**CEE691 Seminars in Civil and Environmental Engineering**

# Load Forecasting and Storage Control in Distribution Grid


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**Location: Bilger Hall 335, Date: Wednesday, January 27, 2016, Time: 1:30 – 2:20 pm**

**Speaker:** Dr. Reihani is currently a postdoctoral scholar at GridSTART (Grid System Technologies Advanced Research Team) in Hawaii Natural Energy Institute (HNEI). His expertise is in smart grid and renewable energy integration. Dr. Reihani's primary research interests include load forecasting in distribution grid, battery energy storage system optimization, demand response control in a grid with high renewable energy penetration and demand response market in distribution grid. He received a PhD in mechanical engineering from University of Hawaii at Manoa in December 2015 and worked as a researcher in REDLab (Renewable Energy Design Lab) before joining GridSTART in January 2016.

## Abstract


Intermittency and variability of distributed renewable energy generation has raised some concerns regarding the reliability of the grid. Higher operating reserve is necessary to cope with the sharp changes in the load profile which also increases the power operation cost. Load forecasting at the distribution grid substation helps the system operator to efficiently allocate the available resources to maintain the system stability while meeting the load demand. The available resources in a modern grid in addition to the conventional generating units are utility scale and distributed battery storage and also demand response devices which are scattered in the distribution grid. Optimal operation of these devices need reduces the power system operation cost while postponing construction of new generating units and transmission lines.

What is the optimal method for operating a utility scale battery for peak shaving and load smoothing? How can we forecast the load in a distribution grid with high renewable energy penetration? How can we manage the distributed residential chemical and thermal storage devices in a distribution grid? In this seminar, the speaker will introduce his research to answer these questions.