

# CHARGE

UCF Department of Electrical and Computer Engineering  
Orlando, Florida | Volume 3 | 2024-2025



UCF

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**Electrical and  
Computer Engineering**

UNIVERSITY OF CENTRAL FLORIDA



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*Charged* is an annual publication that highlights the achievements of the students, faculty, staff and alumni from the University of Central Florida's Department of Electrical and Computer Engineering

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# Letter From the Chair

Dear Friends and Colleagues,

Welcome to the 2025 edition of *Charged*, the magazine of UCF's Department of Electrical and Computer Engineering!

The department has been through a wonderfully momentous year. From research that includes leading-edge developments in artificial intelligence to accolades like NSF CAREER awards, we have had much to celebrate.

Innovation lies at the heart of all we do, as you will see in the pages of our latest issue. In fact, our faculty researchers were granted nine patents this year, demonstrating our department's strong commitment to cultivating this innovation and translating those ideas into technologies that make a difference.

The department's exponential growth continues with three new ECE members — a lecturer, an assistant professor, and the college's first-ever professor of practice, who joined in Fall 2025. We are well on our way to meeting our five-year-plan goal of 50% growth in the number of faculty members. Over the past three years, more than two dozen faculty have joined our ranks, strengthening our research portfolio in areas such as artificial intelligence, space technologies, semiconductors and renewable energy.

We are grateful to have strong industry partners that create incredible opportunities for our students, providing generous scholarships and enabling hands-on research experiences that open doors to impactful careers. The

continued support and collaboration from companies like AMD, Northrup Grumman, Lockheed Martin, Intel and Texas Instruments have been integral to our department's many successes. Read on to learn more about these successes. You will see why I'm so proud to serve such a brilliant group of students and faculty. They continue to amaze me each day with their imaginative intellect and unrelenting commitment to excellence. I hope you enjoy this issue of our magazine.

Go Knights! Charge On!

**Reza Abdolvand, Ph.D.**  
**Chair, UCF Department of Electrical and Computer Engineering**

## Industry Advisory Board

Industry involvement is essential to the success of the UCF Department of Electrical and Computer Engineering's educational and research mission. The Industrial Advisory Board builds partnerships between our researchers and companies that have a strategic interest in electrical and computer engineering development.

We are grateful for the continued support of these dedicated board members, who help ensure that ECE's research and educational efforts address the needs and challenges of the industry, while supporting and enhancing our infrastructure, students, curriculum and research:

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Lend your time and talent to our industry advisory board. Contact Reza Abdolvand for more information at [reza.abdolvand@ucf.edu](mailto:reza.abdolvand@ucf.edu).

# NEW ADDITIONS



**SAIKAT  
DEY**

**Assistant Professor**

Dey's research focuses on the design, modeling and optimization of power electronic converters and the use of semiconductors in efficient power conversion solutions. He earned his doctoral degree from Arizona State University and previously worked as a power electronic design engineer for Tagore Technology, which is currently part of GlobalFoundries.



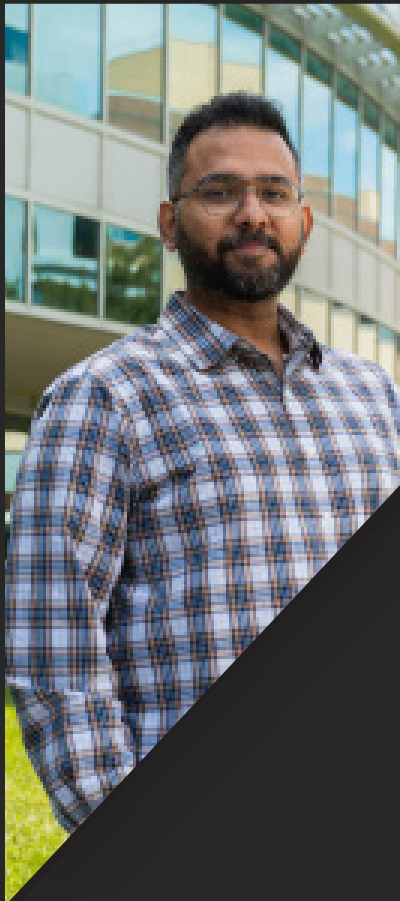
## ECE Department Hires Three New Faculty Members

As the technology industry grows each year, so does the need for experts who create innovations that fuel this sector and educate the workforce that powers it. With this demand in mind, UCF's College of Engineering and Computer Science (CECS) has broken a hiring record with a total of 39 new faculty members joining the college's seven departments in Fall 2025. Three of those faculty members were hired for the Department of Electrical and Computer Engineering. Learn more about them below.

### CHRISTOPHER IANNELLO

#### Professor of Practice

Prior to joining UCF, Iannello served as NASA's longest-tenured Technical Fellow for electrical/power, acting as the agency's senior-most authority on spacecraft and launch vehicle electrical systems. At UCF, he will collaborate with other faculty to develop critical space sector service and test capabilities at UCF, foster new collaborations to advance space exploration and student education, and work with the power electronics research faculty in the department.

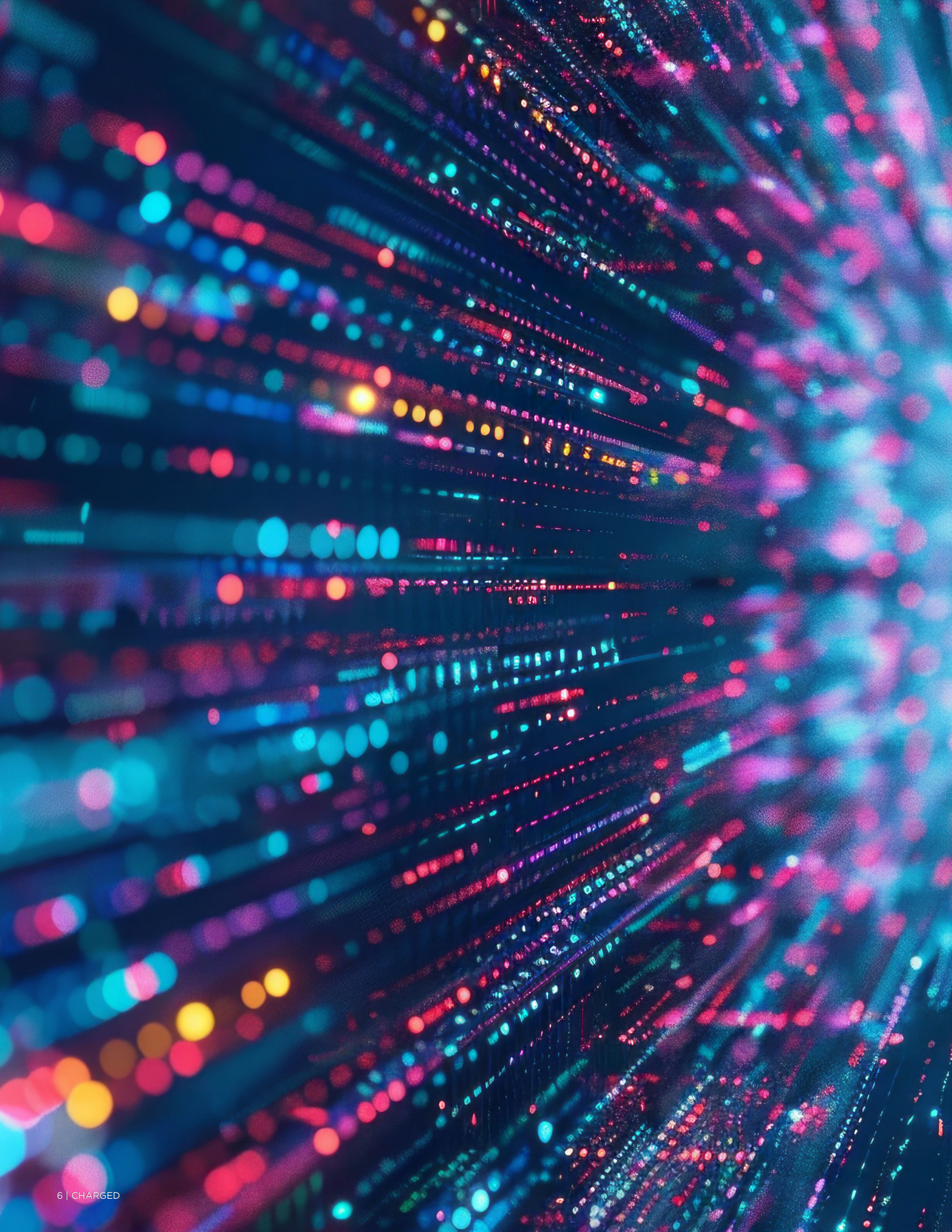


### SREERAM SUNDARESH

#### Lecturer

Sundaresh returns to his alma mater this fall, having earned his master's degree and doctoral degree in electrical engineering from UCF. He previously worked at Intel Corporation, focusing on the development of etch stop materials. His expertise lies in semiconductor processing, thin film deposition and material characterization with proficiency in techniques such as photolithography, radio frequency sputtering, plasma deposition and electrical transport measurements.

Learn more about our faculty:  
[bit.ly/3lpVESb](https://bit.ly/3lpVESb)



# AI FOR ALL

## Computer Engineering Researcher Investigates Economic and Environmental Challenges of AI

**T**he use of an artificial intelligence (AI) foundation model like ChatGPT may be free for the end user, but it doesn't come without an economic or environmental cost. One run of an AI model can cost up to \$500,000 on the cloud and produce emissions that equate to the burning of more than 11,400 pounds of coal.

This demand for higher computational resources can make AI challenging for individuals and small businesses, particularly in low- to middle-income countries, to access.

Professor of Computer Engineering Jun Wang plans to address the efficiency and scalability of foundation models with a \$600,000 grant from the U.S. National Science Foundation.

"Foundation models are transforming industries from healthcare to education to creative works," Wang says. "But the problem is, they are extremely expensive to run. You need a cluster of very powerful graphics processing units (GPUs) and a lot of electricity. That creates [challenges] for small businesses, nonprofits or universities.

Over the next three years, Wang and his team will tackle different obstacles that reduce the efficiency and speed of AI. First, they will identify any informational bottlenecks that cause running AI models to move around data that they don't need, which wastes time and energy.

They'll also investigate the scheduling inefficiencies of AI protocols. AI models perform speculative execution, which means they think ahead to save time, but they don't organize tasks well or always prioritize correctly.

Finally, Wang and his team will also strive to speed up start times and communication with the GPUs that help AI models run. With this three-pronged approach to their research, Wang says his team can improve the effectiveness of AI.

"To reduce the cost and make AI run efficiently and effectively, think of a running AI model like a factory," Wang says. "You have different teams, machines, workers and logistics, and all of them have to be coordinated. So in AI, those teams are the software algorithm and the hardware components like the

GPUs and the operating systems. It just means coordinating across all of them and designing the algorithm and the system together so they work in harmony from the start."

Through the support of NSF, Wang and his team will work with the University of Illinois Champaign to build a large GPU cluster and access an AI supercomputer to conduct their experiments.

Wang says they're also working with industry giants like Microsoft, Google, Oracle and Amazon to integrate their proposed AI solutions into their products.

"There's a lot of exciting things to do in terms of how to make good use of AI, but it's still expensive for everybody to use and not everybody can afford AI's computational resources," Wang says. "By processing the AI models to be faster and more efficient, we reduce the cost and the energy and ultimately allow more people to benefit from the use of AI. And it's not just about performance and program execution time, it is actually about access."

*Written by Marisa Ramiccio.*

Learn more about Wang:  
[bit.ly/4279uzo](https://bit.ly/4279uzo).





**TRUONG NGHIEM**

**“Composite Physics-Informed Learning of Dynamics Systems”**

**A**ssociate Professor Truong Nghiem’s research focuses on developing new methods that blend machine learning with physical principles to improve complex systems such as autonomous vehicles, smart buildings and industrial automation systems.

His CAREER project, which he transferred from his previous university, directly supports his efforts and broadens the scope of his machine learning research.

“This research aims to create a composite physics-informed machine learning (CPIML) framework,” Nghiem says. “Physics-informed machine learning (PIML) embeds the laws of physics into the learning process, leading to models that are more accurate, physically consistent and interpretable compared to traditional machine learning approaches. CPIML takes this a step further by enabling the composition of both physics-based models and PIML components — along with their physical properties — to model more complex, large-scale systems.”



**HAO ZHENG**

**“A Scalable, Polymorphic, and Efficient Architecture for Irregular and Sparse Computations (APEX)”**

**T**he emergence of artificial intelligence (AI) and machine learning, while transformative, has created new challenges for today’s computing hardware.

Assistant Professor Hao Zheng says he’s determined to navigate these challenges and arrive at solutions. His NSF CAREER project, much like his research, focuses on how to enhance the performance, energy efficiency and utility of chip processors to support the evolving landscape of AI workloads.

“My research lies in the area of computer architecture and machine learning,” Zheng says. “I aim to design versatile chip processors that can greatly speed up machine learning applications with significantly reduced power consumption.”



**CHINWENDU ENYIOHA**

**“Limited-Communication Control of Teams of Autonomous Systems”**

**S**uccessful communication between devices comes down to efficient computing, particularly for autonomous systems. For a group of autonomous devices working together to make coordinated decisions, the need for fast and accurate transmissions is essential.

Assistant Professor Chinwendu Enyioha is working to develop efficient communication techniques for distributed computation.

“Cyber-physical systems including are becoming more commonplace,” Enyioha says. “For example, as more smart, intelligent devices are connected to data networks, the communication resources become constrained. Since communication bandwidth is a finite resource, I am fascinated by how we can effectively manage it, while making connected systems work at scale.”

Learn more about our faculty:  
[bit.ly/47mHpWG](https://bit.ly/47mHpWG).



# EMPOWERED TO SERVE

## Alumna Nicole Parker Aims to Create Sustainable Electrical Systems With Global Powerhouse Siemens

**N**icole Parker crossed the stage at UCF's Fall 2024 commencement ceremony poised to make the world a better place by developing more efficient renewable energy sources, integrating renewable energy into the grid and making existing power systems more efficient and reliable.

Parker graduated this past year with a bachelor's degree in electrical engineering and is working for global energy technology leader Siemens. As a power protection and automation engineer she will have the opportunity to design and implement innovative power protection and automation solutions for evolving power systems, paving the way for the integration of clean energy and smart technologies.

Parker says she was inspired to enter the field by her passion for protecting the environment and motivated by the promising growth in the renewable energy industry.

"I want to contribute to the creation of more sustainable, reliable

and efficient power systems," she says. "I love being outside and contributing to environmental advocacy, so I decided that I would combine my passions and focus on electric power systems."

### Gaining Skills Through Hands-on Experiences

Parker says UCF has been instrumental in preparing her for her career, sharing that her internships and jobs offered at the Society of Women Engineers conferences were made possible with support from UCF. In addition, an introduction from her academic advisor connected her to a recruiter at Siemens to help her land her future job.

"My professors and advisors have set me up for success through their continual support," Parker says. "I have learned important skills in my classes and have had teachers that were eager to help me achieve my goals."

At UCF, she was able to gain hands-on experience with technology used in the industry as a member of the Siemens Digital Grid Lab, led by Department of Electrical and Computer Engineering Associate Professor Wei Sun.

The lab, an in-kind gift from Siemens in 2017, is used as part of the curriculum in upper-level electrical engineering classes and serves as an active research lab. The facility gives students and researchers the opportunity to use real-time digital simulations of power grids and prototype microgrid systems. The lab also enables users to incorporate renewable energy sources and design and operate self-healing grids that are less vulnerable to cyberattacks and natural disasters, including damage from hurricanes.

### Winning Top Honors

Parker recently demonstrated her skills as a future electrical engineer

through her senior design project, Cyber Smart Home Integrated Environment for Learning and Defense (CYBER SHIELD). Complete with a mini replica that emulated a real smart home powered by solar, she and her teammates developed a novel educational tool that provided an engaging, interactive experience in demonstrating how smart power systems work. The project also featured a cyberattack detection algorithm to help show vulnerabilities in the power grid and potential ways to mitigate these risks.

CYBER SHIELD won the coveted Best in Show award of the Fall 2024 Senior Design Showcase, awarded to the top overall project among all engineering disciplines.

"I am beyond thankful that I was a part of such an impactful project with the most amazing team," Parker says. "CYBER SHIELD turned out even better than I could have ever imagined thanks to the hard work and dedication of each team member. It is amazing to think that this project will continue to educate students in the lab long after we have graduated. We made sure to hang a picture of the team, or our CYBER SHIELD family, in the house to preserve the great memories."

### Making the Most of Her College Journey

Outside the classroom, Parker showed her commitment to the energy sector through her involvement with the Institute of Electrical and Electronics Engineers Power and Energy Society (IEEE PES), serving as its vice president. She has been recognized for her service and stellar academic record by being awarded two scholarships from the IEEE PES Scholarship Plus Initiative.

When it came time to choose a college, UCF's highly rated electrical engineering program was a key factor in her decision.

"I chose to attend UCF because it is a leader in STEM education," says Parker. "I have wanted to be an engineer since I was in fifth grade, and I saw that UCF had one of the best electrical engineering programs in the state."

As she looks back on her time at UCF, her fondest memories involve enjoying UCF's beautiful campus, underscoring her appreciation for nature and her drive to create sustainable solutions by working in the power industry.

"I have so many fond memories walking with my friends in the UCF Arboretum, playing guitar by Lake Claire, and watching the beautiful Florida sunsets through the trees on the trails," she says.

### Finding Success After Graduation

Parker will have the opportunity to share her passion for the environment well beyond Florida as she embarks on an international adventure after commencement, sharing her expertise halfway around the world before starting her position with Siemens in North Carolina next June.

"I will be volunteering in the Philippines, Thailand and Spain," she says. "In each place, I will be working on projects focused on environmental initiatives and conservation."

Although her new adventures will take her many miles away from UCF, her heart will forever remain with Knight Nation.

"I would like to say thank you to all of the amazing professors at UCF who have gone above and beyond to help students succeed," Parker says. "I have had some of the best teachers of my life here at UCF. I will never forget the time and effort my professors spent on helping me learn and accomplish my dreams."

*Written by Bel Huston  
Photos by Audrey Martini*



Learn more about Parker:  
[bit.ly/3JLXqhe](https://bit.ly/3JLXqhe).



## ECE Alumna Honored with UCF 30 Under 30 Award

Electrical engineering alumna Megan Driggers '19 '22MS has been selected for one of UCF's most elite recognitions: the 30 Under 30 Award. Honored for their outstanding achievements in their careers and ongoing dedication to their alma mater, these awardees represent the best and brightest of UCF.

"I'm so grateful for the people and programs at UCF that believed in me from the very beginning," Driggers says. "This recognition is not just about my personal journey, but about all the mentors, classmates and professors who helped shape it."

Driggers serves the U.S. Navy as the head of the Devices, Sensors and Materials Research and Development Branch at the Naval Undersea Warfare Center (NUWC) Division in Newport, Rhode Island. With a team of 30 researchers and a \$10 million portfolio, she leads her team's work on the Navy's undersea capabilities, advancing sensing and defense technologies.

Coming from a military family, Driggers has the utmost respect and admiration for the men and women who serve our country. She says that her unwavering dedication to her work comes from the motivation to give warfighters the technology they need to be safe and effective in their missions.

"I often work hand-in-hand with operators so I can best understand their needs," she says. "I continue to be inspired everyday by seeing the direct impact, reflecting on my family's military service, and knowing that I am working to keep our country safe through novel research and development."



# ROBOTIC ALLIES

## Professor Earns \$600K Grant to Develop Intelligent Assistive Robotics

**F**or people with upper extremity disabilities — such as a stroke, multiple sclerosis or other conditions — assistive robotics can help restore their independence in performing everyday tasks like eating, grooming and grasping objects. But much like old dogs, these devices have a hard time learning new tricks.

“They need a lot of demos to learn new tasks, and people with disabilities aren’t able to provide these demos,” says Professor Aman Behal, an assistive robotics expert at UCF. “If they can, they might not be the best demos for the robot to learn from.”

Behal aims to address this challenge with his new research project, Mobile Robot Manipulators for Learning and Executing Instrumental Activities of Daily Living. The project is supported through a three-year, \$600,000 grant from the National Institute on Disability, Independent Living and Rehabilitation Research.

Currently, mobile assistive robotics can be mounted to the side of a wheelchair or can trail behind the

individual, ready to assist when needed. These devices allow users to navigate their homes or travel to places like an office or local park, offering greater flexibility than stationary fixed-base robotics.

While the dexterity of these robots allows them to assist with complex tasks like brushing hair or cutting a piece of steak, they can be difficult for the user to control or teach. Assistive robots perform tasks better over time by mimicking the user, but in these situations, the user may not be able to complete the task correctly — or at all.

Behal and his team of researchers, including Clinical Associate Professor of Physical Therapy Morris Beato, and Professor of Statistics and Data Science Edgard Maboudou, will create intelligent and mobile robotic assistants that offer easier control and a better robot-human interface.

The project’s first year will focus on research and development, while the second and third years will incorporate testing and user feedback. Initial testing will be conducted with students, followed by

studies involving adults with upper body paralysis.

“We will recruit adults between the ages of 18 and 65, bring them (into our lab) and essentially get the robots to do several tasks,” Behal says. “At the end of it, we’ll see how easy it was to interact with the robot.”

The researchers will survey the participants to find out how many times they had to tell the robot to perform a task, how long it took for the robot to complete the action, how many mistakes were made and how satisfied they were with the robot’s assistance.

The end goal is to develop smart robots that can give the user a greater degree of independence, leading to increased self-esteem and enhanced quality of life.

*Written by Marisa Ramiccio*

Learn more about Behal and his research: [bit.ly/42LhoPd](https://bit.ly/42LhoPd).

**P**egasus Professors Issa Batarseh and Ronald DeMara have been recognized for their contributions to the field of engineering with prestigious industry honors from the Institute of Electrical and Electronics Engineers (IEEE).

Batarseh has been named the recipient of the 2025 IEEE Medal for Environmental and Safety Technologies while DeMara has been elevated to the rank of IEEE Fellow. Both professors are tenured within the Department of Electrical and Computer Engineering.

### Medal of Honor

The IEEE Medal for Environmental and Safety Technologies is awarded to an individual or team of up to three members that has made significant impact in the areas of intelligent transportation systems, wireless communications, sensor networks control and control and automation, computing and signal processing.

Batarseh was recognized for his outstanding accomplishments in the application of technology that can improve the environment or public safety. His citation reads: "For pioneering contributions to the advancement of renewable energy systems through significant improvement in the overall energy efficiency of microinverters."

"I am deeply honored to receive the 2025 IEEE Medal for Environmental and Safety Technologies, an acknowledgment that underscores the impact of our work on renewable energy systems and the environment," Batarseh says. "This recognition is not just a personal achievement but a testament to the collaborative efforts of the talented colleagues and students I have had the privilege to work with over the years. At a time when sustainable solutions are critically needed, I am humbled to see our contributions recognized at this level, reaffirming the importance of innovation in shaping a better future for humanity."

As a recipient of the IEEE Medal for Environmental and Safety Technologies, which is sponsored by Toyota, Batarseh received a bronze medal, certificate and a \$20,000 award. He was presented with the award during the IEEE Vision, Innovation and Challenges Summit and Honors Ceremony at the Hilton Odaiba in Tokyo earlier this year.



# TECH HONORS

## Industry Organization Honors UCF Faculty for Their Contributions to Technology

In his 33-year career with UCF, Batarseh has served in prominent leadership positions within the College of Engineering and Computer Science, and established the Florida Power Electronics Center, which has garnered more than \$20 million in research funding since 1998.

His research focuses on power electronics with a specific focal point on advanced solar energy conversion systems that can save time and money. He's a fellow of the American Association for the Advancement of Science and IEEE.

### A Hard-Working Fellow

Batarseh is now joined among the ranks of IEEE fellows by his colleague, DeMara. IEEE recognizes DeMara for his contributions to runtime reconfigurable computing and resilient datapath design.

IEEE fellows are selected through a rigorous screening process and less than 0.1% of voting members are selected for this honor.

"IEEE Fellows are selected by their professional peers to have demonstrated exceptional technical accomplishments, including the

innovation of novel design concepts," DeMara says. "Moreover, those advancements were brought into practice via electronic products that contributed tangible benefits for humanity and society as a whole."

DeMara joined UCF in 1993. He teaches courses in computer architecture, computer organization, evolvable hardware and parallel processing. Over the years, he has served as the computer engineering program coordinator, the founding director of the Evaluation and Proficiency Center and an iSTEM Fellow. He has garnered more than \$6 million in research funding, obtained nearly \$600,000 in lab equipment, and received several university and industry awards for his teaching and research.

*Written by Marisa Ramiccio*

Learn more about our faculty:  
[bit.ly/47mHpWG](https://bit.ly/47mHpWG).



# Building an Industry Pipeline

## ECE Department Hosts Semiconductor Manufacturing Workshop to Develop Industry Workforce

**T**he UCF Department of Electrical and Computer Engineering recently hosted an event that offered engineering students and educators the unique opportunity of creating the building block of all modern electronics: a semiconductor.

Funded by industry partner Intel, the Semiconductor Manufacturing and Advances in Recent Technologies (SMART) Workshop, now in its second year, was developed to address a widespread gap in semiconductor manufacturing training. The two-week intensive workshop is just one element of the department's ongoing semiconductor workforce development program, says organizer and lab manager Avra Kundu.

"Such efforts will provide us with the means to attract top talent enabling our industrial partners to

have direct access to a sustainable pipeline of well-prepared talent," he says.

### Training the Next Generation

SMART 2025 offered an introduction into semiconductor fabrication training, geared toward novice users, to expose them to deposition, etching, lithography and characterization systems.

Attendees also had access to sophisticated equipment at UCF's cleanrooms, giving participants hands-on experiences they may not encounter until well into their careers, including plasma making, micromachining and packaging dyes.

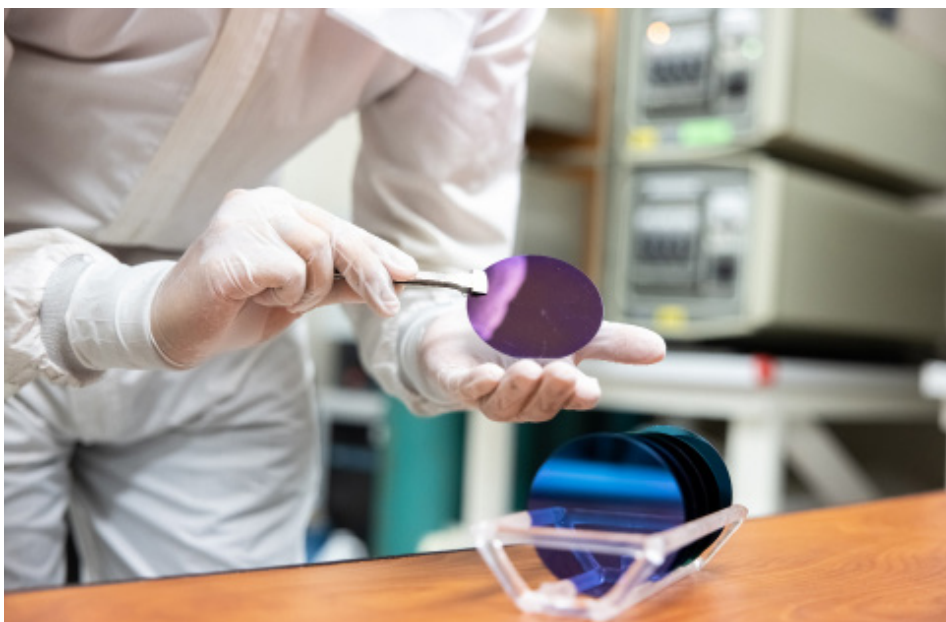
The workshop culminated with an incredibly rare experience: creating a semiconductor device. Using all they learned over the two-week period,

attendees used the equipment in the cleanroom to fabricate their own device, a Schottky diode, then packaged it and measured its current-voltage characteristics.

"The hands-on experience was enjoyed by all attendees," Kundu says. "Getting to hold a silicon wafer, building something from the scratch, and to see it working for the first time gives unparalleled joy."

### A Unique Experience Backed by Industry Giants

UCF's semiconductor workshop is unique in many ways. Kundu says that while other universities offer this type of training, their content tends to be more fundamental than applied. The SMART workshop strikes the ideal balance, offering a wealth of information and hands-on experience



in just a two-week period. For students, this experience and introduction to the fabrication of semiconductors prepares them to work in the field.

Department Chair Reza Abdolvand says that their collaborations with leading companies such as Intel and Texas Instruments helps them build a workforce pipeline from UCF to industry.

"These companies sponsor training programs like SMART and support hands-on experiences in our UCF cleanroom," Abdolvand says. "In return, our students, who gain real-world skills through workshops and paid cleanroom positions, become prime candidates for internships and full-time roles with our partners."

It also boasts an interdisciplinary team of researchers, an aspect Kundu says is fundamental for any successful semiconductor training effort.

"As systems get more complex, it requires more knowledge to understand and solve it," Kundu says. "Without the participation and synergistic collaboration of different branches, no good solution is possible anymore. In this workshop we focused on mainly semiconductor manufacturing, and its present state-of-art is only made possible by decades of interdisciplinary research and development."

The workshop also provided valuable experience for student leaders familiar with the semiconductor fabrication process. Electrical engineering juniors Cade Woods and Sydney Hayes, who both plan to pursue careers in semiconductor manufacturing and design, used the skills

they've gained from working in the cleanrooms to lead presentations and demonstrations during SMART 2025.

"I participated in the SMART workshop, where I was responsible for demonstrating the use of [chip manufacturing software], photoresist spinning, lithography and the wet etching portion of the program," Hayes says. "I believe the most valuable aspect of the workshop was the laboratory demonstrations, as they allowed participants to see how the information learned in the lectures applies to real-world situations."

Woods says that the workshop showed participants a different sector of the electrical engineering field, sharing career options they may not have considered otherwise.

"I found this experience has played an important role in shaping my future career plans," Woods says. The workshop allowed me to assess what I truly know and learn from other co-ops about the different machinery and processes to increase my understanding through teaching and collaboration with the participants."

*Written by Bel Huston  
Photos by Antoine Hart*

Watch the video of the SMART workshop: [bit.ly/4hoySXS](https://bit.ly/4hoySXS).



## Graduate Teaching Assistants Awarded at ECE Banquet

It takes a special person to take on the role of graduate teaching assistant (GTA). This year, the department is honoring two members of our talented group of GTAs, based on votes from the audience that matters the most: the students.

This year's awardees, engineering master's students Chinmay Dhanraj Nehate and Binh Pham, were recognized at the ECE department's awards luncheon this past spring. Each received a plaque to commemorate the honor, as well as a cash award.

Both recipients agree that one of the most gratifying aspects of being a GTA is seeing that their students have successfully grasped the lesson at hand.

"In the Introduction to Robotics lab course, the most rewarding part is watching a student go from 'it won't move' to a working robot," Nehate says. "When it finally runs, you can see the concept click and their confidence lift. Those small breakthroughs are why I love this role."

Pham says past and present students continue to stay in touch to share how they've progressed in their academic and professional careers.

"The most rewarding aspect of my TA experience is to witness my fellow students' learning progress and growth, as many have achieved more from my class than just participating in it," he says. "I have had many students reach out and express their gratitude and tell me stories about their experiences on their future endeavors, which I'm incredibly proud of. And I hope many more students can get the same experience."



# Going Full Throttle

## Student-built Racecar Finishes in Top 10 at Grand Prix

**A** student-built racecar that started off as a senior design project has exceeded all expectations with a Top 10 finish at the Roboracer Autonomous Grand Prix Competition, held at the Institute of Electrical and Electronics Engineers International Conference on Robotics and Automation (ICRA).

The 1/10 scale, autonomous vehicle was built by computer engineering graduate Israel Charles '25, along with his fellow senior design team members: computer engineering graduate Asa Daboh '25, computer science graduate Owen Burns '25, electrical engineering graduate Casey Jack '25, and mechanical engineering graduate Tevin Mukudi '25.

"Together, we saw this project not just as a class requirement but as a chance to do something that aligns with UCF's culture of innovation, and to make a mark in a field we're passionate about," Charles says. "I decided early on that I wanted our team to not only build one of these vehicles but also aim to qualify for the competition."

Simply qualifying for the ICRA event, the team's original goal, was an

incredible win. Their car had to adhere to a strict set of specifications to be approved for the race, including those for the overall size of the car, chassis configuration, computational power requirements and the limitations of its sensors.

"This project was an incredible learning experience that pushed us far beyond the boundaries of the classroom," Charles says. "One of the biggest takeaways was realizing how crucial interdisciplinary collaboration is. The mechanical design, electrical systems and software all had to integrate seamlessly to bring the car to life."

To race the vehicle, the team developed algorithms that would allow the car to perceive the track and avoid colliding into other vehicles, all while putting the pedal to the medal to earn a qualifying time that would allow them to participate.

They not only qualified for the race but also placed ninth overall out of a field of 25. Charles says he is especially proud of their achievement since they entered the competition as undergraduates and many of the other competitors were graduate students.

"Competing live showed us not only how much we had grown but also gave us a global perspective on where we stand in this rapidly advancing field," he says. "It was both humbling and motivating to see our work alongside teams from some of the world's top universities."

Charles came to UCF after learning it was ranked one of the nation's most innovative and fastest-growing universities, and located along Florida's high-tech corridor.

"I wanted to be part of a university that doesn't just keep pace with changes, but also leads them to make sure that I would graduate with cutting-edge knowledge and skills," he says. "I knew I would be provided with access to major engineering companies and industry leaders, and incredible opportunities for internships, networking and real-world experience."

*Written by Bel Huston*

To read the full story on the ICRA autonomous vehicle, visit [bit.ly/4pC8Ofk](https://bit.ly/4pC8Ofk).

# GOOD THINKING

## Undergraduate Student Wins Award for First Project on Neural Networks

**W**riting your first academic paper is an accomplishment in itself. Getting it accepted by a conference is a remarkable achievement. Writing your first paper, getting it accepted and winning a best paper award for your efforts is truly something to celebrate. That's exactly what computer engineering senior Devon Lister was able to do for his work on a novel style of neural networks designed to mimic human thinking.

Lister won the Amar Mukherjee Best Paper Award from the IEEE Computer Society Annual Symposium on Very Large Scale Integration (ISVLSI) for his work, "Catwalk: Unary Top-K for Efficient Ramp-No-Leak Neuron Design for Temporal Neural Networks."

"The award was unexpected and absolutely a joy to receive," he says. "My first paper getting accepted was already a treat, and then winning the best paper award was just not on my radar."

Lister is a computer engineering transfer student who joined UCF in 2022. Though he had worked on various projects for the UCF Baja Team, designed and built his own keyboard and worked on his own reverse engineering projects, research was an area he had yet to experience before taking on this paper.

"I had no idea what research entailed, as this was my first paper, and I wanted to try out academia," he says. "I also wanted something more

complicated than what my classes offered since I am a very project-heavy person."

Assistant Professor Di Wu, director of the U.N.A.R.Y. Lab, which stands for Unary, Neuromorphic, Approximate, Reconfigurable and Yet More Computing, encouraged Lister to research optimization techniques placed within neural networks, and later submit the work to ISVLSI.

"The human brain is a masterpiece of mother nature with extremely high efficiency and intelligence," Wu says. "Our work moves one step towards the efficiency of the biological neuron, which subsequently allows more neurons towards the intelligence of the brain."

With graduation just around the corner in Spring 2026, Lister has been attending workshops to work on his resume in preparation for his upcoming interviews. He says he plans to continue his work in hardware design both personally and professionally.

"I remain positive that once I graduate, that I can nail the interview because I can demonstrate my skills and knowledge once I get the chance."

*Written by Bel Huston*

To read the full story on Lister's Best Paper Award, visit [bit.ly/4nDojSs](https://bit.ly/4nDojSs).

# The Future of Teaching

## Department Establishes Future Faculty Laureates Program to Prepare Students for Careers in Academia

In an effort to prepare doctoral students for careers in academia, the Department of Electrical and Computer Engineering has launched the Future Faculty Laureates Program. The goal is to recognize and prepare engineering students interested in careers at Research 1 academic institutions, which are considered very high activity by the Carnegie Classification of Institutions of Higher Education.

The inaugural group of selected laureates includes computer engineering doctoral students Paul Amoruso '21 '23MS and Fangzhou Ye, and electrical engineering doctoral students Mohammed Hossein Akyash and Zubaidah Al-Mashdani.

As Future Faculty Laureates, these students have access to advanced opportunities that include the chance to teach courses, mentor undergraduate students, publish in academic journals, present at STEM conferences and draft research proposals. They can also participate in biweekly seminars at UCF and other universities, and receive a small discretionary budget for conference travel and professional development.

Al-Mashhdani says the program provides a unique and invaluable opportunity for doctoral students who aim to become professors.

"The program is an exceptional resource to prepare for academic roles, something that isn't typically addressed through formal training for graduate students," Al-Mashhdani says. "I see this as an incredible chance to learn from experienced faculty, gain insight from their expertise, and grow both personally and professionally."

Amoruso says he is also grateful

for the opportunity to hone his teaching skills, which he began to develop as a teaching assistant in his master's program.

"When I started working as a teaching assistant, I discovered a new passion for teaching others," Amoruso says. "One of the most rewarding aspects of teaching is the profound sense of satisfaction I feel when I successfully explain a seemingly complex problem or concept, and then watch as students grasp and understand it with clarity and confidence."

The Future Faculty Laureates Program was developed by professors Ron DeMara and Azadeh Vosoughi to address the gap in STEM curricula for students who want to become faculty members.

Students can be nominated for the program by their dissertation advisor through a formal submission process. Applicants are reviewed by the department's development committee and the graduate coordinator for final selection by the department chair.

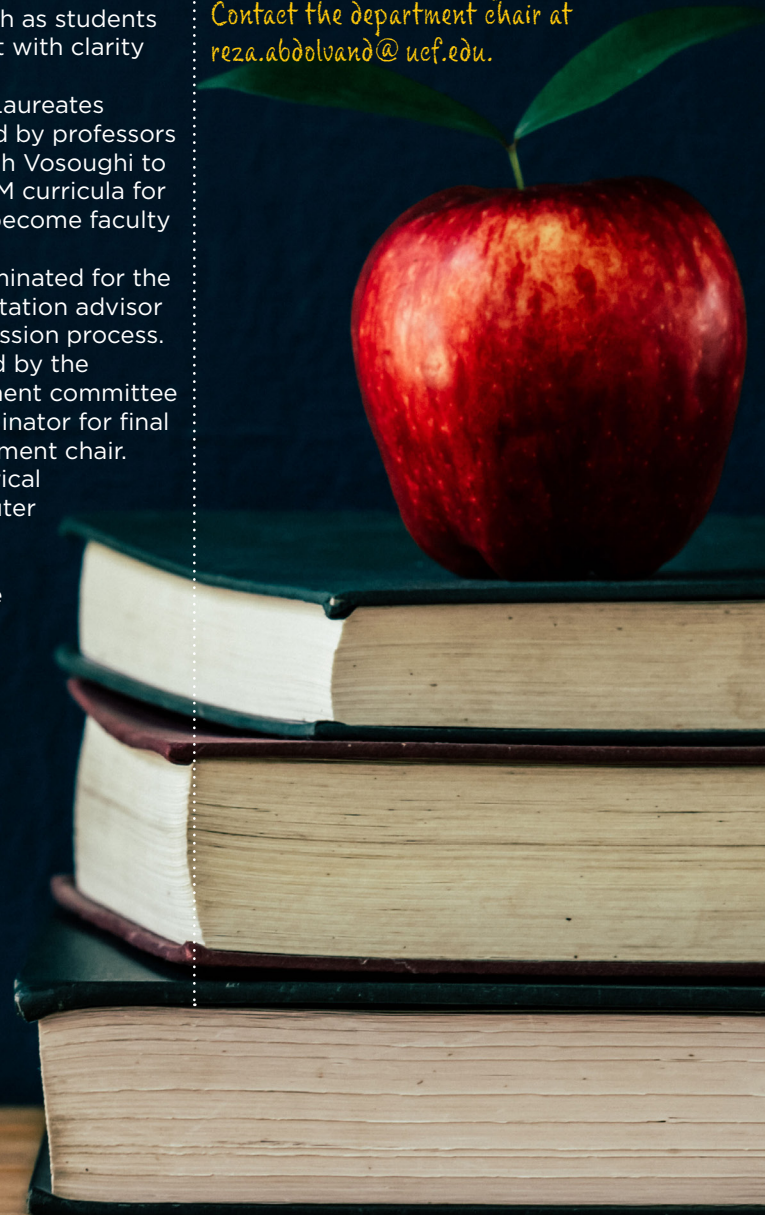
Although UCF electrical engineering and computer engineering doctoral students are the only students eligible for the program right now, the department does hope to expand it to multiple STEM disciplines and other universities in the future.


"There's been a longstanding gap in STEM programs nationally to train future faculty, including great teachers and mentors, beyond attaining technical

research aptitudes inherent in every doctoral program," DeMara says. "So we've launched ways to make that interwoven with their degree program, rather than a glimpse in the month before graduation or as an afterthought."

*Written by Marisa Ramiccio*

*Interested in participating?  
Contact the department chair at  
[reza.abdolvand@ucf.edu](mailto:reza.abdolvand@ucf.edu).*



A portrait of Professor Issa Batarseh, a middle-aged man with dark hair, smiling. He is wearing a dark suit jacket, a light blue dress shirt, and a red tie with a small white pattern. The background is a blurred outdoor scene with greenery and a white architectural element.

# Where Innovation Meets Inspiration

## Pegasus Professor Issa Batarseh Joins National Academy of Inventors Ambassadors Program

**P**egasus Professor of Electrical Engineering Issa Batarseh has been invited to join the Invention Ambassadors Program sponsored by the National Academy of Inventors (NAI) and the U.S. Patent Trademark Office. This prestigious program is open to fellows and honorary members of NAI as well as innovators at NAI member institutions. The goal is to showcase accomplished inventors across a wide range of fields with the intention of building a culture of inclusive innovation and inspiring young creators.

"I am deeply honored to serve as an Invention Ambassador for the National Academy of Inventors on behalf of UCF," Batarseh says. "I strongly believe that innovation holds the power to solve major challenges and become globally competitive, and I am excited to share my experiences and insights with the next generation of innovators. By promoting a culture of inclusive innovation, we can inspire young minds to not only envision the future but actively build it. It is a privilege to serve my community."

Batarseh is one of 17 ambassadors

who are deployed to speak at a variety of engagements for students, STEM professionals and educators, and other stakeholders within private organizations. The group includes professionals and academics from organizations such as the University of Georgia, the Mayo Clinic and Georgetown University.

The electrical and computer engineering professor joined UCF in 1991 and has served in several prominent positions within the College of Engineering and Computer Science since then. He served as the associate dean for graduate affairs and the director of the School of Electrical Engineering and Computer Science before the unit split into two separate departments.

Batarseh established the Florida Power Electronics Center at UCF in 1998 with an initial grant from the U.S. National Science Foundation. To date, the center has garnered more than \$20 million in funding and has received several awards from national and international organizations.

His research in power electronics focuses on the development of

advanced solar energy conversion systems that can save time and money and improve power density and performance. He's been granted 39 patents for his work and has been cited more than 17,900 times, with an h-index (a scholarly measure of productivity) of 64. He's supervised 45 doctoral students and also founded two startup companies engaged in solar energy conversion: Advanced Power Electronics Corporation and Petra Systems.

Batarseh was named an NAI Fellow in 2016 and was inducted into the Florida Inventors Hall of Fame in 2017. He's also a Fellow of the American Association for the Advancement of Science and the Institute of Electrical and Electronics Engineers.

*Written by Marisa Ramiccio*

**Read about Batarseh's other  
achievements:  
[bit.ly/42ELKts](http://bit.ly/42ELKts).**



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Ph.D. in Electrical  
Engineering



Students work in the clean  
room facilities at UCF.