

Machine learning building ALERT system for power outages

by Greg Forna

Zoran Obradovic, Laura H. Carnell Professor of Data Analytics, and his research partners are collecting historical outage data, weather-related data and other types of ‘big data’ and then using advanced machine learning to make predictions on when and where power outages will occur.

Called ALERT: Advanced Learning for Energy Risk Tracking, the National Science Foundation-funded initiative looks to develop an early warning prototype and outage prediction model. Utility companies will be much better prepared to minimize outages and even prevent catastrophic events like total blackouts. Consumers would have earlier access to important—and potentially lifesaving—information.

“We are building a system that is learning from multiple sources, and this type of multimodal learning is where its power lies,” said Obradovic, who is also director of CST’s Center for Data Analytics and Biomedical Informatics. “In the ongoing NSF-funded

project and our related project supported by the U.S. Department of Energy (DOE), we collect large data sets related to weather, weather forecasting, power generation, consumer use of energy, substation failure and information from phasor measurement units.”

Research collaborator on the ALERT project include faculty from Texas A&M University, the University of Texas at San Antonio and the University of Houston. CST graduate students working on the NSF and DOE projects include Hussain Otudi and Daniel Saranovic.

“There are so many layers of information, and so many ways that a down electrical grid overlaps with, for instance, people’s access to water, and other systems,” said Obradovic, who cited a cold snap in Texas a few years ago where earlier and better predictions might have prevented both loss of life and damage to infrastructure. “Our system is called ALERT because it’s about giving utility companies and people the information needed to be proactive, before the power goes out.”

OWLHACKS ORGANIZERS HOST TAPIA HACKATHON WORKSHOP

CIS students Chiku Okechukwu, Egi Rama and Andrew Tran presented a workshop at the 2024 Tapia Conference, where more than 2,000 attendees gathered to discuss broadening participation in computing. Alongside undergraduate collaborators from the University of Washington, the three shared best practices to help other students kickstart hackathons in their local communities. The three CIS students are part of the team behind OwlHacks, Temple’s annual, student-organized hackathon. First hosted in 2019, this year’s OwlHacks attracted more than 275 participants.



NEW CIS CHAIR

by Greg Fornia

Yu Wang was named CIS chair, effective July 1, 2024. Wang joined the department in 2019 and served as director of graduate programs for four years.

Wang, who earned a PhD in computer science from Illinois Institute of Technology, has research interests in wireless networks, smart sensing and distributed computing. Current projects include developing efficient resource management schemes to support edge intelligence and creating mobile smart sensing systems with multi-modalities to perform fine-grained sensing tasks for security and health applications. With more than 300 papers in peer-reviewed forums, his research has been continuously supported by NSF, Department of Transportation and Microsoft.

An IEEE Fellow and ACM Distinguished Member, Wang is a recipient of Sigma Xi Award from Illinois Institute of Technology, Ralph E. Powe Junior Faculty Enhancement Awards from Oak Ridge Associated Universities and IEEE Benjamin Franklin Key Award.

"I am committed to fostering an environment of innovation and cutting-edge research," said Wang, "and enhancing student success with hands-on experience, industry exposure, and opportunities to work on real-world problems alongside our faculty."

As chair, Wang follows Jamie Payton, who now serves as dean of New Jersey Institute of Technology's Ying Wu College of Computing.



AN INCREDIBLE EXPERIENCE AS GOOGLE INTERN

by Stephen Orbanek

For two summers, Prince Geutler, CST '24 interned with Google, helping their Cloud Division by developing software that gathers server performance metrics within the company's massive server infrastructure.

"This has just been an incredible experience," said Geutler. "Within the internship, you get great mentorship from all of the engineers around you, and everybody is very, very helpful. They have great insights, and I feel so confident now as I move forward."

According to Geutler, each intern is assigned a major project during a summer internship at Google. "I was working on the boot process of Google servers, which is basically the start up of a Google server. So you can kind of compare that to the process that occurs when you press the on or start-up button on your laptop or phone," Geutler said.

Geutler knows Temple prepared him for success. "One class that really helped me was Data Structures taught by Andrew Rosen, associate professor of instruction. Technical interviews at Google are oftentimes all about data structures, and I felt like Dr. Rosen did a tremendous job," Geutler said.

As of July 2024, Geutler is a full-time software engineer with Google.



IMPROVING SOFTWARE FOR SCIENTISTS

by Greg Fornia

Sian Jin is an assistant professor who joined CIS in January 2024. He earned his PhD in computer engineering from Indiana University in 2023, after receiving his bachelor's in physics from Beijing Normal University.

His research interests include high-performance computing (HPC) data reduction and lossy compression for improving the performance for scientific data analytics and management.

"My background in physics, combined with an interdisciplinary approach, enables me to deeply understand the unique challenges of scientists," explained Jin. "This comprehension allows for the seamless integration of data reduction solutions into scientific applications, significantly boosting their performance."

Within the past five years, he has published more than 20 papers in top conferences and journals, including the International Conference for High Performance Computing, Networking, Storage, and Analysis and EuroSys, the European chapter of ACM SIGOPS (Special Interest Group in Operating Systems).

"My research spans a variety of applications, opening up many collaboration possibilities within CST," said Jin. "For example, I am currently working on NIH proposals with Mindy Shi on sequence data compression and planning NSF and DoE proposals with Xubin He and external partners."