SIGNALS & NOISE DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

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ECE UPDATES

WE ARE BACK AND WITH A BRAND-NEW LOOK!

The last Signal and Noise newsletter was published in the Summer of 2002.

This newsletter started in 1986 and highlighted all the great events that was going on in the department.

We thought it was time to bring it back and highlight what's going on now!



A Newsletter from the UNIVERSITY OF NEW HAMPSHIRE Department of Electrical and Computer Engineering (603) 862-1357 WWW.ECE.UNH.EDU SUMMER 2002

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CHAIRMAN'S CORNER Professor John LaCourse

WE'RE BACK!

The ECE Signal and Noise newsletter has been resurrected! Many of you, I hope, remember when the first issue came out on June 1986. At that time John Pokoski was chairman. The plan was to provide an annual newsletter that was "light and breezy including department news, nostalgia, comments from readers, faculty activities, and even a puzzle section." The printed and mailed newsletter was a success; however, due to financial constraints our newsletter was abandoned. But now we are back! Many of the items contained in our inaugural issue will be in this annual newsletter.

The department has seen many changes since our last issue of Signals and Noise, way too many to cover in the issue; therefore, the focus will be on the recent past. Through the efforts of Rich Messner, the department held its inaugural and annual, "Old Fogies Luncheon". The luncheon was a gathering of retired professors, instructors and staff. See photo at the bottom of the page. Just think of the combined years of service our alumni provided to the department. And yes, Professors Mike Carter and Kent Chamberlin have retired.

Professor Diliang Chen joined the ECE faculty in Fall 2020 and Professor Dean Sullivan joined in Fall 2021. Dr. Hoda Pahlevanzadeh joined the ECE department this Fall as a full-time lecturer! Professors Nicholas Kirsch, Andrew Kun, Qiaoyan Yu have been promoted to full professors. Professor Edward Song was promoted to Associate Professor with tenure, and Dr. Wayne Smith was promoted to Principal lecturer.

The ECE department continues to grow! We now have two new options: Electrical Engineering Biomedical Engineering option and Computer Engineering Biomedical Engineering option. These options helped in increasing our student numbers and especially female students.We have also established a Graduate Student Advisory Board to complement our Undergraduate Student Advisory Board to student needs.



Pictured Above: The first Signals and Noise Newsletter from 1986.



Congratulations to Jim Abare for receiving Employee of the Month!

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



ECE Faculty Emerti Group Photo: Left to right front row: Frank Hludik, Mike Carter From left to right second row: Don Melvin, Glen Gerhard, John Pokoski, Kent Chamberlin, Ron Clark, John LaCourse, Rich Messner Very back: Paul Nahin and Tom Miller

Emerti Professors not in photo: Allen Drake, Kondagunta Sivaprasad, Gordon Kraft, Bill Lenharth, Andrzej Rucinski







UNDERGRADUATE STUDENT HIGHLIGHT

Amy Prendergast is a junior studying Electrical Engineering with a option in Biomedical Engineering.

During her summers, Amy has participated in the NH BioMade URT (Undergraduate Research Training) Program and the Wake Forest School of Medicine's BME REU (Biomedical Engineering, Research Experience for Undergraduates).For NH BioMade, Amy worked under Dr. Nikhil Padhye to model thin elastic sheets using FEA and NURBS for the purpose of minimizing costs in pharmaceutical manufacturing. For the BME REU, Amy worked under Dr. Jared Weis to develop a clinical support tool by "Multivariate Image-Based Predictive Modeling of Breast Cancer Neoadjuvant Therapy Response". She did this through image and signal processing of breast cancer MRIs for radiological and biophysical markers that were indicative of early treatment response. Most recently, Amy had the chance to attend the Biomedical Engineering Society's Annual meeting in San Antonio, TX to present her research from the BME REU through a poster presentation (see photo on the left).

For fun, Amy enjoys spending time outside through hiking, paddleboarding, kayaking, etc. She also is a Hamel Scholar and the Co-President of the American Cancer Society Club at UNH.

GRADUATE STUDENT HIGHLIGHT

Shuva Paul is a Ph.D. student working in the Wireless System Lab under the supervision of Professor Nicholas J. Kirsch. His research interests include Cellular Vehicle-to-Everything (C-V2X) Communication, Industrial Internet of Things, Signal Processing, Data Fusion, and Machine Learning. Recently he worked on a Verizon, Inc. funded highly interdisciplinary research project in collaboration with three other research groups from Worcester Polytechnic Institute, and University of Massachusetts Lowell. He worked on to develop a novel opportunistic approach of passive RF localization for detecting "phantom car" attacks, followed by building a custom-built Python-based computer simulation platform to evaluate the approach, and a small-scale proof-of-concept hardware test-bed experimentation to validate the approach. In this approach, surrounding trusted sensors network, which is comprised of: moving vehicles on-board C-V2X unit, roadside unit, and existing cellular base stations, passively measure Electromagnetic emissions characteristics (e.g., Received Signal Strength, Time Difference of Arrival) of Signals of Opportunity (e.g., Bluetooth, Cellular, Wi-Fi, Tire Pressure Monitoring System) emanating from target vehicles. Then high-speed data fusion and Machine Learning techniques were used to extract vehicle position/velocity information from these sensed EM emissions as a function of time and distance.

Currently, he is exploring Long-Range Wide-Area Network (LoRaWAN) in the context of Industrial Internet of Things (IIoT) communications application. Multipath and Interference channel modelling is a challenge for industrial environments since industrial environments are remarkably diverse covering wide indoor/outdoor areas with fixed and mobile obstacles. The aim of this study is to investigate which multipath, and interference model is appropriate for LoRaWAN deployment in the IIoT environments. Outside of academic and research activities, Shuva enjoys spending time with his family, travelling at beautiful places, hiking around at NH, and listening to music.



Pictured above: Shuva helping a student in ECE 401 lab.



FACULTY HIGHLIGHT Professor Qiaoyan Yu

The Department of Electrical and Computer Engineering is leading the development of a New Hampshire Cyber Security Enhanced Education Laboratory (NHCyberSEE Lab), which is sponsored by the National Science Foundation (Award CNS-2154606). Professors Qiaoyan Yu (PI, UNH ECE), Diliang Chen (Co-PI, UNH ECE), Dongpeng Xu (Co-PI, UNH CS), and Karen Jin (Co-PI, UNH Manchester) are the core members of this project. Unlike many existing cybersecurity courses mainly offering conceptual overviews and theoretical analysis, the NHCyberSEE Lab will enable us to integrate theories with well-structured hands-on practice projects. Through the training program associated with the NHCyberSEE Lab, students will (1) be trained to trace back the cause of various attacks in hardware/software/network and (2) be guided to develop and implement effective attack mitigation methods at multiple levels. Figure 1 depicts the general flow of the training program enabled by the NHCyberSEE Lab.





Figure 1. Pedagogy for cybersecurity education. (a) course flow and (b) course structure.

Professor Qiaoyan Yu and her former Ph.D. student Dr. Jaya Dofe organized the 5th Workshop for Women in Hardware and Systems Security (WISE) on October 14, 2022 at the University of New Hampshire. This is the first time that the WISE workshop was run independently in a local university. Thanks to the sponsors, National Science Foundation (NSF), IEEE New Hampshire Section, the Department of Electrical and Computer Engineering at the University of New Hampshire, the WISE workshop was expanded from a half-day program (in the first 4 editions) to a full-daylong event.

The 2022 WISE program was featured with one Keynote (Ms. Cheri Caddy, National Cyber Director), and three visionary talks from Dr. Gang Qu (NSF), Dr. Lei Poo (Analog Devices), and Dr. Wayne Burleson (UMass Amherst). Two tutorials were offered by the experts from IBM (Drs. Mengmei Ye and Sandhya Koteshwara) and UNH Manchester (Dr. Maeve Dion). The experts in the Leadership Panel shared their career experience in the field of hardware and systems security and inspired high school, undergraduate and graduate students to pursue their career in this domain.

Twenty student presentations (oral/poster/hardware demo) were selected for the presentation competition. The IEEE NH Section sponsored three Best Poster Awards. More details are available on the website http://www.wise-workshop.org/.

Professors Yu and Dean Sullivan co-organized the 1st New Hampshire Cybersecurity Day in the UNH Memorial Union Building. This event was featured with faculty presentation, IEEE student club presentation, student-professionals Q&A, and professionals' brainstorming for prospective collaboration on research and education.



EVERS URCE

Annette Conticchio – B.S.E.E. 2015 (UNH), M.S.E.E. projected 2023 (WPI)

Annette graduated with a B.S.E.E degree from UNH in 2015 and is currently a Substation Operations Supervisor and department head at Eversource Energy NH (https://www.eversource.com/content/nh). Annette's team consists of engineers, analysts, an environmental technician, and a lab tester; together, they help ensure the safe operation of substation equipment, proper disposal of equipment retired, and safety of electrical workers in the field. The team also responds during storm events to help keep the public safe from fallen wires and repair customer connections to the power grid.

Annette is appreciative of the collaboration that UNH and Eversource have had over the years, stating: "I interned with PSNH, now Eversource, for two years during my undergrad studies at UNH. While there, I fell in love with the variety of indoor and outdoor work as well as the satisfaction of being able to help customers during storm events when they need us the most. I knew when I graduated that I wanted to continue working in the power industry, and I was lucky enough to graduate at a time when Eversource had just launched their first 'cohort' program. I had been working with the UNH CEPS Career Center, and they contacted me as soon as they heard about this opportunity.



This program would allow folks who were newer to the industry to experience different positions within the company while training for their ultimate position, which in this case was supervision. Additional cohort programs were launched the following year and have become one of Eversource's signature programs. I left Eversource as an intern to finish my degree and, with UNH's help, returned as a supervisor cohort trainee. It was a really cool opportunity!"

"I've been working with Eversource for 7 years now and have remained active in the UNH community, giving back and helping the next generation of engineers. Professor Messner has invited me as a guest lecturer for his ECE 401 class almost every year since I've graduated, which I always enjoy! I also represent Eversource by talking to students at many of the CEPS Career Fairs. I love to help students learn more about the power industry, assist with resumes, provide career advice, or even schedule a visit so they can experience some of what we do firsthand."

In her spare time, Annette enjoys watching Star Trek, driving around New England, and exploring Lake Massabesic.

BRIEF ANNOUNCEMENT

Pictured below: George Suarez (left), Ph.D. Student and his advisor, Prof. Rich Messner (right). George successfully

ECE'S HISTORY The first FF class of 1908.



Picture on the right: 3D Density of proton track endpoints showing Bragg peak.





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

Created by Lauren Foxall

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