COMPUTATION

2024

UCF

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Department of Computer Science
UNIVERSITY OF CENTRAL FLORIDA

ADMIRABLE
ACCOLADES

It has been a memorable year for the UCF Department of Computer Science, and I could not be more proud of our faculty, staff, and students for their many achievements.

I'm elated to share that our faculty has grown by 10 this year, with six lecturers hired to support our talented students, and four researchers joining collaborative think tanks at the university: the UCF Artificial Intelligence Initiative and the UCF Cybersecurity and Privacy Cluster. I am confident that their contributions will have a resounding impact on our overall efforts as we continue to innovate and lead in these two ever-evolving disciplines.

Our world-renowned competitive programming and cybersecurity teams have continued their legacy at UCF with another impressive showing at their national and international competitions. UCF's programming teams recently competed at the first-ever double world finals hosted by the International Collegiate Programming Championship, held simultaneously in Luxor, Egypt, to make up for delays in hosting the 2022 and 2023 championships. I'm thrilled to share that our teams placed 21st and 23rd overall. I continue to be astounded by their sheer talent, work ethic, and dedication and congratulate the team and their coaches for such an incredible showing and for representing UCF so well on the world stage.

Hack@UCF, the university's student-founded cyber defense club, has won its sixth national championship with its recent first-place finish at the 2024 National Collegiate Cyber Defense Competition hosted by the Center for Infrastructure Assurance and Security. More than 2,100 students competed in the event, and the top 10 teams advanced to the championship. These team members continue to put the spotlight on UCF for its legacy of winning in cyber competitions. They are incredibly brilliant masters of their craft, putting in hours of training on top of their academic responsibilities. Congratulations to the team and their coaches for a phenomenal season.

Our online programs are rising in the rankings, a reflection of the collaboration, innovation, and dedication of our faculty and students. We have moved up four spots to No. 23 in U.S. News and World Report's Best Online Graduate Computer Information Technology Programs. This ranking is specific to our Master of Science in Digital Forensics, offered in partnership with the UCF departments of Forensic Science, Chemistry, Criminal Justice, and Legal Studies, and the National Center for Forensic Science.

As I complete my second year as department chair, I am more motivated than ever to support our faculty in their service to our students, their innovative research efforts, and their commitment to excellence. I invite you to learn more about the department and its many accolades this year, shared in the pages of our 2024 issue.

DAMLA TURGUT, PH.D.
CHAIR
UCF DEPARTMENT OF COMPUTER SCIENCE

CYBERSECURITY
DYNASTY

The internationally recognized student organization Hack@UCF — which won its sixth championship at the 2024 National Collegiate Cyber Defense Competition — puts a spotlight on the hacking industry. BY JOSEPH HARKINS

Some kids love video games; others are intrigued by how they work. As a 13-year-old, Noah Magill enjoyed breaking into them. The pleasure derived from hacking computers followed the digital rabble-rouser throughout high school and into his search for a college.

"I looked over all the big-name universities and saw that they didn't have a good cybersecurity offering or any clubs for their undergraduates," says Magill, now a 20-year-old honors information technology student and Burnett Honors Scholar. "Then I reached out to UCF and learned about one of the biggest and best cybersecurity clubs and collegiate teams in all the United States. That was the selling point for me."

Thanks to Magill and 406 of his classmates who are current members, the Collegiate Cyber Defense Club at UCF has been sending teams of students around the world to cash in on tournaments at the expense of some of the leading universities in the United States. The latest list of first-place honors for Hack@UCF — as it is more informally known — includes the 2024 National Collegiate Cyber Defense Competition, 2024 Information Security Talent Search (ISTS) competition hosted by Rochester Institute of Technology; the National Centers for Academic Excellence (NCAE) Cyber Games Southeast Regional, in Tampa; the CAE Virtual Internship and Varied Innovative Demonstrations (VIVID) competition qualifier; and the Southeast Collegiate Cyber Defense Competition (SECCDC).

In all, UCF cybersecurity teams have earned 88 first place awards — including six NCCDC titles — 29 second-place and 25 third-place awards. The competitions, which allow UCF students to sharpen and display their skills before cybersecurity professionals, are hosted by companies from private industry, such as Cyberbit, Google, IBM, Lockheed Martin, Microsoft, Raymond James, and Raytheon and federal agencies, including the National Institute of Standards and Technology, Homeland Security, U.S. Department of Energy, National Security Agency and Air Force.

Student teams are typically asked to solve real-world cybersecurity challenges, such as networking, system administration, reverse engineering, cryptography, hacking, programming and forensics, in real-time.

"These companies or government agencies are banking on the fact that schools send their best teams of students to these competitions," says Thomas Nedorost, an associate instructor in the College of Engineering and Computer Science and the club's faculty advisor since 2013. "It is a recruiting event for them. They get to see the best students from each of the schools that are invited to participate."

Expectations Exceeded

In 2013, Jonathan Singer '13 was a UCF senior information technology student who was intent on making a name for himself when he approached Nedorost about obtaining grant funding. When the conversation quickly turned from trying to earn money to having some fun, the idea to start a cybersecurity club and team at UCF was born. The first club meeting exceeded expectations, attracting 86 students who had a strong interest in cybersecurity.

money — it invites experts from major companies to campus to discuss the latest trends in offensive and defensive cybersecurity strategies. The workshops the club conducts on campus, in the community and at high schools are a huge recruiting vehicle to attract top students with strong aptitudes and an interest in cybersecurity to UCF.

"I've really enjoyed being with the club — it's my favorite thing to do at UCF," says senior Harrison Keating, the team's captain. "Before I decided on UCF, I got a chance to attend a

uniforms and out-of-state tuition waivers to recruit high-potential students to the team.

Labor Shortages

Companies, including Lockheed Martin, Harris, Northrup Grumman and Raytheon, that routinely hire UCF students as cybersecurity engineers and analysts, penetration testers and developers have made donations in the past to offset those costs.

In the U.S., the cybersecurity workforce boasts more than 1,178,662 jobs — with around 572,392 of them yet to be filled, according to CyberSeek, a project supported by the National Initiative for Cybersecurity Education, a program of the National Institute of Standards and Technology in the U.S. Department of Commerce.

> "It is imperative...to invest in developing new talent and cybersecurity programs at the university level to ensure tomorrow's professionals have the essential skills to navigate these contantly evolving threats.
>
> *--Tom Nedorost, Hack@UCF faculty advisor*

"Some of the most talented UCF students started to come out of the woodwork," says Singer, a cybersecurity consultant for Virginia-based GuidePoint Security. "I thought I was cool because I already had some industry experience, but the students that came to our first meetings were some of the most incredible and brilliant people I've ever met in my life."

From those early meetings, word spread. Students from all disciplines began to take an interest in the club. Competitions expanded the club's presence internationally. Today, Hack@UCF is a juggernaut, featuring four students who have been drafted to the prestigious U.S. Cyber Team.

Recruiting Vehicle

Not only does Hack@UCF participate in competitions worldwide — exposing members to internships, job opportunities, the chance to travel and scholarship

few club meetings and I was pretty much hooked from there."

Keating says to sustain a top-rated cyber team requires as much as 20 hours of practice a week, which, for many club members, is compounded by classwork, internships, part-time employment and weekend competitions. It also demands financial support to cover competition registration fees, travel expenses, training materials,

"Cyberattacks can have serious consequences on just about everything — from the power grid to defense systems to our personal information," Nedorost says. "It is imperative that organizations — industry and government — and concerned citizens continue to invest in developing new talent and cybersecurity programs at the university level to ensure tomorrow's professionals have the essential skills to navigate these constantly evolving threats."

RISING
RANKINGS

UCF Digital Forensics Program Ranks Among Top in Nation

BY MARK SCHLUEB

With a commitment to unleashing the potential of students, the University of Central Florida offers multiple pathways to earn a high-quality undergraduate or graduate degree, including exceptional online programs developed by expert faculty that offer convenience and flexibility for thousands of students to succeed even while juggling full-time jobs and family responsibilities.

U.S. News & World Report once again recognized the quality of UCF's online degrees through the release of its best online program national rankings, which included ranking the university No. 7 tied in the nation for best online bachelor's programs and No. 23 for best online graduate computer information technology programs. With the 2024 release, UCF has ranked in the top 20 overall Best Online Programs for the past seven years.

"UCF's commitment to developing the talent for Florida's workforce includes broadening access to the high-quality online education that enables us to meet students' needs for flexibility and supports their success," says UCF President Alexander N. Cartwright.

The Evidence of a Quality Digital Forensics Degree

U.S. News and World Report has ranked UCF among the top colleges and universities on its list of Best Online Graduate Computer Information Technology Programs. The university came in at No. 23, four spots higher than its previous ranking in 2023.

The ranking specifically highlights the online Master of Science in Digital Forensics, offered by the Department of Computer Science.

"I'm proud to see UCF rising in the online rankings for computer information technology graduate programs," says Damla Turgut, chair of the Department of Computer Science. "Our success story reflects the collaboration, innovation and the dedication of our faculty and students."

Alan Tromba works in the IT field and is pursuing an online master's degree in digital forensics. The program has earned UCF the No. 23 ranking for U.S. News' Best Online Graduate Computer Information Technology Programs.

"It became apparent that my degree program had put me a step ahead of my counterparts. I chose UCF's program for three reasons: one, because it was solely involved in digital forensics and not a concentration, two, because UCF was on the short list for top universities for the field, and three, cost and availability," says Tromba, who lives in Brandon, Florida.

UCF now ranks No. 52 for Best Online Graduate Engineering Programs, according to U.S. News' latest release. UCF Online has built new pathways for students — some of whom live thousands of miles away and have full-time jobs — to earn bachelor's and master's degrees, doctorates and graduate certificates. UCF is meeting the needs of its students, who are pursuing a better life for themselves and their families through distance learning.
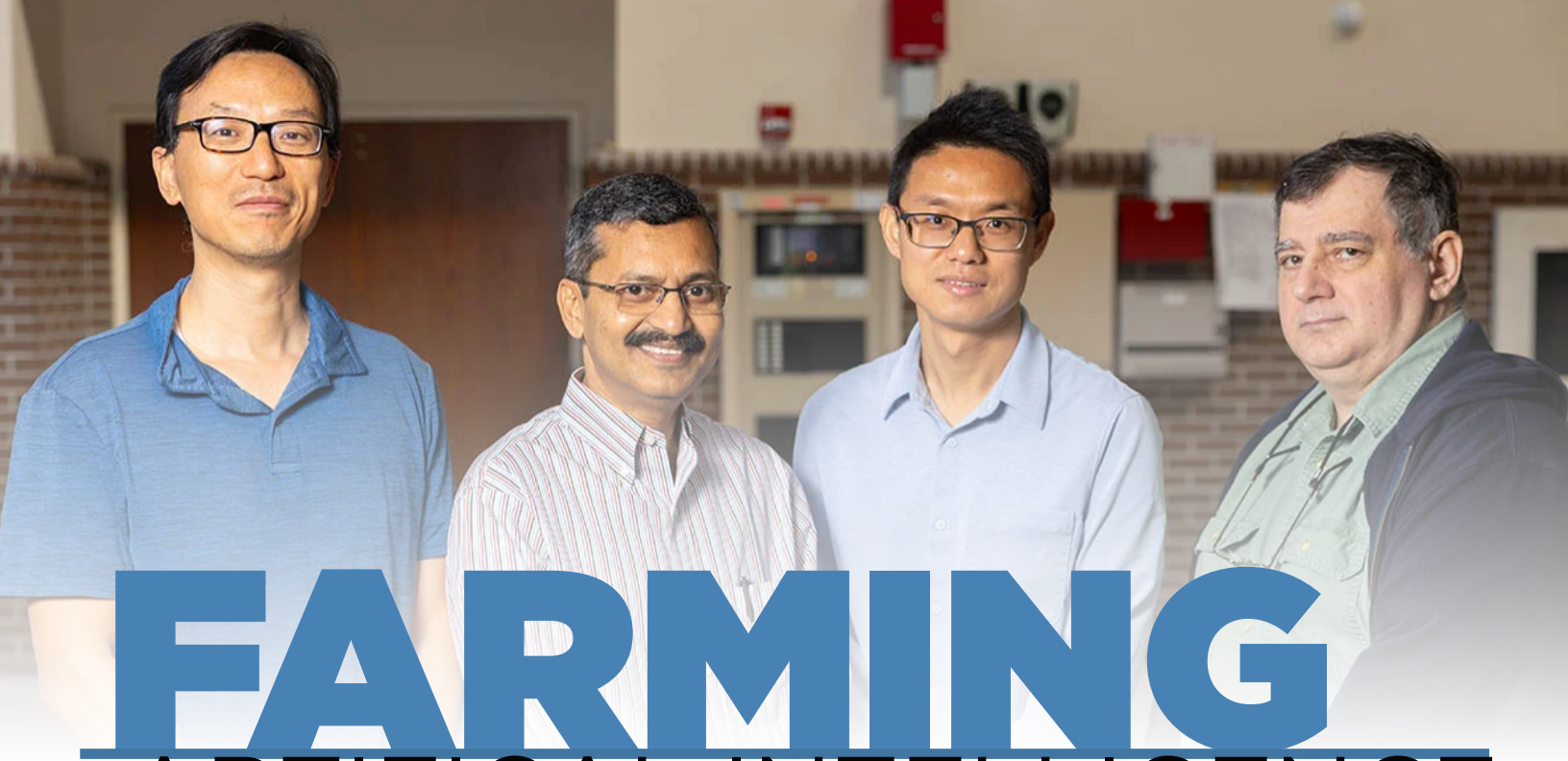
FARMING
ARTIFICAL INTELLIGENCE

UCF Researchers Lead Project to Develop AI-driven Technologies for Agriculture

BY MARISA RAMICCIO

Artificial intelligence (AI) isn't just used to power electronics, apps or self-driving cars — it's also driving key innovations in agriculture. From sensors that can monitor soil and water to autonomous robots that can harvest crops, AI is making farming more efficient, sustainable and cost effective.

In an effort to expand the use of AI in agriculture, several UCF researchers will work together to develop several AI-driven technologies that aim to improve the industry's field operations. The team is supported by a $2.74 million grant from the U.S. Department of Agriculture (USDA) – National Institute of Food and Agriculture (NIFA). The funded project will specifically enhance the agricultural applications produced by the AI Institute for Transforming Workforce and Decision Support (AgAID), an institute funded by NIFA. Professor Manoj Karkee from Washington State University is the team's leading collaborator of AgAID.

Leading the charge for UCF is Professor Yunjun Xu of the Department of Mechanical and Aerospace Engineering. He will use his expertise to develop AI methods for motion control and scheduling in agricultural robots. These autonomous ground robots are used to conduct several operations in open fields such as detecting diseases and harvesting crops.

Collaborating with Xu are Professor Ladislau Bölöni of the Department of Computer Science and Assistant Professor Chen Chen from the Center for Research in Computer Vision. Bölöni will strive to integrate AI into the manipulation of agricultural robotic arms to improve the way they interact with their physical environment, while Chen will investigate a new AI method for the sensors used in precision agriculture, a farming practice that uses technology to make more accurate and informed decisions.

Also on the project is chemistry Professor Swadeshmukul Santra, who will work with Chen and Xu to integrate AI into the analysis of pesticide residues.

The UCF team hopes that these technologies will be of use to both current and future generations of farmers and AgAID researchers.

"We anticipate that each AI method will advance its respective state-of-the-art technology and can have performance superior to existing or traditional methods," Xu says. "We also hope to inspire more people, especially younger generations, to join the U.S. agricultural sector workforce."

To spark an interest in agriculture, the UCF researchers plan to coordinate various outreach activities for students including a summer exchange program and workshops.

The project is funded via the NIFA interagency application program in conjunction with the U.S. National Science Foundation.

PROGRAMMING
PINNACLE

UCF Programming Teams Shine at the ICPC World Finals

BY MARK SCHLUEB

UCF has demonstrated its programming prowess on the world stage for the 12th consecutive year, sending two teams to compete in the first-ever International Collegiate Programming Contest (ICPC) double World Finals in Luxor, Egypt.

UCF Cactus (team members Daniel West, Seba Villalobos and Jacob Magnuson) and UCF Beehive (team members Natalie Longtin, Andy Phan and Jacob Steinebronne) competed among 253 teams from more than 50 countries.

UCF Cactus placed 23rd in the 2022 World Finals, and fourth among U.S. teams, placing ahead of teams from Columbia University, Stanford University and Rutgers. UCF Beehive placed 21st in the 2023 World Finals and third overall among U.S. teams, placing ahead of Carnegie Mellon, Georgia Tech, Purdue University.

For decades, ICPC has been at the forefront of preparing university students to be the next generation of elite programmers. The contest has grown into a worldwide collaborative of universities hosting regional competitions that advance the top 1% of teams to the annual global championship round, the ICPC World Finals.

Participating universities assemble three-member teams of students who train rigorously to compete at solving real-world computer programming challenges. In this intense battle of the brains, students race against the clock in a competition of logic, strategy and mental endurance.

According to the U.S. Bureau of Labor Statistics, employment in computer and IT occupations is projected to grow 13% from 2020 to 2030, adding about 667,600 new jobs based on the high demand for workers in these fields. The median annual wage for these occupations was $97,430 in May 2021 — substantially higher than the median for all occupations of $45,760.

The projected growth in these fields translates to heavy demand from employers for skilled programmers able to fill the vacuum. Many companies recruit students who participate in ICPC competitions, often before they graduate.

ICPC — the oldest, largest and most prestigious programming contest in the world — helps to meet that need through training and competition. The contests are held under the umbrella of the ICPC Foundation, a 501(c)(3) charity, which is responsible for sponsorship, hosting, fundraising,

outreach and operation.

These contests have drawn sponsors that include the U.S. Department of Defense, IBM Quantum, AWS Educate, Endure Capital, Two Sigma, JetBrains and others. Sponsorships continue to be vitally important if the ICPC is going to continue to train and develop programmers who can fill these jobs.

To reach the level of an elite programmer requires skill, commitment — and practice.

"I tell people that programming is like sports — the more they practice, the better they get. If you keep shooting free throws, you'll continue to improve,"

says Ali Orooji, who coaches programming students at UCF. "They become great problem-solvers and great programmers."

"Competing in ICPC on the UCF Programming Team put me in a fast-paced environment where I was able to learn new algorithms and data structures quickly," says Timothy Buzzelli '18, a computer science major who is now a software engineer at Google. "The UCF Programming Team is successful because team members are constantly helping each other and sharing cool new programming tricks."

Computer science alum Alex Coleman '19, who works at

Statsig, a Seattle-based startup, looks back fondly on his time competing in ICPC.

"The biggest value of the competition for me was having a fun and engaging way to explore new problems in a team environment," Coleman says. "It's just not something you get from a classroom, and not something you could dive into on your own. Many of the topics covered don't come up often in practice, but have changed the way I think when problem-solving, even outside of advanced theoretical problems."

STANDOUT
SCHOLAR

UCF Student $25,000 Google-CAHSI Award for AR, VR Research

UCF computer science student Esteban Segarra '22MS has been selected for the 2023 Google-Computing Alliance of Hispanic Serving Institutions (CAHSI) Dissertation Award, worth $25,000. He was one of five students in the U.S. who received the award, which supports doctoral candidates during their final year of studies at a CAHSI school.

Originally from Monterrey, Mexico, Segarra earned his master's degree in computer science from UCF in 2022. He considered several different universities for his graduate studies but decided that becoming a Knight was the best option for him.

"UCF's distinguished reputation, especially in the field of computer

vision when I enrolled, solidified my decision," he says. "Following a comprehensive search during my graduate studies, I determined that UCF was the optimal choice."

Segarra has two major projects in the works, both inspired by his zeal for computer science and the desire to leverage video games for real-world solutions.

The first project, Infrastructure for Photorealistic Image and Environment Synthesis (I-SPIES) helps render synthetic images from terrestrial scanners, which use lasers to capture data from highly detailed 3D surfaces.

His second project, Capturing and Logging Ecological Virtual Experiences and Reality (CLEVER),

is an open-source tool and dataset that facilitates capturing data from various virtual reality devices, regardless of the type of equipment or application.

Segarra says he is grateful for the recognition from Google CAHSI and for the opportunity to share his research. He also says that CAHSI's vison of increasing the Hispanic representation in computing and its mission to accelerate the progress of Hispanics is laudable.

He encourages students to work with passion toward their goals, and to pursue a graduate degree to help achieve CAHSI's goal of having a 20% Hispanic population in computing by 2030.

TACTICAL TECH

Computer Science Students Support U.S. Army Reserve with New Technology

BY ROBERT STEPHENS

Reserve Mercury is one of the most ambitious real-world projects UCF computer science students have undertaken, with the mission to help members of the U.S. Army Reserve do their crucial work better.

"In the Army Reserves, they still fill out most forms manually," says computer science lecturer Rick Leinecker. "Every minute they spend on those forms takes them away from the work they signed up to do."

A few years ago, Col. Rex Eiserer, a brigade commander in the Army Reserve Aviation Command, noticed how these menial tasks were distracting reservists from the work Leinecker alludes to: piloting, engineering, nursing and practicing field missions. These administrative obstacles created efficiency issues that led to frustration, and impacts with recruitment and retention of reservists.

The Army Reserves reached out to the National Security Innovation Network (NSIN), which has close ties to UCF and is fully aware of the university's reputation in the tech sector and at computer science competitions around the world.

"The challenges the Reserves had been dealing with didn't surprise us," says UCF computer science lecturer Matthew Gerber. "When a large organization tries to create and adopt efficiencies from within, it can be like trying to turn a cruise ship compared to a Jet Ski. That's why they came to us."

In early 2021, Capt. Rich Mautino organized the first group of UCF students who began work on what would become known as Reserve Mercury. The pitch: Create an app that's easy to use, accessible on any device, and improves the overall experience for soldiers in the Army Reserves.

To build a Reserve Mercury team, Leinecker and Gerber dipped into UCF's deep pool of computer science students. At this moment, 28 students are working on the project because of its scope.

They completed the proof of concept so well and so quickly that Army Reserve representatives from the 75th Innovation Command — a specialized unit of civilian tech experts — took it up the ladder to a panel of leaders and said, "You need to see this." The project, and the relationships with the Army Reserve and NSIN, has grown since then.

"UCF students embody the adage: bring me a solution now before we have a problem," LacKamp says. "They've floored us with their professionalism and expertise. It's incredible."

The focus of Reserve Mercury for now is to help the Army Reserve, but word is spreading. LacKamp says the app "would be terrific to eventually implement in the Army active and National Guard." In less than two years and on a relatively small budget, Reserve Mercury has gone from a proof of concept to an evergreen project for UCF's computer science department.

"It's gratifying to see our students work on such a big project for such a big organization," Leinecker says, "and to know they're making such a big difference."

CYBER
STARS

Two Computer Science Students Compete on the 2024 U.S. Cyber Team

Two UCF computer science students have made it to the Olympics of collegiate cybersecurity competitions by being drafted as members of the U.S. Cyber Team. As part of the team, they will represent America and compete in thevarious global scrimmages, including the Cyber Games, and the International Cybersecurity Challenge in 2024

Senior computer science major Matthew McKeever and cyber security and privacy graduate student Jeffrey DiVincent '23 will help represent the U.S. as two of the 30 members on this year's team.

Both McKeever and DiVincent are members of UCF's Collegiate Cybersecurity Competition (C3) team, and placed first in the U.S. Department of Energy's CyberForce Competition. They are also members of student organization Hack@UCF and students in the Burnett Honors College.

McKeever, who formerly served as a red team vs. blue team specialist, was recruited as a binary exploitation specialist and is charged with uncovering program vulnerabilities and using them to his team's advantage. He is one of 17 veterans on the U.S. team.

"Meeting and interacting with the various countries at the competition was enlightening, learning their culture and socializing in general, but more importantly, fun," he says of his experiences last year. "Everyone was extremely talented and respectful, but also competitive. Overall, it was an amazing experience competing internationally. I learned a

lot in cybersecurity and met and befriended many talented cybersecurity experts from across the world."

DiVincent, a first-time member of the U.S. Cyber Team, says he had a feeling he might get selected.

"I had a sneaking suspicion that I was going to be drafted. The coach that interviewed me was at the Raymond James Capture the Flag cybersecurity challenge I did a few weeks back, and she was super excited to see me and even asked for a selfie," he says. "But when I officially found out, I was in class, learning about AI, when I just started getting flooded with congratulatory messages. It was surreal."

Though he is new to the national team, DiVincent has already competed on an international level as a member of the UCF C3 team this year.

"The two things I am most excited about are the ability to learn from

some of the county's best young minds and getting to travel around the world. I love learning, and I love seeing the world," DiVincent says.

C3 team members have a rigorous training regimen, often putting in hours on weeknights and weekends and traveling to competitions on top of their academic responsibilities. Their coach and associate instructor Tom Nedorost says the team is no stranger to good old fashioned hard work and is committed to practicing, learning and challenging themselves to continually improve.

"UCF is recognized as a cybersecurity powerhouse far beyond campus due to our performance record in multiple cyber competitions every year," Nedorost says. "We compete in more competitions and practice together as a team than other schools. overall, Over the past 12 years, we've brought home 80 first place, 24 second place and 23 third place awards to date."

KNIGHTS
HACK

700 Students Attend UCF's Largest Hackathon

One idea, 36 hours and lots of passion and drive — these were the key elements of Knight Hacks 2023, sponsored by UCF student organization Knight Hacks, which drew a record-setting 700 attendees including students from Florida International University, the University of Florida and the University of South Florida.

From an app that locates the nearest water bottle filling station to an AI-enabled legal assistant, there was a hack for that, all novel ideas by attendees who embraced the hackathon culture of learning and growing by creating. Participants had just 36 hours to conceive and develop an original "hack," or innovative solution for a task, evaluated by judges at the end of the event.

Nick Lamontagna, a junior majoring in computer science and the president of Knight Hacks, says the club was created to help computer science students connect what they are learning in the classroom to the real world.

"Knight Hacks as a club inspires others to pursue greater and larger endeavors in technology," he says. "We empower people who maybe aren't really familiar with how to build that thing that they really want to build and bring them up to the level to where they can make something they're proud of."

Hands-On Experience Outside the Classroom

Hackathon attendees Zandryn Epan, Gabby Rose and Andrea Vinas, first-year computer science students, spent the weekend developing a dress-up game that recommends clothing inspired by the event's sponsors, including Geico, Morgan & Morgan and Royal Bank of Canada, based on answers from a questionnaire.

Their group was part of the 60% of attendees experiencing their first hackathon, and the 15% within that group who are first-year students.

"I knew I needed to get into the field early and get some experience to get my foot in the door, so I decided to join," Epan says.

A few tables away, sophomore Wei-Lin Chou, senior Adam Whitlock and first-year students Haresh Palli and Daniel Rivera, all computer science majors, were building a website and app that tracks the nearest bottle refill station on campus.

"I really wanted to look for experience outside of the classroom to manage a project. I wanted to build something that I care for and am passionate about," Chou says. "I also wanted to meet new people who have the same passion as me."

Empowering Future Programmers

Lamontagna says that their hackathon gives students the opportunity to develop a project and collaborate with a team, just as they would in their senior design projects, but much earlier. He adds that it allows students to practice their skills before their senior year, boosting their confidence and dispelling a common belief among younger students that "they're not good enough yet."

"This hackathon is our first step toward truly knocking down that wall," he says. "I want to not only tell people you're good enough, I want you to show people you're good."

In the spirit of building confidence

and introducing new experiences, Hack@UCF, the university's cybersecurity club, hosted two competitions during the event, drawing in 120 competitors from the hackathon. Horse Plinko, named for a humorous gif of a horse falling through the pegs of a plinko board, is the club's signature competition geared toward beginners. Competitors served as blue team members, defending their network against Hack@UCF red team members who attempted to infiltrate their systems.

A Hack for Employers

The confidence and hands-on experience gained from hackathons can make a big impact on future careers. Brandon Melendez, integrated business major and public relations director for Knight Hacks, says a hackathon gives employers who sponsor the event a valuable opportunity to see students at work. Knight Hacks secured 40 sponsors who helped fund the event, participated in a career fair, hosted challenges for the students and observed and asked questions as they worked on their hack.

"At the end of the day, this is one of the best ways for them to get an accurate gauge on what their talent is properly capable of," Melendez says.

Event sponsor and law firm Morgan & Morgan was able to experience this first-hand this past spring when they reached out to Knight Hacks to organize a hackathon for their firm.

Morgan & Morgan Chief Information Officer Ryan Colbert says the firm has been undergoing a digital transformation effort into much more of an agile software-driven organization. He adds that partnering with Knight Hacks on a hackathon organized for their firm was an excellent opportunity for students to contribute to the effort while also giving them a chance to develop their skills along the way.

"Data drives a lot of our business at this point, and the tools and technology are so rapidly evolving that we felt like the best place we could get the talent we need is directly from the college campuses," Colbert says. "The energy and the creativity and the enthusiasm

that we got from the students was invigorating for our team, and we collaborated on new ideas and new technologies that our engineers had never even heard of before."

Being Good Enough

At the end of the 36 hours, students are invited to submit their projects and present it to the judges. Lamontagna says whether you submit or not, the experience of the hackathon itself is what's most valuable.

"These are people that we've introduced to the culture of hackathons, introduced to that culture of you should always be learning, you should always be striving to do better. And now we can go even further," he says. "People are going to then say, 'Hey, I was where you were. You are good enough. You can do this.' And then when these people get to senior design, they're ready."

> " The energy and the creativity and the enthusiasm that we got from the students was invigorating for our team, and we collaborated on new ideas and new technologies that our engineers had never even heard of before.
>
> --Morgan & Morgan CIO Ryan Colbert

MOBILE MARVEL

Kevin Moran Wins ACM SIGSOFT Early Career Award

BY BRIANNA JESIONOWSKI

Kevin Moran has won the 2024 SIGSOFT Early Career Researcher Award "for outstanding contributions to improving the quality of mobile applications, through software testing, deep learning and user interface development" from the Association for Computing Machinery (ACM). He received a $1,000 honorarium, a signed plaque with his name engraved and up to $3,000 in travel support to attend the International Conference on Software Engineering.

"I am extremely honored to be recognized by the software engineering research community with this award. While the award goes to a single person, it is a testament to the hard work of the many students, collaborators and mentors that I have had the privilege of working with over the years," Moran says. I could not be prouder of what we have accomplished, and I am excited to continue to push forward the field of software engineering."

This award is given once a year and is one of the highest awards for software engineering given to pre-tenure faculty. It was awarded to Moran for his outstanding research in understanding how engineers develop software and the challenges they face.

SCHOLARLY SERVICE

Yan Solihin Recognized for Service to Computing Community

Yan Solihin has been honored by the Association for Computing Machinery Special Interest Group in Microarchitecture (ACM SIGMICRO) with the Distinguished Service Award. He was recognized for the achievement at the International Symposium on Microarchitecture in Toronto, held from Oct. 28 to Nov. 1, 2023.

The Distinguished Service Award is presented to a member who has made noteworthy contributions to the processor microarchitecture and microsystems community, in addition to demonstrating impactful service to ACM SIGMICRO and its committees.

"My service to ACM is a way for me to give back to the community that has been very supportive of young faculty members advancing in their careers, including my own," Solihin says. "It has been an honor for me to be a part of this vibrant community of researchers."

An active member of ACM since 2010, Solihin has served the organization in numerous leadership roles. He served as the chair of the ACM SIGMICRO History Project, an endeavor he particularly enjoyed as it gave him the opportunity to learn from pioneers in computer architecture.

His contributions to cybersecurity include key technologies for trustworthy cloud computing, including split-counter mode memory encryption and the Bonsai Merkle Tree. Some of the key discoveries and designs have been incorporated into commercial processors such as Intel SGX.

MODEL
MENTOR

Mubarak Shah Receives Mentoring Awards from UCF and CRA

Mubarak Shah, computer science professor and founder of the UCF Center for Research in Computer Vision, has won the UCF's Award for Faculty Excellence for Mentoring Postdoctoral Students.

Honorees are selected for their outstanding efforts in guiding their postdoctoral students in their academic journeys, often serving as advisors both in and out of the lab. They are evaluated on how well they prepare their postdoctoral students for success, including their ability to in obtain funding, speak at conferences and engage in professional development, and on their effectiveness in supporting their students overall.

Shah has also received the Undergraduate Research Faculty Mentoring Award from the Computer Research Association Committee on Education (CRA-E). The honor recognizes outstanding mentorship and exceptional undergraduate research experiences that encourage students to pursue graduate programs in computing.

Shah has mentored nearly 400 undergraduate students over the past 37 years through UCF's REU in Computer Vision, established in 1987, the longest-running REU in the country.

PEGASUS
PRIDE

Chair Damla Turgut Named Pegasus Professor, UCF's Highest Faculty Honor

Department chair Damla Turgut is an internationally known researcher in emerging technologies, including wireless communication networks, mobile computing, and sensor networks. She has held visiting researcher roles at the University of Rome, Imperial College London, and the KTH Royal Institute of Technology in Sweden. She engages with top thought leaders in her field through various professional service roles. She was recently selected as the editor-in-chief of Computer Communications, an international journal for the computer and telecommunications industry.

Turgut enjoys promoting faculty growth and shaping programs to advance student success and meet industry needs. She is especially passionate about teaching and mentoring students. "I think the best thing about being a faculty member is seeing your students grow," Turgut says. "I try to encourage students who did not have the same opportunities or encouragement that I had growing up."

Turgut sees an exciting future for the college's teaching and research in areas such as computer vision, artificial intelligence, and digital twin technology and is proud of UCF's ascent as Florida's premier school for engineering and technology. Gone are the days when she meets conference goers who haven't heard of her university.

"Now they say, 'Oh, we heard you guys are doing this,' or they will know about a program," Turgut says. "You feel like you contributed to that growth, and that's a really good feeling."

NEW
FACULTY

The department is pleased to welcome 10 faculty for the 2023-2024 academic year.

UCF Artificial Intelligence Initiative

AMRIT SINGH BEDI

ASSISTANT PROFESSOR
PH.D: IIT KANPUT, INDIA
RESEARCH AND TEACHING INTERESTS:
AI ALIGMENT, REINFORCEMENT LEARNING, LANGUAGE MODELS, OPTIMIZATION, ROBOTICS, STATISTICAL INFERENCE

SER NAM LIM

ASSOCIATE PROFESSOR
PH.D: UNIVERSITY OF MARYLAND COLLEGE PARK
RESEARCH AND TEACHING INTERESTS:
COMPUTER VISION. LANGUAGE AND REPRESENTATION, ARTIFICIAL INTELLIGENCE, MACHINE LEARNING

UCF Cybersecurity Cluster

KEVIN MORAN

ASSISTANT PROFESSOR
PH.D: WILLIAM AND MARY
RESEARCH AND TEACHING AREAS:
SOFTWARE ENGINEERING, SOFTWARE SECURITY, MACHINE LEARNING APPLICATIONS TO SOFTWARE ENGINEERING

MENGXIN ZHENG

ASSISTANT PROFESSOR
PH.D: INDIANA UNIVERSITY BLOOMINGTON
RESEARCH AND TEACHING INTERESTS:
MACHINE LEARNING SECURITY, CYBERSECURITY

Lecturers and Instructors

JOHN AEDO

PH.D: UNIVERSITY OF CENTRAL FLORIDA
RESEARCH AND TEACHING INTERESTS:
STEM EDUCATION, OPERATING SYSTEMS WEB DEVELOPMENT, PROGRAMING LANGUAGE AND COMPILERS

RAMYA AKULA

PH.D: UNIVERSITY OF CENTRAL FLORIDA
RESEARCH AND TEACHING AREAS:
FIGURATIVE AND TOXIC LANGUAGE DETECCTION ON SOCIAL MEDIA USING LARGE LANGUAGE MOELS IN NATURAL LANGUAGE PROCESSING

SALIH SAFA BACANLI

PH.D: UNIVERSITY OF CENTRAL FLORIDA
RESEARCH AND TEACHING INTERESTS:
WIRELESS SENSOR NETWORKS, DELAY
TOLERANT NETWORKS, CLUSTERING
TECHNIQUES AND APPLICATIONS

JOSHUA LAZAR

M.S.: UNIVERSITY OF CENTRAL FLORIDA
RESEARCH AND TEACHING INTERESTS:
CORE BUILDING BLOCKS OF COMPUTER
SCIENCE AND HOW TO DELIVER THAT
KNOWLEDGE TO OTHERS

KURT KULLU

PH.D: BILIKENT UNIVERSITY
RESEARCH AND TEACHING INTERESTS:
PROGRAMMING AND DISCRETE STRUC-
TURES, COMPUTATION NEUROSCIENCE,
VIRTUAL CROWD SIMULATION

SUBHARAG SARKAR

PH.D: UNIVERSITY OF TEXAS AT ARLINGTON
RESEARCH AND TEACHING INTERESTS:
ARTIFICIAL INTELLIGENCE, GENERATIVE
ADVERSARIAL NETWORKS, DEEP LEARNING,
MACHINE LEARNING

PROMOTION
AND TENURE

One-hundred-forty-three UCF faculty members, including three from the Department of Computer Science, recently achieved significant career milestones in earning promotions and tenure for the 2022-23 cycle.

Haiyan Hu was promoted to professor, and Wei Zhang was promoted to associate professor with tenure.

The approved faculty underwent a rigorous evaluation of their work and performance by peers, college and university leaders that took nearly an academic year.

Tenure must be approved by the UCF Board of Trustees. The president and provost make final decisions on promotions following reviews and recommendations from individual colleges and units.

"The faculty members approved this year for promotion and tenure…have met a lofty and demanding standard, and I am confident they will contribute significantly to advancing UCF as the University for the Future," says Michael D. Johnson, UCF's provost and executive vice president for Academic Affairs.

HAIYAN HU

WEI ZHANG

PH.D. PIONEER

UCF'S first doctoral graduate from 1980 reflects on his time at the university and growth of his area of study: computer science. BY RACHEL WILLIAMS '15 '20MA

Ali Hurson '80PhD is quite familiar with what it feels like to be a pioneer.

A computer science student in the 1970s, when computers had a fraction of the popularity they do today, he was accustomed to having just a small cohort of colleagues and friends who understood the kind of work he was doing.

Fast forward to 1980 and he truly would be a pioneer — the first Ph.D. graduate of UCF.

While he was pursuing a Ph.D. at the University of Iowa, where he was a research assistant, his advisor — the late Professor Amar Mukherjee — was offered a faculty position at UCF.

"One of the challenges of being a Ph.D. student at the time was word processors, computers, workstations — these were not popular [or widely accessible] at the time," Hurson says. "UCF supplied all that for me and hired staff to type and proofread my dissertation."

In 1980, UCF had just been approved by the State University System of Florida to offer a doctoral degree in computer science — the first doctoral program at the university and the first computer science doctoral program in the state.

Hurson, who now is a professor of computer engineering at Missouri University of Science and Technology, was an early adopter of computers thanks to his home country, Iran.

"Computing, or the notion of computer science, was restricted to an elite group of people in society [in its early days]. I was among the small group of people who were exposed to computing. I saw the future in it and knew this was an area I had to invest in," says Hurson, who previously worked at a government information center.

He also aspired to teach because of his upbringing in Iran, where teaching was considered a privileged position.

"My family motivated me. They sensed I liked studying and kept encouraging me to pursue my education as far as I could go," he says.

That privilege is something Hurson does not take for granted, even today.

"To have a Ph.D. is to be privileged," he says. "Not everyone is lucky enough to reach that point. I hope those who get it remember that. If you have the opportunity in the future to help others, please do so."

To students today, especially graduate students, Hurson suggests this: Be consistent. Keep going. Doing research is a lot like growing up.

"There is a lot of frustration because you are trying to solve an unknown," he says. "You often make a mistake. I let students know this is part of the deal. That's a part of growing up. Learn from your failures. Look at them as part of the learning process."

DIGITAL DETECTIVE
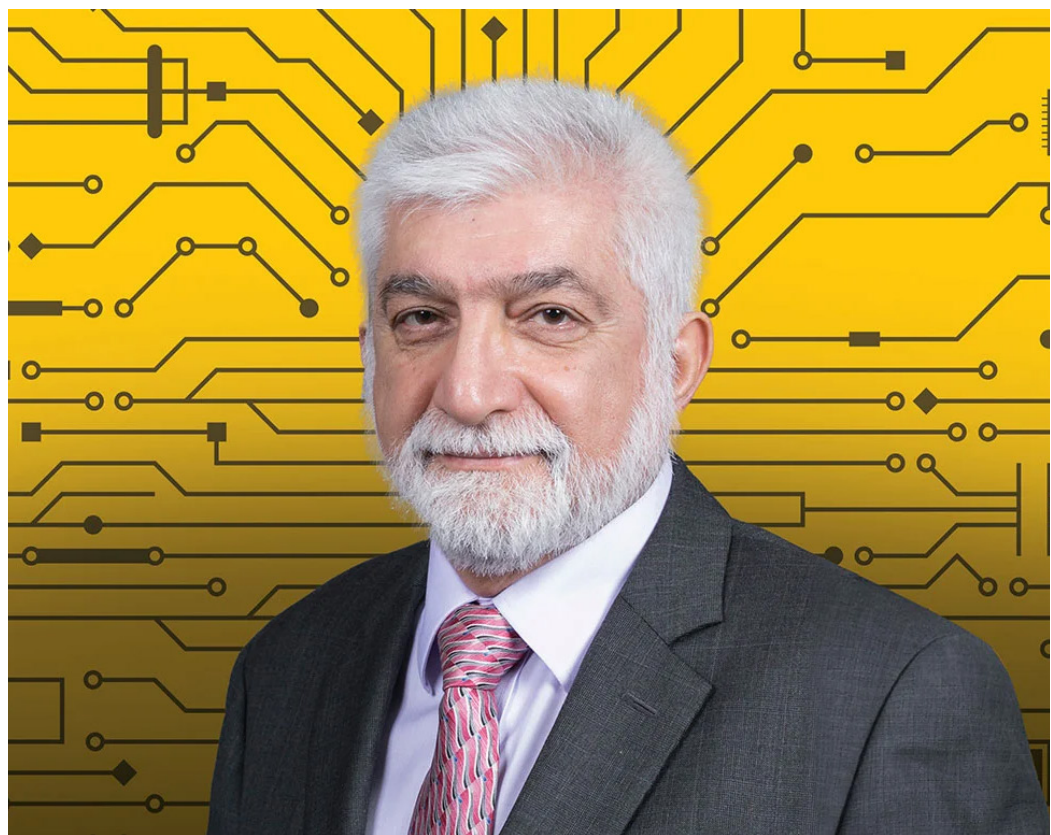
Aspring digital forensics professional pursues simultaneous master's degrees

Computer science graduate student Ariel Turnley had very different plans for her future while she was a freshman at Spelman College. Turnley originally dreamed of becoming a surgeon but wasn't a fan of biology. When she took a computer science class that was required for her major, it changed her whole career trajectory. Her ultimate motivation however has never changed: helping people.

UCF was one of two Florida schools Turnley considered to pursue a graduate degree. She chose to become a Knight after determining UCF's programs were more unique and hands-on, and with many more resources to help her succeed with it being such a large school. With her sister in Orlando and friends in the area who had graduated from UCF, she had a strong support system in place as well.

She had her sights set on UCF's master's in digital forensics program, one of the six master's degree programs offered by the UCF Department of Computer Science. With few forensics programs offered across the U.S., Turnley made a judicious decision to take on a second master's degree program simultaneously.

"Thinking strategically, I decided that it would be beneficial to also have a degree in cyber security and privacy as this would provide me with more opportunities if I was unable to find a role in digital forensics initially," she says. "The cybersecurity program was built off of the digital forensics program, therefore, some of the classes I have taken apply for both programs."

Her inspiration for pursuing digital forensics is an unconventional one, but for Criminal Minds fans, it makes complete sense. Turnley has been enamored of the show since her first year in college, and a fan of the character Penelope Garcia in particular. As a technical analyst for the FBI's Behavioral Analysis Unit, the quirky hacker turned criminal profiler helped track down miscreants with digital evidence, uncovering incriminating data in seconds.

"I am a true crime junkie and understanding the psychology behind the criminals was fascinating. What really drew me in, though, was Garcia, the tech genius behind finding all the information that the team needed," she says. "I wanted to be just like her: fighting crime without having to be on the front lines."

As a digital forensics intern for the Seminole County Sheriff's Office, Turnley is well on her way to doing just that.

"As you can imagine from my original career choice, I have always wanted to help people. By doing digital forensics in the criminal space, I would be able to assist people on a larger scale by helping keep communities and the world safe," she says.

Her ultimate goal is work for a law enforcement or government agency to provide digital forensics services on a grand scale. She says UCF has helped put her on this path in her academic career with several resources.

"UCF has helped me so far through organizations like the National Society of Black Engineers, Career Services, and my mentors, Dr. (DeLaine) Priest and Dr. (Ali) Gordon," Turnley says. "I will continue to cultivate my UCF network even after graduation and the services available to me as an alumnus to further achieve my goals."

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M.S. in Financial Technology
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