Presenter: Jason Trager, UC Berkeley

Other Contributors: Tyler Jones, Michael Sankur, Jay Taneja, Phoebe Schmidt, Alex Placentra, Dave Auslander, David Culler, Paul K Wright

STEEP Optimization for Distributed Intelligent Automated Demand Response

A Socio-Technical Energy Efficiency Protocol (STEEP) is a numerically driven method of reducing electricity use in a building that has multiple independent energy consuming systems. This presentation describes how the STEEP Optimization system is applied to enable Distributed Intelligent Automated Demand Response (DIADR) in Sutardja Dai Hall, a mixed-used building on the UC Berkeley campus. Information is gathered from subsystems controlling lighting, HVAC, and plug loads, integrated into a weighted inconvenience minimizing mixed-integer program, and then used to reduce power consumption within a building to a specified level. After each demand response event, short surveys are conducted in order for the occupants of the building to report their experience with the demand response event. These surveys are analyzed and then used to re-configure the weighting of parameters within STEEP's optimization procedure. Feedback can then be generated for users in order help maximize energy savings while simultaneously minimizing inconvenience. The numeric parameters of the optimization are presented, along with independent control systems that interact with users, and their corresponding inputs and feedback loops that are generated within the program. Additional subject of discussion include outtakes, potential additional optimizations, and STEEP extensions.