

The background of the cover is a photograph of several graduates in black gowns with red stoles, celebrating and throwing their caps into the air. A large, stylized white letter 'N' is superimposed over the center of the image. The 'ini' logo is in the top left, and the Carnegie Mellon University name is in the top right. The magazine title 'THE NETWORK MAGAZINE' is on the left, and the issue date 'SUMMER 2024' is on the right.

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Carnegie Mellon University
Information Networking Institute

THE NETWORK MAGAZINE

SUMMER 2024

Carnegie Mellon University Information Networking Institute

The Network SUMMER 2024

The Network is published annually for alumni, students, faculty, staff and friends of the Information Networking Institute (INI) at Carnegie Mellon University (CMU).

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We've come a long way, haven't we? In 2024, we mark a milestone: the INI's 35th anniversary!

Our community continues to thrive as shown in our headlines, social media and the stories you share with us at events, near and far. Despite our ever-changing world, the INI is steadfast in our mission to provide a transformative learning experience.

Another milestone, I mark my 20th anniversary as INI Director in 2024. Since becoming Associate Director in 2002 and Director in 2004, I have been driven by the INI's ongoing success for more than two decades. I'm fiercely proud of my team laying the groundwork for the INI to remain competitive, fiscally responsible and equitable every day. One of the hardest feats in recent years was to establish our own INI faculty organization, and it was well worth it.

Five years ago, the INI's strategic plan set a goal to build a faculty organization from the ground up. Previously, courses for INI students had been taught by other CMU departments, but our enrollment had grown enough to justify hiring teaching faculty. The INI faculty is nine members strong, and growing!

The INI's 2024–2029 strategic plan has a focus on building a flourishing faculty that will support them to the fullest extent possible. Academia demands leadership, as many of our readers know from interacting with our professors. The faculty create a strong foundation for our students and alumni and play a critical role in our mission.

This edition of *The Network* shines a spotlight on the faculty organization in a feature story. There's also a Q&A with recent hires Pedro Bustamante and Quinn Jacobson. We discuss creating the new Master of Science in Artificial Intelligence Engineering – Information Security program. In recognition of teamwork, there are award articles featuring my amazing long-time colleague, Nancy Doyle, and my own induction into the Pittsburgh Smart 50, representing the INI and CMU as part of our region's thriving economy.



Shout out to our alumni who are making waves in the field! This edition features alumni stories on Deb Dutta '09 and Karthik Suresh '08 discussing entrepreneurship and Harshvardhan Chunawala '23, Hunter Wodzinski '22 and Henry Howland '22 talking about pursuits in space. Within these pages, we also honor several alumni winning prestigious awards and the victories of our hacking teams, while spotlighting some current students.

On a historical note, three stories recognize the 20th anniversaries of the Master of Science in Information Security program and Carnegie Mellon CyLab and the 25th birthday of Wi-Fi that occurred since our last edition. As always, we included a graduation wrap-up and highlights from our Alumni Leadership Council.

Stay in touch with me and the INI community throughout the year as we continue to spread the news about our students, alumni, faculty and staff. As we mark our 35th year, I'm so pleased to be able to continue sharing our milestones with you in *The Network*. Enjoy!

Dr. Dena Haritos Tsamitis

Barbara Lazarus Professor in Information Networking
Director, Information Networking Institute (INI)
Founding Director, Education, Training and Outreach, CyLab

Remembering President Cohon

Jared “Jerry” Cohon served as the eighth president of Carnegie Mellon University, 1997–2013, during a time when the university further grew as one of the preeminent institutions of higher education in the world.

Throughout his presidency, Cohon was a staunch advocate for access for and support of all people of great talent, ensuring that the richness of the university community was enhanced by having people of all backgrounds in its faculty, staff and student ranks. Cohon was deeply committed to CMU being not just of the world, but in the world, and the university’s global footprint under his leadership continues to inform and bolster the university and its connections in Asia, Europe, Africa and the Middle East.



During his tenure, Cohon shared in many of the INI’s most notable developments as the institute grew from one graduate program to multiple, with global engagements around the world and two bicoastal master’s programs. He and his wife, Bunny, attended the INI’s first graduation ceremony in Greece in 2004, where they explored the ancient sites and experienced the unique community at the INI’s first global campus.



“The INI played a significant role in CMU’s expansion into new countries, and Jerry was a dedicated champion of our work as we grew,” said Dena Haritos Tsamitis, director of the INI. “I had the pleasure of traveling with Jerry to every one of our international campus locations. It was wonderful to experience that 2004 graduation with Jerry and Bunny, since it marked such an important milestone in the development of the INI.”

“Jerry was a dedicated champion of the INI who shared in many of our milestones.”

In addition to his leadership in the university’s growing global footprint, Cohon also participated in the launch of CyLab, which has continued to drive innovations at the forefront of cybersecurity. Last year, he joined Haritos Tsamitis and other CyLab founders and leaders to celebrate its 20th anniversary.

“Jerry truly exemplified the impact of great leadership,” said Haritos Tsamitis. “He was remarkably engaged across the entire campus, and his support for our work at the INI was deeply felt. We will always remember his thoughtful leadership, and our hearts are with Bunny and his entire family.”



BUILDING A Flourishing Faculty

A mighty team comes from a modest beginning

By Ann Lyon Ritchie



Considering the breadth and depth of the teaching faculty today, it's hard to believe that the INI's first faculty members were hired only 10 years ago.

Nine members strong, the team now includes teaching faculty and special faculty under the leadership of one director, Dena Haritos Tsamitis. Its growth began when Haritos Tsamitis set forth strategically to build a faculty organization from the ground up.

"When the INI began as a fledgling initiative in 1989, INI students took classes from other departments to satisfy the interdisciplinary nature of the programs," Haritos Tsamitis said. "As the other departments established master's degrees and spots in key courses became more competitive, we realized that we needed to develop our own faculty organization to meet our students' needs. The INI faculty organization has evolved into a talented, innovative team. Importantly they collaborate and work closely with students as a united front committed to student success."

The faculty teach in a hybrid format at the Pittsburgh and Silicon Valley campuses. They are experts in their domains, industry-tested advisors and outside-the-box thinkers. They are members of a formidable team who work every day to shape the future.

Complementary Strengths

Originally from Ecuador, Assistant Teaching Professor **Pedro Bustamante** works out of CMU's main campus in Pittsburgh and studies telecommunication advancements with a particular interest in the interplay of the technical, economic and policy dimensions. Prior to CMU, Bustamante worked for the telecommunications regulator in his home country. At the INI, he has taught Fundamentals of Telecommunication Networks and Advanced Real-World Networks.

"The most unique 'thing' about the INI is its people," Bustamante said. "Our fantastic team at the INI is always willing to help and guide the students."

Patrick Tague, associate teaching professor, is a recipient of the NSF CAREER Award and brings a depth of knowledge in wireless communications, networking, mobile and Internet of Things (IoT) security. He is also well-versed in the INI's coursework and Silicon Valley's entrepreneurial landscape, having taught a breadth of courses at the CMU-SV campus since 2009.



Tague has a cross-disciplinary approach to teaching Mobile and Internet of Things Security. "One of the fun parts of this course is also one of my favorite things about the INI, which is thinking holistically," he said. "Understanding mobile and IoT security requires some understanding of business economics and marketing, as they have important impacts on what types of security technologies actually make it into commercial products."

Team Players

In the fall of 2022, the INI enrolled the largest class ever and more than 100 students took the INI Practicum, a core requirement of the bicoastal programs involving students in team-based projects for real-world clients. **Cynthia Kuo**, associate professor of the practice, and **Sujata Telang**, former associate teaching professor, answered the call to collaborate and co-teach the course.

The depth of Kuo and Telang's backgrounds complemented the hands-on approach of the Practicum, enabling the student teams to learn from mentors with proven expertise. Prior to joining the INI faculty, Telang taught engineering at CMU's Institute for Software

Research, and she infuses her teaching methods with deep industry experience in software engineering and agile methods. Kuo spent years working in strategy and product development in the startup environment. Before CMU, she advised entrepreneurs in health technology and funded startups at Infineon's Silicon Valley Innovation Center.

In addition to the Practicum, Kuo teaches Mobile and Embedded Software Design, a course for students interested in entrepreneurship or wearables. It introduces key concepts in working with sensors and sensor data, user experience and interaction design.

Newly hired Professor of the Practice **Quinn Jacobson** is heading up the INI's new Technical Entrepreneurship Coaching Hub (TECH) initiative with Kuo to provide cutting-edge knowledge, skills and mentoring to entrepreneurial students. Previously, the pair co-founded Vibrado Technologies, a venture-backed startup that created the first truly smart apparel. In addition to his entrepreneurial experience, Jacobson adds to the faculty's expertise in secure distributed systems and domain-specific accelerators. He has led engineering efforts to advance products for companies such as Altera, Sun Microsystems and Nokia, garnering over 70 granted U.S. patents.

Proven Experience

Both in Pittsburgh, Associate Professor of the Practice **Joanne C. Peca** and Assistant Teaching Professor **Mohamed Farag** lend their extensive professional and educational experiences to the benefit of the classroom.

With deep experience in academia, Peca was recognized as the 2019 Pittsburgh Technology Council's Non-Profit CIO of the Year for her work at Pennsylvania State University Altoona prior to joining the INI. She teaches a variety of courses; in her course on cyber risk modeling, she presents a balanced approach to understanding risk that considers the technological, policy and human aspects of a secure organization.

Farag, who has been an information technology consultant for over a decade and serves as a reviewer of artificial intelligence topics for the IEEE Systems journal, introduces students to cloud infrastructure and DevOps in the Cloud Infrastructure and Services course. Before joining the INI as a full-time faculty member, Farag was a lecturer in the Department of Statistics and Data Science at CMU. "The student feedback about this course is all about its practicality," Farag said. "We conduct hands-on demos and labs during the lectures. The assignments focus on practical implementations. The students will have the opportunity to use GCP [Google Cloud Platform], AWS [Amazon Web Services] and [Microsoft] Azure throughout this course."



Innovation in Teaching

Hanan Hibshi '11, assistant teaching professor, has sought out innovative ways to teach cybersecurity and brought capture-the-flag activities into her courses. Hibshi was selected as one of CMU's Provost Inclusive Teaching Fellows 2021-2022 and makes strides to adopt new, evidence-based teaching practices. Her redesign of the Secure Coding course has increased enrollment for the course and attracted students from outside the INI. "The course is heavy on hands-on exercises that teach you to read manuals and documentation and debug code," she said. "Students share that experience with their classmates in a learning environment that fosters peer-learning, creativity, independent thinking and productive discussions. All of these activities are used to help you gain one of the hardest skills in software engineering: systems programming and debugging in C (and a little of Rust)."

Associate Teaching Professor **David Varodayan** represented the INI on the college committee for the Artificial Intelligence Engineering initiative and helped create the INI's newest program, the Master of Science in Artificial Intelligence Engineering - Information Security (MSAIE-IS). Varodayan designed the new program and teaches the AI Applications in Information Security course, in which he shows students how AI systems leverage data to detect and attribute threats. He also developed the course Introduction to Machine Learning with Adversaries in Mind, and he has taught introduction courses in computer systems and machine learning. Prior to the INI, he taught at Stanford University and the University of Illinois at Urbana-Champaign.

Guiding and Growing

Other CMU units continue to shape the INI student experience. Associate Teaching Professor at the Tepper School of Business **Dave Lamont**, who taught Fundamentals of Business and Management to many alumni, continues to teach the course to INI students at Tepper. Engineers at CMU's Software Engineering Institute teach a set of cybersecurity courses as adjunct instructors, including INI alumni **Matt Kaar**, who has taught Applied Information Assurance to a generation of engineers, and **Jarrett Booz**, who very recently began teaching Host Based Forensics. The INI continues to navigate the changing landscape of communication networks, but thanks to the strengths and commitments of these talented faculty members, the future is looking bright.

Ahead In Security

By Evan Lybrand

Artificial intelligence (AI) has become an increasingly significant part of modern life. With its rise in prominence, cybersecurity experts have found another tool for their arsenal. To best train the next generation, the INI has introduced a degree program with courses designed by INI faculty. The Master of Science in Artificial Intelligence Engineering – Information Security (MSAIE-IS) program launched as a part of a College of Engineering initiative, with its first cohort in the fall of 2023.

This college-wide initiative offers a strong foundation across varied fields of AI. From topics like pattern recognition, machine learning and robotics to language processing and more, students learn how to apply AI in an engineering context. The INI's MSAIE-IS program provides students with an in-depth exploration of AI and how to implement it in the information security field.

"AI creates new opportunities to sift through reams of security data and revolutionize how we do information security," said David Varodayan, INI associate teaching professor. "Conversely, the principles of information security are essential to making AI systems resilient and trustworthy. We have designed the MSAIE-IS program to provide both perspectives."

Introduction to Machine Learning with Adversaries in Mind, a course developed by Varodayan, gives students hands-on experience with machine learning. Another course taught by Varodayan, AI Application in Information Security, delves into the realm of AI to show students how to utilize it to detect threats, train AI and protect AI against attacks.

Students will combine the state-of-the-art techniques at the heart of the INI's information security curriculum with courses that provide a strong foundation in AI.

Mohamed Farag, INI assistant teaching professor, co-teaches Systems and Toolchains for AI Engineers, a course exploring the various AI frameworks routinely used in academia and throughout the industry. Students come from diverse backgrounds and different departments to learn how this new tool is transforming the future of their work.

"Joining the Masters of Artificial Intelligence Engineering initiative at Carnegie Mellon University is not just an educational journey," Farag said.

"It is a gateway to being at the forefront of technological innovation."

Right now, students are able to take Farag's course, Generative AI, while the technology is currently becoming widespread around the world. CMU has stayed one step ahead of change by offering students relevant preparation.

Another course Farag teaches is AI in Business Modeling, where the students explore two main themes: the innovation in using AI to build and scale businesses and the adoption of AI to an existing enterprise body with legacy processes.

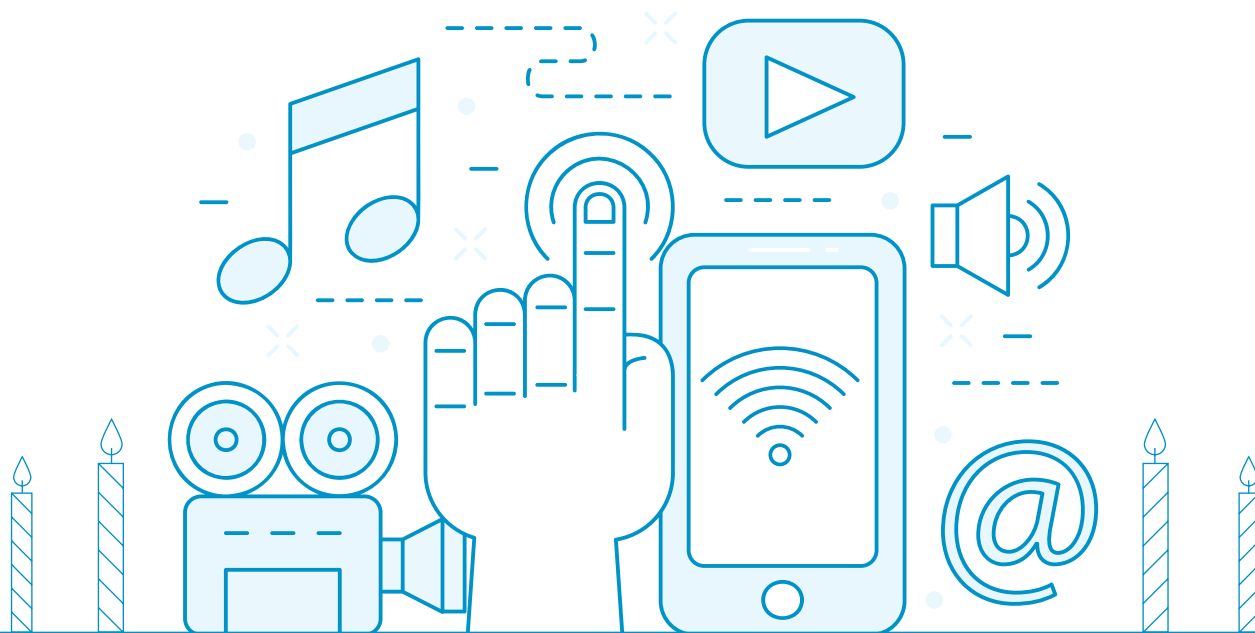
Although MSAIE-IS is a new program, past students embraced the in-depth knowledge and flexibility available with an INI degree to adapt their coursework to focus on AI and become early professionals in the field.

Sarthak Munshi '21, a Master of Science in Information Technology – Information Security graduate, now works on the AI security team at Amazon Web Services. "The AI courses at CMU were nothing short of transformative," he said. "The practical orientation and foundational approach set them apart. This intensive training became a notable differentiator in my career trajectory."

Sai Prathik '20, another INI alumnus, was encouraged to further his understanding of AI through his choice of electives. "The ability to explore AI and AI-related courses as part of my electives gave me formal incentive to learn about the domain, something I knew I would need as part of the company I had decided to join," he said.

CMU has always been at the forefront of technological innovation, from developing the first AI computer program Logic Theorist in 1956 to advancing Wi-Fi in the 1990s. With the rise of AI, CMU and the INI are leading the charge to address the challenges of this new technology.

"In 2024, we're already witnessing generative AI used to impersonate prominent public figures, from politicians to business leaders," Varodayan said. "The potential harm of this to enable the spread of misinformation is immense and we're still building the infrastructure to defend against it. The promise of the MSAIE-IS program is to prepare our graduates to build the AI tools that anticipate and mitigate these kinds of emerging threats."



Happy 25th Birthday, Wi-Fi

By Ann Lyon Ritchie

**“CMU's Wireless
Andrew was
the precursor
to what we now
know as Wi-Fi.”**

Just two years after the first wireless area network protocol — called IEEE 802.11 — was adopted in 1997, CMU became the first university to offer campus-wide, high-speed wireless internet access.

Alex Hills vividly remembers how CMU students went wireless long before their counterparts at other universities.

"CMU's Wireless Andrew was the precursor to what we now know as Wi-Fi," said Hills, a distinguished service professor of engineering and public policy and the INI's first director.

Supported by a \$500,000 grant from the National Science Foundation for wireless research in the early 1990s, and as principal investigator, Hills launched the Wireless Andrew initiative, with the help of then-INI director Ben Bennington and Computing Services' Charles Bartel.

In its earliest days, CMU's first wireless network covered a portion of Wean Hall — for wireless researchers only. It was password protected so as not to disrupt the research.

"CMU students are smart and pretty soon they hacked their way on to the network," Hills said. "It didn't take long before we had more students than researchers using it. That was my first hint of the demand for an anytime, anywhere internet."



As part of his wireless research, Alex Hills pushed a computer on a cart to take campus measurements. This was the Rollabout tool he had developed with the assistance of INI students to help others design their own wireless networks. It later became a commercial product called Site Scout.

INI students participated in Wireless Andrew research and helped Computing Services implement plans and conduct testing. The students later helped Hills develop a measurement tool to help others design their own wireless networks. It eventually became a commercial product called Site Scout.

“CMU students are smart and pretty soon they hacked their way on to the network... That was my first hint of the demand for an anytime, anywhere internet.”

Hands-on learning was as integral to CMU programs then as it is today. Recently, a student team in the INI's bicoastal graduate programs prototyped a wireless network-based solution for a Practicum project, sponsored by Honda Development and Manufacturing of America.

“The Honda project is exploring how idle, connected devices could share their compute resources using peer-to-peer communication,” said Cynthia Kuo, an INI associate professor of the practice. “A blockchain network would serve as a distributed ledger to maintain transactions.”

Kuo coordinates industry-sponsored Practicum projects and connects them to students, such as Yukun Li '22, a recent graduate from the Master of Science in Information Technology – Mobile and Internet of Things Engineering program. “This is very exciting because we can put what we learned about peer-to-peer networks, blockchain and distributed systems in a traditional classroom setting into action with real impact,” Li said.

“What is more unique about the Practicum is that this exploratory project has us in charge of system design and tool selection while communicating with our clients to meet their needs. This is an incredible way of learning how real-world tech teams function and make decisions — through experience and action.”

Wireless research has thrived at CMU for decades. As Wi-Fi marks 25 years, its applications touch every aspect of modern life, from cars to phone apps.

Hills, who chronicled the Wireless Andrew initiative in the book *Wi-Fi and the Bad Boys of Radio*, is now working on low-Earth orbit satellite technology, which promises to provide broadband service to people living in unserved areas anywhere in the world.

“At CMU, we solve problems,” Hills said. “We take an interdisciplinary approach, create innovative work and apply hands-on experience.”



Alex Hills with Dena Haritos Tsamitis, current INI director, and Marvin Sirbu, INI founder, at the INI's 15th anniversary celebration.



A Groundbreaking Information Security Program Marks 20 Years

By Ann Lyon Ritchie

A world without cybersecurity is unimaginable. The Master of Science in Information Security (MSIS) program turned 20 years old in 2023. As the first program of its kind in the nation, it came at a time of need.

In 2001, CMU was among the first educational institutions to be designated a National Center of Academic Excellence in Information Assurance Education by the National Security Agency. Through this designation, CMU became an early university partner supporting the U.S. National Science Foundation's CyberCorps Scholarship for Service (SFS), a federal program that prepares students for careers that help to defend the nation's information infrastructure.

Since 2001, the university has received approximately \$25.8 million through the SFS program and graduated more than 250 SFS students who have gone on to work for government organizations. Dena Haritos Tsamitis, INI director and the Barbara Lazarus Professor of Information Networking, is the principal investigator of the SFS program at CMU.

"A convergence of interests from industry, government and academia came together at this time that put cybersecurity in the spotlight," Haritos Tsamitis said. "The INI was positioned to lead cyber workforce development, having been preparing engineers in this realm along with interdisciplinary strengths in business and policy since 1989."

On September 11, 2001, the terrorist attacks on U.S. soil gave rise to a national imperative to secure and protect the nation at all levels — and on all fronts. Through an unprecedented effort, the federal government formed collaborations among various departments and agencies, acting quickly to create the Office of Homeland Security in 11 days and appoint then-Pennsylvania Governor Tom Ridge to be the first director. The U.S. Department of Homeland Security would be formally established in 2002.

The Pennsylvania connection to Secretary Ridge created synergy between the thought leadership at the university and the federal government. CMU fueled growth in security-focused initiatives at the INI and the Software Engineering Institute, among others, and created CMU CyLab, the university's privacy and security institute.

Although it was a time of shock and disruption in the U.S., it was also a time of courage and invention. In this climate, the INI designed a unique, interdisciplinary program in information security, technology and management that continues today as the second largest program at the INI, after its flagship degree in information networking. The Master of Science in Information Security, Technology and Management (MSISTM) was established in 2003, later changing its name to MSIS, and marked its 20th anniversary last fall.

"The MSISTM program gave us a wider range of courses than I would have gotten with a traditional electrical engineering or computer science master's program by including policy

and business classes which have contributed to my ability to expand my job roles beyond just security," said Elizabeth Schweinsberg '05, a member of the first class.

Schweinsberg, an SFS alumna, is Senior Technical Advisor to the chief information security officer at the Centers for Medicare and Medicaid Services.

"As a new program, there was the flexibility for us to do some experimentation with our studies, and a group of us were able to create an independent study together to help us get even more out of the program," Schweinsberg said. "In future years, some of the topics we worked on have become regular class offerings."

Pradeep K. Khosla, former dean of the College of Engineering, sought to build upon the INI's strong base in information networking to bring a focus on cybersecurity. Khosla directed the INI from 2000 to 2004 while also leading the department of electrical and computer engineering and CyLab.

Khosla commanded the foresight to recruit emerging leaders in information security to CMU faculty, including Adrian Perrig, Michael Reiter and Dawn Song. Haritos Tsamitis, then-INI associate director, succeeded Khosla as the director in 2004 and expanded the INI's global presence at campuses in Greece, Japan, Portugal and Silicon Valley.

MSIS graduates are in high demand, whether they decide to pursue positions in government, industry or academia. Some have attained dream jobs at competitive employers such as Goldman Sachs, Google and the National Security Agency. Over the past twenty years, hundreds of graduates have earned the MSIS and moved into technical and influential positions around the world.

Mike Doyle and Dena Haritos Tsamitis (left) celebrate at the CyLab anniversary gala in 2023. Pradeep K. Khosa (center) and Jared L. Cohon (right) speak at the CyLab kickoff event in 2003.



The INI Celebrates CyLab's 20th Anniversary

By Ann Lyon Ritchie

Great beginnings — from new apps to new startups — happen within the walls of the INI at 4616 Henry Street. Among them is Carnegie Mellon University CyLab, the university's privacy and security institute, which was first located in the INI Building in 2003. Last October, CyLab hosted a 20-Year Celebration Gala at the Heinz History Center, marking two decades of innovative research. It is home to more than 30 corporate and government partners and continues to drive innovation, collaboration and leadership in cybersecurity.

Former U.S. Congressman Mike Doyle gave remarks at the gala and credited the university for playing a vital role in Pittsburgh's transformation from a "one-horse town" centered around the steel industry to a diverse economy with strengths areas such as information technology, robotics, biomedical engineering and more. Doyle strongly advocated for CyLab in its early years to receive federal funding.

"The return on investment has been 100-fold," Doyle said.

Many contributors to CyLab's success attended the festivities honoring its past and future. Provost Jim Garrett spoke at the gala, thanking Pradeep K. Khosla, CyLab's founding director, for spearheading the visionary endeavor and Dena Haritos Tsamitis and Michael Reiter for their early leadership. Haritos Tsamitis was the founding director of education, training and outreach, and Reiter was the founding technical director.

"From the start, CyLab and the INI were counterparts in research and education, respectively," Haritos Tsamitis said. "We strengthened, built up, developed and implemented initiatives with a sense of urgency unlike any other university before because cybersecurity was such as critical issue in the early 2000s."

CMU has three distinct federal designations that include Cyber Defense Education (CAE-CDE), Research (CAE-R) and Cyber Operations (CAE-Cyber Ops). Through these designations, CMU participates in the National Science Foundation CyberCorps Scholarship for Service program and the Department of Defense Cybersecurity Scholarship Program.

"The educational initiatives at CyLab directly address the pressing need for talent in the workforce," Haritos Tsamitis said.

In 2003, the INI launched the nation's first master's program in information security, the MSIS. In 2005, CyLab launched MySecureCyberspace, an initiative established by Haritos Tsamitis to raise cyberawareness in internet users of all ages. It reached over one million people in 167 countries through a portal, game and curriculum, including more than 48,000 users of the Carnegie Cyber Academy and game.

Students from the INI and across CMU participate in picoCTF, a CyLab initiative created in 2013 that teaches concepts to high school students through puzzle-like challenges. A problem development team, led by faculty advisor and INI alumna Hanan Hibshi, participates in designing challenges that mimic real-life security problems and teaching core concepts in the major domains of cybersecurity, including general skills, cryptography, web exploitation and forensics.

CyLab grew from an idea amongst a few CMU faculty members into a worldwide leader in providing expertise on security and privacy issues. "Looking back, I don't think [CyLab] could have been created at any other place except CMU," said Khosla. "I also think that the combination of actors was perfect, and it was the perfect time to do this."

Deboshree Dutta

Criya Harnesses AI for Solopreneurs

By Ann Lyon Ritchie

Criya Founder and CEO Deboshree Dutta '09 wants every professional to have a powerful personal brand that lands them million-dollar opportunities, built with artificial intelligence (AI). Smart and resourceful, Dutta developed Criya, pronounced cree-ya, an AI-enabled technology platform that generates AI-powered personal brand websites in 20 seconds. Two years later, she left her day job to run her Y Combinator-backed company full-time and on a global scale. An engineer and product manager with past roles at PayPal, Hitachi, Cisco, Nokia and Microsoft, Dutta is a sought-after speaker on leadership and product development and leads the Bay Area Chapter of Women in Product. She is a member of the INI's Technical Entrepreneur Coaching Hub (TECH) advisory board.

An interview with Deboshree Dutta, 9/11/2023. Edited for clarity.



Q Where did the idea for Criya come from?

A lot of opportunities were coming my way, in terms of people coming to me for advice, for coaching and so on. I knew there had to be a way to productize this, but it had not been done well yet. So, I started building — literally coding — the first version of Criya myself back when I was at PayPal.

I didn't have fancy mockups, a launch strategy, none of that! Really, I just built an early version of the product myself in about a month. Then I reached out to people on my Instagram and LinkedIn. I would just say, 'Hey, look, I built this idea. I want people to give me feedback. I'll buy coffee!' I would literally send them a \$5 Starbucks gift card, and then they booked a 20-minute Zoom call with me.

So, that's really how it started. I gained feedback on the product. I started iterating over it. Long story short: we had 100 users in 100 days.

When people started running their businesses on the platform, such as booking their services with their clients and running their revenue, that's when I knew I was running something a lot more than a side project.

Q Is Criya still focused on women?

It used to be, but it has evolved. At Criya, we build reputations. We help professionals land those million-dollar opportunities, with a powerful personal brand.

In a highly competitive job market, my vision is to enable professionals to build their personal brands in one-click, with AI. You can simply enter your LinkedIn profile, and get a free, stunning, AI generated website in 20 seconds! Hiring managers and decision makers are going to Google you, and we want you to make a stellar first impression in seconds. Not only will you have a fantastic online showcase of your experience, publications and speaking engagements, you also will have an AI-generated business card to help you easily network and build your contacts — particularly handy during conferences, career fairs and networking events.

Q Tell us about your transition from the tech sector to entrepreneurship.

In my early days after CMU, entrepreneurship was not even something I thought about. As an immigrant, it's such a far-off dream that seems too hard. But, over time, as you're surrounded by smart people doing cool things, I mean, the energy is coming to you. And it's up to you whether you want to take it to the next level or not.

Q How has the INI influenced your career?

It's crazy — I will not joke — the alumni power that the INI has! When I quit my day job, I thought I was alone ... I went back to my INI network. Believe it or not, from my own batch, Ankita Sharma '09 is already an Y Combinator-backed entrepreneur [of Global Belly] and she'd already been doing it for five years. Just reaching out and contacting her and talking with her gave me so much confidence ... Karthik Suresh '08 was another INI alum who helped me. He's on his second startup [Ignition].

"When you're just going about your day job, there is no influence for entrepreneurship because you're focused on your day-to-day life. Just going back to my INI network really energized me and gave me the support I needed."



Q Which CMU courses were most memorable?

It has been a few years now! I liked the way the INI was designed because in my current job what I learned at CMU actually holds a lot of value. Even though, during the years immediately after CMU, I had honed myself into being an engineer. That's all I did. When I was a product manager, that was all I did.

At the INI, I took courses on, obviously, coding, and different aspects, such as operating systems, but I also took courses on public speaking, I also took courses on business development, economics and so on. Today, all of it matters. When you're just at a day job, you exercise one faculty of your brain, but what the INI gave me was extremely holistic. So, I felt it was designed for someone who wants to pursue a path like mine.

Q What new technologies are catching your attention today?

The use of generative AI. That's what we're using. Personal branding has been a challenge for most individuals: job seekers need a way to easily stand out, or founders need a way to communicate their authority and reputation in seconds. But no one has the time to build a traditional website, let alone make it attractive and maintain it, but this is now a reachable dream with generative AI. It's what's been fascinating me for some time now. We're finally able to build models that can empower the entire world to tell their unique story, visually.

HENRY HOWLAND

Among the Stars at SpaceX

By Ann Lyon Ritchie



Henry Howland '22 landed a dream job as a security analyst at SpaceX. Working for the aerospace company had been his goal all along. He had engineered it to happen, starting with enrolling in the INI's Master of Science in Information Security (MSIS) program.

"I came to Carnegie Mellon with the purpose to get the kind of background I would need to be able to do intense cybersecurity on space systems," Howland said. "That's the streak that carried through most of my work at the INI. I thought I really needed to codify what I'm trying to do here."

"Henry's story illustrates what it means to be a true engineer at heart," said Dena Haritos Tsamitis, director of the INI and Barbara Lazarus Professor of Information Networking. "He reverse-engineered his career, starting first with where he wanted his graduate school journey to end: the job listings on the SpaceX website."

"From there, I systematically tried to check off all the boxes that are there on that job description," Howland said. "Carnegie Mellon provided me with a really in-depth fundamental understanding of networking protocols that make up how this side of the world operates, which is something not a lot of people understand."

He selected courses to cover the systems side of cybersecurity, including the topics of embedded systems, software systems, and reverse engineering, as well as the advanced Linux programming used in satellites.

"The threading lab in my embedded systems course was a great project," Howland explained. "It answered a lot of questions about how operating systems work. It taught me how exactly a syscall works and scheduling algorithms to a certain extent, as well as how a mutex in a thread works under the hood."

In his courses, Howland learned about reading an assembly, using a debugger in multiple courses and finding vulnerabilities in code.

"It was very clear to me early on that Henry had a plan for his career," said Maverick Woo, a systems scientist at CMU CyLab and Howland's independent study advisor. "In one of our early meetings in Fall 2021, he already articulated his desire to go work for SpaceX after graduation. I was very impressed by how enterprising he was."

For his independent study, Howland served as the lead for a student team working with the 2022 MITRE Embedded Capture-the-Flag (eCTF) competition.

"Essentially, MITRE released (i) a technical specification containing both functional requirements and security requirements and (ii) a demo system to help seed the development effort by the participating teams," Woo explained via email. "Then, our students extended the demo system into a full system that aims to completely meet the provided specification."

Capture-the-flag (CTF) competitions interested Howland and allowed him to practice new skills. He also interned at Raytheon in vulnerability research.

"I had used Hack the Box [cybersecurity training program] to better understand penetration testing, but [prior to graduate school] I hadn't been doing anything low level, such as binary exploitation," he said. "The deep systems background that CMU gives you prepares you for it. Now that's my favorite category."

Howland attended DEF CON in 2021 and 2022, where he participated in events such as in the Hack-a-Sat Aerospace PiSat Challenge, sponsored by Aerospace Corporation, and attended the 2022 StarLink talk covering hardware hacking. Attendees could see a proof-of-concept hacking demonstration at the Starlink terminal with custom-made hardware.

"At DEF CON, you get to be very hands-on with technology," Howland said. "I definitely got a lot more out of DEF CON in 2022 just because of all of the coursework and extracurricular activities that CMU made available to me."

By the time Howland graduated in December 2022, he had his job offer. He had transitioned from graduate school to his dream job in 15 months. A cross-country move was his final obstacle. Over the course of one week, he traveled from Pittsburgh to settle into a new apartment in Los Angeles. He began his position at SpaceX in January 2023. Mission accomplished.

Left: Dena Haritos Tsamitis, Rohyt Belani and Sari Smith. Center: James Garrett with Hao-Wei Chen. Right: Dena Haritos Tsamitis with Hooman Radfar and his father.



Hao-Wei Chen, Rohyt Belani and Hooman Radfar Are Tartans on the Rise

By Reenie Kuhlman

The university has distinguished three INI alumni by naming them to Tartans on the Rise. The INI honorees are Hao-Wei Chen '13 for 2024 and Rohyt Belani '02 and Hooman Radfar '04 for 2023.

Tartans on the Rise celebrates recent alumni who are making an impact in their organizations and in their communities across the nation and around the world through leadership, innovation and career achievements.

Chen first joined Amazon in 2014 and is now the director of information security for Audible, the company's audiobook division. He has helped steer information security initiatives in several lead roles, including as head of Amazon's vulnerability research and product security, head of proactive security and subsidiary security for Amazon Payments and the investigations lead for internal threat reduction at Amazon Security. He also gives back as a volunteer to non-profit organizations such as the INI Alumni Leadership Council, the NEX Foundation and the Taiwan International Foundation.

Belani is the chairman and chief executive officer of COFENSE. He was recently a board member at Terbium Labs, which was acquired by Deloitte. Belani and co-founder Aaron Higbee launched PhishMe in 2008, focused on arming employees with training and tools to avoid falling victim to hackers and scammers. PhishMe expanded its product portfolio to provide a more holistic approach to workplace cybersecurity. In 2018, PhishMe was bought by private equity giant BlackRock for \$400 million and became COFENSE. Belani stayed on as CEO of the company.

Radfar is the chief executive officer of Collective, an organization he co-founded to support entrepreneurs. He is a venture partner at Expa and the founder of 10e9. He is also the co-founder of AddThis, a marketing automation platform for online publishers and advertisers that was acquired by Oracle for \$200 million. AddThis evolved from the startup ClearSpring Technologies that Radfar started with classmate Austin Fath '04 while the pair was studying at the INI.

"They are phenomenal Tartans and are great examples of the heights our alumni can reach," said Dena Haritos Tsamitis, director of the INI.

"I am very proud to see them be recognized by the university for all that they have accomplished so far."

CMU Alumni Award Honoree



Devika Yeragudipati Devarakond

By Evan Lybrand

The CMU Alumni Awards are a prestigious honor presented to alumni who have made great strides in their fields and majorly impacted the CMU community. Devika Yeragudipati Devarakond '12 was named 2023 Recent Alumni Service Award honoree.

Yeragudipati Devarakond, a Master of Science in Information Security (MSIS) graduate, has been a consistent presence at the INI since her graduation, participating in a number of student-focused events, in person and virtually. "She brings a boundless energy to all she does," said Dena Haritos Tsamitis, the Barbara Lazarus Professor of Information Networking and director of the INI. "Her first-hand experience and insight are something that can't be replicated by our faculty or staff. And her willingness to answer questions and participate in admissions events is invaluable. The testimonials she has shared of her CMU experience and her consistent engagement has made an irreplaceable impression on INI students."

Her enthusiasm is evident in the support and advice she regularly shares with students at the INI and throughout CMU at alumni panels and the INI's Academic and Professional Development classes.

Always thoughtful, Yeragudipati Devarakond offers comments during discussions, such as the "What is Diversity? Being a Change Agent in Tech" panel, that are always heartfelt, considered and helpful for those in attendance. Her career advice is greatly appreciated by students. She is also a fixture in the INI's virtual alumni events.

This level of engagement is truly inspiring; however, she doesn't stop there. Yeragudipati Devarakond has been voted in as the INI Alumni Leadership Council (ALC) Chair for 2023 to 2025. INI ALC was founded in 2009 to help the alumni community and help to shape the future of the INI. She, once again, demonstrates an inspiring level of dedication to enacting change at the INI. She brings with her a passion to help others and a true collaborative spirit that welcomes all ideas from members of the ALC.

**"She brings a boundless energy to all she does,"
Haritos Tsamitis said.**

Outside of participating in INI events, Yeragudipati Devarakond also dedicates her time to mentoring students. She is one of the most active INI alumni mentors and has given multiple individual mentorship sessions to students throughout CMU. She is an ever-present support throughout students' time at CMU and the INI.

Yeragudipati Devarakond has been a pillar in the INI community. Whether it's through her engagement in the alumni community or her willingness to share her knowledge with students, she has demonstrated her passion and love for the INI. The INI is thankful for all she has done and excited to see what she will accomplish next.



SFS Hall of Fame Recipient: Samuel Edoho-Eket

By Ann Lyon Ritchie

Samuel Edoho-Eket '04, a graduate of the Master of Science in Information Networking program (MSIN), was selected to be the distinguished 2024 Scholarship for Service (SFS) Hall of Fame honoree by the U.S. Cybersecurity and Infrastructure Security Agency. The national program inducts only one outstanding professional for the SFS Hall of Fame each year.

The announcement took place at an induction ceremony at the SFS Job Fair in Washington, D.C., on January 8, 2024. INI Director Dena Haritos Tsamitis, who is the principal investigator of the SFS program at Carnegie Mellon University (CMU), presented Edoho-Eket with the honor.

"Beyond the workplace, Sammy goes the extra mile to be a supporter and a mentor," Haritos Tsamitis said. "He is not only an inspiration to others in the field, but also to future generations. When the SFS program lifted up Sammy and helped him achieve his career goals, he exceeded everyone's expectations by 'paying it forward' to others. He embodies what it means what it means to live a life of service in everything that he does. His commitment to others is remarkable and so deserving of this recognition in the SFS Hall of Fame. After hearing him speak at the ceremony, I was compelled to invite him, and he agreed, to be keynote speaker at the INI Diploma Ceremony."

Edoho-Eket is president and founder of PrismSix Technologies and a certified, leading cybersecurity, telecommunications and project management expert. After graduating from CMU, he worked for the Department of Defense (DoD), steadily increasing his responsibilities and leadership roles. He served as a DoD technical director for more than six years and a consulting systems engineering for several years before founding PrismSix in 2012. In total, he has dedicated more than two decades to supporting the government and commercial sectors.

His many significant career accomplishments include leading the establishment of large DoD Voice over Internet Protocol (VoIP) infrastructure environments.

This infrastructure today enabled the DoD to adopt newer technologies while phasing out legacy infrastructure. In addition to leading system deployment activities, his firm also conducts cybersecurity training and audits for commercial organizations. During the COVID-19 pandemic, he helped lead the establishment of a secure cloud-based voice gateway for the DoD alongside critical capacity increases required to handle Voice and Video over IP (VVVoIP) traffic supporting remote workers.

Edoho-Eket loved computers during his childhood in Nashville. With his middle school computer science teacher, he helped set up the school's computer lab and established with his teacher the "Sammy Award" at Meigs Magnet Middle School that has been awarded to a talented computer student since 1994.

CMU has participated in the National Science Foundation CyberCorps SFS program since 2001, graduating more than 250 scholars through approximately \$25.8 million in grants. The program gives students scholarship funds in exchange for service in a government agency for a period equivalent to the length of their scholarship, typically two years. As a result of the SFS program, federal employers are able to select from a highly qualified pool of student applicants for internships and permanent positions. The SFS program is funded by the NSF and co-sponsored by the Department of Homeland Security (DHS).

Iris Rover Insights from Harshvardhan Chunawala and Hunter Wodzinski

By Evan Lybrand

On January 8th, 2024, CMU's Iris Rover embarked on its journey from Cape Canaveral SLC-41, Florida. Iris Rover was housed within the Peregrine lunar lander — a creation of CMU spinout Astrobotic, aboard the United Launch Alliance's Vulcan Centaur rocket. Throughout the project's lifespan, students from all seven colleges of CMU, including the INI, engaged in an interdisciplinary collaboration to forge Iris, striving to mark it as the first lunar rover engineered by CMU students. INI alumni and integral Iris Rover team members, Harshvardhan Chunawala '23 and Hunter Wodzinski '22, along with their team, journeyed to Cape Canaveral, Florida, to witness the culmination of their dedication and dreams ascend into the skies. Harshvardhan and Hunter were also Lunar Rover Mission Operators and piloted the Iris Rover from the team's Mission Control in Florida.

Despite encountering a propulsion issue that prevented the Peregrine Lander and Iris Rover from completing their soft lunar landing on the moon, the mission provided an invaluable experience for all involved. Ultimately, after being active for 10 days in space, a propellant leak in the lander necessitated an early conclusion to the mission, leading to a controlled re-entry back to Earth. The Peregrine lander and Iris Rover successfully covered the distance to the moon before disintegrating in Earth's atmosphere during re-entry over the South Pacific Ocean on January 18 at 4:04 PM EST. Despite its challenges, the mission yielded significant data for science and humanity.



Leaders of the Iris Rover Mission traveled to Cape Canaveral, Florida, for the Peregrine Mission One launch in January 2024.



The mission's notable achievements encompassed several key milestones like successfully establishing two-way communication with the Iris Rover, including a message sent by the INI: "We heard there is no Wi-Fi on the Moon? INI invented it on Earth way back in 1989! Email ini@cmu.edu." The team activated and verified the functionality of various systems within the challenging cis-lunar region. These systems overcame obstacles such as the radiation of the Van Allen belt, extreme temperatures and the vacuum of space. The mission gathered valuable telemetry and scientific data from its sensors and achieved the milestone of turning the rover's wheels in space. These accomplishments underscored the mission's contribution to advancing our understanding of space travel and technological resilience in the face of adversity.

The data gathered and the insights gleaned from this mission will shape future space initiatives at CMU, providing invaluable perspectives on the operations of low-cost rovers in the harsh environment of space. The mission's success in demonstrating a proof-of-concept for small-scale lunar exploration has the potential to inspire smaller organizations and countries around the world. By showing what is possible, CMU's Iris Rover mission contributes to the democratization of space, making it more accessible and encouraging a broader participation in the exploration of our solar system with the INI continuing to contribute towards developing secure space systems.



Karthik Suresh's AI-Powered Startup Streamlines Go-to-Market Operations

By Evan Lybrand

The world of technical startups can be thrilling and challenging; for Karthik Suresh '08, it was a passion that kept calling. Suresh began his startup, Ignition, to bridge the gap between engineering a product and bringing it to market. After only two-and-a-half years, Ignition has raised \$8 million in funding from Altman Capital, Audacious Ventures and other venture capitalists.

Suresh came to the United States from India in 2006 to attend the INI's Master of Science in Information Networking (MSIN) program. Inspired by the unique, interdisciplinary nature of the INI's programs, he pursued courses at CMU's Tepper School of Business and Heinz College.

After graduation, Suresh went to Wall Street, where he worked in the finance sector for seven years. He then went to business school and eventually became the first employee at Craft.co, a supply chain resiliency startup. Suresh helped to grow Craft.co exponentially and then decided he "needed a vacation" from the startup world.

However, it wasn't long before Suresh felt the call to return. Working as a product manager in then-Facebook's Reality Labs, Suresh noticed the inefficiency of product launch planning. He was working on a new product launch when he became frustrated with its lack of organization.

"The launch plan was a spreadsheet with about 100 tabs," he remembers. "It was a nightmare to run the whole process."

From this frustration, Ignition was born. Suresh used the interdisciplinary foundation from his coursework at the INI and his professional experiences in the industry to create a successful business.

As a graduate of MSIN, the INI's flagship degree program, Suresh learned the fundamentals of information networking that underly all aspects of technology advancements.

"Information networking impacts the whole tech ecosystem; on every aspect of software engineering, from the application side, the server side and on AI infrastructure too," Suresh said.

"The INI also gave me an early exposure to non-technical courses," he added. "CMU is one of the top engineering schools in the country. However, when you're creating new businesses or a startup, that's just one part. Courses like accounting, finance and business modeling had a big impact on my outlook and the way I approach problems."

This exposure to courses outside of the core engineering curriculum gave Suresh the well-rounded skill set to develop his startup. Ignition is a platform that bridges the gap between product development and marketing. The tools offer the potential to revolutionize how products go to market.

"If you work with engineering teams to build a product, you need to know how to talk about that product with your customers," Suresh said. "If you cannot message your product, if you don't know how to position your product, how are you going to build a good product?"

In a single platform, Ignition users can conduct audience research, build a product, collaborate on roadmaps as a team and launch a product, all with the help of artificial intelligence (AI). Ignition uses AI to help generate text for copywriting and aggregate customer insights. Currently, Ignition is introducing a chatbot called ChatGTM to help its users navigate product roadmaps.

"AI is a big part of our platform because nobody wants another project management tool or task management tool anymore," Suresh shared. "People want to automate the work."

To Suresh, AI is a powerful tool that shouldn't be ignored. "You can see the real power of [AI]. Whether tech, pharma or entertainment, AI is impacting every industry and that acceleration is only going to get faster."

Alumni Leadership Council News

By Sari Smith

The INI Alumni Leadership Council is dedicated to strengthening the INI alumni community and helping to achieve strategic goals. Members lend support and foster engagement throughout the year.

A Look at the Numbers in 2023

20 Alumni on the Alumni Leadership Council

The ALC is made up of a diverse group of alumni from various cohorts, programs and locations. They offer their insights and expertise on topics that impact INI's mission to serve our students and stay engaged with our alumni. In addition to 18 alumni members, two student members were appointed to serve as well.

471 Active Members of the INI Group on CMUniverse

CMUniverse is an alumni and student mentorship platform that has been growing since its launch in Fall 2021. We now have 471 active members and 123 of these have also joined the new INI mentoring platform on the site that matches students to alumni. CMUniverse makes it easy for our alumni to make an impact by offering their advice and expertise in one simple platform.

16 Alumni Panelists

ALC members and other alumni were panelists for four different alumni events for students over the academic year. Two of these events were for INI's Academic and Professional Development course, which all new students take. We also had two alumni panels for WINI events in the Spring and Fall. Women@INI

hosted the "Self-reflection as Your Superpower" event in April, featuring alumni with the INI Director and ended the year with "Transitioning from Grad student to Workplace Performer."

10 Virtual Meet-Ups

More than 120 INI alumni joined us for our INI Alumni Virtual Reunion and virtual alumni meet-up series! Our topics featured our ALC chair, practicum, crypto insights, ChatGPT, smart city blockchain implementations, autonomous vehicle technology, self-sponsored and merit-based immigration, handling too many requests and globetrotting.

100% Tartan Proud

We proudly celebrated Devika Yeragudipati Devarakond '12 receiving the CMU Recent Alumni Service award and Sammy Edoho-Eket '04 being inducted into the SFS Hall of Fame, along with Rohyt Belani '02 and Hooman Radfar '04 being recognized as Tartans on the Rise. We raised a glass with 34 alumni, including two practicum sponsors, to honor the work at the Silicon Valley Practicum Showcase in December.

Look for events in a city near you! In 2023, alumni met up in Mountain View, Orlando and Seattle.

Meet Our Newest ALC Members!

Hugrun Hannesdottir '21

Wayne Tung '94

Adam Hunt,
student representative

Sahithi Maddula,
student representative

Continuing New Members:

Devika Yeragudipati Devarakond '12, chair

Hao-Wei Chen '13

Chris Dorros '12

Alfredo Freyre '94

Erye Hernandez '14

Servio Fernando Lima Reina '01

Yasmine Kandissounon '14

Dooyum Malu '14

Archie Agrawal '15

Yen-Ming Chen '99

Ben Draffin '17

Sin-Kuen Hawkins '90

Patty Huang '92

Xinfeng Le '14

To Outgoing Members:

Thank You!

Tyelisa Shields '10

Andrew Spangler '17

Sree Ratnasinghe '97

Jatin Shah '06

Madhur Shrimall '16



CMU Team Wins Seventh DEF CON Championship

By Ryan Noone

The winningest team in DEF CON's Capture-the-Flag (CTF) competition history, CMU's Plaid Parliament of Pwning (PPP), was back at it again, as the team defended its title, earning its seventh victory in the past eleven years. This year's team was joined by Erye Hernandez '14, Carolina Zarate '19, Jenish Rakholiya '20, Palash Oswal '23, Dillon Wu '23, Kevin Stephens '33, Luke Rindels '21.

PPP joined forces with the University of British Columbia's Maple Bacon and hackers from CMU alumni startup Theori.io (The Duck), playing under the name Maple Mallard Magistrates (MMM).

DEF CON's three-day flagship competition, widely considered the 'Olympics' of hacking, brought together some of the world's most talented cybersecurity professionals, researchers and students, as twelve of the world's top teams (who qualified from a field of 1,828 teams) attempted to break each other's systems, stealing virtual flags and accumulating points while simultaneously protecting their own.

As the number of cybersecurity attacks continues to increase worldwide, competitions like DEF CON's Capture-the-Flag provide the opportunity for leading cybersecurity engineers to measure up against one another, learning and developing new techniques as they work through various challenges.

Students, faculty and alumni once again demonstrated the CMU's prowess in cybersecurity, finishing in the top spot on the leaderboard at the end of days one and two, and holding on in the competition's final 24 hours to secure the victory. For the win, the team earned eight black badges, the most elite recognition in hacking.

"It's great to see the team grow from just having CMU alumni and current students to also include communities that PPP members have built after leaving CMU," said Hernandez, an INI alumna and member of the INI's Alumni Leadership Council. "Despite having an extended team, we have managed to maintain a cohesive and tight-knit group with diverse and complementary skills who are passionate about security."

PPP was first formed in 2009 and began competing at DEF CON in 2010. The team's previous wins came in 2013, 2014, 2016, 2017, 2019 and 2022, with second place finishes in 2015, 2018, 2020 and 2021. The team runs and competes in several cybersecurity competitions each year, and recently defended its title at the MITRE embedded Capture-the-Flag event (eCTF).

Members of PPP contribute to CMU's annual student-focused hacking competition, picoCTF, developing challenges of varying levels of complexity. picoCTF has long been the go-to CTF for middle and high school students looking to build and hone their cybersecurity skills, and in recent years has expanded to include an undergraduate leaderboard, as well as several country and continent-specific leaderboards.



Back row (L to R): Aditya Desai, Ethan Oh, Hanjie Wu, Anish Singhani, Eliana Cohen, Neha Gautam (screen), Henry Howland (screen), Ray Huang (screen), Nandan Desai (screen), Palash Oswal (screen). Front row (L to R): Carson Swoveland, Suma Thota, Ray Huang, Madeline Tasker-Fernandes, Harrison Leinweber

INI Students Defend CMU Hacking Team's Title at MITRE Cybersecurity Competition

By Ryan Noone

For the second year in a row, CMU's competitive hacking team, the Plaid Parliament of Pwning (PPP), has taken home the top prize at the MITRE Embedded Capture-the-Flag (eCTF) cybersecurity competition. The PPP team is made up of 14 students from across the university, more than half of which were INI students and alumni. INI Associate Teaching Professor Patrick Tague serves as co-advisor to the team along with CyLab Security and Privacy Institute Project Scientist Maverick Woo and Electrical and Computer Engineering (ECE) Professor Anthony Rowe.

"CTF competitions are more than just games," said Dena Haritos Tsamitis, director of the INI and Barbara Lazarus Professor in Information Networking. "The challenges help players enhance the essential skills that make them more valuable in the workplace. I am thrilled to see such a high level of participation from our INI community and wanted to congratulate the PPP team members, as well as the faculty advisors who continue to dedicate themselves to training the problem solvers of the future."

Over the course of three months, PPP and 79 other collegiate-level teams worked to design and implement a key fob system for a car door lock to prevent unauthorized entry or attacks such as replays and key fob cloning.

"The challenges help players enhance the essential skills that make them more valuable in the workplace. I am thrilled to see such a high level of participation from our INI community and wanted to congratulate the PPP team members, as well as the faculty advisors who continue to dedicate themselves to training the problem solvers of the future."

PPP's win was definitive, scoring over 10,000 points more than the second-place finisher. Woo credits the victory to the group's composition and work ethic

"Our team has strong expertise in both embedded development and attacks," said Woo. "Our students worked hard and were committed, and they were able to organize themselves to take advantage of the large team size."

The annual competition saw teams from the United States and around the world, with a record-breaking 546 student participants. Notably, PPP finished ahead of hackers from the University of California, Santa Cruz (2nd place) and the University of Illinois Urbana-Champaign (3rd place).

The competition had two phases — design and attack. Each phase offered opportunities to score points by obtaining flags and submitting them to the live eCTF scoreboard.

During the design phase, hackers acted as a team of engineers at a car manufacturer, designing and building the embedded software that would be installed on the next line of cars and key fobs sold to customers. In the attack phase, teams had the opportunity to analyze other groups' designs and identify security flaws as they aimed to unlock and start the vehicles without authorization from the vehicle owners.

eCTF competitions are unique from other CTF competitions because they focus on embedded systems security. Students not only defend against traditional cybersecurity attack vectors but also need to consider hardware-based attacks such as side-channel attacks, fault injection attacks and hardware modification attacks.



Members of PPP's winning team include:

Eliana Cohen

ECE '23

Aditya Desai

INI Master's Student

Nandan Desai

INI Master's Student

Neha Gautam

INI '23

Henry Howland

INI '22

Ray Huang

ECE Student

Harrison Leinweber (Lead)

INI '23

Ethan Oh

ECE Student

Palash Oswal

INI '23

Anish Singhani

ECE Student

Carson Swoveland

ECE Student

Madeline Tasker-Fernandes

INI Master's Student

Suma Thota

INI '23

Hanjie Wu

INI '23

INI Director Dena Haritos Tsamitis Named to Pittsburgh Smart 50

By Ann Lyon Ritchie and Evan Lybrand

On November 23, 2023, the most innovative leaders and entrepreneurs from 50 of the region's most brilliant organizations gathered at The Westin Pittsburgh for induction into the Smart Business Pittsburgh Smart 50 Awards Class of 2023.

The Information Networking Institute (INI) Director and Barbara Lazarus Professor in Information Networking Dena Haritos Tsamitis is among the honorees and joins an esteemed list of presidents and CEOs. Haritos Tsamitis is unique among her peers as one of the few representatives from academia recognized with this award, which typically honors business leaders.

Haritos Tsamitis has a business-focused mentality that has shaped the INI since she began as director in 2004. Thanks to her leadership, the INI has grown impressively and prepared the next generation of information networking, security, mobile and IoT and AI engineering professionals from around the world.

INI alumni offer cutting-edge knowledge and skills while also applying business and policy insights. They are sought after by employers for their interdisciplinary strengths. Haritos Tsamitis strategically develops INI programs and curricula to stay ahead of innovation and prepare graduates to be successful engineers and leaders in the world's ever-changing landscape.

David Brumley, CEO of ForAllSecure and a Carnegie Mellon University (CMU) faculty member, described her as "a visionary leader" whose capabilities "demonstrate that running an academic department is analogous to operating a successful small business."

As director, Haritos Tsamitis has played a pivotal role on the global stage by building international relationships and partnerships to extend the university's reach. She was instrumental in launching the Athens Master of Science in Information Networking degree, CMU's first global program. Expanding the reach further, she has spearheaded efforts in support of diversity, equity and inclusion as a passionate supporter of women and underrepresented populations in engineering fields. She has led innovative programs as the founding director of education, outreach and training at Carnegie Mellon CyLab, the university's security and privacy research institute.

Her rigorous planning and resource allocation has ensured that the INI has remained financially secure while staying at the forefront of industry. She has applied her mind for marketing to strategies for attracting top talent to the student body, as well as to the faculty and staff. Since its inception, she has continued to steer the growth and development of the INI faculty into a flourishing team.

"It is an honor to receive this award and recognition for what we strive to do at the INI: to lead and advance the future of engineering through innovation, dedication and the inclusion of diverse perspectives," Haritos Tsamitis said.

Haritos Tsamitis has shaped the INI into a dynamic, responsive, self-sustaining academic force. The Pittsburgh Smart 50 Awards celebrate her impactful leadership.



College of Engineering Staff Awards

Nancy Doyle Honored with Continuous Excellence Award

By Evan Lybrand

It is an annual tradition for the College of Engineering to bring together employees in celebration of extraordinary dedication and hard work at the Staff Recognition Awards. Four staff members on the INI team were recognized at the awards celebration on January 18.

Staff were recognized for their length of service at the award ceremony. Asia Donegan, associate director of academic and student services, was recognized with a Years of Service award for her 10 years with the College of Engineering.

Three INI staff members were nominated for special awards. Nancy Doyle, manager of the director's office and administration, was nominated for the Continuous Excellence Award. Renny Hartono, administrative assistant, was nominated for the Rookie Award, and Sari Smith, senior director of strategic operations, for the Inspirational Leadership Award.

The room was packed as INI team members joined an eager crowd to support the nominees. As always, the celebration was a joyous gathering honoring the achievements of the College of Engineering staff. INI Director Dena Haritos Tsamitis was present to cheer on the nominees, and her pride shone bright when Doyle's name was called for the Continuous Excellence Award.

Haritos Tsamitis was instrumental in the nomination. Despite several nominations throughout her time at CMU, Doyle had yet to be selected. "As INI Director over the last 20 years, I've had the privilege and opportunity to build an amazing team of talented staff and faculty and Nancy is among my top hires," Haritos Tsamitis said. "It will be difficult to replace her presence on staff when she retires because Nancy has a unique combination of a love for her job, an incredible talent for organizing tasks and a deep knowledge of CMU."



Doyle has been an invaluable member of the INI team for 18 years. "Nancy is basically in charge of making sure that all 'trains run on time,'" said School of Computer Science Professor Nicolas Christin. "She is one of the rare people with whom everybody in INI worked at one point or another. I started at the INI before Nancy joined and could see firsthand how much value she brought to the organization; it is simply staggering."

The Continuous Excellence Award recognizes those staff members who "take it to the next level." And it is no surprise that Doyle has done that time and time again. As the INI has strived to grow and develop our faculty, Doyle took charge by designing and managing a new process to recruit and hire new faculty. She has been integral in onboarding countless new team members and regularly trains the administrative team. And all of this is on top of her numerous daily tasks. Her positivity and interpersonal skills have made a lasting impact on the INI and cannot be understated.

During the ceremony, Doyle was presented the engraved award by William Sanders, the Dr. William D. and Nancy W. Strecker Dean and professor.

New Faculty Q&A

By Evan Lybrand

Q **What is your hometown and alma mater?**

My hometown is Cuenca, Ecuador. It is a small city south of the equator.

I have two universities that I consider my alma mater. Back home, I got my electronics engineering bachelor's degree at a local university named Universidad del Azuay. My other alma mater is the University of Pittsburgh where I got both my Master of Science in Telecommunications and my PhD in Information Sciences with a concentration in telecommunications and networking.

Q **What are some of your hobbies?**

In general, I love building things, especially toys. My favorite ones are Mecanos as you build them as traditional engineering pieces using screws, metal plates, nuts, etc. In fact, I have a small collection of Mecano vehicles in my office (besides my small collection of small toys).

Other than that, I have normal hobbies, I like to listen to music, watch TV and go out for dinner.

Q **What is your subject area and what drew you to it?**

My subject area is telecommunications policy. I was fascinated by policy early in my undergrad because it goes beyond the technical aspects of it. It includes regulation, enforcement, economics, human factors and politics. In addition, it covers so many new technologies that need to be regulated and I've always enjoyed learning about new telecom technologies.

Q **What is one piece of advice you would give your students?**

On the academic side of things, it would be to develop efficient time-management strategies. I do believe managing your time as efficiently as possible is key to success in grad school (and to avoid having major issues). But, in general, my advice would be to enjoy your experience at the INI beyond the classrooms. First, take advantage of all the events and activities that happen everywhere on campus. Second, make friends. Third, enjoy Pittsburgh!



Q **What is your favorite subject to teach?**

I do not have a particular subject that I consider my favorite to teach. In general, I enjoy teaching everything related to technology. In particular, I love to teach telecom and network classes as I find it fascinating how a series of small steps can lead to something as big as the Internet.

Q **What is the most rewarding part about being a professor?**

This is going to sound like a cliché, but being able to teach students something new. I always enjoy conversations with students at the end of the semester where they let me know that they learned multiple new things in my class.

Q **What drew you to the INI?**

The whole package! The top-notch students that we have, the amazing staff team that always wants to help you and the very talented faculty group.



Q What is your hometown and alma mater?

I was born in Wisconsin, but consider Sandpoint, Idaho, my hometown as that is where I went to elementary and middle school.

I did my undergrad at the University of California – Santa Cruz and my PhD at University of Wisconsin – Madison.

Q What are some of your hobbies?

I am an avid cyclist and hiker. I also read a lot of sci-fi and fantasy.

Q What is your subject area and what drew you to it?

My subject area is computer and system architecture. I love visualizing how computation and data move through a system and figuring out how to optimize it. Early in my career it was primarily CPU [central processing unit] architecture and memory hierarchies. Then I moved into embedded and IoT. Now it is artificial intelligence and neuromorphic computing. Over the years I have also focused more on entrepreneurship, as it presents a whole range of new interesting problems in optimization.

Q What is one piece of advice you would give your students?

Follow your passions and find things to work on that you enjoy, that keep you engaged, and where you are constantly learning. Life is too short to not love your work.

Q What is your favorite subject to teach?

I like broad topics like entrepreneurship, where no one has the answers but we can discuss the problems together.

Q What is the most rewarding part about being a professor?

Being able to learn alongside bright young minds. The tech industry is constantly evolving and there are always new things to learn. And what better place to learn than the environment of academia?

Q What drew you to the INI?

Any venture capitalist will tell you that the number one thing to look at is the team. I was drawn to INI by the people: the faculty, staff and students. The dedicated and innovative faculty and staff set the tone but that is then amplified by the stream of top caliber students moving through.

Alumni in the World

Inês Oliveira Publishes Her First Children's Book, *Calvin and the Sugar Apples*

By Evan Lybrand

Everyone's journey after graduation is unique and INI students are well equipped with skills and experience that can be applied anywhere. Inês Oliveira ('08, MSIN), a graduate of the INI's joint degree program with the University of Aveiro in Portugal, has drawn from her experience in a surprising way. After spending some time in the tech industry, Inês decided to write a children's book to impart some valuable life lessons about life and loss. With her first book about to be published, Inês took some time to share her journey and filled us in on how her time at CMU and the INI inspired her to pursue writing.

Q ***I wanted to take a moment to thank you for sharing your story with us.***

Thank you, Evan and the INI, for having me. I do miss Dena and the INI community.

Q ***Could you share with us what you're doing now?***

I currently work as a freelance writer in the tech industry. As I invest in my career as an author, I am dedicating more time to creative writing.

Q ***Where are you living right now?***

I live in Aveiro, a beautiful city on the Portuguese coastline south of Porto.

Q ***Could you share with us a little bit about your new book?***

Calvin And The Sugar Apples by The Collective Book Studio will be out by the end of August, but is currently available for pre-order. The book taps into important life lessons about friendship, grief and talking through feelings.

Calvin is a twenty-one-year-old chinchilla and has always been there for ten-year-old Amelia whenever she needed to talk about her problems — but he is no longer in his cage, and her parents say he's in a "better place." Everything feels wrong without Calvin. Who does Amelia talk to about her disappointments at school? Who does she talk to about missing Calvin? And just when Amelia thinks she's alone, a new student, Iris, arrives. Amelia learns that expressing oneself can happen in different ways, but it always starts with talking it out.

We've received wonderful feedback about the book. *Publishers Weekly's* recent review says it "brings Portugal's setting to life and portrays Amelia's grief with realism."

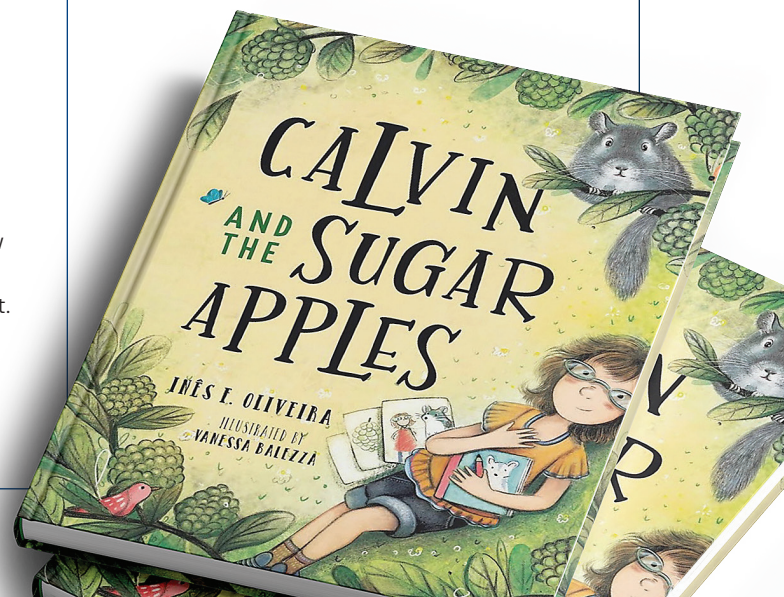
Vanessa Balleza, a Venezuelan author and illustrator of children's books, illustrated the book.

Calvin And The Sugar Apples is for children ages 7 to 10. But it's also for librarians, teachers, educators and parents. It's for everyone who enjoys reading various genres, but speaks to elementary age children looking for heartfelt stories with depth and a relatable voice, and stories about solid friendship and family themes that teach something about life.

Q ***What inspired the book?***

My inspiration was a real-life event. The chinchilla in the book is our chinchilla, Calvin. Calvin lived for 21 years, and despite his long life, we weren't expecting him to leave us. It made me think about how we take family for granted when no human or animal will live forever. Our children miss Calvin the most. But our son opened up after a few weeks, as he couldn't stop crying about losing his pet friend. It took time, and it took our help. We learned from the process that different children (and people) grieve differently for various reasons.

We expect our children to learn from us but we stay open-minded to learn from them too. We as parents have a lot to learn.



Q Did anything about your experience at the INI contribute to you wanting to write a book?

An episode at the INI that caused me to reactivate and recognize my love for writing was when I wrote a short essay and won the Silver scholarship for Grace Hopper Conference.

It took me a few more years to embrace writing as a career, but every recognition sets our way. It's kind of the same as raising a child. You don't work to change the mindset but plant the seeds for them to find their way on their terms. INI worked like that for me.

Q How did your CMU degree influence your career path?

I wouldn't say my CMU degree influenced my career, but my CMU course choices certainly did.

After graduating, I was sure I wanted to work in innovation management. CMU professor Erica Fuchs inspired me. I had to wait two years before accomplishing this goal. I finally started on a team to explore and apply innovation-related topics. We fueled innovation within a telecommunications company in Portugal. By doing so, I researched and learned about user-centered methodologies and design processes.

The work in the innovation field led to a nomination to lead on a Product Design and User Experience (UX) team. One of the skills the team needed to improve was UX writing capabilities. By creating a product persona, we wanted it to have a voice besides its image. It's an important part of the personality. Unfortunately, there was no education available in the Portuguese market for such skills. I decided to teach myself.

It was one of the triggers for my writing path. If for no other reason, CMU inspired me to embrace new fields, change my career, and add new skills. It challenged me to challenge myself.

Q What did you learn at CMU that you still apply today?

I learned a lot from my CMU experience. Besides the course work, I learned the power of community. I learned the importance of keeping strong links between universities and companies. And I learned how studying different fields and keeping an open mind adds to our skills. CMU gave me the resources to route my path.

Q How has your experience at CMU made a difference in your life?

How could my experience at CMU not make a difference in my life? You don't make it easy, but you sure make it memorable.

From everything I learned at CMU, I mostly learned about myself. I'm capable of overcoming any obstacle when I set my mind to it. I believe everybody can, and I try to pass this message along to my children. I love studying and learning, and CMU provided the opportunity to awaken that within myself after a couple of years in the work field. Finally, I am the only person to set my path and surround myself with the ones that add value and to whom I add value.



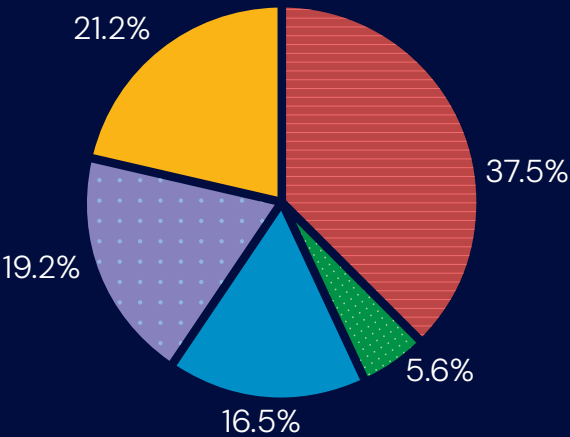
**An INI
onesie
for your little one!**

INI alumni, email us a baby picture and your current address and we'll mail you an INI onesie for your little one!

Send your pictures to ini-alumni@cmu.edu



INI Programs by the Numbers



MS35 Fall Starts

160

MS35 Spring Starts

24

- MSAIE-IS**
Masters in Artificial Intelligence Engineering-Information Security
- MSIN**
Masters in Information Networking
- MSIS**
Masters in Information Security
- MSIT-IS**
Masters in Information Technology-Information Security
- MSMITE**
Masters in Mobile and Internet of Things Engineering

Student Spotlights

By Evan Lybrand



Rohan Viswanathan

Joining the Team

Rohan Viswanathan, a first-year student in the Master of Science in Information Security program and a scholar in the Department of Defense Cyber Scholarship Program (CySP), has been drafted onto the U.S. Cyber Team for Season III. The U.S. Cyber Team selects the top cyber athletes to join and compete in international competitions. Team members are coached by professionals in the field and given intensive challenges to improve their skills.

"It's honestly been incredible," he said. "My other team members are very competent in everything in this realm. So, it is nice to see how people solve different problems and how they approach it."



Shreya Deepak

One Small Step

Shreya Deepak, a second-year student in the Master of Science in Information Networking program, has always wanted to work on projects that make an impact. Deepak was thrilled at the chance to work on the Moonranger project, a CMU initiative to design and build an autonomous vehicle that can search the moon for sources of frozen water. The Moonranger project brought students together to collaborate on the design and development of the automated bot. It was an opportunity for her to test the skills learned in INI courses in a real-world scenario. Despite the challenges, the experience was a rewarding one allowing her to look at systems through a new lens and think outside of the box.

"We all start somewhere, and working on Moonranger helped me hit the ground running in this journey," Deepak said. "I am excited to see the future and where this passion will take me."

William "Red" Whittaker, a research professor of robotics at CMU, shared the following testimony: "The body of her work, technical virtuosity, accomplishments and leadership were A+. I am unfamiliar with the standard that is common within her degree program, but the result well exceeds the standard of a one-semester project report regardless of the intensity and scope pursued in that short period."



Olivia Wu

An Eye for Entrepreneurship

Olivia Wu, a first-year student in the Master of Science in Information Technology - Information Security program, has always had a passion for innovation. In high school, she designed her first product, a unique yogurt wrapper. Next, while attending her undergraduate institute, she developed a degree-planning tool to help students with building their schedules. At CMU, she has continued to pursue her entrepreneurship passion and is the first INI student to be named a James R. Swartz Entrepreneurial Fellow.

Wu is working to combine the knowledge she is gaining in her INI course work with the leadership insight she is gaining in her fellowship. "I think it's a good balance because, sometimes, [going deeply] into those technical things, it's good to gain that [level of] exposure," she said. "In the fellowship, you switch your mind, switch your space into something that's different."



Jiin Jeong

Building a Community

Jiin Jeong, a second-year student in the Master of Science in Information Security program, has a passion for building a collaborative and inviting environment. Alongside her regular studies, Jiin is also a Scholarship for Service student and co-chair of Women@INI (WINI) student organization. "Managing different tasks in a fixed amount of time feels like a fun optimization problem," Jeong said. It was at the annual Grace Hopper Celebration of Women in Computing in 2018 where she first learned about the INI. From there it seemed like a perfect fit to join WINI. Being a part of WINI was a way to honor her personal computer science and cybersecurity journey.

"WINI is all about community — whether it is carving pumpkins for the first time, enjoying a Thanksgiving meal, or listening to an alumni panel," she said. "I love seeing students come together to engage in fun social activities, be inspired by stories and find a community at WINI events."



2023 INI Diploma Ceremony

By Evan Lybrand

On May 14, 2023, the INI held its annual diploma ceremony, a time-honored tradition that brings together graduates and their families from around the world to celebrate their hard-earned master's degrees. Friends, family and supporters gathered at Rodef Shalom to cheer on 185 of the 271 members of the record-breaking class of 2023.

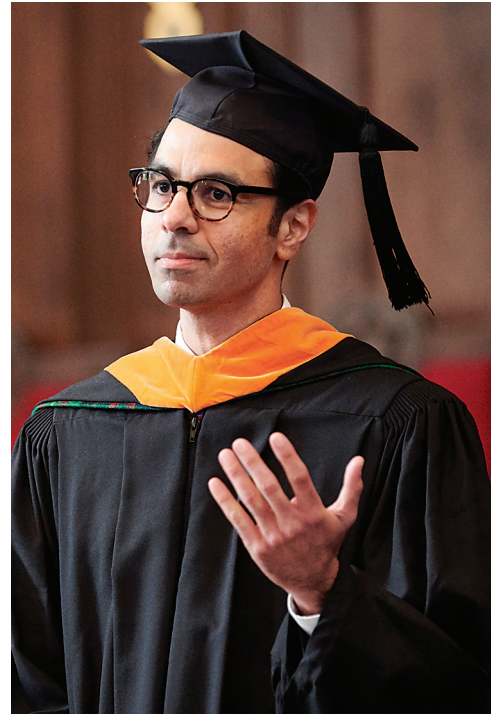
In her annual address to the graduates, INI Director and Barbara Lazarus Professor in Information Networking Dena Haritos Tsamitis referenced the dedication and hard work demonstrated by the students, who now join a community of over 2,700 INI alumni. Haritos Tsamitis also acknowledged the ever-changing global landscape: "You are entering into a different world than the one you encountered when you started the pursuit of your master's degree. The pandemic and its aftermath have left many industries struggling and the competition for positions fierce."

However, despite these challenges, Haritos Tsamitis encouraged the graduates. "You have persevered through difficult challenges, tackled complex problems and expanded your mindset, knowledge and expertise," she said. "These experiences have taught you to be steadfast, agile and adaptable. You have learned to be resilient, and this will serve you well in any career path you choose."

Haritos Tsamitis urged the graduates to remain adaptable in the rapidly changing job market: "I encourage you to keep your focus on the big picture. Embrace every opportunity, stay curious and never stop learning."

"Your INI journey does not end here" she said. "It is just beginning. I can't wait to feel the impact you have on the world." Haritos Tsamitis then introduced the commencement keynote speaker and INI alumnus Rohyt Belani '02, chairman and chief executive officer of the email security company COFENSE Inc., which serves nearly half of the Fortune 100 and nearly 400 Fortune 1000 companies.

Belani was named a 2023 honoree of CMU's Tartans on the Rise, a prestigious honor that recognizes recent alumni making an impact in their organizations and communities.



As he started his speech, Belani shared an insight with the graduates. "I do have some good news and some bad news," he said. "The good news is that you have no more tests. No more grades. You're done with that. The not-so-good news is that life is one heck of a long exam and there isn't an answer key."

He went on to share his experiences and challenges during his time at the INI and reminded the graduates about the many skills they've gained, "Let's take a moment to reflect on your experiences here," he said. "Academics aside, you know the real world is tough. But I'll tell you, you guys are tough too. You've been in this resiliency gym here, called Carnegie Mellon and the INI. You've been working out that tenacity muscle for a bit here. You've built confidence. And it goes without saying, you've amassed technical skills most people can only dream of having."

At the conclusion of his speech, Belani gave one last encouraging word about the future: "So, as you enter the next phase of your life, just make the most of this head start you have. Make Carnegie Mellon proud, make the INI proud, make your families proud, and I'd say most importantly, make yourselves proud."

Your Gift Matters

By Sari Smith

How You Can Make an Impact

Your Workplace

Practicum sponsorship is a great way to connect with INI students and apply their talents to projects in your workplace. We are always looking for internship, full-time and Practicum project sponsorship opportunities.



SCAN HERE

Your Experience

Participate in CMUniverse. The INI alumni network is actively discussing questions about careers and professional development and offering advice. Join them at cmuniverse.peoplegrove.com.

Your Online Support

Social media is a great way to stay connected with the INI:

- Facebook Group: Search “INI Alumni” and request to join.
- LinkedIn Carnegie Mellon Information Networking Group.



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