

Weekly Seminar

12pm - 1pm, Friday, October 18, 2019
UWM EMS E 237

Optimal Variable Load Scheduling for Hybrid Energy Systems

Mr. Avinash Rajendra
Software Engineer
Northwestern Mutual, Milwaukee



Abstract:

Renewables such as solar and wind energy are good for the environment, save energy costs, and are expected to be an important part of future energy systems. For many applications, however, renewables cannot be the only energy source because their output fluctuates, depending on weather and seasonal conditions. As a result, renewables are usually used in a hybrid energy system (HES) that has access to conventional energy supplies, such as the power grid and generators, as well as to re-chargeable batteries that store any excess renewable energy.

In an HES, variable loads are ones that can be scheduled at flexible times and it is desirable to schedule them in a way that maximizes usage of renewable energy and minimizes costs. This work exhibits an optimal approach that is based on a state-space model of the HES and dynamic programming. Simulated experimental results demonstrate the efficacy of this approach, which performs significantly better than several other control strategies, such as the constant, random, and bang-bang controls.