

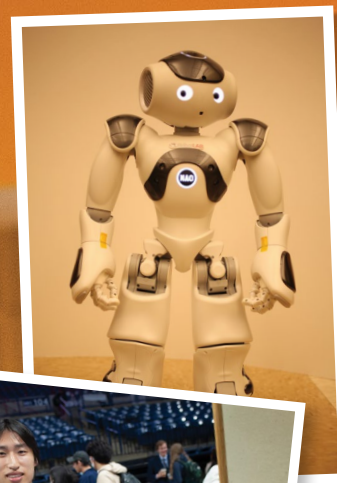
ECE

ELECTRICAL & COMPUTER ENGINEERING

UConn

COLLEGE OF ENGINEERING

Fall 2024



Robotics Research Labs

Working to Benefit Humans Safely, Efficiently

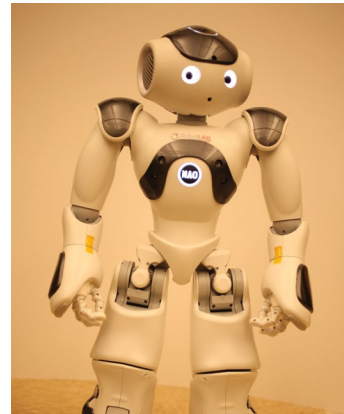
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FALL 2024

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ON THE COVER

Robots can assist humans in many different applications, from underwater exploration (center) to drones and bots that can navigate dynamic environments or work in manufacturing, or bots just for fun (inset photos). Read more about UConn's various work with robotics in this issue.

Story on page 10.

UConn

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ENGINEERING

This newsletter is published for the alumni, faculty, students, corporate sponsors, and friends of the Department of Electrical & Computer Engineering at the University of Connecticut. Comments are always welcome.

Please send correspondence and address corrections to the address below or email john.chandy@uconn.edu.

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The creative efforts of the College of Engineering staff members Brandy Ciraldo, Chris LaRosa, and Claire Tremont are gratefully acknowledged.



MESSAGE FROM THE DEPARTMENT HEAD



I am pleased to share with you the Fall 2024 edition of our newsletter. The data below summarizes the ECE Department activities during the past year. However, numbers never tell the full picture of a department, and the following pages highlight some recent student, alumni, and faculty success stories. Our faculty and students continue to conduct world-class research in all aspects of electrical engineering. We continue to see growth in our undergraduate program and our incoming freshman class is projected to be over 100 students across all three majors (Electrical, Computer, and Robotics). This is our largest freshman class in recent memory.

As always, every year brings change – two of our faculty, John Ayers and Eric Donkor, retired after 30+ years in the department. Check out the short articles talking about their contributions over the years. Also, Kazem Kazerounian stepped down as the dean of the College of Engineering after 12 years and his impact on the college and the department will be sorely missed. We are looking forward to the new leadership of Dean JC Zhao who comes to us from the University of Maryland.

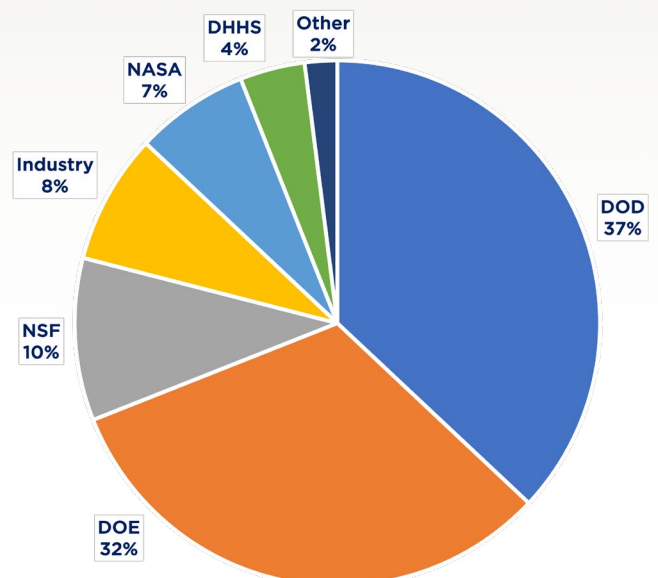
If you would like more information about any item in the newsletter or about our research and educational programs, please send me a note at john.chandy@uconn.edu. Also, check our website www.ee.uconn.edu for the latest news about the department.

JOHN CHANDY
Professor and Head

2023-2024 SUMMARY

185	Peer-Reviewed Publications
\$7.9M	Research Expenditures
14.3K	Citations
26	Tenured-Tenure Track Faculty
373	Undergraduate Students
56	BSE Degrees Granted
118	Graduate Students
17	Ph.D. Degrees Granted

2023-2024 RESEARCH EXPENDITURES



SENIOR DESIGN DEMONSTRATION DAY 2024 WINNERS

Senior Design Demonstration Day was held at Gampel Pavilion on April 26, 2024. The ECE department had 25 teams sponsored by 12 various companies, with a total of 61 students participating. The teams selected as the top projects last year were the following:

1st Place

TEAM 2415 JOINT WITH ME

Robotic Perception Sensor Characterization Platform

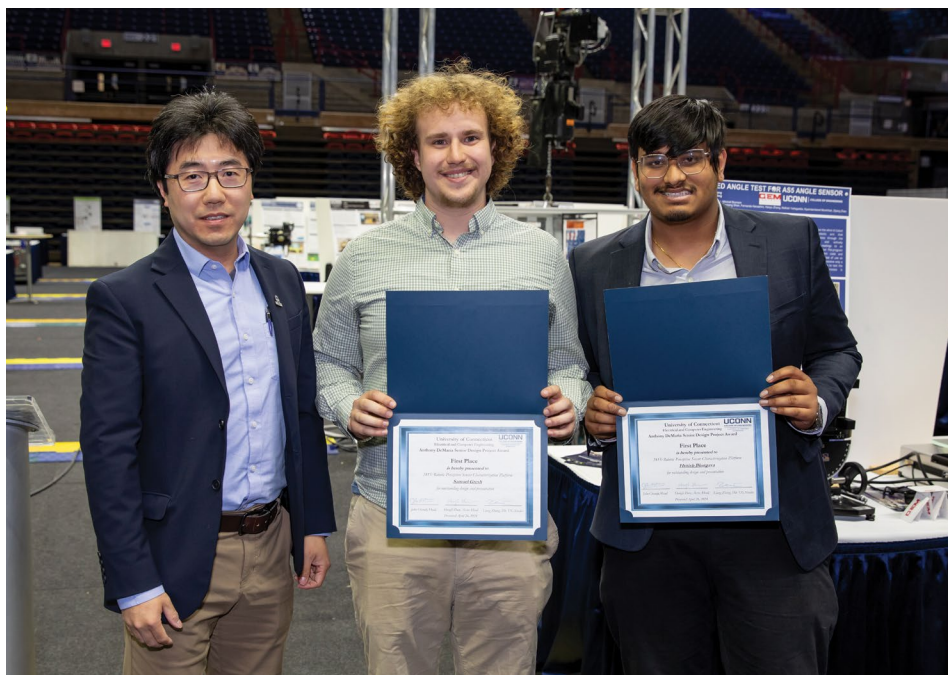
Sponsor: Draper

ECE Advisor, Shan Zuo

Team Members: Samuel Gresh (CMPE), Hritish Bhargava (EPhysics)

Unmanned Aerial Vehicles (UAVs), often referred to as drones, have revolutionized various industries. The problem addressed in this project involved developing a reliable UAV capable of carrying different combinations of sensors while supplying a variety of different power and communications interfaces for potential sensor integration. Upon completion of the project, the team created such a small UAS multirotor that would allow for the rapid integration and changing of different sensors including Electro-Optical and Infrared cameras, various COTS IMU assemblies, LIDAR, radar, etc. The vehicle is designed to be equipped with a small single board computer capable of flying with seven pounds of sensors for more than 15 minutes. The platform also has a universal mechanical mounting interface located in several positions around the vehicle and would expose multiple communications interfaces for sensors so that sensors could be easily changed in the field.

This team also attended the sponsor's internal Annual Research Symposium. Their poster and drone were fan favorites! Not only did the students win 2nd prize in a contest of technical merit, they also were voted #1 in a people's choice ballot out of 67 projects.



Left to right: award presenter Liang Zhang, Samuel Gresh, Hritish Bhargava

2nd Place

TEAM 2402

AFRL SDR University Challenge:

Physical Layer Network Slicing

Sponsor: UConn ECE

Team Members: Spencer Albano (EE), Matt Silverman (EE), Nicholas Wycoff (EE)



Left to right: Matthew Silverman, Spencer Albano, and Nicholas Wycoff

3rd Place

TEAM 2420

Automated Angle Table for AS5

Sponsor: OEM Controls

Team Members: Mitchell Bronson (EE), Alexander Recouper (CMPE)



Left to right: Alexander Recouper, Mitchell Bronson

FACULTY NEWS

Prof. **Peter Willett** began serving as a program manager at the Strategic Technologies Office of the Defense Advanced Research Projects Agency (DARPA). The office's mission is to develop technology to give national security leaders "trusted, disruptive capabilities ... across the



spectrum of competition, from deterrence to high-end peer combat." Prof. Willett will retain his position at UConn, but will be primarily located in the DC area for the next few years.

Prof. Willett teaches various topics like signal processing, information theory and communications, however his research focuses on applications to national defense: detection, classification, target tracking, etc.

For his research to have stronger value, he felt he needed to see what the real problems are, and to be able to look "behind the curtain."

In his words – "I truly want to help my country, if I can. Like many of us, I'm an immigrant – from Canada in my case. I appreciate all the opportunities this wonderful land has offered me, and I'd like to do my part to help it."

DEPARTMENT RANKINGS

The UConn ECE Department is ranked 35th nationally in the 2024 Research.com ranking of top universities in the field of Electronics and Electrical Engineering. ScholarGPS ranked UConn ECE #132 world-wide and #56 in the US. Here are a few more rankings from our prestigious faculty and department.

95

YAAKOV
BAR-SHALOM
RANKED GLOBALLY
IN ECE

55

BAHRAM JAVIDI
RANKED GLOBALLY
IN ECE

20

KRISHNA PATTIPATI
IN CYBERNETICS

1

YAAKOV
BAR-SHALOM
IN SENSOR FUSION

2

BAHRAM JAVIDI
IN DIGITAL IMAGING

6

BAHRAM JAVIDI
IN OPTICAL
ENGINEERING

5

BAHRAM JAVIDI
IN 3D
RECONSTRUCTION

2

SHENGLI ZHOU
IN UNDERWATER
ACOUSTICS

9

JUNBO ZHAO
IN STATE OBSERVER

8

PETER WILLETT
IN UNDERWATER
ACOUSTICS



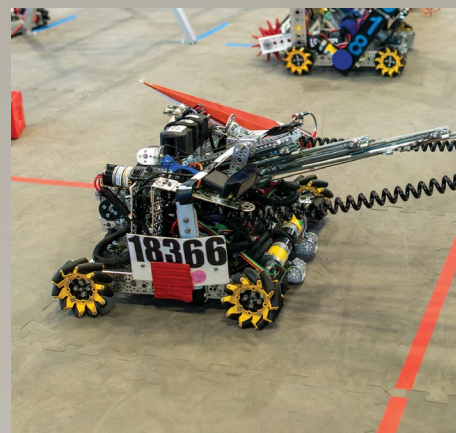
ROBOTICS

CAMPUS EVENTS

Above: The second **Husky Robotics Invitational** robotics competition took place in June 2024 on the UConn Campus. HRI is a First Tech Challenge competition co-sponsored by ECE and FTC Team 16008, The Armored Artemises.



Above and right: ECE hosted a **Precollege Robotics Program** in Summer 2024 where students constructed and programmed robots for several experiments, including object avoidance.



Above and left: UConn **FIRST** club hosted the First Tech Challenge State Championships in February 2024, which involved the best 24 FTC Teams in Connecticut coming together to compete for a shot at participating in the New England Championships.

Photos courtesy of Evan Sayles Photography www.evansayles.com

STUDENT CLUBS



Above: **FROST Robotics** club was founded in 2021, and their goal has been to offer all UConn students the opportunity to build robots and learn valuable skills like CAD, electronics, machining, and software design. They compete at bot battles regularly. This year FROST was awarded a \$2,500 grant from Automated Building Systems, Inc.

Some current projects include:

- Custom 6 DOF robotic arm
- Tombstone-like horizontal spinner combat robot
- Flamethrower combat robot
- Meltybrain translational drift combat robot

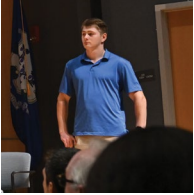


At left: **IEEE-HKN** has provided weekly tutoring sessions for undergraduate courses in EE, CMPE, and CS. IEEE-HKN collaborated with the MITRE Corporation to offer an Embedded Security Workshop for undergrads. This year, eight dedicated undergraduates were inducted as new members of the IEEE-HKN Beta Omega Chapter.

UNDERGRADUATE NEWS



Malik Francis (CMPE '25) was selected as a McNair Scholar and was also a competitor at the 2023 Clean Energy Summit.



Paul Zambrzycki (EE '24) was a competitor at the 2023 Clean Energy Summit.

Chenglou Lin (EE '23), Kevin Medeiros (EE '24), Devon Rojas (EE'24), and Steison Ruiz (EE '24) received a best poster paper award at the 2024 CMOC Symposium.



Left to right: Steison Ruiz, Chenglou Lin, Devon Rojas (not pictured; Kevin Medeiros)



Hezekiah Theophile (EE '26) was selected as the March member of the month by the UConn chapter of the National Society of Black Engineers.

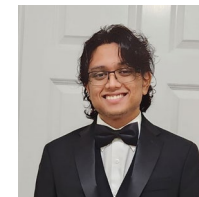
Senior Design team 2301, including **Abram Rosario (EE '23), Alfred Lee (ECE '23), Uilliam Kutrolli (EE '23)** and **Dawid Karpiej (EE '23)** received an Educational Progress Award from the 2023 IEEE International Future Energy Challenge.



Left to right: Dawid Karpiej, Abram Rosario, Alfred Lee, Uilliam Kutrolli

Senior Design team 2402 consisting of **Spencer Albano (EE '24), Matt Silverman (EE '24), and Nicholas Wycoff (EE '24)** won first place at the 2024 AFRL Software Defined Radio University Challenge. The team was advised by **Shengli Zhou**.

UConn awards two \$2,000 FIRST Robotics/FIRST Tech Challenge Scholarships each year to incoming Engineering first-year students, who

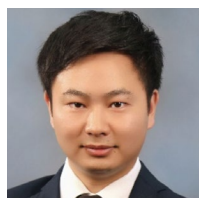


participated in the First Robotics Competition and have a recommendation from a First Robotics team mentor. Congratulations to Scholarship Winners for 2024-2025: **Rick Paul** (Robotics Engineering) and **Gordon Chen** (Computer Science)



RESEARCH ACTIVITY

Zongjie Wang received a \$4.5M Dept. of Energy grant for a project to create open-source data visualization tools to display information about renewable energy sources and distributed energy resources. Prof. Wang also received a portion of another DOE grant, valued at \$1.63M, for a Wind Impact Study for Power Resilience.



Junbo Zhao secured \$3.7M in funds for an offshore wind integration project which is part of a national effort to

improve grid reliability, optimize electricity infrastructure, and facilitate grid connection with renewable resources. In addition, he received \$2.5M in funds to create the new Northeast University Cybersecurity Center for Advanced and Resilient Energy Delivery, or CyberCARED.

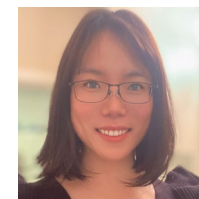


Simulation Center. This project aims to enhance companies' adoption of smart manufacturing and high-performance computing, and reduce emissions.

Liang Zhang was awarded \$2M in funding from the Dept. of Energy for UConn's Industrial Assessment Center and Manufacturing



Prof. **Faquir Jain** and **Shan Zuo** received Quantum seed grants. Dr. Zuo is researching entanglement in quantum computing and Dr. Jain is working on sensors that can detect ultra-low magnetic fields that help with navigation (such as underwater or underground).

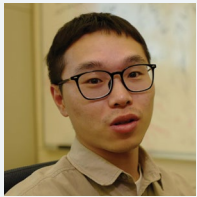


Please visit our homepage to read articles that explain more about these research projects, and other ECE news.



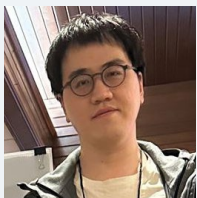
GRADUATE STUDENT NEWS

SEVERAL OF PROF. JUNBO ZHAO'S ADVISEES RECEIVED RECOGNITIONS, INCLUDING:



Bendong Tan received the IEEE PES CT chapter Outstanding Young Engineer Award, as well as a Best Paper Award from the *International Journal of Electrical Power and Energy Systems*. Bendong was also named an Outstanding Reviewer for the journals *Transactions on Power Systems* and the *Journal of Modern Power Systems & Clean Energy*.

Tong Su received an *IEEE Transactions on Power Systems* Outstanding Reviewer recognition.



Jinxian Zhang received a 2nd place Poster Award at the North American Power Symposium.

Alaa Selim and **Soroush Vahedi** earned a 2nd place award in the 2023 IEEE PES Ideathon Competition. Alaa and Soroush were also selected as Explore Phase competitors in the EnergyTech University Competition hosted by the Department of Energy, and selected to join the 2024 Clean Energy & Sustainability Innovation Program.

Gokul Krishnan, advised by **Bahram Javidi**, received a SPIE Optics and Photonics Scholarship.

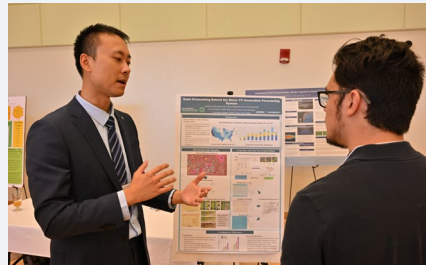
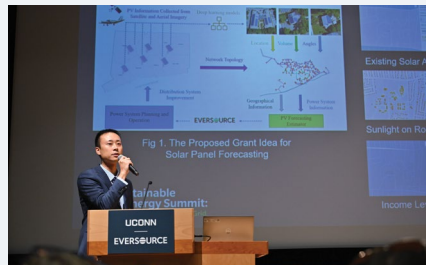
Leila Chebbo, advisee of **Ali Bazzi**, **Alaa Selim** and **Soroush Vahedi**, advisees of **Junbo Zhao**, won 1st, 2nd and 3rd place respectively in the IEEE/ECE Poster Competition. Also, at the College of Engineering Poster Competition Alaa won the best department poster for ECE, and Leila won a People's Choice award.

Alaa Selim also received the 2023 IEEE PES Connecticut Chapter Outstanding Chapter Volunteer Award, and an NSF travel grant to present at the Texas Power and Energy Conference.



Yitong Liu received an *IEEE Transactions on Power Systems* Best Paper Award.

Haoyi Wang presented, as part of a research team, at the Sustainable Clean Energy Summit, which was co-hosted by Eversource Energy. His team received \$2,500 towards development of a real-time solar power forecasting system.



Left to right: Alaa Selim, Leila Chebbo, Soroush Vahedi

Steven Allaby, **Abdulmajeed Almalki**, and **Nina Stefanovic** won ECE TA awards for Fall 2023, and **Aalvee Kausani** won the TA award for Spring 2024.



Left to right: Abdulmajeed Almalki, Steven Allaby, Nina Stefanovic



Aalvee Kausani

Niranjan Raghunathan, **Soroush Vahedi**, **Ketian Ye** and **Bendong Tan** were selected to present at the best paper session at the IEEE PES 2024 General Meeting.

Prize winners from the 2024 Connecticut Microelectronics & Optoelectronics Consortium poster competition include **Abdulmajeed Almalki**, advised by **Faquir Jain**, and **William Stark**, advised by **Lei Wang**.

Ayah Abdallah, **Sandra George**, **Alaa Selim**, and **Soroush Vahedi** were selected to join the 2023-24 cohort of the John Lof Leadership Academy.

Qian Yang, an advisee of Prof. **Krishna Pattipati**, received a best paper award from the IEEE Transportation Electrification Conference.

Leila Chebbo and **Hasnain Nisar**, both advisees of **Ali Bazzi**, placed 1st and 3rd respectively in the C2E2 Grad Student Research Summit in Sustainability.



Leila Chebo pictured with C2E2 Center Director, Xiao-Dong Zhou

Continued on page 13



ELECTRICAL & COMPUTER ENGINEERING

ROBOTICS RESEARCH LABS

WORKING TO BENEFIT HUMANS SAFELY, EFFICIENTLY

By Olivia Drake

Computer controlled, collaborative robots—or cobots—are designed to work alongside humans and support them in accomplishing various tasks. However, they're primarily used in static environments without moving obstacles. In airports, factories, hospitals, and offices, cobots need the ability to quickly respond to moving objects—such as people, cars, and wheelchairs—while completing a task.

“It's desired that these cobots autonomously navigate in dynamic

motion planning, collaborative robotics, human-robot interactions, artificial intelligence, data analytics, motion path planning, and machine learning to

“Robotics is a growing field that has applications in a number of commercial areas including healthcare, manufacturing, surveillance, and monitoring amongst others.”

environments while replanning in real-time as needed to achieve high success rates and low travel times,” explains ECE Associate Professor Shalabh Gupta. “We envision that the role and need for cobots will increase in supporting humans for various tasks.”

Gupta, who oversees the Laboratory of Intelligent Networked Systems and Robotics (LINKS) at UConn, is among four ECE faculty currently exploring robotic engineering and technology.

LINKS LAB, LED BY ASSOCIATE PROFESSOR SHALABH GUPTA

In LINKS, Gupta's group studies fundamental problems related to small and large-scale autonomy including adaptive

generate robot paths and motions. These research areas are applied to adaptive robotics, autonomous vehicles, sensor networks, smart manufacturing, energy systems, aerospace systems, underwater vehicles, and more.

“Robotics is a growing field that has applications in a number of commercial areas including healthcare, manufacturing, surveillance, and monitoring amongst others,” he explains. “My lab, in particular, is working on advanced robotics technologies that would enable cobots to work alongside humans safely and efficiently in private, commercial as well as defense sectors.”

ROBOTICS AND CONTROLS LAB, LED BY ASSOCIATE PROFESSOR ASHWIN DANI

Similarly, the Robotics and Controls Lab, led by ECE Associate Professor Ashwin Dani, studies human-robot collaborations, machine learning, and visual perception and control for robotics. His group works on using sensors to forecast human trajectory in manufacturing environments or space. The research creates learning algorithms that develop reusable models and controls that promote stability and safety.

His group is currently working on human-robot collaboration in manufacturing systems with ECE Professor Liang Zhang. Specifically, the researchers are analyzing human-robot teaming in small to medium enterprises where the product variability of manufacturing systems is large.

The Robotics and Controls Lab also is developing technologies for robots to manipulate flexible objects using vision

sensor feedback for the NASA Resilient Extraterrestrial Habitats (RETH) Institute led by Purdue University.

“This capability can be useful in a number of ways,” Dani explains. “For the RETH Institute work, flexible object manipulation capability is used to carry out routine habitat maintenance tasks by robots.”

The Robotics and Control Lab aims to integrate research, education, and outreach to build a sustainable ecosystem for advancing state-of-the-art controls and

to support various tasks in nuclear domains, such as remote inspection, dosage reduction, decommissioning and cleanup. The project will enable reasoning, secure, and resilient autonomy for HMuRF in dynamic and adversarial nuclear environments by utilizing Large Language Models, deep neural networks, and adaptive control techniques.

“D2L2 aims to foster safe, efficient, and reliable human-autonomy. This advancement will accelerate the beneficial impact of HiEMAS across critical industries

This includes developing new robotic and exoskeleton hand designs, ways to control them (with or without sensors), and studying how these devices function with human use.

He’s currently focusing on the task of co-grasping. Assistive devices, such as prostheses, he explains, do not guarantee that objects can be reliably grasped and manipulated. “But with the addition of tactile sensors, some autonomy could be imparted to the devices themselves,” he says. “But in order to maintain user agency, the question then is, how much autonomy should these devices have?”

As director of the ECE’s newly formed Rehabilitation Robotics, Grasping and Manipulation, Kinematics, and Assistive Technology Lab—or RUKA Lab—Gloumakov aims to bridge the gap between humans and machines, improve rehabilitation outcomes and patient wellbeing through the development of assistive technologies, and to continue developing new robot controls and functionalities that operate safely. (RUKA, by the way, means “hand” in Russian.)

“My goal is to bridge the gap between humans and machines, improve rehabilitation outcomes and patient wellbeing through the development of assistive technologies, and to continue developing new robot controls and functionalities such that one day the operation of a robot manipulator will be seamless and indistinguishable from our own hand,” he says.



Inset photo: Ashwin Dani in his robotics lab.

Photo at left: A robot that can perform various tasks in warehouses and factories.

robotics. As part of its public outreach efforts, Dani’s group recently participated in the Vergnano Institute of Inclusion’s BRIDGE program to prepare students from underrepresented groups for the demanding engineering curriculum at UConn.

D2L2, LED BY ASSISTANT PROFESSOR SHAN ZUO

ECE’s Distributed Decision-Making and Learning Lab at UConn (D2L2), led by ECE Assistant Professor Shan “Susan” Zuo, strives to advance human-interactive embodied multi-agent systems (HiEMAS) with reasoning, secure, resilient, and safe autonomy.

In one of the lab’s projects to be sponsored by the U.S. Nuclear Regulatory Commission, D2L2 will develop a heterogeneous multi-robot fleet (HMuRF)

such as automotive, power infrastructure, and military multi-robot systems, where integrating humans into operations while guaranteeing security, resilience and safety is paramount,” Zuo says.

RUKA LAB, LED BY ASSISTANT PROFESSOR YURI GLOUMAKOV

This August, ECE welcomed its newest robotics engineering faculty—Assistant Professor Yuri Gloumakov, to the department. Gloumakov’s work is inherently interdisciplinary, bridging advancements across biomechanics, computer science, mechanical design, and psychology with the overarching goal of engineering safe, reliable, and fully functional prosthetic hands. In particular, he’s interested in tactile sensing, grasping and manipulation, and rehabilitation.

ROBOTICS ENGINEERING MAJOR

While Professors Gupta, Dani, Zuo, and Gloumakov are leading robotics research in their respective labs, they’re also teaching courses as part of UConn’s new robotics engineering major, which launched in 2022. UConn is among only three U.S. research-active universities to offer a major in robotics engineering. Also, UConn’s student-run FROST Robotics club competes in robotics competitions across the state and the UConn FIRST club runs high school robotics competitions and mentors some of those high school teams.

Gloumakov, in particular, plans on developing and teaching new courses related to robotics in an interdisciplinary way. “This can include integrating some of my research as class projects and demonstrating how robotics can be applied to different fields,” he says.



2024 COMMENCEMENT Congratulations to All of Our Graduates!



UNDERGRAD STUDENT PROFILE

THAO TRAN

Thao Tran (EE '24) is a senior majoring in Electrical Engineering at UConn. She spent her first 2 years at Manchester Community College and then transferred to UConn.



Her passion for STEM began in her early college years when she started working

as a lab assistant for the Physics department. This role allowed her to explore and operate a variety of electrical devices, sparking her interest in electrical engineering. She often spent her free time in the lab working on personal projects. This hands-on exposure reinforced her desire to delve deeper into the world of electrical engineering.

Tran has found the ECE program at UConn to be a rewarding experience. She states that the program offers a comprehensive curriculum that balances theoretical knowledge with practical application. The instructors are not only knowledgeable but also supportive, guiding, and motivating. Additionally, the collaborative environment among her peers fosters a sense of community and motivates Tran to grow.

In Spring 2024, Tran had the opportunity to serve as an undergraduate teaching assistant for ECE 2001 class. She felt this role was extremely rewarding as it allowed her to assist other students in understanding complex concepts and troubleshooting their projects. Teaching others not only strengthened her own knowledge but also improved her communication and leadership skills. This experience highlighted the importance of

mentorship and has inspired her to continue supporting and guiding others in their learning journeys.

After graduation, Tran hopes to enter the telecommunications industry, where she hopes to contribute to the advancements in communications technology. She is particularly interested in exploring innovations that enhance connectivity and data transmission. Additionally, she plans to return to UConn to pursue a master's degree in Engineering. She believes that furthering her education will provide her with a deeper understanding and the technical skills necessary to make a significant contribution to the field.

In her spare time, Tran enjoys reading and running a small sticker shop. These activities provide a well-rounded balance to her academic pursuits and help maintain a healthy and creative lifestyle.

GRADUATE STUDENT NEWS

The UConn IEEE PELS/PES Student Chapter won the 2024 IEEE PELS Best Student Branch Chapter Award. In addition, a new IEEE Systems and Controls Chapter was formed and received funding from IEEE of CT, which they used to host a career development seminar.



ECE hosted a Women in STEM discussion, featuring faculty speakers from ECE and Computing, who spoke of their inspirations and challenges working in STEM. ECE Grad Students **Leila Chebbo** and **Efi Safikou** led the program and hope to establish a women's support chapter that meets regularly.



Left to right: Leila Chebbo, Efi Safikou

Congratulations to the following ECE Graduate Students who completed their Ph.D defense in the 23-24 Academic Year: **Usman Ali, Majid Chauhdry, Wenqiang Gao, Muhammed Gultekin, Deniz Gurevin, Saidjafarzoda Ilhom, Tashfiq Kashem, Adnan Mohammad, Mohsin Shan, Desmon Simatupang, Hasan Talukder, Jiangwei Wang, Pranav Wani, James Wilson, Jianghua Wu, Ketian Ye, and Yang Zhao**

FACULTY RETIREMENT

ERIC DONKOR



When **Eric Donkor** began his career at UConn in the late 80s, fiber-optic communication networks operated at speeds ranging from 1 to 10 megabits per second (Mbps). With advancement in fiber optics and fiber lasers, data transfers leaped to 10,000 Mbps by the mid 2000s and 100,000 Mbps by 2010.

While speeds have continued to rise to almost 800,000 Mbps in recent years, Donkor focuses his primary research on the design and development of fiber optics and opto-electronic devices for high-speed optical networks. These range from 40,000 Mbps to 100,000 Mbps and are ideal for transmitting information through laser light and fiber optic cables. Signal loss is minimal, making them ideal and reliable for electronic communications and medical, mechanical, military, automobile, and aerospace applications.

"As a result, today's internet providers are installing fibers to the home, thereby providing high-speed large bandwidth fiber communication networks to remote and rural towns all across the U.S.," he explained. "We never would have seen this 35 years ago."

Donkor, who retired in August after spending his entire career at UConn, is founder of ECE's High Speed Optical Network and Device Lab. There, he also researched terahertz optical frequency comb generation, optical analog-to-digital conversion, and the investigation of high-speed switching in fiber optics. His most current research, supported by the Air Force Research Laboratory (AFRL), centered on the application of nano-photonics for optical nano-circuits design, and quantum photonics for secure communication over fiber optics.



Scan here to read the full story.

DEPARTMENT NEWS

The ECE department hosted a colloquia series, inviting speakers from peer universities and industry, whose lectures covered a wide variety of topics such as, metamaterials, deep learning, neuromorphic systems, thin film electronics, and clean energy. The seminars were open to students and faculty alike, and provided an excellent opportunity for knowledge sharing and networking.

Dr. **Jagadeesh Tangudu** from Raytheon and **Lauren Magin** from Avangrid provided perspectives from industry. Academic speakers included **Rajit Manohar** and **Mengxia Liu** from Yale, **Lin Cheng** from Trinity, **Daniel Mittleman** from Brown, **Qiangfei Xia** from UMass, **Meng Wang** from RPI, **Khurram Afridi** from Cornell, **David Crouse** from Clarkson, and **John Kymissis** from Columbia University.



John Kymissis

FACULTY NEWS



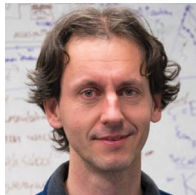
Krishna Pattipati received the 2023 Distinguished Alumnus award from IIT Kharagpur and, with his graduate student **Adam Bienkowski**, had their

Tool for Multi-Objective Planning and Asset Routing selected to be operationalized for use by Navy Operators.



Liang Zhang was appointed as Pratt & Whitney Associate Professor in Advanced Systems Engineering, and was promoted to full Professor in Fall '24.

Marten Van Dijk was awarded the "Test of Time" award at the 2023 ACM Conference on Computer and Communications Security.



Ali Bazzi was selected to become a member of the Connecticut Academy of Science and Engineering, and promoted to full Professor in Fall '24. He was also appointed as the Madonna Term Professor in Power Engineering.



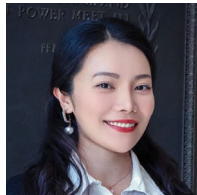
Necmi Biyikli was promoted to Associate Professor in Fall '24, and appointed as the Collins Aerospace Associate Professor of Engineering Innovation.



Bahram Javidi was appointed as SNET Professor of Communications & Information Technologies.



Faquir Jain was recognized as an outstanding reviewer for the *Light: Science & Applications* journal.



Zongjie Wang was appointed as the Eversource Energy Center Associate Director for DEI and Industry Workforce Training. Also, with

the group Equipe LPS/H₂O, won the Hydrogen Optimization Prize from the Water Power Technologies office in the Department of Energy.



Peter Willett received the 2024 Yaakov Bar-Shalom Lifetime of Excellence Award from the International Society of Information Fusion.

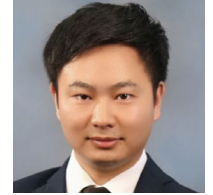


The late **Peter Luh**, along with his former graduate students and research professors **Bing Yan** and **Mikhail Bragin**, were part of a team that received the

IEEE PES PSOPE Technical Committee Outstanding Technical Report Award.

The IEEE Power and Energy Society CT Chapter, which ECE Prof. **Junbo Zhao** chairs, won the High Performing Chapter award. The IEEE Power Electronics Society CT Chapter, which Prof. **Ali Bazzi** chairs, held an inaugural seminar delivered from Lockheed Martin/Sikorsky.

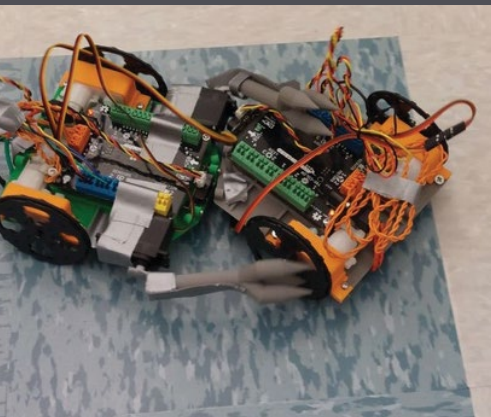
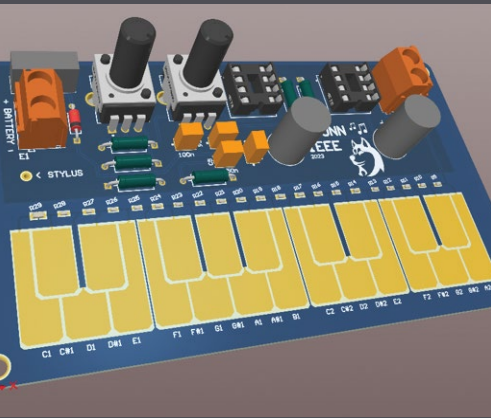
Junbo Zhao earned a number of honors and awards including:



- Appointed as Castleman Assistant Professor of Engineering Innovation
- Received Distinguished Individual Service Award for his role in IEEE PES Technical Committee
- Received an Early-Career Research Fellowship from the National Academies of Sciences, Engineering, and Medicine Gulf Research Program
- Received Outstanding Editor awards from the *Journal of Modern Power Systems and Clean Energy*, *IEEE Transactions on Power Systems*, and *CSEE Journal of Power and Energy Systems*
- Selected for two Best Paper awards from the *International Journal of Electrical Power and Energy Systems*
- Received three recognitions for Outstanding Technical Reports from IEEE PES
- Recognized for highly cited papers in *IET Energy Systems Integration Journal*, *IEEE Transactions on Power Systems* and *Journal of Modern Power Systems and Clean Energy*
- Appointed Technical Committee Program Chair (TCPC) of IEEE PES Renewable Systems Integration Coordinating Committee
- Invited as an Early Career engineer to The Grainger Foundation Frontiers of Engineering 2024 Symposium
- Honored by IEEE PES in celebration of Asian American and Pacific Islander Heritage Month's 2024 theme of "Advancing Leaders Through Innovation"

STUDENT CLUB NEWS

The members of the undergraduate chapter of **UConn IEEE** had an active year assembling custom toy piano PCBs, programming microcontroller sumo robots, and providing awesome decorations in time for the holidays. On top of that, they also received firsthand experience, advice, and exciting career prospects from industry professionals at Collins Aerospace and Burns & McDonnell.



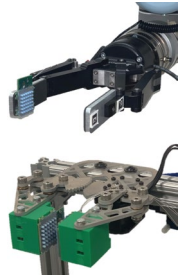
NEW FACULTY PROFILE

YURI GLOUMAKOV

Dr. **Yuri Gloumakov** is a roboticist who joined the ECE department in Fall 2024 as an Assistant Professor, bringing expertise in tactile sensing, grasping and manipulation, and rehabilitation. His work is inherently interdisciplinary, bridging advancements across biomechanics, computer



science, and mechanical design. During his Ph.D. at Yale University's GRAB Lab, he studied human and animal grasping behavior, developing upper-limb prosthetic controls inspired by his findings. He then went on to do a postdoc at University of California Berkeley's Embodied Dexterity Group as part of the InnoHK Centre for Logistics Robotics, where he leveraged tactile sensors to enable robot and prosthetic hands to sense and respond to slip in a similar way that our own hands do. Learn more about his research in "Robotics Research Labs" on pages 10-11.



UNDERGRAD STUDENT PROFILE

JOSH SCHULMAN

Josh Schulman (EE '25) is a senior majoring in electrical engineering. Throughout his time at UConn, he has focused his studies on very large-scale integration (VLSI), field programmable gate arrays (FPGAs), programmable logic circuits (PLCs), embedded systems, consumer and industrial electronics, and microcontroller applications. He has been actively involved in various leadership and research roles throughout his collegiate journey.

Since March 2023, Schulman has been a Student Researcher at the Institute of Materials Science, where he helped to design and construct electrical circuits and embedded systems for experimental test automation.

He has also been an active member of the Institute of Electrical and Electronics Engineers (IEEE) Undergraduate Branch at UConn, where he has held multiple leadership roles, including serving on its Executive Board as Secretary from July 2023 until May 2024, Treasurer, from January 2024 until May 2024, and now Vice President since April 2024.

This past Summer, Schulman worked as a Weapons Systems Engineering Test and Simulation Intern at General Dynamics Electric Boat in New London, Conn. In this role, he gained experience and understanding of the role of engineers and tradespeople in the construction of submarines. He also contributed to various projects and collaborated and networked with experienced professionals in his profession. This internship provided him with invaluable insight into the industry and practical skills that complemented his academic studies.

In addition, Schulman has held key roles within UConn's Undergraduate Student Government (USG). He served as the College of Engineering Senator where he advocated for engineering students, and now represents UConn Hillel as an Ex-Officio Senator. He also currently serves as the USG Fiscal Manager and Deputy Comptroller, managing its \$2.2M budget. In his USG roles, Schulman has written impactful legislation, bylaws, and financial reports and policies.

In 2023, Schulman was elected as the University Senate Parliamentarian, and has served on various university committees such as Curricula and Courses and the Student Trustee Election Committee.



UConn Entrepreneur's \$1 Million Gift to Launch New Student Entrepreneurs

The Gift Will Build on the Existing UConn Entrepreneurship Hub (EHUB)

By Ira Morrison

Professor **Matthew Mashikian** – who retired from UConn to start a multimillion-dollar company – is making sure that engineering student entrepreneurs have an easier path to success. He is also teaching again – this time about giving back.

That was the message the former Electrical & Computer Engineering professor gave to friends, family and UConn leaders at a July 29 campus event, as he announced a gift of \$1 million to endow the Matthew & Margarethe Mashikian Innovation & Entrepreneurship Hub in the College of Engineering. The endowment will help students, faculty, and researchers learn about and pursue technological entrepreneurship opportunities.

Mashikian retired in 1997 with an idea he was certain he could build into a viable business. With the support of several past engineering deans, he rented space on the Depot Campus for what would become IMCORP – a company that provides leading technology for diagnosing and pinpointing problems with underground electrical power cables.

Mashikian said he and his wife, Margarethe, wanted to make a gift that represented their affection for the College of Engineering, and to have their donation serve as an example to other faculty and alumni about the importance of giving back to UConn. Addressing some of the challenges students face in the engineering world, Mashikian talked about the value of having people who believe in and support you.

“I faced many challenges myself,” he said. “Twenty-seven years ago, I was retiring from UConn and decided to use some of the patents that several of my colleagues and I at the University had developed. I needed some help to move from academia into the ‘real world.’ I wish, that at that time, we had a center that would have helped me. I hope these difficulties will be made easier to confront for others, whether they are students or faculty, who want to become entrepreneurs.”

Former College of Engineering Dean Kazem Kazerounian, who returned to teaching on August 1, expressed his appreciation for the generous gift. He emphasized that faculty and student innovation is the bedrock of UConn's success. Commenting on the Mashikian gift, Kazerounian said, “Matt and Margarethe, your investment in our students and faculty continues to ‘fuel the fire of innovation in the belly.’ You’ve shown that same fire, innovation, and passion in your own careers. We learn from you.”

For more information about donations and gifts to the College, visit engineering.uconn.edu.



FACULTY RETIREMENT

JOHN AYERS

Professor **John Ayers'** career could be summarized in miles.

With two groundbreaking inventions that traveled the planet, numerous doctoral and master's students mentored to move the industry forward world-wide, and several half marathons completed following an incredibly rare disease – one so rare it was named after him – Ayers looks at the miles logged behind him with gratefulness and humility.

His 34-year tenure in ECE encompassed thousands of research citations, hundreds of research papers, 27 research grants, eight teaching awards, 10 published books, and three new graduate courses.

“None of us aspire to this breadth of success, or enter into our careers thinking it could be possible,” Ayers said. “It shows that even an ordinary person can do the extraordinary.”

He graduated from Rensselaer Polytechnic Institute in 1990 and joined UConn's Electrical and Systems Engineering Department (now the Electrical and Computer Engineering Department) soon after.

Some of his achievements were singularly remarkable, such as the widespread adoption of his patterned heteroepitaxial processing invention for flat screens and infrared detectors, and the ensuing legal battle for the technology by a major consumer electronics company; the emergence of his Digital Integrated Circuits textbook as one of the top four worldwide; the development of the industry standard tool for modeling strain and defects in Silicon-Germanium (SiGe); the establishment of his research book, Heteroepitaxy of Semiconductors, as the leading authority in the field, and his invention of an electric circuit model for strain and defects in semiconductor heterostructures, which allows the application of well-established commercial circuit analysis



tools to the modeling of graded and multi-layered epitaxial structures.

Scan here to read the full story.



ALUMNI NEWS



David Sidoti (B.S.E EE '11, M.S '16, Ph.D. '18) was presented a Letter of Commendation, for "... building the science and technology foundations

for enabling future Naval technologies for the next 25 years and beyond." Also, along with **Krishna Pattipati** and **Yaakov Bar-Shalom**, Sidoti was selected to receive the Alan Berman Research Publication Award for outstanding federal government-authored research contributions to the Naval Research Laboratory.



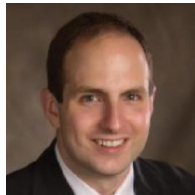
Radu Visina (Ph.D. '19), Vice President of Product Development at Information Systems Labs, was an industry panelist at the 2024 IEEE Radar Conference.



Ilhom Saidjafarzoda (Ph.D. '23) formerly advised by Necmi Biyikli, was a finalist for the Coburn and Winters (C&W) Student Award, presented by the Plasma

Science and Technology Division of the American Vacuum Society.

Qin Lu (Ph.D. '18), co-advised by **Peter Willett** and **Yaakov Bar-Shalom**, is an Assistant Professor at the University of Georgia and she received a 2024 NSF CAREER award.



David Crouse (B.S.E EE '05, M.S '08, Ph.D. '11) received an "International S&T Cooperation Award"

from the Under Secretary of Defense for Research and Engineering at the Pentagon for "contributions to the Technical Cooperation Program (TTCP) on Open-Source Software Framework."



James Wilson (Ph.D. '23) formerly advised by **Shalabh Gupta**, began as an adjunct instructor with UConn in Spring of 24, teaching Computational Methods for Optimization, and returned for AY 24-25 to teach Intro to Systems Theory.

After graduating in Summer 2024, **Yishu Bai**, formerly advised by **Liang Zhang**, joined UConn as a Visiting Assistant Professor.



We encourage all alumni to join the ECE LinkedIn Group located at linkedin.com/groups/7452805.

ACADEMY OF DISTINGUISHED ENGINEERS

Edward Grace (B.S.E EE '62) and **Robert Hotaling** (B.S. EE '01) were named as 2024 inductees to the UConn College of Engineering Academy of Distinguished Engineers.



Edward Grace spent 10 years at the MIT Instrumentation/Draper Laboratory working on the Apollo program. He was a member of the Apollo 13 Mission

Operations Team awarded the Presidential Medal of Freedom by President Nixon. He later founded several high-tech companies.



Robert Hotaling had served as Deputy Commissioner and Chief Investment Officer at the Connecticut Department of

Economic and Community Development and is now the Deputy Program Advisor for Infrastructure for the State of Connecticut.

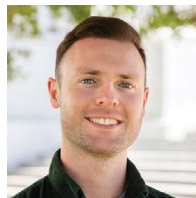


FACULTY PROFILES



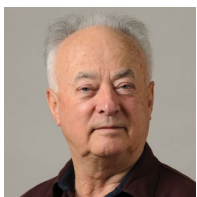
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YURI GLOUMAKOV

Assistant Professor
Robotics, tactile sensing, controls, machine learning, design, rehabilitation and biomechanics
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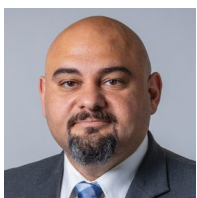
YAAKOV M. BAR-SHALOM

Board of Trustees Distinguished Professor & Marianne E. Klewin Endowed Professor in Engineering; Fellows, AAAS, IEEE; Member, CASE
Target tracking with radar, sonar, and infrared sensors, air traffic control, data fusion for surveillance systems with multiple sensors.
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Professor
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ALI BAZZI

Madonna Term Professor in Power Engineering; Member, CASE
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Associate Professor
Cyber physical systems, distributed intelligent systems, robotics, autonomous systems, statistical learning and perception, information fusion, fault diagnosis & prognosis in complex systems.
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NECMI BIYIKLI

Collins Aerospace Associate Professor in Engineering Innovation
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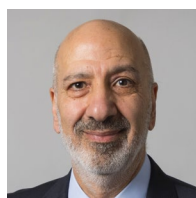
FAQUIR C. JAIN

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JOHN A. CHANDY

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Distributed storage, clustered file systems, networking, hardware security, parallel architectures, VLSI design and automation.
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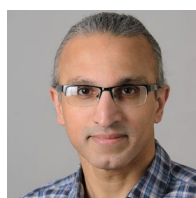
THOMAS KATSOULEAS

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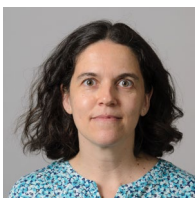
MONTY ESCABI

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Human perception of sound, neuronal processing of sound information, neuronal modeling.
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SUNG-YEUL PARK

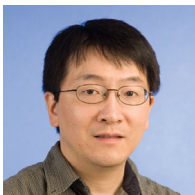
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**HELENA SILVA**

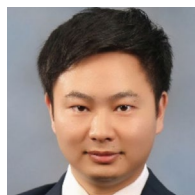
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**ZONGJIE (LISA) WANG**

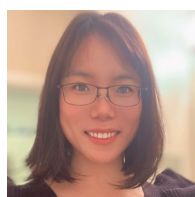
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2023-2024 GRADUATE FELLOWSHIPS



Mohamadamin Rajabinezhad, advised by **Shan Zuo** received a Synchrony Fellowship.

This year's Peter Willet Fellowship was awarded to **Benjamin Brown**, advised by **Peter Willett**.

This year's Vijaya Raghavan Fellowship was awarded to **Qian Yang**, advised by **Krishna Pattipati**.

Alaa Selim, advised by **Junbo Zhao**, received a Sikorsky Fellowship.

Ayah Abdallah, advised by **Shengli Zhou**, was selected for a Pratt & Whitney Fellowship.

Nina Stefanovic, an advisee of **Kazem Kazerounian** from the School of Mechanical, Aerospace, and Manufacturing Engineering was selected to receive the CoE Outstanding Grad Student Fellowship.

The following students received Fellowships from Eversource Energy: **Kalinath Katuri**, **Shenqi Yuan**, **Haoyi Wang**, **Shaya Abou Jawdeh**

Incoming graduate student, **Yingyi Tang** was one of four selections worldwide to receive the 2024 IEEE PES Outstanding Student Scholarship. She was also selected as a GE NextGen Scholar.

Kevin Lindstrom was awarded a Directed Energy Professional Society (DEPS) Graduate Research Grant

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