UCONN | SCHOOL OF ENGINEERING

ECE

ELECTRICAL & COMPUTER ENGINEERING

SCIENCE 1 BUILDING

The Science 1 Building is one of the largest projects in the *Next Generation Connecticut* initiative, which was announced in 2013 to significantly expand UConn's educational and research work in STEM fields.

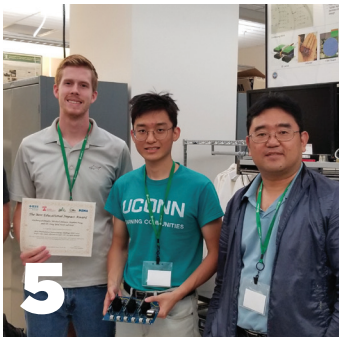
Read more on page 11

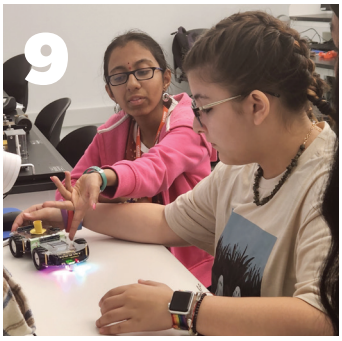
FALL 2022
WWW.EE.UCONN.EDU

FALL 2022

CONTENTS

UCONN
SCHOOL OF 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**.

John Chandy
University of Connecticut
Department of Electrical and Computer Engineering
371 Fairfield Way, UNIT 4157
Storrs, CT 06269-4157

The creative efforts of the School of Engineering staff members Brandy Ciraldo, Eli Freund, Chris LaRosa, and Mary McCarthy are gratefully acknowledged.

MESSAGE FROM THE DEPARTMENT HEAD

I am pleased to share with you the Fall 2022 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.

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

2021-2022 SUMMARY

293 PEER-REVIEWED PUBLICATIONS

26 TENURED/TENURE TRACK FACULTY

124 GRADUATE STUDENTS

$6.8M IN RESEARCH EXPENDITURES

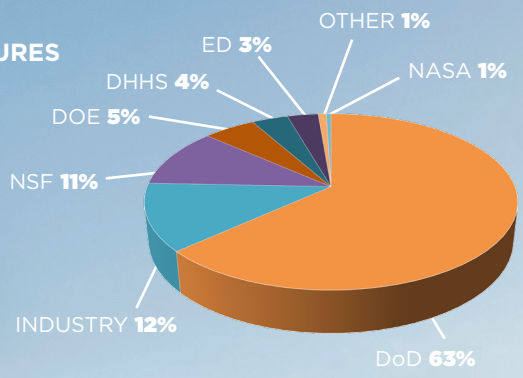
276 UNDERGRADUATE STUDENTS

12 Ph.D. DEGREES GRANTED

14.1K CITATIONS

84 BSE DEGREES GRANTED

2021-2022 RESEARCH EXPENDITURES



SENIOR DESIGN DEMONSTRATION DAY 2022

On April 29, 2022, we were able to return back in person for Senior Design Demonstration Day at Gampel Pavilion. The ECE Department had 29 teams sponsored by 18 different companies with a total of 88 graduating students participants. The teams selected as the top projects last year were the following:

1st Place
TEAM 2213

Compact and Robust Data Logger in Harsh Environments

SPONSOR: COLLINS AEROSPACE

Collins Aerospace requested that the team create a compact and robust data logger that can withstand extreme environmental temperatures for long periods for use in testing aircraft parts in simulated real-life settings. The data logger samples signals of +/- 15V at a frequency of 1MHz and stores them on a removable storage device. The data logger enclosure was constructed to ensure that it can withstand outside temperatures of -40°C to 85°C in an environmental chamber and act as a Faraday cage to provide electromagnetic shielding for the electronics. The team designed a six-layer printed circuit board for the data logger. The requirements for the circuit board were that it should be compact, be able to sample four differential inputs at 1MHz frequency, be able to withstand temperatures of -40°C to 85°C, store the digitized version of the signals on a removable storage device, read user input settings, and have status indicators. The team's PCB design includes four Twin BNC connectors for the four differential inputs, two-stage instrumentation amplifiers with programmable gain to step down the input signal to an acceptable range for the high sample rate analog to digital converters, a Xilinx FPGA/CPU, USB-C input to power the onboard voltage regulators, three LED status indicators, and a microSD card slot to store the signals and read user settings.

Left to Right: Michael Benvenuto (CMPE), Jeremy Amoro (EE), and Diego Vilca (EE).

2nd Place
TEAM 2229

AC-Power Driven Brushless DC Motor Controller

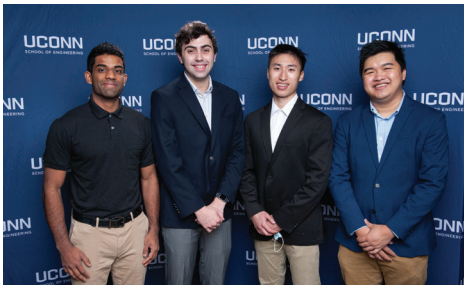
SPONSOR: TRIUMPH GROUP

Left to Right: Jan Feyen (EE), Jacob Parent (EE), Bolivar Baez (EE), Theoharis Puka (ME), James Hipsky (EE), and Alexander Jarrett (ME).

3rd Place Tie
TEAM 2206

Autonomous Search and Rescue Helicopter System Design

SPONSOR: SIKORSKY



Left to Right: Kevin Joshy (EE), Nathanael Metke (CMPE/EE), Terry Zhao (EE/CMPE), and Duy Le (EE).

3rd Place Tie
TEAM 2212

Electromagnetic Expulsion of a Cylindrical Body from an Outer Tube

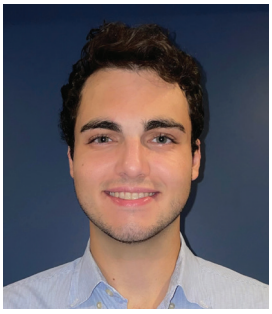
SPONSOR: NAVSEA WARFARE CENTER

Left to Right: Justin Maramo (EE), Daisy Megnath (EE), and Joseph DiBenedetto (EE).

UNDERGRAD STUDENT PROFILE

NICHOLAS SATTA

Nicholas Satta (EE '23) is a senior majoring in Electrical Engineering with a minor in Mathematics. You may have seen him building robots, fixing 3D printers, or helping you experience virtual reality at the OPIM Innovate lab in the School of Business. As lab manager, he is responsible for day-to-day operations and incorporating emerging technologies for students to learn from and use in their own entrepreneurial projects. He is also an Energy Analyst at the Southern



New England Industrial Assessment Center under Dr. Liang Zhang. His role is to assess and identify potential improvements in motors, pumps, and fans to help local manufacturers reduce their carbon footprint and energy costs.

This past summer, Nicholas interned at ASML in Wilton, CT as part of the reticle stage and handling electrical development group. He worked on engineering a test box for the qualification and validation of sensors used on the latest EUV lithography machines which manufacture the world's smallest and fastest computer chips. This allowed him to incorporate his passions for circuit design, programming, 3D modeling, and printing all into one project.

During the summer entering Nicholas' junior year, he was an intern for Garg Consulting Services. His role was to review schematics and specifications to inspect the installation of overhead catenary systems for a new section of track at the CTDOT Metro-North maintenance facility in New Haven.

Upon graduation, Nicholas is interested in going into the semiconductor or space industry. He plans to return to school in the future to earn a master's degree in Engineering.

UNDERGRAD STUDENT NEWS

Abi Young

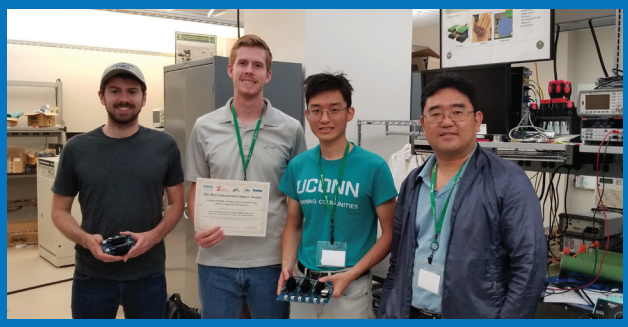
Mitchell Johnson

Two undergraduates, **ABI YOUNG (EE '23)** and **MITCHELL JOHNSON (EE '22),** were named Scholarship Plus Scholar Recipients by the IEEE Power and Energy Society. Each was awarded $2k in funds.

MALIK FRANCIS (CMPE '25) was selected as a McNair Apprentice and will learn about STEM graduate program career avenues and undergraduate research opportunities.

WILLIAM CRYAN (EE '23) and **THOMAS CUSSON (EE '23)** each received a DoD Cybersecurity Scholarship with one year of full tuition, a stipend, and an internship at Naval Air Warfare Center Weapons Division China Lake.

Undergraduate students **ZACHARY DIMEGLIO (CMPE '22), MITCHELL JOHNSON (EE '22),** and **STEPHEN PANG (EE '22)** attended the 2022 International Future Energy Challenge with Prof. Sung-Yeul Park and earned the Best Educational Impact Award.



Left to Right: Zachary DiMeglio, Mitchell Johnson, Stephen Pang, and Professor Sung-Yeul Park.

REU NEWS

We resumed our **NSF-FUNDED RESEARCH EXPERIENCE FOR UNDERGRADUATES** program in trustable computing systems after a brief hiatus due to the pandemic. The UConn ECE Department has hosted this 10-week summer program since 2011 and it provides an opportunity for undergraduates to work on cutting-edge research in computer systems security and trustable computing systems. Guided by faculty mentors, students work on research projects with an impact on national security. Furthermore, they interact with graduate students and learn what graduate study is all about, participate in weekly seminars on professional and research topics, and improve their communication, writing, and presentation skills. This year, the students also were able to attend the USENIX Security Conference in Boston, one of the top security conferences in the world. The 2022 cohort was organized by **PROF. OMER KHAN.**

NSF-Funded Research Experience for Undergraduates Program 2022 participants.

‘THE MIDDLE OF HISTORY BEING MADE’:

US Energy Secretary Granholm Lauds UConn in Campus Visit

By Kimberly Phillips, UConn Today

U.S. Energy Secretary Jennifer M. Granholm rolled up to UConn’s Center for Clean Energy Engineering on Friday in no ordinary vehicle, shuttling between stops at the Innovation Partnership Building and C2E2 with Interim President Radenka Maric in a fuel cell-powered Toyota Mirai.

Her visit to Storrs was the first of three scheduled stops in eastern Connecticut to talk about the importance of clean energy and was meant to take note of UConn’s major contributions to the field.

Using the backdrop of the much-larger fuel cell that powers C2E2, Granholm also announced $7 million in funding from the U.S. Department of Energy for five institutions to create industrial assessment centers similar to the one developed last year in partnership between UConn and the University of New Haven.

The Southern New England Industrial Assessment Center, which is led by Prof. Liang Zhang, was established in August with significant funding from the Energy Department and was among a group of 32 universities in 28 states to share $60 million to begin programs that provide free energy assessments to small and mid-sized businesses.

“The whole point here, of course, is to make sure we are using less energy across the country. The industrial sector produces about 30 percent of our greenhouse gas emissions. Making sure we use less energy is an important part of getting to that clean energy future,” Granholm said, calling UConn and its assessment center “an example of what we want to have happen across the country.”

U.S. Energy Secretary Jennifer M. Granholm, UConn Interim President Radenka, and U.S. Rep. Joseph D. Courtney, D-2nd District listen to Professor Liang Zhang discuss his research.

From fuel cells to batteries and decarbonization, she said the department is investing $9.5 billion in hydrogen technologies and the requisite infrastructure.

“It’s just really an exciting time to be in this energy space,” Granholm said. “We feel like we’re in the middle of history being made. Sometimes it’s hard to tell that you’re making history when you are in the middle of it but we are right in the thick of just an incredible time.”

Before riding over to C2E2 in the sporty Mirai with Maric behind the wheel, Granholm toured the IPB at UConn Tech Park with UConn’s Interim Vice President for Research, Innovation, and Entrepreneurship S. Pamir Alpay and U.S. Rep. Joseph D. Courtney, D-2nd District.

Continued on next page

“It’s just really an exciting time to be in this energy space,” Granholm said. “We feel like we’re in the middle of history being made. Sometimes it’s hard to tell that you’re making history when you are in the middle of it but we are right in the thick of just an incredible time.”

U.S. Secretary of Energy Jennifer Granholm speaks a press conference at the Center for Clean Energy Engineering on May 20, 2022. The Department of Energy is preparing to invest $8 million in regional hydrogen hubs, including the northeastern consortium that UConn has joined. (Peter Morenus/UConn Photo)

Granholm Visit continued

The group walked through the Pratt & Whitney Additive Manufacturing Center and got a primer on the Titan Themis ACEM microscope, which can see down to the single atom, before meeting with students who comprise the Southern New England Industrial Assessment Center. Zhang said they've already had requests from six companies for assessments and began assessments this summer.

Since the funding was announced last summer, students have undergone training on how to do the assessments, and once they get going should complete around 20 per year. Companies can expect to save on average $130,000 in annual energy expenses just by looking at systems such as heating and cooling.

Georgia Tech in Atlanta, San Jose State University in California, the University of Delaware, the University of North Texas, and San Diego State University will receive aid from the $7 million announced Friday.

"I'm so excited about the many initiatives we have at the national level around hydrogen," Maric, who is a green energy researcher, said in her remarks at C2E2. "The future is in front of us, and with our great students and faculty we can make a difference in Connecticut and the national level."

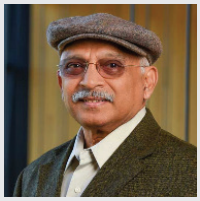
Courtney praised Maric, saying, "I can't think of a better person to have at this moment leading the University of Connecticut in terms of your experience here certainly on campus, but your incredible knowledge about the topic that we're going to talk about today.

"All of you who are working in this space, what a great moment to be here because we see this clean energy economy just exploding and making us as a nation energy secure with clean energy so that we are not relying upon the volatility of fossil fuels or petro-dictators," Granholm said. "It's an American strategy, it is a jobs strategy, and it is certainly a strategy that will heal our planet."

Also joining the group and recognized at the event were Connecticut Department of Energy and Environmental Protection Commissioner Katie Dykes and state Rep. Jaime S. Foster, D-57th District.

ALUMNI NEWS

ECE encourages all Alumni to join our LinkedIn group to stay in touch with the ongoings of ECE as well as network with others. The Group is located at **linkedin.com/groups/7452805/.**



HEMCHANDRA SHERTUKDE (Ph.D. '89) received the IEEE Power Systems Society Transformers Committee Outstanding Service Award for longstanding commitment and participation in Committee activities. He was one of three recipients who have been an officer of 35 or more standards development activities (task force, working group, or subcommittee). Hemchandra was an advisee of Prof. Yaakov Bar-Shalom, and is currently a Professor of Electrical and Computer at the University of Hartford.

DAVID SIDOTI (B.S.E. EE '11, M.S. '16, Ph.D. '18) received the prestigious Delores M. Etter Top Scientists & Engineers of The Year Award for Individual Emergent Scientist. The award is one of the most prestigious civilian awards from the Department of Defense. David is currently a Computer Scientist at the Marine Meteorology Division in the Naval Research Laboratory in Monterey, CA.

DAVID CROUSE (B.S.E. EE '05, M.S. '08, Ph.D. '11), co-advised by Profs. Peter Willett and Yaakov Bar-Shalom, was promoted to Senior Member of IEEE.

ROBERT TOMASTIK (B.S.E. EE '89, Ph.D. '95) and **DIPAYAN GHOSH (B.S.E. EE '10)** were named as 2021 inductees of the UConn School of Engineering Academy of Distinguished Engineers and were formally inducted in May of 2022.

Robert Tomastik is currently the technical fellow of operations research at Pratt & Whitney.

Dipayan Ghosh is currently co-director of the Digital Platforms and Democracy Project at the Harvard Kennedy School of Government.

IEEE GRAD POSTER COMPETITION

1ST PLACE **ADNAN MOHAMMAD** - Plasma Enhanced Atomic Layer Deposition of Vanadium Oxide Thin Films

2ND PLACE **ARSHIAH MIRZA** - Modelling High-Voltage High-Frequency Breakdown of Kapton HN for Electric Machine Insulation

3RD PLACE **ALAA SELIM** - Deep Reinforcement Learning (DRL) for Distribution System Restoration using Distributed Energy Resources and Tie-Switches

Left to Right are: Gaurav Gupta and Saurabh Goswami (event organizers), Alaa Selim, Arshiah Mirza and Adnan Mohammad (Winners), and Roman Mays (event organizer).

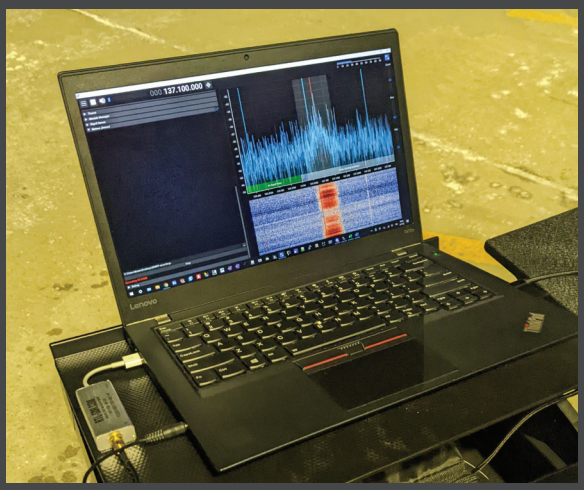
STUDENT CLUB NEWS

Student club **FROST ROBOTICS** was formed in Fall 2021. The team has competed in the MakerSpace CT MakerBattle Competition and Norwalk Havoc Robot League (NHRL), which are tournament style battles of remote-controlled robots. The Frost Team debuted Polar Vortex – a set of two 2-lb beater bar bots they built – at the NHRL competition in May 2022. The entire team assists with part replacements, quick repairs, and bot checkups in between battles. The team also is embarking on the 2023 University Rover Challenge. The club is lead by undergrad student **SERENE FENG (EE '23)** and the faculty advisor is Prof. Ashwin Dani.

Students have formed a new ECE-focused club, the **UCONN RADIO ELECTRONICS CLUB,** whose mission is to build and promote enthusiasm about radio electronics, mentor students through the ham radio licensing process, teach about various radio electronics topics, and encourage experimentation through projects and demos.

Since its creation in December 2021, the club has learned how to use software defined radio (SDR) to receive images from weather satellites and the International Space Station, prepare for the amateur radio licensing exam, built and tested their own yagi antennas, and learned how to use KiCAD for printed circuit board design (PCB)!

The club is led by undergraduates **KEVIN KNOWLES (EE '22)** and **MATT SILVERMAN (EE '23),** and the faculty advisor is Prof. Shengli Zhou.



UNDERGRAD STUDENT PROFILE

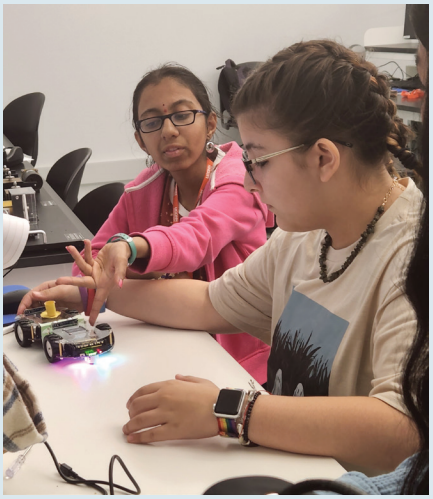
ABI YOUNG

Abi Young (EE '23) is a senior majoring in Electrical Engineering with a minor in Mathematics. She took notice of the major when she was studying mechatronics at one of the state's technical high schools.

While at UConn, Abi has worked with the theater lighting team at Connecticut Repertory Theater, where she has helped lighting designers prepare for shows such as "She Kills Monsters", "Little Shop of Horrors" and many others. Aside from working

in theater, she is the President of UConn Chapter of IEEE, which she has been a member of since her freshman year.

Over the summer, she worked at General Dynamics: Electric Boat where she worked as a test engineering intern, testing the tactical software for ship control of the Columbia class submarine. In the future, she plans on going into the power systems industry to work on substations or on offshore wind projects.

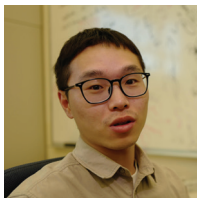


SUMMER ROBOTICS PROGRAM

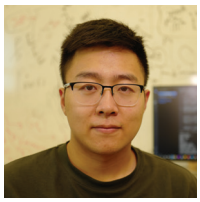
In anticipation of the new robotics undergraduate major, the ECE department ran a summer robotics program through the UConn Pre-College Summer program. High school student participants worked for a week assembling a mobile robot involving components such as a microcontroller, sensors, display, and battery with the base motors. They learned to modify and download micro Python codes to the robot and run them to perform object following using ultrasound sensors, as well as line following using infrared sensors and PID controls. The program finished with a leader-follower formation control competition.

Robotics Engineering Pre-College Summer students with PicoGo robots alongside mentor Prof. Abhishek Dutta and graduate assistant Rongting Yue.

GRADUATE STUDENT NEWS



Bendong Tan



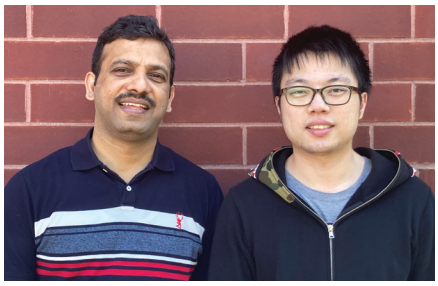
Yansong Pei

BENDONG TAN and **YANSONG PEI,** Ph.D. students under the supervision of Prof. Junbo Zhao, received two Best Paper Awards from the 2022 IEEE Power and Energy Society (PES) General Meeting. The IEEE PES General Meeting is the largest annual conference for IEEE PES and each year, only about 30 papers out of more than 1500 submissions are selected to be the best conference paper.

Tan's paper, entitled *"Power System Inertia Estimation: Review of Methods and the Impacts of Converter-Interfaced Generations"*, received the 2022 Best Journal Paper Prize from the *International Journal of Electrical Power and Energy Systems.* Tan also received a Best Paper Award from IEEE PES ISGT 2022 with his first authored paper *"Interpretable Data-Driven Probabilistic Power System Load Margin Assessment with Uncertain Renewable Energy and Loads".*

The UConn graduate student team comprising **ADAM BIENKOWSKI** and **HEE-SEUNG KIM** (ECE Ph.D. students) as well as Shanglin Zhou (CSE Ph.D. student) placed third in the World Meteorological Organization (WMO) Challenge to improve Sub-seasonal to Seasonal (S2S) Predictions using Artificial Intelligence with a prize of 5000 Swiss Francs.

In January, ECE graduate students formed a joint chapter of IEEE Power Electronics Society (PELS) and Power and Energy Society (PES).



RAJA GUDLAVALLETI *(above left)* won the ECE Spring 2022 TA award for his outstanding service to ECE 4244.

ZONGYUAN SHEN *(above right)* won the ECE Fall 2021 TA award for his outstanding service to ECE 3101.

ECE graduate student **TASHFIQ KASHEM** won Third Place in the School of Engineering's 8th Annual Student Association of Graduate Engineers Poster Competition.

A number of ECE graduate students received GE Fellowships in the past year. **HABEEB MOUSA** and **SERGIO DORADO** received new student GE Next-Gen Fellowships that include a one-time $7500 award. **AYAH ABDULLAH** and **YUTING SUN** received GE Fellowships for Inclusion and Equity which include a 50% graduate assistantship. Finally, **GOKUL KRISHNAN** was recognized for outstanding contributions with a GE Fellowship for Excellence and a 50% graduate assistantship.

Congratulations to the following ECE Graduate students who completed their Ph.D. defenses in the 21-22 Academic Year! **ANDREW FINELLI, RAJA GUDLAVALLETI, ROMAN MAYS, HIEP NGUYEN, TIMOTHY O'CONNOR, TOHID SHAHSAVARIAN, ZACHARIAH SUTTON, PAUL WORTMAN, AND ZHE ZHANG.**

FACULTY NEWS

IEEE Systems magazine published an interview with **PROF. YAAKOV BAR-SHALOM** in August 2022. The interview covers such things as Yaakov's early influences, living and serving through wartimes, his time working in industry, his advice for new grad students, as well as the seven accomplishments he is most proud of.

The full video of the interview is available at: **https://ieee-aess.org/presentation/online/interview-yaakov-bar-shalom** and a transcript is available at: **https://ieeexplore.ieee.org/document/9767683**

Yang Cao

PROF. YANG CAO was recognized by the ECE department with the 2021-2022 ECE Outstanding Research Achievement Award.

Sung-Yeul Park

PROF. SUNG-YEUL PARK was recognized with the 2021-2022 Outstanding Teaching Achievement Award.

PROF. ABHISHEK DUTTA has been awarded the 2022 AI 2000 Most Influential Scholar Honorable Mention in Multimedia for his contributions to the field of artificial intelligence between 2012 and 2021.

PROF. THOMAS KATSOULEAS was named a 2022 Optica Fellow. Optica Fellows are researchers that have served with distinction in the advancement of optics and photonics through contributions to education, research, engineering, business and society. The National Academy of Engineering has also selected Katsouleas for the Bernard M. Gordon Prize, which recognizes trailblazers in engineering education for being instrumental in the conception, design and growth of the Grand Challenge Scholars Program. Katsouleas gave the Gordon Prize Lecture at the Annual Meeting of the National Academy of Engineering on Oct. 2.

PROF. YANG CAO has been selected to receive $2.7 million in funding over three years from the U.S. Department of Energy's Advanced Research Projects Agency-Energy (ARPA-E) to develop a lifecycle management framework to help utilities make a smooth transition to a new, sulfur hexaflouride– free electrical grid.

PROF. JUNBO ZHAO was selected by the IEEE Power and Energy Society for the Outstanding Young Engineer Award, which recognizes only one engineer worldwide under the age of 35. The IEEE also recognized Zhao, serving as chair of the IEEE Task Force on Power System Dynamic State and Parameter Estimation, for his contributions in the development of a technical report that impacts the power and energy community. Zhao has been recently selected for a number of appointments including Associate Director of the Eversource Energy Center for Grid Modernization & Strategic Partnerships, Technical Committee Program Chair of the IEEE PES Renewable Systems Integration Coordinating Committee, and the next chair of the IEEE PES Connecticut Chapter. Finally, Zhao received the 2021 Best Paper Award from the *IEEE Transactions on Power Systems* for his paper, *"Power System Dynamic State Estimation: Motivations, Definitions, Methodologies and Future Work."*

STAFF TRANSITIONS

The department saw a number of changes in the main office in the last year. **MARY McCARTHY** and **DENISE (DEE) STOLSTROM** both retired in Spring 2022. Mary had been the department business manager since 2006 and Dee had been a department secretary for nearly 30 years. Also, **PHILIP DUNCAN,** the department IT and lab technician, moved on to a new job in University ITS. We appreciate their long service and commitment to the ECE Department.

Mary McCarthy

Philip Duncan

Brandy Ciraldo

Shane Eagleson

Jodi Peterson

Kelsey Glynn

With these departures came new faces. **BRANDY CIRALDO** joined the department in March as an Administrative Program Support II, **SHANE EAGLESON** in April as the new lab technician, and **JODI PETERSON** in July as an Administrative Program Support I. Furthermore, we have a new academic advisor, **KELSEY GLYNN,** who joined the School of Engineering in January.

SCIENCE 1 BUILDING UPDATE

The Science 1 Building which is part of the new Northwest Science Quad, a cornerstone of the Next Generation Connecticut program, began construc tion in July 2020. Comprised primarily of a large science building, a supplemen tal utility plant and subsurface tunnel, a performative and healing open space, and a parking area, the Northwest Sci ence Quad is scheduled to open in the academic year 2022-2023.

The building is one of the largest proj ects in the *Next Generation Connecticut* initiative, which was announced in 2013 to significantly expand UConn's educational and research work in STEM (science, technology, engineering and math) fields. The building will be one of UConn's largest and most technological ly advanced facilities when it opens. Its 198,000 square feet will house research, teaching and core laboratories; a new 240-seat active-learning room designed to engage students more dynamically than traditional lecture halls; and faculty offices, public spaces including a new cafe, administrative support offices and informal gathering spaces. It also includes a "clean room," which is a space designed to support specialized scientific research in a tightly controlled environ ment where contamination is minimized to protect the work by filtering airborne particles such as dust or other particu lates from within the room.

FACULTY RETIREMENTS

Nearly 100 years of institutional knowledge left the University of Connecticut Department of Electrical and Computer Engineering when three long-standing members of the department retired in 2021-2022.

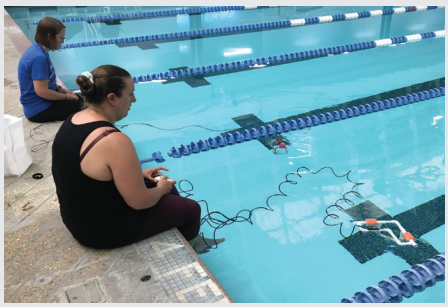
The three people, staff members **MARY MCCARTHY** and **DENISE STOLSTROM,** and Board of Trustees Distinguished Professor **KRISHNA PATTIPATI,** made deep impacts on the ECE department during their tenures, leaving large shoes to fill in their absence.

Pattipati, who joined UConn in 1986 as an associate professor, served many roles during his time here, including as UTC Chair Professor of Systems Engineering, Board of Trustees Distinguished Professor, and director of the Systems Optimization Laboratory. Pattipati was one of the most research-active faculty members at UConn during his time here and an advisor and mentor to over 70 M.S. and Ph.D. students—many of whom have gone on to very notable careers. Pattipati ended his career with $15 million in grants, 23 book chapters, 140+ journal papers, over 300 conference proceedings, and was a member of the Connecticut Academy of Science and Engineering.

McCarthy, who joined UConn in 2006, held many roles, including administrative coordinator, business manager, and administrative program support. Not only did she provide assistance to multiple department heads, but she managed the budgets, supervised staff, was a resource for faculty and staff, and kept the department running smoothly. For her service, she was recognized by the School as a 2009 Outstanding Staff Award recipient. Prior to UConn, McCarthy worked in private industry for nearly 30 years.

Stolstrom joined UConn in 1983, and saw a tremendous amount of change and growth during her 30+ years with the department, and left with the title of secretary 1. She assisted with travel, procurement, and graduate student admissions. To her colleagues and current and former graduate students, she was a welcoming and inspiring force. She cared deeply about the students, and would answer questions from students who came from all over the world.

THE DaVINCI PROGRAM



The School of Engineering has run the DaVinci Program for several years to help teachers of grades 5-12 integrate elemental engineering into the classroom. This past summer, Prof. Shalabh Gupta hosted teachers for a program on Innovative Underwater Robotics for STEM Projects. Participants learned about the operation of autonomous underwater vehicles (AUVs) as well as their sensing capabilities by working on a 3D underwater simulator where they ran various realistic AUVs. They also built and tested simple underwater vehicles. Exercises such as these can help teachers bring the concept of sonars to the classroom in addition to topics of buoyancy, propulsion, depth measurement and attenuation of light.

Systems Research

By Ryley McGinnis

A system is only as good as its parts and ability to work in tandem. A group of faculty members focused on systems research in the Department of Electrical and Computer Engineering has fine-tuned their collaboration to provide top-notch systems research and teaching.

Professors Yaakov Bar-Shalom, Peter Willett, Shengli Zhou, and Shan Zuo are four of the faculty members in the systems faculty group, with additional members Ashwin Dani, Abhishek Dutta, Shalabh Gupta, Liang Zhang, Peter Luh, Krishna Pattipati, David Kleinman, and Francesco Palmieri. The faculty group's research expertise is broad, with projects spanning missile defense, airport surveillance, autonomous systems, communication systems, manufacturing systems, and more. While the research areas they touch are expansive, faculty members consistently look for ways to collaborate across their expertise on high-impact projects and teaching.

"We have many joint projects across the systems group. We continually look for joint research and joint advising opportunities for our Ph.D. students," said Bar-Shalom, who has collaborated on numerous projects with Willett, including ones with the Missile Defense Agency.

Similarly, Willett and Zhou consistently collaborate on course materials and curriculum innovation to limit interruptions to students learning. "We consistently converge our information. We share materials and experiences. So when one of us needs coverage, there is no gap and no disruption to students," said Zhou.

The group's longstanding collaboration exemplifies the department's goals for innovative and cross-disciplinary research, and as new members join with additional expertise more becomes possible.

The group's newest member, Zuo, joined in January and specializes in the growing field of networked autonomous systems. "There's been a recent trend towards cooperation among networked autonomous systems research," she said. "I'm looking forward to collaborating with the systems group and learning from their professional expertise and experiences."

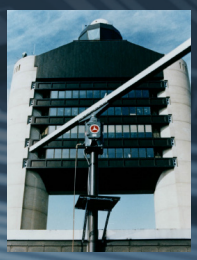
Faculty in the group have diverse research interests and numerous strategic partnerships that they leverage together to provide leading-edge research and learning opportunities for students.

"We hope to continue this tradition and maintain a very encouraging environment for collaboration within the systems group, with new members and more research areas," said Zhou

Across the group, many of the faculty hold distinguished positions with IEEE and other organizations. Collectively, across the last 40 years, the systems faculty groups have held numerous titles, some including:

- **Six IEEE Fellows**
- **Six editor-in-chief positions for various publications**
- **24 editor or associate editor positions**
- **Three IEEE Distinguished Lecturers**
- **Six society vice presidents**
- **One society president**
- **One International Conference General Chair**
- **Two IEEE Medals and Lifetime of Excellence award recipients**



Meet the Faculty

YAAKOV BAR-SHALOM is a UConn Board of Trustees Distinguished Professor, IEEE Fellow, and leader of the Estimation and Signal Processing Laboratory. His lab's research focuses on using radar, sonar, or electro-optical sensors to extract the maximum amount of relevant information to monitor friendly or hostile targets moving in space, air, on land or underwater. Bar-Shalom's projects have been sponsored by numerous government and industry partners, and he has published over 650 papers and eight books.

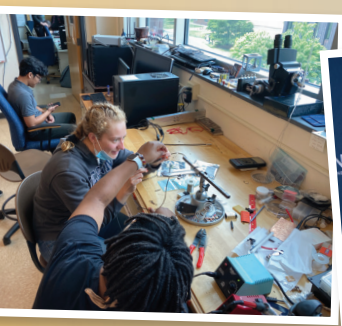
PETER WILLETT has been a faculty member in the department since 1986 and an IEEE Fellow since 2003. He has published 278 journal papers and 502 conference proceedings papers. Willett's primary research area has been detection theory, and he has collaborated on numerous projects in statistical signal processing, machine learning, communications, data fusion, and tracking. Willett has also been editor-in-chief of numerous IEEE publications throughout his career.

SHENGLI ZHOU is an IEEE fellow and runs the Wireless Communication Research Lab. His lab focuses on research in wireless communication and networking across platforms, including wireless radio, underwater acoustics, and optical wireless communication. Zhou is a recognized expert in wireless communications with over 270 papers, two books, and projects sponsored by the Office of Naval Research and the National Science Foundation.

SHAN ZUO joined UConn in 2022 and is the faculty leader of the Distributed Decision-Making and Learning Lab. Her goal with her lab is to design and analyze reliable and resilient distributed autonomous systems using innovative mathematics, including control theory and machine learning. While early in her career, Zuo already has 20 papers published in top-tier journals, including IEEE publications.

2022 COMMENCEMENT

Congratulations to All of Our Graduates!



FACULTY PROFILES

A.F. ANWAR
Professor; Fellow, SPIE; Member, CASE
Quantum size effect devices, transport in semiconductor devices, high frequency noise in electronic devices, GaN-based high power devices.
a.anwar@uconn.edu

JOHN E. AYERS
Associate Professor
Semiconductor materials, heteroepitaxial growth and characterization, defect engineering in heteroepitaxial semiconductors, semiconductor devices, VLSI fabrication.
john.ayers@uconn.edu

YAAKOV M. BAR-SHALOM
Board of Trustees Distinguished Professor & Marianne E. Klewin Endowed Professor in Engineering; Fellow, IEEE; Member, CASE
Target tracking with radar, sonar, and infrared sensors, air traffic control, data fusion for surveillance systems with multiple sensors.
yaakov.bar-shalom@uconn.edu

ALI BAZZI
Charles H. Knapp Associate Professor
Power electronics, motor drives, electric machinery, renewable energy integration in micro-grids.
bazzi@uconn.edu

NECMI BIYIKLI
Assistant Professor
Atomic layer deposition (ALD), semiconductor thin films and (opto) electronic devices, nanoscale energy materials, flexible and wearable electronics, smart/tunable materials, environmental sensing, selective materials processing.
necmi.biyikli@uconn.edu

YANG CAO
Professor; Member, CASE
High voltage engineering, HVDC materials, grid asset management.
yang.cao@uconn.edu

JOHN A. CHANDY
Professor & Head; Member, CASE
Distributed storage, clustered file systems, networking, hardware security, parallel architectures, VLSI design and automation.
john.chandy@uconn.edu

ASHWIN DANI
Associate Professor
Estimation and controls, machine learning for control, vision-based control, robotics.
ashwin.dani@uconn.edu

ERIC DONKOR
Associate Professor; Fellow, SPIE; Member, CASE
Fiber optic high-speed digital and high-frequency network implementation, quantum computing and communications.
eric.donkor@uconn.edu

ABHISHEK DUTTA
Assistant Professor
(jointly with Mechanical Engineering)
Cybernetics, Systems Medicine, Controls, Neuroscience, Robotics.
abhishek.dutta@uconn.edu

MONTY ESCABI
Professor; Member CASE
Human perception of sound, neuronal processing of sound information, neuronal modeling.
monty.escabi@uconn.edu

ALI GOKIRMAK
Professor
Nanofabrication, micro and nanoelectronics, thermo-electrics, electrical characterization, transport, electrical materials processing.
ali.gokirmak@uconn.edu

SHALABH GUPTA
Associate Professor
Cyber physical systems, distributed intelligent systems, robotics, autonomous systems, statistical learning and perception, information fusion, fault diagnosis & prognosis in complex systems.
shalabh.gupta@uconn.edu

FAQUIR C. JAIN
Professor; Fellow, SPIE; Member, CASE, NAI
Quantum dot (QD) multi-state/multi-bit FETs, NVRAMs and SRAMs, QD lasers and modulators, Implantable biosensors.
faquir.jain@uconn.edu

BAHRAM JAVIDI
Board of Trustees Distinguished Professor; Fellow, IEEE, OSA, SPIE, AIMBE, IoP, NAI; Member, CASE, NAI
Optics for information systems, 3D imaging, 3D display, 3D visualization, information security, nano technologies for imaging, 3D microscopy, biomedical imaging, bio-photonics.
bahram.javidi@uconn.edu

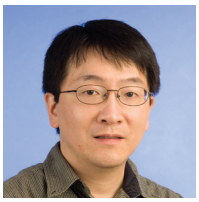
THOMAS KATSOULEAS
Professor; Fellow, IEEE, APS, NAI; Member, CASE
Relativistic plasma physics, plasma-based particle accelerators and high power light sources, novel radiation sources in magnetized plasma.
thomas.katsouleas@ucon.edu

OMER KHAN
Castleman Term Associate Professor
Computer architecture, large-scale multicores, architectures for heterogeneity, energy-efficiency, reliability, security, data and programmability, scalable on-chip communication, memory models and networks, hardware/software co-design.
omer.khan@uconn.edu

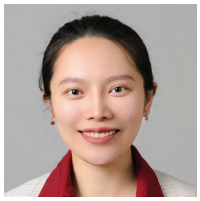
SUNG-YEUL PARK
Associate Professor
Intelligent power conditioning systems, energy conversion, renewable energy integration, microgrid and smart grid applications.
sung_yeul.park@uconn.edu

HELENA SILVA
Professor
Nanofabrication, micro and nanoelectronics, thermo-electrics, electrical characterization, transport, electrical materials processing.
helena.silva@uconn.edu

AMY THOMPSON
Associate Professor in Residence
Model-based systems engineering; systems engineering education; digital thread for the system lifecycle; design for manufacture; manufacturing systems modeling and analysis; smart and energy efficient buildings and facilities.
amy.2.thompson@uconn.edu



LEI WANG
Associate Professor
Low power, high performance integrated Microsystems, design methodologies for ASIC/SOC, VLSI signal processing algorithms and architectures.
lei.3.wang@uconn.edu



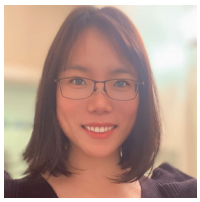
ZONGJIE (LISA) WANG
Assistant Professor
Power systems, power market, optimization and simulation, integrated optimal system dispatch, renewable energy integration, data analytics.
zongjie.wang@uconn.edu

PETER K. WILLETT
Professor; Fellow, IEEE
Detection, target tracking, communication, signal processing.
peter.willett@uconn.edu

LIANG ZHANG
UTC Associate Professor of Engineering Innovation and Director of Undergraduate Studies
Systems and control with applications to manufacturing, service, and battery systems.
liang.zhang@uconn.edu

JUNBO ZHAO
Assistant Professor
Cyber-physical power system modeling, monitoring, stability control, resiliency and cyber security, uncertainty quantification, machine learning and robust statistics.
junbo@uconn.edu

SHENGLI ZHOU
Professor and Associate Head; Fellow IEEE, Member, CASE, NAI
Wireless communications and signal processing, underwater acoustic communications, and optical wireless communications.
shengli.zhou@uconn.edu



SHAN (SUSAN) ZUO
Assistant Professor
Autonomous systems, heterogeneous multi-agent systems, distributed decision making, deep reinforcement learning, microgrids.
shan.zuo@uconn.edu

AFFILIATED FACULTY

Sherman Fang, Adjunct Lecturer
Kaleel Mahmood, Assistant Research Professor
Louis Parrillo, Professor in the Field
Ulrich Rührmair, Research Professor
David Tonn, Adjunct Lecturer
Marten van Dijk, Research Professor

EMERITUS FACULTY

Rajeev Bansal, Fellow, Electromagnetics Academy; Member, CASE
Peter K. Cheo, Fellow, IEEE
David Jordan
David Kleinman, Fellow, IEEE
Peter B. Luh, Fellow, IEEE; Member, CASE, NAI
Matthew Mashikian, Fellow, IEEE; Member, CASE
Krishna Pattipati, Fellow, IEEE; Member, CASE, NAI
Geoff W. Taylor, Fellow, IEEE

INDUSTRIAL ADVISORY BOARD

David Adams ('88 B.S.), Sikorsky Lockheed Martin
Frank Chan ('99 Ph.D.), Undersea Warfighting Develop. Ctr. (retired)
Mark Culler, ABB
Mary Girard, Mitre Corp.
Georgiy Levchuk ('03 Ph.D.), Aptima
Diana Mahoney ('88 B.S.), Eversource Energy (retired)
Tom Martin, ('74 Ph.D.) Phonon Corporation (retired)
Don Masters, Pratt & Whitney
Brian McCabe, Raytheon Technologies Research Ctr.
Paul Melzen, Eversource Energy
Steven Moffett, Electric Boat
Eric Mueller, Coherent, Inc.
Venk Mutalik ('94 M.S.), Comcast
Eric Reed ('91 B.S., '95 M.S.), Cigna
Dan Schwarting, ISO New England
Leo Veilleux, Collins Aerospace

6323070

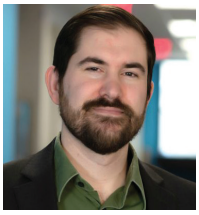
UCONN
SCHOOL OF ENGINEERING

Department of Electrical & Computer Engineering
371 FAIRFIELD WAY, UNIT 4157
STORRS, CT 06269-4157

ADDRESS SERVICE REQUESTED

NON-PROFIT
ORG.
US POSTAGE
PAID
STORRS, CT
PERMIT NO.3

SOE PROFESSIONAL EDUCATION



ADAM NOGIEC Vice President, Engineering at Unison earned both of his undergraduate and master's degrees in mechanical engineering at UConn. Nogiec says, "After 15 years working in the clean energy industry (fuel cells and combined heat & power), I had a lot of on-the-job experience with electrical power equipment but was lacking the theoretical background to fully understand how they worked. UConn's School of Engineering Professional Education Graduate Certificate in Power Engineering has been the perfect way to supplement my electrical engineering knowledge."

As a husky, you know that UConn is a leader in engineering education. Advance your career and gain the knowledge you can use today with graduate level programs through the School of Engineering Professional Education program. Graduate offerings that fit your life and your schedule. Take an engineering class, start your Master of Engineering Degree or

> **"UConn's School of Engineering Professional Education Graduate Certificate in Power Engineering has been the perfect way to supplement my electrical engineering knowledge."**

earn an Advanced Engineering Certificate. 14 Engineering Concentrations. 10 Advanced Engineering Certificates. Part-time; asynchronous, and synchronous offerings. Set up a meeting with our Professional Education team so we can personalize your plan.

860-486-5955, soeprofed@uconn.edu, https://soeprofed.uconn.edu