

Master-Thesis:

Online Networked Optimization for E-mobility

Context:

Intelligent power systems and smart grids aim to maintain a clean and sustainable energy supply for E-mobility. To do so, system operators would need an energy management system (EMS) that is responsible for scheduling the interactions of electric vehicles (EVs) and the grid. The optimization algorithm must also account for the possible limitations in the communication network and potential privacy issues. In this regard, the use of online networked optimization, a.k.a. multi-user optimization is envisioned.

Your tasks:

Your objective in this thesis is to implement an energy management system in a simulation environment. The energy management system should use an online networked optimization for e-mobility. The simulations will be done on standard distribution test systems and on a synthetic grid built on top of a city map. Here, typical load data and models of EVs have to be accounted for. The student will evaluate the performance of the algorithm by changing different optimization parameters such as size, number of constraints and speed. Furthermore, electric loads and EVs have to be programmed in an agent-based way using MATLAB. Basic skills in Python are also needed to run an existing software that produces synthetic grids on top of OpenStreetMap.

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