

SIGNALS & NOISE

DEPARTMENT OF ELECTRICAL AND
COMPUTER ENGINEERING

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ECE UPDATES

CHECK OUT WHAT PROF. YU HAS BEEN UP TO!

In August 2023, Prof. Qiaoyan Yu was selected to the position of Expert (part-time program director) in the Division of Computer Network System (CNS), Directorate for Computer and Information Science and Engineering (CISE) at the National Science Foundation. She will use her expertises on hardware security and cybersecurity to help the Secure and Trustworthy Cyberspace (SaTC) program.



National Science Foundation

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Check Us Out!



CHAIRMAN'S CORNER

Professor John LaCourse

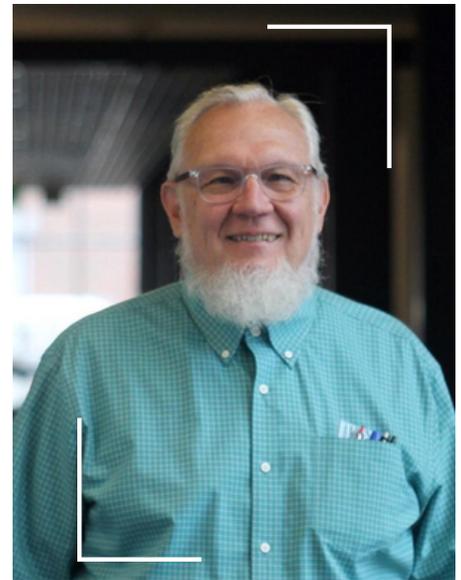
It is accreditation time again and the excitement is growing. However, we are well-prepared for the assessment due to the extraordinary leadership of Professor Richard Messner who has spent countless hours participating in ABET-related department and college committees, gathering and analyzing data, and eventually writing the entire first draft. Of course, without the technical support of Ms. Lauren Foxall, the final delivery in the proper form would have been a challenge. Since the last ABET visit, our curricula have been modified as follows: both EE and CE majors and the BioMed Engineering options now have a common number of overall credits (129) and semester structural alignment of core course requirements; each degree has a common structure with four, in major, core courses culminating in a second semester course launching them into the senior year. Furthermore, the department has developed a Course Improvement Audit Form to assess students meeting ECE Program Educational Outcomes (PEO). PEO consists of statements describing what students are expected to know and be able to do by the time of graduation, the achievement of which indicates that the student is equipped to achieve the program objectives. Before I forget, UNH is seeking reaccreditation under NECHE this semester. Wow! What a busy semester.

On another note, Prof. Arezoo Hasankhani will be joining the faculty in January 2024; presently, she is a Postdoctoral Research Associate at the Symbiotic Engineering and Analysis Lab at Cornell University. She received her Ph.D. in Electrical Engineering from Florida Atlantic University. Her research interests are in Marine Renewable Energy System, Design, Control Co-design, Optimization, Control, Reinforcement Learning, Robotics, Autonomous Underwater Vehicle, Path Planning, Path Tracking, and Spatiotemporal Optimization. Prof. Hasankhani will be sharing her talents with the Ocean Engineering Program. Also, Dr. Thomas Blanford will be joining us as an Affiliate Research Assistant Professor. He holds a joint appointment in the Center for Coastal and Ocean Mapping and the Center for Acoustics Research and Education to investigate acoustic sensing, signal processing, and instrumentation.

Furthermore, Dr. Michael Carter, Emeritus Professor, has established the UNH Amateur Ham Radio Club. And congratulations to Prof. Qiaoyan Yu who was selected for the position of Expert in the Division of Computer Network Systems (CNS), Directorate for Computer and Information Science and Engineering (CISE) at the National Science Foundation.



We hope you are doing well. Please keep us up to date, we'd love to hear from you.



Please congratulate and welcome Prof. Arezoo Hasankhani and Dr. Thomas Blanford to the ECE Dept.!



Pictured: First meeting of the UNH Amateur Ham Radio Club, led by Emeritus Professor, Dr. Michael Carter.

UNDERGRADUATE STUDENT HIGHLIGHTS

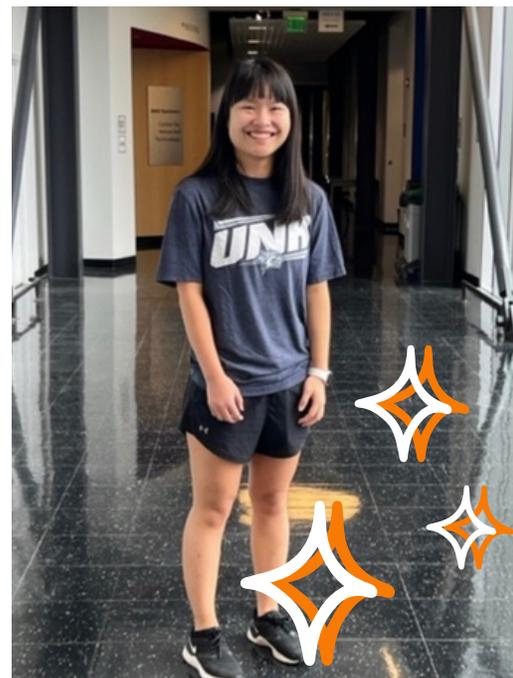
Avery VanHendrick is a sophomore at UNH studying computer engineering. He has always had a passion for electronics and how they work. Throughout his childhood he was constantly working on some type of project. These included designing his own computer games, building PCs, teaching himself how to code, and making projects using the Arduino microcontroller. During high school Avery took many electrical based classes such as electric circuits and an electrical tech class. While in high school Avery also became certified to be an electrician, but when working as a residential electrician, he realized he wanted to do more. With this realization he decided to come to UNH as a computer engineer in the ECE department.

Avery's exceptional work during his freshman year in Prof. Messner's ECE 401: Perspectives in ECE class provided him with the opportunity to be a Lab Assistant in the class his sophomore year. This position consists of Avery working with the ECE freshman class by assisting his fellow teaching assistants with answering the students questions and working to help them through the difficulties of the labs. On top of working in the lab Avery also works outside of the lab grading homework and giving feedback to the students.

Outside of school and work Avery enjoys going to the gym and staying active, from playing pick-up games with friends to hiking throughout Vermont and New Hampshire. Avery still enjoys creating projects with Arduinos and is always writing code. His passion for ECE is always growing, and he looks forward to the many things he will learn in his future here at UNH in the ECE department.



Libby Segal is a Junior studying Electrical Engineering with the Biomedical Engineering Option. She is currently working as a grader and lab assistant for ECE541: Electric Circuits class and formerly worked for ECE 562: Computer Organization as a grader and lab assistant. In the laboratories she assists the TA by answering questions from students and troubleshooting their circuits. Libby is the Treasurer of the new and upcoming ECE Biomedical Engineering Club. The club's mission is to provide hands-on opportunities for designing and building biomedical devices. She is also a part of the Society of Women Engineers Outreach Committee (SWE) where she goes to the local middle schools and assists in fun engineering projects with the kids. When Libby is not in class or studying, she enjoys watching sports, skiing, and going to the beach with friends.



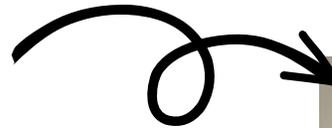
UNDERGRADUATE STUDENT HIGHLIGHTS



Erin McDonald is a junior studying electrical engineering with the biomedical engineering option. Besides her classes, she is also the secretary of the Biomedical Engineering Club, a new and up- and-coming club. With the help of some other ECE biomedical engineering students, they are in the process of planning new activities for the members so they can gain more hands-on experience in the lab outside of classes. She is also a part of the Society of Women Engineers (SWE) Outreach program, attending numerous events and activities at the nearby middle schools to get the girls interested in the STEM field!

She was offered the position of becoming a lab assistant for Professor Messner's ECE 543: Introduction to Digital systems class. Being one of the first electrical and computer engineering lab assistants for the department, she assists the TA in the laboratory by checking circuits, troubleshooting errors, and more. Having an extra set of hands in the lab cuts down time of students sitting around waiting for assistance while the TA instructs others who need help. She is excited to be a part of the department, and if you see her, say hi!

GRADUATE STUDENT HIGHLIGHT



Prashant Purohit is a Ph.D. student at the Biomedical and Wearable Technology Lab supervised by Prof. John LaCourse. His research area and interests are Biomedical Devices and Wearable Technology. He worked on developing a prototype for the smart syringe, which provided information about the pressure applied to the syringe and the needle trajectory to the target. He is currently working on developing a training tool for experienced and inexperienced nurses in Neonatal Resuscitation. The training tool will provide real-time insights into various dynamics of neonatal chest compressions: chest compression depth, recoil, force, rate, and different fatigue levels while performing Neonatal Cardiopulmonary Resuscitation.

Prashant has also worked as a teaching assistant in the ECE department. He coordinated labs for ECE 537: Introduction to Electrical Engineering, and ECE 784/884: Biomedical Instrumentation. His other interests include hiking, listening to music, sports activities, and traveling.



Grad Student Update

Listen to what Shuva has been doing!!



Shuva Paul, Ph.D. student and Teaching Assistant of ECE had the honor of solely representing the University of New Hampshire in the Accelerate to Industry (A2i) immersion week program at North Carolina State University during the week of July 17-21. This NSF's Innovations in Graduate Education Grant-funded program brought together doctoral and post-doctoral researchers from thirty-three other universities, industry professionals, business leaders, educators, and career counselors. It was a remarkable opportunity for him to foster collaboration with other graduate students and engage in intensive experimental learning, and workshops to develop new skills in problem-solving, leadership, teamwork, project management, entrepreneurship, and communication.



Shuva was also an Orientation Leader (OL) to welcome new international graduate students at the University of New Hampshire in Fall 2023. When describing his role experiences, he said "It's not only about leading and helping new students adjust to a new campus, country, culture, and academic life, but the role also provided me with valuable insights from diverse cultures and new perspectives that these students brought to UNH Graduate School."



FACULTY HIGHLIGHT:

Professor Richard Messner

Prof. Richard A. Messner came to UNH as an Assistant Professor in January of 1985 at the young age of twenty-eight. He has proven to be an excellent teacher, impacting many undergraduate and graduate students over the thirty-eight years he has been a member of the ECE Department. Professor Messner began his career path by attending and receiving a B.S. and M.S. in Electrical and Computer Engineering from Clarkson College of Technology in Potsdam, NY. After completing his MS degree, he worked for MITRE Corporation, where he worked on error correcting codes and encryption for the MILSTAR program. While working at MITRE, Prof. Messner applied for and was awarded an ONR fellowship to pursue a Ph.D. degree at the Naval Research Laboratory in Washington, D.C. Taking a leave of absence from MITRE he worked with Dr. Harold Szu (Naval Research Laboratory) and Dr. Robert Schilling (Clarkson University) on smart Visual Sensors for real-time image processing and pattern recognition. He received his Ph.D. degree in 1985.



Once arriving at UNH Prof. Messner established the Synthetic Vision and Pattern Analysis Laboratory (<http://svpal.unh.edu/>) where he began conducting research on biologically inspired vision systems. To date he has been major advisor to 43 graduate students (39 MS, and 4 Ph.D.). Prof. Messner also teaches a variety of courses from freshman to graduate level. He created the freshman course ECE401, Perspectives in Electrical and Computer Engineering, and has taught it for over two decades. It is his favorite course as he can inspire the next generation of engineering minds who will tackle the engineering problems of the future. He has also introduced courses in digital image processing and optical signal processing. Prof. Messner has consulted for numerous companies while being a professor at UNH, including positions at Ektron Applied Imaging from 1985-1988, consultant and co-founder of Kenophase Inc. from 1990-1998, and at Datacube Inc. from 1988-2001. Prof. Messner is a Senior Member of IEEE and has served as IEEE NH State IEEE Chairman.

Most recently, Prof. Messner has been collaborating with Dr. James Ryan (UNH Physics Department) and colleagues at NASA's Goddard Flight Center where work continues into the development of the next generation Solar Neutron Tracking (SONTRAC) Instrument. This instrument will be used to detect neutrons which are harmful to astronauts and can damage electronic equipment in space. Prof. Messner's latest Ph.D. student, George Suarez, was instrumental in the analysis of both simulated as well as actual neutron and proton interactions with the SONTRAC instrument.

Outside of his work, Prof. Messner enjoys outdoor activities such as kayaking and gardening, he even has a koi fishpond. Of course, no article on Prof. Messner would be worth a read without mentioning his eclectic office in Kingsbury Hall. In fact, his office was featured in the UNH Alumni Magazine in Spring 2013 (<http://unhmagazine.unh.edu/sp13/rich-messner.html>). You can also check out "What's in Messner's Office Wednesdays" on our instagram.



ALUMNI HIGHLIGHT: LEE BEAUREGARD

MSEE 1992



Lee Beauregard has worked in the field of biomedical engineering for more than thirty years. Over that time, his career has taken him from academic research to the product development of a wide range of medical instrumentation for both human and animal health care.

Lee's passion for biomedical career was first ignited when he returned to UNH to get his MSEE in 1992 and worked under Prof. John LaCourse. His thesis focused on developing an instrument to detect the early onset of carpal tunnel syndrome. The underlying principle was based on measuring tactile sensitivity loss in the fingertips. It was through this experience, Lee found that he really enjoyed applying engineering principles to biological systems. (Plus Prof. J's enthusiasm, support and creativity made the whole experience an extremely positive one!) After completing his MSEE, he attended Boston University and received a Ph.D. in biomedical engineering in 1996. Though enrolled at BU, Lee was fortunate to carry out his research at MIT as a visiting scholar and after graduation remained at MIT as a Post-Doctoral Fellow studying haptic psychophysics.



It was at a job fair at MIT that he landed his first biomedical engineering job in industry. Lee was hired by a startup company, called VTI, that was developing electromagnetic-based image guided surgery system for sinus and spinal surgery. The heart of the technology involved the "GPS" tracking of small magnetic sensors attached to endoscopic surgical instruments. The location of sensors enabled the surgical instrument to be displayed real-time on an MRI or CT scan computer display mounted near the operating room table. Over time, he became a chief scientist and was an inventor on several patents around the technology. Like many startup companies, there were plenty of up and downs. They work long hours and tackle tough problems to build their product platform. Lee learned a lot about perseverance and creative problem solving on a shoestring budget. Most of all, he loved the challenge of applying cutting edge technology to improve the quality of life for many people. In the end, they developed a very successful product that was used in over half million surgeries around the world by the time VTI was acquired by GE Medical Systems in 2001.

Today, Lee is the Vice-President of Instrument Development at IDEXX, a \$3.6B animal diagnostic healthcare company. Lee oversees the R&D organization responsible for developing a wide suite of diagnostic instruments for veterinarians. In his current role, he is much farther away from the day-to-day design and development work that he did earlier in his career. However, he has found that people leadership has its own set of interesting problems to solve!

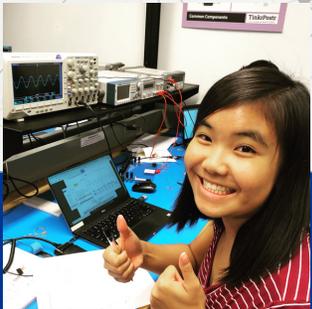
Throughout his entire career, his wife Jean, has been his strongest supporter. They have been married for almost 35 years and have two young adult children. They love to travel far and near. Their family has been to Europe and many places across the United States. When they are not travelling you can often find them cooking and enjoying a nice glass of wine at home.



ECE NEWSLETTER HISTORY



In 1923 we were the New Hampshire College of Agriculture and the Mechanic Arts. The Electrical Engineering Program was a member of the Engineering Division. We had three faculty members, one being Leon Hitchcock. Tuition was \$75. The electrical engineering laboratories occupied the ground floor of the south end of DeMeritt Hall. Today, we are the University of New Hampshire, members of the College of Engineering and Physical Sciences, and the Department of Electrical and Computer Engineering. The faculty consists of eleven tenured-track professors and two lecturers. Our laboratories are found on the 2nd and 3rd floor of Kingsbury and in Morse Hall. Tuition is \$15,520. WE have come a long way since 1923. Let us celebrate our 100th year as a university!



STAY CONNECTED!

We would like to stay connected with our alumni and friends. We also welcome newsletter contributions and suggestions.

Please send in your news items, e.g., awards, promotions, personal updates, memories of UNH, and suggestions to Lauren Foxall at lauren.foxall@unh.edu.

The Electrical and Computer Engineering Faculty, Staff, Graduate Students, and Undergraduate Students immensely appreciate the support we have received from our generous donors. Thank You!

If you would like to make a financial contribution to the ECE Department, please visit: www.unh.edu/give/ceps

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