COMPUTATION

THE MAGAZINE OF THE UCF DEPARTMENT OF COMPUTER SCIENCE 2025



UCF

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COMPUTATION
2025

Computation is a publication of the University of Central Florida Department of Computer Science that showcases the accomplishments and accolades of its students, faculty and alumni.

UCF COLLEGE OF ENGINEERING AND COMPUTER SCIENCE DEAN
Michael Georgiopoulos, Ph.D.

DEPARTMENT CHAIR
Damla Turgut, Ph.D.

MARKETING AND COMMUNICATIONS SPECIALIST
Bel Huston

UCF DEPARTMENT OF COMPUTER SCIENCE
4328 Scorpius St.
Orlando, Florida 32816-2362
cs.ucf.edu

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CHAIR'S MESSAGE

We have had so much to be proud of over the last year. I'm excited to share the highlights with you in the latest edition of our department magazine, *Computation*.

Kevin Moran is a recipient of the coveted NSF CAREER award and we could not be more excited for this well deserved recognition. He joined UCF two years ago as part of the UCF Cyber Security and Privacy Cluster and we are fortunate to have him as part of our talented and dedicated team.

Four new faculty have come on board, expanding our research focus areas and strengthening our commitment to provide a world-class education for our students. We're pleased to welcome Awrad Mohammed Ali, Edward Amoruso, Santu Karmaker and Yancy Paredes to the department. These new faculty are part of a larger college initiative to hire 100 new faculty over the next three years as enrollment numbers rise.

Our cyber security defense team and programming team have once again had banner years. UCF won its fifth championship at the Department of Energy's CyberForce competition, its fourth straight victory. And our progrmamming team will compete for a spot at the world finals at the International Collegiate Programming Contest's North America Championship.

Thanks to our faculty's commitment to academic excellence, we've climbed in *U.S. News and World Report* graduate program rankings. We are now ranked No. 64 on the Best Graduate Computer Science Schools list, moving up 6 spots. Among public universities, our computer science program ranks No. 49 in the nation and No. 2 in the state. Overall, UCF is ranked No. 71 in Best Undergraduate Engineering Schools.

I'm grateful to our faculty and staff who continue ensure our Knights have an outstanding academic experience year after year. I invite you to learn more about the department and our numerous accomplishments.



CAREER COUP

Kevin Moran earns NSF CAREER award

BY BEL HUSTON

Never before in history has society been so dependent on computing. From phones and tablets to laptops and smart whiteboards, the technology that allows people to use the software on their devices is something they don't think twice about — until it stops working.

It's an issue that UCF Department of Computer Science Assistant Professor Kevin Moran is tackling, and one that has earned him one of the most prestigious grants awarded to up-and-coming faculty. Moran has received a National Science Foundation Faculty Early Career Development Program (NSF CAREER) award for his efforts.

His research, Enhanced User Interface Engineering via Automated Semantic Screen Understanding, will be supported by the NSF with a $582,308 grant.

Moran's work tackles a ubiquitous issue that impacts anyone who has ever used a program to send an email, log into an account or make an online purchase: software bugs.

"Have you ever used a piece of software on your phone or computer and gotten frustrated with the user interface (UI) being sluggish, buggy or confusing?" he says. "Unfortunately, this is not uncommon due to the complexity involved with engineering software UIs."

Moran says UI engineering, or the practice of developing, testing and managing UI software, has historically been a particularly demanding effort for software engineers. It's the reason bugs are ever-present in software.

"Past studies of developers and open-source code have shown that building UIs is a more cognitively challenging task compared to other types of programming, and requires more maintenance effort," he says. "A developer has to reason between the visual representation of a program in the pixels of a UI screen, and the low-level code representation of this same screen."

Moran intends to change that.

> **"We aim to build new tools that will automatically document, test and fix UI-related bugs for engineers.**

His goal is to automate the more laborious tasks for software engineers by giving them new tools powered by artificial intelligence (AI).

"We aim to build AI models that are specifically tailored to understanding the semantics, or meaning, of UI screens and relate them to code — think ChatGPT, but tailored for UI screens," he says. "Then, using this model, we aim to build new tools that will automatically document, test and fix UI-related bugs for engineers."

Moran says since multimodal AI models can understand both images like screenshots along with text, he took the opportunity to apply this innovation in the UI space with his team at UCF, members of the Software Automation, Generation and Engineering (SAGE) Lab.

To accomplish this, he and SAGE researchers will take on the challenging endeavor of building an AI model capable of performing three essential tasks: learning from the textual and visual cues in UIs, grasping the features and capabilities of UI screens, and automatically connecting them to code.

"It requires understanding the various components or widgets of a UI screen, like buttons and toggle switches, and inferring meaning from the spatial and stylistic properties of these widgets," he says. "For example, a login screen usually consists of two text boxes and a button for signing in."

His work has far-reaching impacts for UI software engineers. An automated documentation, testing and debugging process is a game-changer, leading to efficiencies that can translate to lower costs in software development, as well as better-performing UIs.

"Our aim with this work is to get our developed programming tools to software engineers so that they can improve the quality of the UIs they are building," Moran says. "For the general public that uses software, this means UIs that are easier to use and contain fewer bugs."

Moran would also like to educate the next generation of software engineers by providing them with new tools to construct high-quality UIs.

"We hope to get this work into the hands of engineers at major companies, such as Apple, who have supported this work with a supplementary research grant," he says. "I hope that we see the tools that we develop spur additional research in the area of UI engineering, and that some of our techniques get adopted by professional engineers."





ACADEMIC ADVANTAGE

Mubarak Shah leads $2.5 million NSF supported mentoring and scholarship initiative for students in AI

BY EDDY DURYEA

Faculty in UCF's College of Sciences and College of Engineering and Computer Science are preparing incoming students to keep pace with the emerging multidisciplinary field of artificial intelligence.

A team of five faculty, led by UCF's Center for Research in Computer Vision (CRCV), recently received a U.S. National Science Foundation (NSF) grant totaling nearly $2.5 million over five years to serve as resources to uplift bright yet low-income or struggling undergraduate students in pursuing a well-rounded education in AI.

The initiative is called STRONG-AI (STEM Opportunities for Nurtured Growth in AI), and it is an effort to help students anticipate and navigate the intersections of STEM careers and AI through faculty and peer mentorship and scholarship.

STRONG-AI is a refocusing and continuation of longstanding NSF-supported mentorship programs at UCF that have helped more than 100 low-income students since 2010 find success in STEM education and prepare them for the workforce. It also further reaffirms the university's commitment to President Alexander N. Cartwright's vision

of continuing to be the University for the Future through the Artificial Intelligence Initiative.

There are countless challenges and opportunities for implementing AI that span many STEM fields, and that is why STRONG-AI is important, says Mubarak Shah, UCF trustee chair professor of computer science and founding director of CRCV.

"The idea is to support the financially challenged and academically talented students to pursue the degrees in STEM majors," he says. "AI is important, and we've had a lot of success in computer vision — my area of research — but we want to broaden this to other areas of AI like robotics, machine learning and healthcare. There's a big need in the workforce."



The team already has received more than 150 applications and ultimately will select about 10 to 15 yearly based on financial aid eligibility, academic success and interviews with faculty, Shah says.

Students are encouraged to accelerate their education, as they may take courses toward their master's while they work toward their bachelor's, he says.

There may be many UCF students who already are confidently pursuing a path in AI in STEM; and so STRONG-AI is addressing the need to identify promising students and provide them with resources and raise their confidence in their ability to succeed. It's important to ensure these talented students are not overlooked, he says.

"We need to make sure that these students have our support," he says. "Many of the students may be able to finish their bachelor's degree but they may not think they have the resources to get that graduate degree. They may not do well, and they may drop out or change their majors to non-STEM, and that's a big problem because we need a qualified STEM workforce. We want to encourage those students to stay in the system. And our idea is to recruit these students and assign a mentor who each of these students can talk to and get help."

Nazanin Rahnavard, professor in UCF's Department of Electrical and Computer Engineering and a STRONG-AI mentor and co-investigator, has seen the transformative potential of the previous NSF mentorship program.

> **"We want to broaden this to other areas of AI, like robotics, machine learning and healthcare. There's a big need in the workforce.**
>
> — MUBARAK SHAH

"Based on my experience with that program, I know we changed their lives," she says. "Our scholars may come from low-income families and may have many challenges outside of the classroom. This program is specifically designed to help those students who without this program might not find success."

Focusing on the foundational development of AI will give students a solid background and context to further their STEM careers, says Brian Moore, STRONG-AI program manager and mentor and associate professor in UCF's Department of Mathematics.

"With majors in computer science, computer vision, computer engineering, data analytics, and statistics and data science, our students will be more than just users of AI, they will be on the road to becoming the creators of tools for AI," he says. "Each of our five majors are represented by faculty with strong records of research and mentoring in that field. They will guide students to opportunities, such as tutoring, research and internships, as well as organizing regular group gatherings."

STRONG-AI co-principal investigators include Niels da Vitoria Lobo, associate professor in UCF's CRCV and HanQin Cai, director of UCF's Data Science Lab and endowed assistant professor at UCF's Department of Statistics and Data Science.



VIRTUAL VISIONARY

Carolina Cruz-Neira inducted to National Center for Simulation Hall of Fame

BY BEL HUSTON

Carolina Cruz-Neira, Agere Chair Professor in the UCF Department of Computer Science, was honored by the National Center for Simulation (NCS) with her induction to its 2024 Hall of Fame, a testament to her groundbreaking work and global acclaim in modeling and simulation, virtual reality, interactive visualization, high-performance computing and digital twins.

She was one of three inductees this year, along with Daryl Holt, vice president and chief operating officer of Electronic Arts, and the late Navy Capt. Daniel Holsenback, former vice president of university relations and director of government relations at UCF.

"Their leadership and accomplishments in their different areas contribute to the growth of the modeling and simulation field and impact every industry sector," says George Cheros, NCS president and CEO, in a release.

The recognition marks the second time that Cruz-Neira has been honored for her research. She was also inducted into the inaugural Augmented World Expo XR Hall of Fame along with an elite group of 100 other inductees worldwide, representing just 22 researchers selected overall.

Cruz-Neira says the accolade from NCS is a tribute not only her research, but also an honor for the volume of work done in collaboration with the amazing people she has worked with over the years.

"I had incredible mentors when I was a student and a junior faculty who opened my eyes to the exciting world of modeling and simulation," she says. "Talented students, postdocs and collaborators inspired me, challenged me and encouraged me to strive for excellence, to address hard problems without fear, and to think differently about each problem we tackle."

A member of the National Academy of Engineering, Cruz-Neira is a pioneer in the areas of virtual reality and interactive visualization. She is internationally known for being the creator of the CAVE virtual reality system, which allows multiple people to have an immersive experience in the same space. Over her career, she has created and deployed a variety of technologies that have become standard tools in industry, government and academia.

Cruz-Neira's latest work involves a number of modeling and simulation projects for Florida companies, all contributing to innovative research in areas such as microelectronics, space and national security.

She says one of the research projects closest to her heart is the

UCF Knights Digital Twin, a strategic funding initiative developed to grow UCF's research capabilities in this rapidly emerging strategic discipline.

"Prior to coming to UCF, I was already developing a plan to create a research focus in this area for my previous institution, and coming to UCF made this vision a reality due to UCF's strong faculty and researchers in that area," says. "Together with [UCF Institute for Simulation and Training Director] Dr. Grace Bochenek, we developed the vision for UCF to become a national leader in digital twins and this vision is now growing fast."

They have made impressive inroads toward this goal, including receiving funding from the National Science Foundation, in collaboration with Osceola County to develop digital twins for the microelectronics industry.

In addition, she and UCF computer science Associate Professor Dirk Reiners have partnered with Miami-based company Buendea to create a digital twin of the surface of Mars. Their work will influence the design of the astronauts' suits for extravehicular activity missions, funded by a large award from NASA.

Locally, she's working with Orange County to create digital twins of beautiful places in virtual reality to reduce stress in first responders and other high-stress occupations.

"Pretty much all my projects involve modeling and simulation with an applied focus of a 'modeling and simulation for good' approach, which is grounded on my fundamental belief of applying my engineering knowledge to make the world a better place and improve the quality of life for all."



Damla Turgut Elected to IEEE CS Board of Governors

The Institute of Electrical and Electronics Engineers Computer Society (IEEE CS) has elected Professor Damla Turgut, the chair of the UCF Department of Computer Science, to its Board of Governors. She will serve a two-year term, playing a pivotal role in guiding strategy and direction for the organization that furthers the interests of its 375,000 members worldwide.

Turgut brings a wealth of valuable experience to the board, including serving back-to-back terms as the organization's chair for the technical community on computer communications (TCCC) since 2022. In addition to sponsoring a number of conferences focusing on computer networks and communication each year, TCCC fosters activities, facilitates information exchange, and encourages the development of systems that integrate communication capabilities with computing technologies.

"I am honored and humbled to be elected to the Board of Governors of the IEEE Computer Society. I look forward to contributing to the strategic decisions that shape the future of the society and its role in advancing technology," Turgut says. "I believe my experience as an academic researcher and department chair, as well as my roles in the TCCC and N2Women will be beneficial towards achieving the Computer Society's strategic plan."

Turgut's decision to take on a more senior role through board involvement was influenced by the highest of recommendations: those from her peers. She says several colleagues on the TCCC executive committee encouraged her to apply.

"I am well-positioned to support the engagement of more students and early-career professionals," says Turgut. "This has always been one of the central themes of my professional service activities. Furthermore, my current work aims to empower the volunteer base by promoting broader involvement in the society's activities."

PRIVACY PROTECTOR

Yogesh Rawat addresses privacy issues with advanced video monitoring software

BY BEL HUSTON

With video surveillance becoming more and more ubiquitous, Assistant Professor Yogesh Rawat, a researcher at the UCF Center for Research in Computer Vision (CRCV), is working to address privacy issues with advanced software installed on video cameras. His work is supported by $200,000 in funding from the U.S. National Science Foundation's Accelerating Research Translation (NSF ART) program.

"Automation allows us to watch a lot of footage, which is not possible by humans," Rawat says. "Surveillance is important for society, but there are always privacy concerns. This development will enable surveillance with privacy preservation."

His video monitoring software protects the privacy of those recorded by obscuring select elements, such as faces or clothing, both in recordings and in real time. Rawat explains that his software adds perturbations to the RGB pixels in the video feed – the red, green and blue colors of light – so that human eyes are unable to recognize them.

Since Rawat aims to have the technology available in edge devices, or devices that are not dependent on an outside server such as drones and public surveillance cameras, he and his team are also working on developing the technology so that it's fast enough to analyze the feed as it is received. This poses the additional challenge of developing algorithms that can process the data as quickly as possible, so that graphics processing units (GPUs) and central processing units (CPUs) can handle the workload of analyzing footage as it is captured.

To that end, his main considerations in implementing the software are speed and size.

"We want to do this very efficiently and very quickly in real time," Rawat says. "We don't want to wait for a year, a month or days. We also don't want to take a lot of computing power. We don't have a lot of computing power in very small GPUs or very small CPUs. We are not working with large computers there, but very small devices."

The funding from the NSF ART program will allow Rawat to identify potential users of the technology, including nursing homes, childcare centers and authorities using surveillance cameras.

His work builds on several previous projects spearheaded by other CRCV members, including founder Mubarak Shah and researcher Chen Chen, including extensive work that allows analysis of untrimmed security videos, training artificial intelligence models to operate on a smaller scale and a patent on software that allows for the detection of multiple actions, persons and objects of interest. Funding sources for these works include $3.9 million from the IARPA Biometric Recognition and Identification at Altitude and Range program, $2.8 million from Intelligence Advanced Research Projects Activity (IARPA) Deep Intermodal Video Analysis, and $475,000 from the U.S Combating Terrorism Technical Support Office.



RISING RANKINGS

UCF undegraduate engineering and computer science programs are among the top in the nation

BY MARISA RAMICCIO

The University of Central Florida continues to be recognized for its innovative education by *U.S. News and World Report*, which ranked its undergraduate engineering and computer science programs among the best in the nation.

UCF climbed 11 spots on the list of Best Undergraduate Engineering Schools to rank at No. 71. It also climbed 13 spots on the list of Best Undergraduate Computer Science Schools, with a ranking of No. 87. Among public universities, UCF ranks No. 41 for engineering education and No. 49 for computer science and ranks No. 2 in the state for both categories.

"We are proud of UCF's rise in national rankings for both engineering and computer science. This recognition highlights our faculty's dedication and our students' drive to innovate," says Professor Manoj Chopra, the college's associate dean for academic affairs. "It reaffirms our commitment to innovative education that prepares students to meet the challenges of tomorrow. Our commitment to cutting-edge research continues to drive us forward, and we are excited to see the impact our graduates will have on the world."

In addition to the high rankings in engineering and computer science education, UCF was ranked the Most Innovative University in Florida for the seventh year in a row. It ranks among the top five innovative universities in the nation.

The College of Engineering and Computer Science is fueled by a spirit of innovation, inventiveness and entrepreneurship. Earlier this year, two computer science undergraduate students, Noah Magill and Harrison Keating, were part of the winning team in the 2024 Joust New Venture Competition, a Shark Tank-style competition that allows students to pitch their ideas to a panel of judges.

Keating, who graduated with a Bachelor of Science in Information Technology last year, is also part of the six-time national champion Collegiate Cyber Defense Team. He says the continued success of this team and the reputation UCF computer science students have built factored into his decision to come to UCF.

As a high school student, Keating heard about the National Collegiate Cyber Defense Competition and checked out who the winners were.

"That is how I ended up at UCF," Keating told *Florida Trend* earlier this year.w

Several CECS undergraduates were recently selected for the prestigious SMART Scholarship offered by the Department of Defense, illustrating the strength of the university's engineering and computer science education. Students in the American Society of Civil Engineers brought home 12 awards for their ingenuity in various competitions at the 2024 Southeast Student Symposium, and a group of industrial engineering students won the 2024 Milwaukee Bucks Hackathon as the first team to represent UCF.

Matthew Alderman, the Hackathon's team captain, credits UCF's industrial engineering courses for the team's win. He has since graduated and now works for a local infrared optics and camera sensors company in Orlando and chose his major because it offered a miwx of creativity and entrepreneurship.

"It was the most business-oriented engineering degree I could find," Alderman says. "Seeing as we won a business analytics competition, it's super validating knowing the skillset I've learned over the years is definitely applicable to solving real-world problems."

> **"Our commitment to cutting-edge research continues to drive us forward, and we are excited to see the impact our graduates will have on the world.**
>
> — ASSOCIATE DEAN MANOJ CHOPRA

VISIONARY VENTURE

The nation's longest-running REU is UCF's Center for Research in Computer Vision

BY EDDY DURYEA

UCF's Research Experience for Undergraduates (REU) site, funded by the U.S. National Science Foundation, connects promising STEM students with established faculty, enhancing their in-class learning experience with research, workshops and events. UCF's Center for Research in Computer Vision (CRCV), led by director Mubarak Shah, has run the nation's longest continuous REU program for 37 years.

Students engage in a 10-to-12-week program and participate in workshops, labs and an individual research project that they may select from topics provided by corresponding mentors. Students then present their research to their cohort at the conclusion of the REU just before the start of the fall semester.

UCF's CRCV has hosted about 370 students since it was designated as an REU site 37 years ago and continues to guide undergraduates in the evolving field of computer vision, says Niels Lobo, associate professor of computer science and CRCV REU mentor.

"The nature of the REU has matured," he says. "The field has evolved, and what students are doing now in their projects is vastly different than what people would have done 10 to 20 years ago."

Lobo came to UCF 31 years ago and was encouraged to assist with REUs within the first year. Lobo has seen the composition of student applicants and participates becoming more varied during his time at the university.

"What we're seeing is that the student population applying for these research opportunities is exploding in numbers," he says. "That means that the overall experience of the cohort is going to be a little bit richer because everybody gets exposed to something different."

Computer vision is harnessing the power of technology to not just view things through a camera, but to understand them, Lobo says. Continually adapting to the constant evolution of the field while also considering computer vision's ethical implications are two components he is teaching students.

"Every two or three years, the field discovers something new," Lobo says. "In research, there are no study guides, so you need to go out and explore. That process of discovery is only accomplished through research."

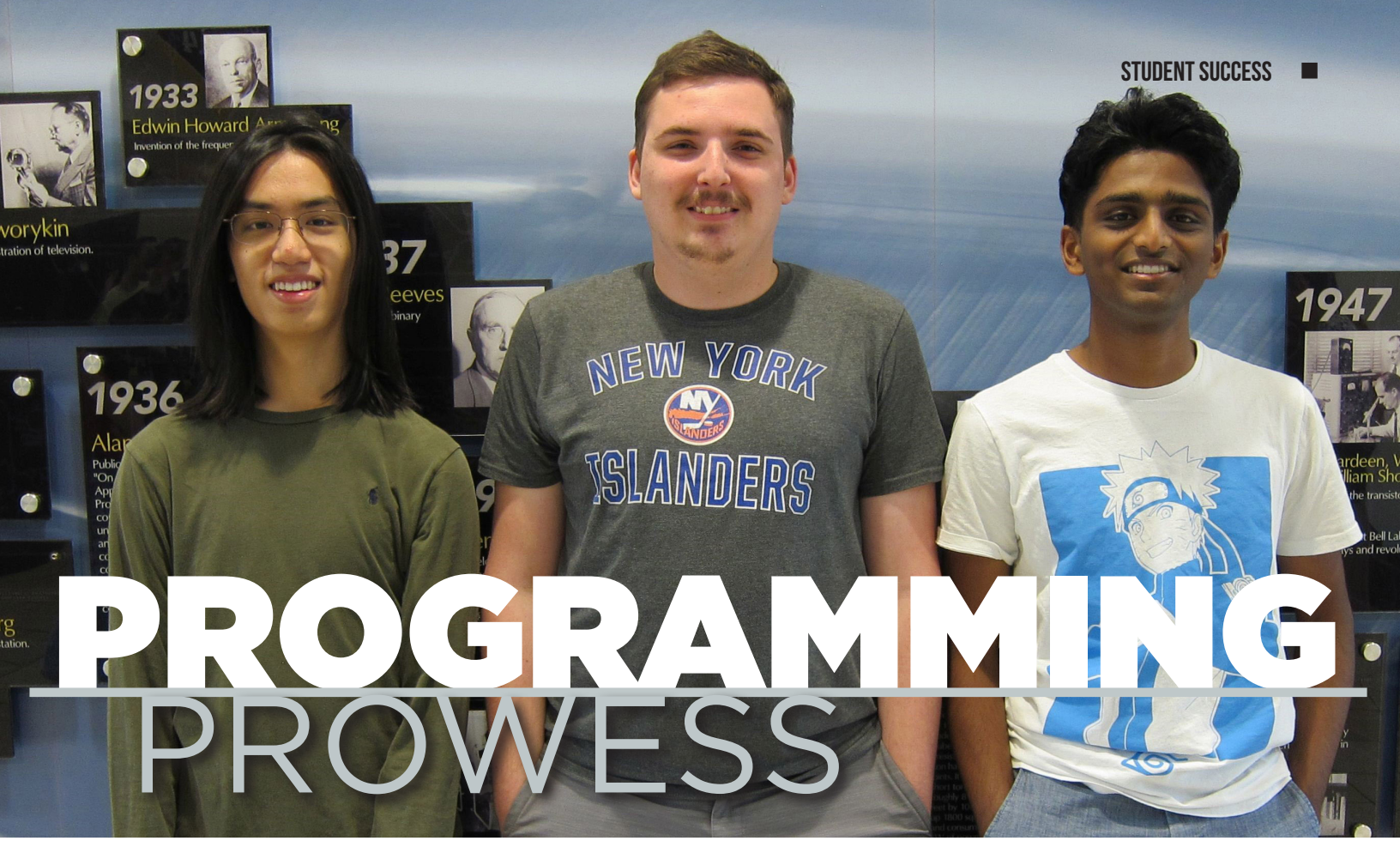
Claire Zhang, a junior studying applied mathematics-computer science at Brown University, was glad to have embarked on CRCV REU.

She previously conducted remote research, but she says the program at UCF provided her with a more immersive and shared experience.

Her project involved creating segmentation masks for solar cells to show their degradation in a quantitative way rather than the qualitative way of identifying degradation by darkened glass regions of cells. Zhang created and used a model that outlines the materials and can characterize how degraded the cells are.

"It was really nice meeting this community and coming to work together," Zhang says. "I imagined it being very independent, but I found that it was a lot more collaborative than I originally thought even though we all had our own independent projects."





PROGRAMMING PROWESS

UCF to compete for a spot at the ICPC World Finals

BY BEL HUSTON

The UCF Programming Team placed first at the 2024 Southeast Regional Programming Contest, besting more than 100 other teams. Their victory secures a spot at the North America Championship (NAC), which will be held in May 2025. Top teams from the NAC are invited to compete at the world finals.

UCF sent a total of seven teams to the competition, all with strong finishes. In addition to the first-place win, the other six teams placed third, fifth, sixth, 11th, 15th and 24th.

The winning team, "UCF OrElse," comprises mechanical engineering master's student Tyler Marks '24, mathematics master's student Andy Phan '21 '23MS and computer science undergraduate Sachin Sivakumar.

Not only did the trio finish at the top of the leaderboard for the regional ahead of teams from Georgia Institute of Technology and the University of Florida, they also came out on top in the larger North America South Division, placing ahead of teams from Johns Hopkins University, the University of Texas at Austin and Duke University.

UCF has placed in the Top 3 of the Southeast Regional — the qualifying competition for the national contest for universities in Florida, Georgia, South Carolina, Alabama and Mississippi — for the last 42 years, underscoring its dominance in competitive programming. Their impressive track record brings the same publicity and recognition as it does for other college sports, says Ali Orooji, UCF Programming Team's faculty advisor and coach.

"There is really no difference between programming competitions and other sports such as football and basketball," Orooji says. "Universities receive recognitions if they finish as the conference champion in football."

Marks says one of the keys to the team's success over the years lies in the strong sense of community among competitors and coaches.

"Despite the competitive nature of the regional contest, since we can only send one team to NAC, we all want to see the other teams do well and everyone is constantly teaching each other new ideas and discussing various problems and techniques they have seen," he says. "This open discourse allows for team members to continue to get stronger at problem solving and has been a huge factor in my growth as a competitive programmer."

Sivakumar says the strength of the programming team is one of the chief reasons he decided to attend UCF.

"I think that our school takes this competition a lot more seriously than other schools in that we have organization and structure both in our teams and the way that we train for the contests," he says. "One of the main reasons I decided to go to UCF over other colleges was due to the programming team and the environment surrounding it. I think this attitude is a feedback loop, since it draws in strong competitive programmers and also helps train up even stronger ones."



CYBER SAVANTS

Why cybersecurity students choose UCF

BY MARGOT WINICK

In a world increasingly defined by digital innovation, the demand for skilled cybersecurity professionals has never been greater. For students aspiring to become tomorrow's cybersecurity professionals, UCF stands out as the premier destination for learning, training — and winning. Home to one of the nation's most prestigious cybersecurity programs, UCF is not only fostering the next generation of cyber defenders but also consistently proving its excellence in national competitions.

Harrison Keating '24, who earned his bachelor's in computer science last May and is now a master's student in cyber security and privacy, won dozens of competitions for UCF. At the National Collegiate Cyber Defense Competition (NCCDC) last April, he served as team captain of a UCF team, which recently defeated nine other regional champions in the largest collegiate competition of its kind in the nation. The team won UCF's record sixth national championship in San Antonio and the Alamo Cup trophy in April last year.

"I had been interested in cybersecurity competitions for a long time," says Harrison, who is from St. Augustine, Florida. "When I learned about the NCCDC — the most prestigious cyber defense competition in the U.S. — I researched the past winners and saw UCF's history of dominance. I knew I wanted to go here and work with the best. Being geographically close to home helped too, but after visiting as a high schooler and attending several Hack@UCF club meetings, I was hooked. That active, passionate student community around cybersecurity is really what drew me in."

A Dynasty of Champions

UCF's cybersecurity program is not just about classroom learning — it's about real-world success and a dominant force in collegiate cyber sports.

The most recent victory, winning the NCCDC, often dubbed the "Super Bowl" of cybersecurity competitions, a record six times, further cemented UCF's status as a dynasty in the world of competitive cyber competitions.

Overall, UCF's Collegiate Cybersecurity Competition Team is the nation's best collegiate cybersecurity competition team, winning a total of 12 national championships since 2014.

The UCF Collegiate Cybersecurity Competition Team members are all members of larger Collegiate Cyber Defense Club (also known as Hack@UCF), which has grown exponentially as a club in the past few years. Club membership has nearly doubled over the past four years from 210 active student members in 2020 to a record 406 active members by the end of the 2023-24 school year. The 2024-25 school year is off to a great start with over 350 students joining the club within the first month of the school year.

"With our successful track record in the [NCCDC] and other cyber competitions over the years, it's an undeniable fact that UCF has the best cyber program, best students and best coaches in the nation," says Professor of Computer Science Tom Nedorost '02MS, who is head coach of the team.

The team's success is no accident. UCF's competitive edge stems from a comprehensive and hands-on approach to cybersecurity education. Students engage in complex scenarios that mimic real-life cyber threats, requiring them to protect networks and systems from simulated attacks. This immersive learning model sharpens their skills, prepares them for high-stakes situations and gives them a significant advantage when entering the workforce.

"Competing on UCF's cybersecurity team was probably the best decision I've made since joining UCF," says Matthew McKeever '24, who earned his bachelors in computer science and has also returned for a master's degree in cyber security and privacy, after interning at Microsoft security group, where a job offer has been extended for him to join.

"Competing has taught me topics and concepts you learn in class but … I would say that competitions are more valuable than the classes you take. Companies sometimes view competition experience as working experience," McKeever says.

UCF offers more than just an education — it provides a pathway to a successful and impactful career. With a winning tradition, cutting-edge curriculum and real-world training that industry recruiters notice, UCF stands out as the leader in cybersecurity education.



UCF Continues Winning Legacy at CyberForce

The UCF Collegiate Cyber Defense Competition Team has claimed another national title with a first-place finish at the 2024 U.S. Department of Energy (DOE) CyberForce Competition. The win marks UCF's fifth championship and fourth consecutive victory, with previous wins in 2018 and 2021-23.

The annual competition challenges competitors to protect a critical infrastructure against malicious cyber activity. Ninety-six teams representing 71 universities put their cybersecurity skills to the test by protecting a wind energy generation plant.

"CyberForce is the preeminent collegiate cyber defense competition during the fall semester," says team head coach and advisor Tom Nedorost. "It's big news that we've won it five times in the past nine years. No other team has won more than once."

The first-place team, A Team With a Dream, comprises cyber security and privacy master's student and team captain Harrison Keating '24, cyber security and privacy master's students Jeffrey DiVincent '23 and Matthew McKeever '24, computer science doctoral students Caitlin Whitehead '24MS and Cameron Whitehead '24MS, and senior computer science student Rodrigo Almeida Santos.

UCF's second team, the Citronauts, earned sixth place and a spot among the top 10 finishers in the competition. The team comprises junior political science student and team captain Noah Magill, junior computer science major Joseph Durand, senior computer science student Anthony Marrongelli, junior IT student Ardian Peach and sophomore computer science students Muhammad Ali and Miles Rack.

GOING PLACES

The university approved a total of 104 promotions and tenure for 2023-24

UCF faculty members across the university, including several from the College of Engineering and Computer Science, achieved significant career milestones in earning promotions and tenure for the 2023-24 cycle.

The 104 approved faculty — 63 for promotion, 40 for promotion and tenure and one for tenure — underwent a rigorous performance evaluation by peers, college and university leaders that took nearly an academic year.

The president and provost make final decisions on promotions following reviews and recommendations from individual colleges and units. The UCF Board of Trustees must approve tenure, which is a key factor in fulfilling UCF's strategic plan of becoming a preeminent state university, a national top 25 public institution and the world's leading public metropolitan research university. Aside from helping UCF recruit and retain exceptional faculty, tenure helps protect academic freedom and encourages faculty to focus on challenging and important problems to benefit society.

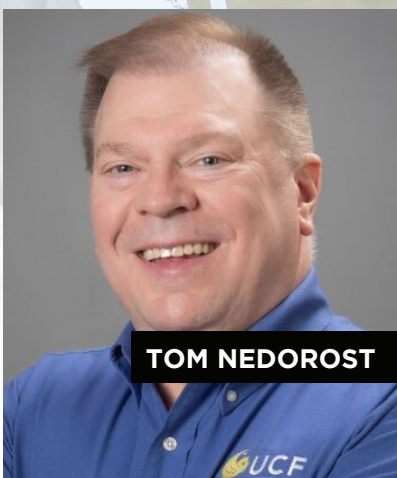
"These faculty members who earned promotion and tenure met a lofty and demanding bar in demonstrating excellence and high productivity over several years in teaching, research, and service," says Michael D. Johnson, UCF's provost and executive vice president for Academic Affairs. "I am confident this group will make a significant contribution to UCF's future success."

Within the Department of Computer Science, Damian Dechev and Annie Wu were promoted to professor. Paul Gazzillo and Chen Chen were promoted to associate professor with tenure. Tom Neodorost was promoted to senior instructor.


PAUL GAZZILLO


CHEN CHEN


DAMIAN DECHEV


TOM NEDOROST

NEW FACULTY

The UCF Department of Computer Science welcomes four faculty for 2024-25

The UCF College of Engineering and Computer Science has witnessed unprecedented faculty growth over the past few years and the spring 2025 semester is no exception.

Eleven additional faculty members, including one with a joint appointment, joined the college this semester, after 17 new hires in fall 2024. The increase in faculty is part of an initiative to hire 100 new faculty over three years. Close to 30 new faculty joined the college during the previous academic year and 18 new positions have already been posted for the 2025-26 academic year.

"We are thrilled to welcome 28 new faculty members to our college plus another 36 next year. Their diverse expertise and innovative approaches will undoubtedly drive our institution forward, fostering a vibrant academic environment," says Dean Michael Georgiopoulos. "These additions will enhance our research capabilities, enrich our curriculum, and inspire our students to reach new heights. Together, we are committed to pushing the boundaries of knowledge and making significant contributions to our fields."

The UCF Department of Computer Science welcomed one new faculty member in Fall 2024 and three new faculty members in Spring 2025.



AWRAD MOHAMMED ALI

LECTURER
PH.D: UNIVERSITY OF CENTRAL FLORIDA
RESEARCH AND TEACHING AREAS:
MACHINE LEARNING, ARTIFICIAL INTELLIGENCE, DATA MINING, NATURAL LANGUAGE PROCESSING, PREDICTIVE ANALYTICS



EDWARD AMORUSO

LECTURER
PH.D: UNIVERSITY OF CENTRAL FLORIDA
RESEARCH AND TEACHING INTERESTS:
CYBER ARTIFICIAL INTELLIGENCE, IN-DEPTH MALWARE ANALYSIS AND COMPREHENSIVE DIGITAL FORENSICS



SANTU KARMAKER

ASSISTANT PROFESSOR
PH.D: UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN
RESEARCH AND TEACHING INTERESTS:
NATURAL LANGUAGE PROCESSING, INFORMATION RETRIEVAL, MACHINE LEARNING, ARTIFICIAL INTELLIGENCE, DATA SCIENCE



YANCY PAREDES

LECTURER
PH.D: ARIZONA STATE UNIVERSITY
RESEARCH AND TEACHING AREAS:
LEARNING ANALYTICS, EDUCATIONAL DATA MINING, EDUCATIONAL TECHNOLOGY, PROGRAMMING LEARNING



Undergraduate Researcher Presents Work in Italy

An impressive finish on a computer vision conference challenge has paved the way for a computer science student's first trip overseas.

Tina Tran, an accelerated bachelor's to master's student and undergraduate researcher at the Center for Research in Computer Vision (CRCV), earned a trip to Milan to present her research courtesy of CRCV founder and director Mubarak Shah. Shah generously offered the prize as motivation to pursue and complete a workshop challenge sponsored by Google DeepMind at the European Conference on Computer Vision.

It was a whirlwind experience for Tran, who presented her research to an international audience at the conference for the first time.

"Poster sessions, oral presentations and demos were happening parallel, so it was very overwhelming," she says. "I was able to learn about the cutting-edge research happening in the field and what researchers all over the world are doing. "What I enjoyed the most was the atmosphere. It was exciting, inspiring, and motivated me to continue pursuing research."

CS Student Awarded 2024 DoD SMART Scholarship

Receiving paid tuition, annual stipends, an internship and guaranteed employment after graduation sounds like a dream come true to any college student. But for several UCF students, that dream is about to become a reality.

Ten Knights were selected for the 2024 Department of Defense (DoD) Science, Mathematics and Research for Transformation (SMART) Scholarship, an educational and workforce opportunity available to undergraduate and graduate students pursuing STEM degrees.

Jordyn Stinson, who's pursuing a Bachelor of Science in information technology, is one of this year's scholarship recipients and plans to become a cyber analyst and researcher. Now in her senior year, she's already lined up a job with the DoD.

"My favorite part of the cybersecurity field has always been finding the clues that lead up to a cyber-attack, and by pursuing a career as an analyst I'll be able to search for these traces firsthand and stay up to date on any trends that may be related to the cause of potential cyberattacks," she says.





Ph.D. Student Lands Tenured Faculty Role

It's not uncommon for new graduates to hit the pavement, degree in hand, in search of a new job. That's not the case for Tiffany Do. The computer science doctoral student not only has a job waiting for her, but a coveted one that many in academia aspire to for many years before it is offered. Do will be a tenure-track assistant professor of computer science in the College of Computing and Informatics at Drexel University in Philadelphia this fall.

When she joined UCF in Spring 2020 to pursue her Ph.D., she was motivated by a quality that unites all engineers: curiosity.

"I went for a Ph.D. because I had way too many questions and not nearly enough answers," she says.

Do's research areas — human-centered artificial intelligence (AI), augmented reality, virtual reality and virtual avatars — give her many opportunities to not only seek out answers, but to develop innovative solutions.

"My research explores the potential of AI to personalize experiences, emphasizing the importance of unique identities and perspectives," she says. "AI has the power to tailor systems to meet the specific needs of each user. I envision a virtual world where personalized computing enables everyone to reach their maximum potential."

Students Selected for Summer Language Program

Although English has become the world's de facto lingua franca, college students across the U.S. are increasingly discovering the benefits of language learning and the many opportunities it provides.

This was certainly true for Jacqueline Zamitalo and Alex Nash, two UCF students who were selected this summer for prestigious language programs with the U.S. Department of State.

Nash, a senior, was a 2024 participant of the Critical Language Scholarship (CLS) Program, which partners with universities and nonprofits around the world to provide American students with an opportunity to gain language and cultural skills that enable them to contribute to U.S. economic competitiveness and national security.

Zamitalo attended CLS Spark, which provides virtual lessons facilitated by native speakers at a host institution abroad to undergraduate students with limited experience in three of the critical languages: Russian, Chinese and Arabic.

FIRST-RATE FELLOW

Data scientist Mohammad Arifur Rahman serves the National Institutes of Health

BY BEL HUSTON

A UCF computer science alumnus who earned a master's degree as a student-veteran has been selected for a prestigious fellowship.

Mohammad Arifur Rahman '21MS was selected for the U.S. Digital Corps fellowship, a program that gives early-career technology professionals the opportunity to serve the federal government. Seventy fellows were chosen from more than 2,000 applications for the third cohort of the program to serve 19 different federal agencies.

For the next two years, Rahman will serve as a data scientist for the National Institutes of Health working on the Science Collaborative for Health Disparities and Artificial Intelligence Bias Reduction (ScHARe) initiative. ScHARe, a cloud-based platform, was developed to give equal access to research opportunities in big data by increasing underrepresented populations in data science and cloud computing. The initiative is led by the National Institute on Minority Health and Health Disparities in collaboration with the National Institute of Nursing Research.

"My goal is to enhance the ScHARe platform to make it a more accessible and impactful resource for researchers addressing and health disparities," Rahman says. "By applying advanced data science techniques, I hope to uncover meaningful insights that inform public health policies and drive initiatives to reduce health inequities."



Rahman began his career in the U.S. Army as an orthopedic technician and clinic supervisor. When he was driven to further develop his problem solving and leadership skills, he chose UCF for its reputation as a veteran-friendly institution and nationally recognized STEM programs.

"As a veteran transitioning to a civilian career, I appreciated UCF's supportive environment and resources for veterans, which made the university an ideal choice," he says. "The Master of Science in Data Analytics program particularly stood out for its rigorous curriculum and focus on practical applications in areas like machine learning, data visualization, and statistical analysis."

The wealth of experience he gained in the military and in the civilian world, combined with his UCF graduate education, makes for a perfect fit for his role at the National Institutes of Health.

"I hope my journey inspires fellow Knights and veterans to explore the U.S. Digital Corps program and other opportunities within the federal government, where they can apply their unique experiences and perspectives to drive real change."

FINTECH PHENOM

Recent fintech graduate Nathan Wilk heads to Microsoft

BY MARK SCHLUEB

As a master's in fintech student, Nathan Kurelo Wilk '22 is graduating with plenty of experience to set him up for success as a software engineer with Microsoft, where he'll focus on artificial intelligence (AI) innovation.

"This role provides an excellent chance to continue working on cutting-edge projects, contribute to advancements in the tech industry … and develop innovative solutions that can benefit people," Wilk says.

The experiences that have helped him secure a job after graduation include:

- Co-founding a fintech business, Expand Financial LLC, to provide financial literacy support and integration of AI
- A fellowship with Meta
- Speaking at a Board of Governors meeting about the opportunities available at the university and the economic benefit UCF's talent pipeline provides to the state
- Traveling to New York with College of Business Dean Paul Jarley and business students meeting with the college's corporate partners

During high school, the native of Brazil moved to the U.S. in 2017 — a decision that he found both challenging and exciting.

"I had to dedicate extra time to catch up on standardized exams, classes and the language, all while getting involved with new extracurricular activities and planning for college applications," Wilk says. "When I started my bachelor's in computer science at UCF in the fall of 2019, the transition felt much smoother. I knew that success depended on my engagement and making the most of the opportunities that came my way."

Wilk continued to take advantage of as many opportunities as he could when he began his master's studies in fintech at UCF, which is offered through the colleges of Business, and Engineering and Computer Science. Launched in Fall 2022, the program is the first of its kind in Florida and teaches students how to harness the power of data, technology solutions, and financial services to reduce costs, improve customer experience, and create economies of scale.

"UCF has been incredibly supportive throughout my journey. The variety of resources available in entrepreneurship, professional development and networking helped me grow," Wilk says. "One of the standout aspects of UCF is how accessible the faculty are when it comes to exploring opportunities beyond the classroom."





CHARMED LIFE

UCF undergraduates' entrepreneurial venture ToolCharm sold to leading fintech company

BY ROBERT STEPHENS

How's this for a business lesson on bootstrapping? Two acquaintances from middle school reconnect in college — during a freshman orientation on Zoom, to be exact. A few weeks into their first semester they pull out a mothballed idea they believe might provide "a little magic" to help companies easily integrate their software. Over the next three years, these two computer science majors with little business background survive the "let's quit" crossroad multiple times. They win a few competitions to generate financing. Together, they put in 3,000 hours and a grand total of $1,000 of their own money to develop this artificial intelligence (AI)-driven system they call ToolCharm. Their magical moment happens late one night when their technology finally works the way they once imagined: seamlessly and within milliseconds.

"A magic potion that no one else has," they say, "and we created it!"

Four months later these UCF students and Burnett Honors Scholars, Mark Bruckert and Owen Burns, agree to sell ToolCharm to a leading fintech company, OneEthos, for a large confidential sum. To the best of anyone's recollection, they're the first student team to initiate a startup in UCF's Blackstone Launchpad and sell it prior to graduating.

"We took a gamble on ourselves," Bruckert says, "and it's safe to say we made a good return on our investment."

Burns and Bruckert will earn their diplomas this spring and summer, respectively, yet they're already looking back on their entrepreneurial steps with gratitude. None of this would have happened if Bruckert hadn't stored away dozens of big ideas, or if Burns had enrolled at another university, or if the two of them hadn't found each other early their freshman year at UCF, or if there were no Blackstone Launchpad conveniently located in UCF's Student Union.

Bruckert and Burns certainly wouldn't be the subject of a success story if they'd succumbed to repeated temptations to give up.

"Everything we've accomplished traces back from UCF to our upbringing," Burns says. "We were both instilled with a mindset to focus on wins whenever we're down and to refuse to fail."

> **"Everything we've accomplished traces back from UCF to our upbringing. We were both instilled with a mindset to focus on wins whenever we're down and to refuse to fail.**
>
> — OWEN BURNS

The culmination of this story is OneEthos purchasing ToolCharm and hiring Bruckert and Burns to work as research and development engineers. But there's more to the triumph than a straightforward agreement. The two say their own values align with OneEthos, which plans to use ToolCharm to make fintech more accessible for smaller banking institutions and millions of people.

"We feel like we'll be helping institutions like Bailey Building and Loans in It's A Wonderful Life, Burns says. "It fits everything we stand for."



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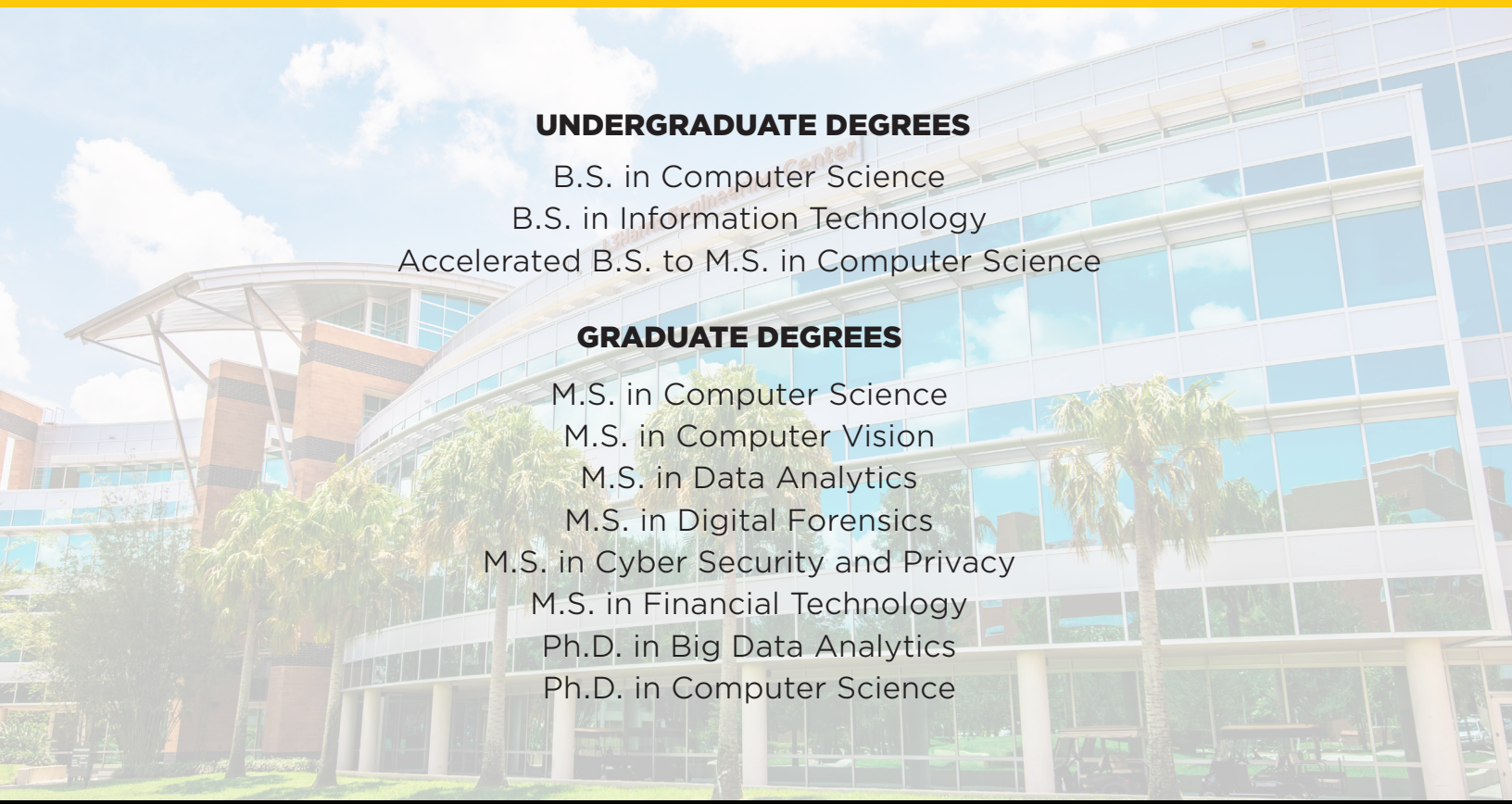

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