

## Title: Load Disaggregation: Towards Energy Efficient Systems

### Abstract:

Electricity is one of the valuables and widely used form of energies. However, with the fast-paced technological development in the electrical and electronics engineering fields, electricity demand is on a constant rise. In order to tackle energy and sustainability issues, there are two paths to be followed by the world community. New generation plants either have to be established with an expense of millions of dollars or to look deeper into the existing system by designing and deploying innovative techniques that can lead to a significant amount of energy saving. Researchers are extensively working towards energy efficiency and conservation via developing different techniques. Energy monitoring is one of the key techniques which is an attractive and popular research topic in the field of sustainable energy. Moreover, energy monitoring is more viable due to the worldwide deployment of smart meters in the last decade. One of the widely used energy monitoring techniques is known as Non-Intrusive Load Monitoring (NILM), which provides appliance level energy consumption profiles to the stakeholders. Appliance-level energy monitoring is not only beneficial for the consumers in terms of having valuable information regarding the energy consumption of their appliances but also benefit the system operators, policymakers, and manufacturers in terms of analyzing the network's energy flow, creating policies/tariffs, and manufacturing of advanced appliances respectively. This research work focuses on developing robust NILM algorithms and exploring the applications of NILM for future smart grids. Overall the outcomes of this research will significantly contribute to fields of energy efficiency and conservation.