things like privacy, ownership, and legal responsibilities.

I'm using computational methods and natural language processing—a branch of AI that extracts meaning from human language—to explore the texts of these legal agreements and investigating how they can be made more understandable and actionable.

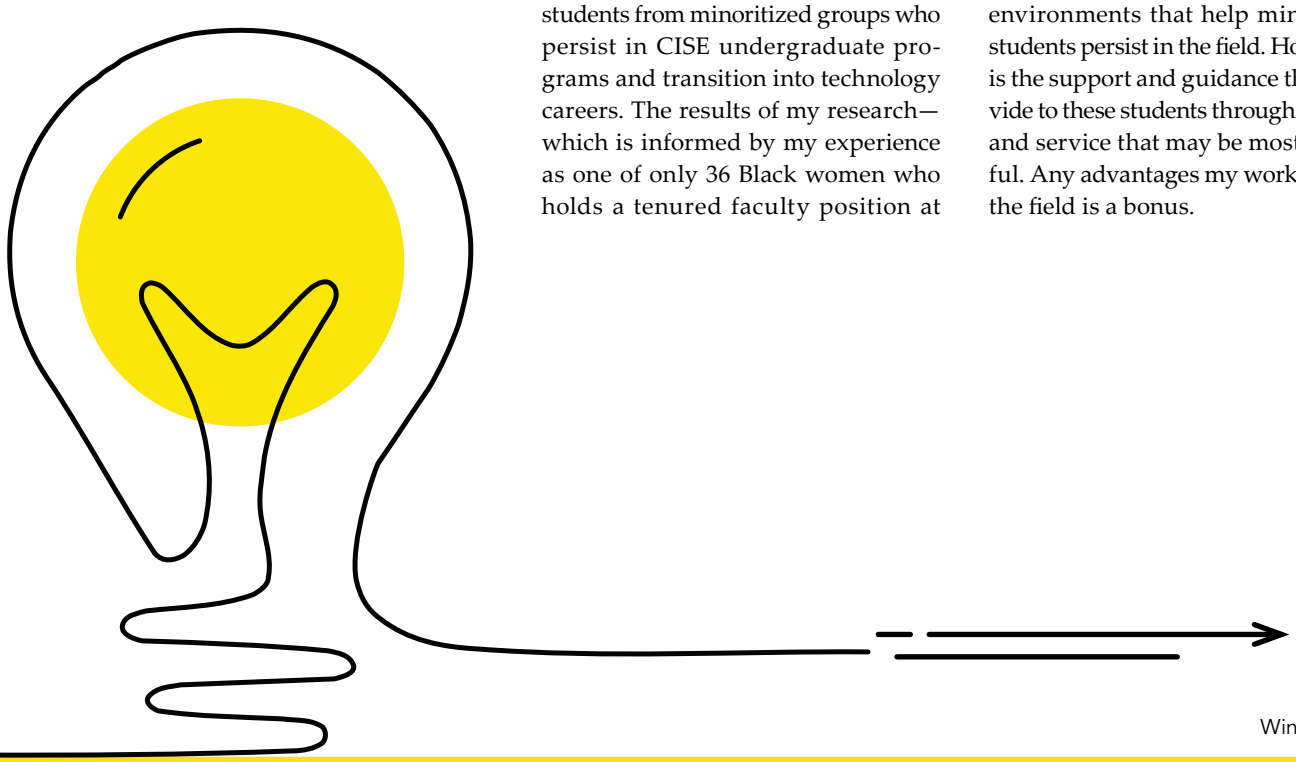
We've created resources like collections of text and software that have inspired other researchers to work on privacy policies. We've also released a web browser plugin and a searchable site—privaseer.ist.psu.edu—of more than 1.4 million privacy policies. It's an exciting way to use natural language processing for social good and collaborate across traditional disciplines.

Jinghui Chen

Assistant Professor

Boosting machine learning security

It's been a relatively recent development that there's been a focus on improving the security and privacy of machine learning to make it more reliable in our daily use. As applications employing machine learning increase, related security and privacy issues will only become more important. I'm working to understand adversarial machine learning and federated learning, which has included achieving several state-of-the-art results for evaluating model robustness and mitigating the effect of malicious adversaries.



Lynette Yarger

Professor

Improving outcomes for minoritized groups in tech

For decades, disparities in the completion of undergraduate degrees in computer and information sciences (CISE) across minoritized groups has been a topic of national concern among policy makers, educational leaders, and the scientific community. Yet, these disparities persist despite innumerable education reform and intervention efforts to combat achievement gaps.

My research focuses on efforts that expand opportunities in technology to people from historically excluded racial, ethnic, and gender identities, as well as socioeconomic backgrounds. Currently, my research examines the perceptions and experiences of college students from minoritized groups who persist in CISE undergraduate programs and transition into technology careers. The results of my research—which is informed by my experience as one of only 36 Black women who holds a tenured faculty position at Penn State—contribute to developing a highly talented, diverse technology workforce that will advance the nation's technology, economic, and scientific development.

Diversifying campus environments and facilitating opportunities for those not traditionally welcomed is vital to my ability to persist as a professor. I hope my research lends legitimacy to the perspectives and experiences of minoritized undergraduate students and professionals who experience institutional barriers at every stage of the degree process and career progression. I hope it inspires a commitment to actions that create learning and work environments that help minoritized students persist in the field. However, it is the support and guidance that I provide to these students through teaching and service that may be most impactful. Any advantages my work offers to the field is a bonus.

Jonathan Dodge

Assistant Professor

Bettering AI assessment

Products infused with artificial intelligence—like self-driving cars—are increasingly a part of everyday life; they are the next frontier of automation. However, the techniques we use to assess this automation are often not applicable out of the box, so we're working to devise new techniques and adapt existing ones, as well as figure out how to validate the efficacy of assessment techniques.

I'm trying to prevent negative outcomes of AI-infused products by working on explainable AI from both the system side and the human side. There are countless examples of products being released before this type of adequate vetting, which has damaged lives and brands. My goal is to improve how we assess AI by providing new kinds of models that lend themselves to assessment more naturally, as well as designing tools and processes for assessors to use.

Kelley Cotter

Assistant Professor

Advancing socially just social media

Data-centric technologies like social media platforms shape social life and vice versa, and they can both benefit and pose problems for society—particularly when it comes to questions of power, equity, and inclusion.

I'm interested in how we can translate these issues into better governance of the underlying technologies and how we can design policies that contribute to more socially just outcomes. I focus a lot on social media algorithms. I am motivated by the idea that if we want algorithms to function fairly and justly, then we need to understand people's accounts of what they uniquely mean to and for them.

I feel a deep sense of responsibility to help ensure people are seen and heard in their full humanity, can exercise autonomy, and have what they need to live well. I recently contributed to the Center for Democracy and Technology's report about shadowbanning—when platforms block a user's content without their knowledge—and have been in touch with Meta's Content Policy team on how they can bring more algorithmic transparency for content creators and users. In the future, I hope to partner with activist and advocacy organizations on projects that would more directly produce material changes.

Lu Lin

Assistant Professor

Building trust in our connected world

Connections and networks are everywhere—social networks, transportation grids, even the molecules that make up our world. As we enable AI systems to understand and facilitate information flows on these networks, we need to address the issues of trust that can exist and be exaggerated through these links, such as a user's private information being leaked from one of their digital connections.

My research focuses on developing AI systems that can understand the world in a trustworthy way. Specifically, I create machine learning models that can harness the connections and network structures of data to empower AI, while mitigating potential threats to trustworthiness—like fairness, robustness, and privacy. Ultimately, I want my work to encourage us to rethink and improve the development of AI systems in a more accountable way.

Linhai Song

Assistant Professor

Detecting programming bugs

Go and Rust—two newer programming languages—have been used to build several operating systems, browsers, and other infrastructures. Ensuring the quality of these infrastructures is critical, as bugs in these systems influence all applications running on top of them.

I'm working to improve the reliability, security, and performance of these systems. We've identified ways to help programmers avoid bugs and guide future researchers in building techniques to detect bugs in Go and Rust. We've also built two practical tools to detect these bugs, which have found hundreds of previously unknown issues in famous open-source software like Docker and Kubernetes. Detecting these bugs means they can be fixed, which improves the quality of the languages and the systems they're used to create.

Carleen Maitland

Professor

Enhancing global aid through tech

In the early 1990s I served as a Peace Corps volunteer on the border of Malawi and Mozambique during the latter's civil war. My town housed 10,000 refugees fleeing the conflict. From that time, I came to understand the role technology could play in enhancing aid distribution and impacting lives.

My research promotes equitable benefits from advances in information technology for marginalized members of our global society. I work with aid organizations and refugees in low-income countries to enhance how they use technology to provide assistance and promote community resilience, which informs the strategies, policies, and work processes of UN organizations.

None of this work would be possible without the cooperation of all the aid agencies and refugees who take the time to participate in interviews, fill out surveys, and participate in training through which knowledge is developed.

Amulya Yadav

PNC Career Development
Assistant Professor

Bringing AI to the underserved

Despite years of emancipation efforts, there are still significant disparities among communities based on factors like race, gender, and sexual orientation. Now, with the advent of AI-based societies, new disparities have emerged based around whether people can easily access AI-supported technologies, like Google Maps and Uber.

The bulk of AI research and development focuses on the needs and problems faced by people in developed societies, in part because these users pay for these AI-based services. My lab—Responsible AI for Social Emancipation, or RAISE—partners with non-governmental and non-profit partners to address the challenges faced by the marginalized and underserved communities that can't easily access and enjoy the benefits of these technologies.

Our partners help us understand the challenges these communities face and identify the real-world problems. Then, we develop foundational AI algorithms to help solve these problems. Together, we've worked to address issues like strengthening education and preventing HIV/AIDS in homeless youth, increasing crop production and stability for farmers, ending child poverty, and improving environmental sustainability, among many others.

LEARN MORE ABOUT OUR IMPACT

ist.psu.edu/research

Inspiring Digital Fluency

Donor support helps students with financial need meet IST's laptop requirement

As industry evolves, so does the technology that supports it. To ensure that College of IST graduates are well-positioned to enter a competitive workforce and prepared to solve the complex challenges of an information society, the college requires that all incoming students at University Park have their own laptop that meets or exceeds minimal technical specifications.

The requirement, which launched in fall 2021, is intended to ensure students have access to a level of technology needed to complete coursework and enable instructors to effectively incorporate a standard of technology into their courses. Over time, having a personal laptop that meets certain standards better positions students to complete assignments, collaborate effectively with classmates, receive hands-on instruction, and make use of flexible education environments. Ultimately, it supports an equitable Penn State experience and prepares students with the digital fluency needed to create new knowledge and thrive in emerging careers.

While implementing a laptop requirement benefits individual students in their learning, purchasing a laptop can be a considerable expense. The College of IST has provided additional aid for students with demonstrated financial need to offset the cost of the requirement. This effort has inspired several donors to help students meet this need.

"Think about how challenging it would be for a student today to not have some of the basic technology and tools that they need to be able to come here and really learn," said **Chandra McMahon**, senior vice president and chief information security officer at CVS Health and member of the IST Dean's Advisory Board. "They don't need that added challenge or burden; they need to be able to focus on their learning and not worry about whether or not they [can afford] a computer that can help them get through the curriculum and the work they need to do."

McMahon is one of several donors to recently establish a technology scholarship at IST. Through their generosity, endowments have been created to provide funds to students needing financial assistance to access required technology.

Former IST Dean's Advisory Board member **Elizabeth King**, who established a technology endowment in the college last year, further expanded the impact of her support last fall. On Giving Tuesday, King pledged to match every donation made that day dollar for dollar, up to the first $2,500. More than $5,500 was donated to the IST Technology Fund on Giving Tuesday alone.

"[Scholarship support] gives you a sense that somebody believes in you and somebody is pulling for you," said King. "I think about those points in college that were fundamentally life-changing, and how having scholarships was important to (my family). And because it was so impactful to me, I want to be part of that impact for other students going forward."

Shania King, class of 2026, is just one of many students who have benefited thanks to the generosity of King, McMahon, and the donors who participated in Giving Tuesday.

"The technology scholarship that I received from IST has greatly impacted me because it granted me the privilege of being able to purchase an up-to-date laptop for school that will last me all four years of college," she said. "In addition, this scholarship took away a great financial concern that I once had and allows me to fully focus on my schoolwork."

! Contact Mike Weyandt, director of development, at mjw134@psu.edu to learn more about supporting student technology needs.

A Meaningful Journey

With a goal of working in the consulting and policy field after her graduation, **Mariya Jivaji** is on the right track to accomplish her dream thanks to her hard work and support from the IST community.

A first-generation college student, Jivaji earned her bachelor's degree in cybersecurity analytics and operations in December after just seven semesters. Throughout her time at Penn State, Jivaji served as a member of both the Gamma Tau Phi IST Honor Society and Women in IST. She also completed research projects that explored poaching in her home country of Kenya and water sustainability and availability in underdeveloped countries.

"Sustainability has been a passion of mine growing up," said Jivaji. "Every little bit of research and data collection can help solve these issues, or at least help us gain a broader perspective on them."

On top of her discipline in academic pursuits, Jivaji was driven to put her skills and knowledge to use in the professional world. Through the College of IST career fair, she connected with a recruiter from KPMG and completed an internship as a cybersecurity intern with the company last summer. She recently launched her professional career with Deloitte in their cybersecurity consulting practice.

As a student, Jivaji's passion and hard work helped her earn the Copeland Family Scholarship, which was established by Jeff and Jacky Copeland to support underrepresented students who are studying cybersecurity. This financial support provided her with peace of mind and allowed her to fully concentrate on her studies.

"Any help that I was able to get was appreciated," said Jivaji. "I was able to take on these internships and didn't have to worry too much about working for money. Rather, I could work for something that would help my career and pursue something larger than just working many jobs to pay tuition."

Calling the support students like her receive an investment in the individuals and their careers, Jivaji said her scholarship has inspired her to help others who might be in her shoes.

"It's meaningful because it's from people who care about Penn State and want to give back to support students. It shows me that one day, I can probably do the same," she noted. "Without it, I wouldn't be able to focus as much or even graduate in the time that I have."

In Nature's Path

As an Azure sales specialist for Microsoft, **Sam French '18** provides clients in 33 Caribbean islands and countries with cloud computing solutions. He educates them about disaster preparedness with the cloud and how his company's product can support their businesses during prolonged periods of IT downtime—for example, as the result of a hurricane.

For French, the benefits of his product hit close to home when in September Hurricane Ian made landfall just 20 miles from his home in Southwest Florida. With the storm initially projected to hit further north, he and his fiancée Kristen Aquaro '18 Bus opted to stay put. As the storm got closer, they realized it had rapidly shifted and they were right in its path.

They did their best to protect their possessions and, along with a few neighbors, relocated to a nearby two-story house hoping it would be safer from the rising storm surge. All they could do then was watch the destruction.

"Not even five minutes after being there, the wind started and the water started filling up," said French. "We were very lucky and we were safe, but we were in 150-mile-per-hour wind gusts watching roofs blow off houses and watching boats float through the street. I could see our house filling with water and watched our pool cage collapse. There was nothing we could do."

Sam French and fiancee Kristen Aquaro

Drone footage of Sam French's house in Cape Coral, Fla., in the aftermath of Hurricane Ian.

After the storm ended and the water receded, Sam and Kristen returned to their house. Five inches of mud on the floor, the furniture and walls soaked beyond saving, most of their possessions destroyed—it was a total loss.

Ironically, French's work with Azure—and his intimate knowledge of how much revenue a company could lose for each hour IT was down—prepared him well for a natural disaster. He had already purchased a generator and emergency essentials and had fiber lines running through his house to keep his technology running.

"I always knew about redundancy and how to keep things secured," he said. "And once I started working with these Caribbean customers, I started practicing what I preached a little more."

Those practices, combined with the strong teamwork foundation he built at Penn State through his courses and as an IST Diplomat, inspired French to take action in his devastated community.

"In the first two days after the storm, all you heard were sirens and helicopters; they were pulling people from rooftops and out of the river. It was like a warzone," he said.

Sam and Kristen helped clean up their neighbors' homes and ran electricity on their generator. They raised $5,000 for their elderly next-door neighbor, who did not have flood insurance. Now temporarily living near Orlando while cleanup efforts continue, they hope to return to Cape Coral—a city they've come to love—in February.

Said French, "I thank Penn State for instilling values and for helping me to recognize and build a sense of community in a [new] place."

Photos provided (4)

Inspired to Serve

Congratulations to **Mark Poblete '07, '20g**, who was recently honored with the 2022 Philip Philip Mitchell Alumni Service Award by the Penn State Alumni Association. The award recognizes an individual who has significantly contributed in the area of public service by sharing or volunteering their talent, time, and resources on behalf of the University.

Deeply engaged as both an undergraduate and a graduate student, Poblete has continued this commitment as an alumnus. He has served in multiple roles across the Alumni Association, including terms as president of the IST Alumni Society Board and the Alumni Blue Band Association, and he is currently on the executive committee of the World Campus Alumni Society Board. A former member of the Penn State Alumni Council, Mark represented the IST Alumni Society and went on to hold multiple leadership positions, including serving on the executive board for three years. Poblete was previously recognized for his service with the IST Alumni Society President's Award in 2013, the College of IST Outstanding Alumni Award in 2016, and the Alumni Council Member of the Year Award in 2019.

"This is not an individual award. I was given incredible opportunities to serve over the past 18 years, and I share this recognition with each of the individuals who encouraged and inspired me to serve," he said. I can't wait to embark on a new journey to discover and celebrate the Penn State leaders who are building bridges to the next generation and paving the way for an even greater future."

Inseparable Connections

"I met my best friends through the College of IST. Three of us had Fred Aebli's IST 221 class together when we were students at Penn State Scranton, and the grueling group project brought us together outside of class hours. From that class through the rest of college we were inseparable, and now, all graduates, we live all around the country but made it a pact to spend New Year's Eve together." — **Sarah Kaneski '21**

Bailey Rumford, Sarah Kaneski, and Nina Cirelli became fast friends at Penn State Scranton, and later formed a friendship with Nate Fangio when they came to the College of IST at University Park.

NEWS & NOTES

Darin Carter '14 was a recent guest on Following the Gong, a podcast of the Schreyer Honors College at Penn State. In the episode, "Understanding and Making an Impact with Blockchain and Cryptocurrency," Carter shared his perspective working in consulting, big tech, and careers in the pioneering spaces of Web3 including blockchain and cryptocurrency. Carter is currently a program manager on the Coinbase Giving Team, managing a portfolio of social impact investments from humanitarian aid to education.

Connor Mathews '18 achieved Distinguished Honor Graduate while attending the Navy's Joint Cyber Analysis Course, one of the most academically rigorous military schools. "I am proud to have achieved this honor, which was made possible in major part due to the base knowledge learned through the IST and SRA curriculum."

Rylee Smith '22 is one of 14 recent graduates named 2022-23 Young Alumni Ambassadors by the Penn State Alumni Association. Smith and her cohort will share a yearlong experience aimed at developing their skills to become the University's future volunteer leaders. She currently serves as a cyber risk analyst with Deloitte.

Do you have professional accomplishments or personal milestones you'd like to share?
Submit them to **ist.psu.edu/class-notes** or tag **@ISTatPENNSTATE**.

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The Power of Internships • Technology Scholarships

MARK YOUR CALENDAR

» **PENN STATE COOKING CLASSIC**
February 8
Online

» **IST IDENTITY TALKS: WOMEN IN CYBER**
March 15
Online

» **ALUMNI NETWORKING: TEXAS**
April 27

Stay tuned to your email, IST social media channels, and **ist.psu.edu/alumni-events** for details of these and additional events!

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