

Title of the project : Multi-objective optimization of demand in smart homes

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Topic : Optimization, smart grids, smart homes

Keywords : Metaheuristics, Evolutionary algorithms, Multi-objective evolutionary algorithms, Smart grids

Description :

With the *smart grid revolution*, house energy consumption will play a significant role in the energy system. Home users are indeed responsible for a significant portion of the world's energy needs portion, but are totally inelastic with respect to the market (i.e. the energy demand does not follow the price of the energy itself). Thus, the whole energy generation and distribution system performance can be improved by optimizing the house energy management. Those problems are concerned by multiple objectives such as cost and users' comfort, and multiple decision makers such as end-users and energy operators. We propose a home automation system that can monitor appliance scheduling in order to simultaneously optimize the total energy cost and the customer satisfaction.

The project consists in:

- Proposing a multi-objective model for the demand side management in smart grids
- Design and implementation of a hybrid optimization algorithm combining exact algorithms and evolutionary algorithms
- Validation of real scenarios of smart homes

Level of studies :

Bachelor's level (undergraduate)

Master's level (postgraduate)

Duration : from 3 to 6 months

Type of evaluation

Written report and oral defense

No funding available from the laboratory