ASU Sensor, Signal & Information Processing (SenSIP) Center
Ira A. Fulton School of Engineering, Arizona State University
SenSIP Center
GWC 411 | PO Box 875706
Arizona State University
Tempe, AZ 85287-5706
480 965 5311 (Phone)
480 965 8325 (Fax)
sensip@asu.edu

SenSIP Seminar Series

Energy Load Modeling at the Household Level

Presenter: Kristen Jaskie
PhD Student in ECEE

August 31, 2018, 3:00 PM / Room: GWC 487

Abstract

Energy companies such as Arizona's APS and SRP companies produce energy to meet industrial, commercial, and household demand for different times on different days. It is prohibitively expensive to store energy, so energy companies would like to accurately predict how much energy will be needed in real time given different weather, social, and other conditions. Identifying anomalous behavior is also important as it can indicate equipment failure and other problems. Smart meters are beginning to become more common and can produce individual household level data at increments of 5 minutes to every hour. Current research is still mostly based at the aggregate level, but in this talk, we will discuss a new approach to household level profiling, anomaly detection, and forecasting. Household level profiling can help predict household and neighborhood energy use, along with user-specific time-specific price incentives. Household anomaly detection can assist in locating failing or aging power equipment, and even in identifying unusual or illegal behaviors. Household level forecasting can help improve overall aggregate forecasting for centralized power stations, and neighborhood level micro-grid scenarios.

Biography:

Kristen Jaskie is a PhD student working in Machine Learning and Signal Processing with Dr. Spanias at Arizona State University. She got her M.S. degree in Computer Science with an emphasis in Machine Learning from UC San Diego in 2011. In recent years she has worked on applying Machine Learning to home-level energy load data with Arizona company Prime Solutions Group, been an owner and senior scientist of Data Analytics Consulting LLC, along with being an instructor and department chair of Computer Science at Glendale Community College in Glendale, AZ. Kristen's research has centered on developing an effective semi-supervised learning algorithm for the positive and unlabeled learning problem – a very common real-world problem – along with its applications to signal processing for energy, biological, and security applications.

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