

Applying deep learning techniques to design and control Hybrid Energy Storage Systems (HESS) in industrial users

Abstract:

Nowadays, the energy sector is undergoing an unprecedented transition with massive investments in renewable energy sources (RES) taking place all over the world. Among those sources, electricity generation through photovoltaics (PV) and wind turbines are the most promising. In order to allow further penetration of those sources in the near future, energy storage will be needed. Especially, energy storage located behind-the-meter (customer sited) can provide the largest number of services.

This PhD research will focus on the **development of design & control strategies of energy storage systems in SMEs** (small-medium sized enterprises). The emphasis is on **battery storage**, taking also into account long-term as well as short-term storage technologies (e.g. **H2, super caps**). The PhD research is based on the following 4 pillars - research problems:

- i) Analysis and forecasting of renewable energy (PV/Wind) yield profiles
- ii) Analysis and forecasting of consumption profiles in SMEs
- iii) Evaluation of potential applications
- iv) Development of design & control strategies of energy storage systems

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