Home Electric Consumption Forecasting

The current EU initiatives in the framework of energy encourage the use of Home Energy Management Systems (HEMS) to achieve the three EU main goals for 2030:

- At least 40% cuts in greenhouse gas emissions (from 1990 levels)
- At least 32% share for renewable energy
- At least 32.5% improvement in energy efficiency

The use of HEMS implies, at least, the monitoring of electricity consumption; other variables, such as external weather, occupancy, can also be considered as they also influence the load consumption.

In this work, your goal is to forecast the electricity usage for a residential house in the Algarve. Making use of measured atmospheric air temperature and electricity consumption, sampled every 15 minutes, and daily occupation, you should forecast the house consumption for 12 hours in advance, is., 48 steps-ahead.

The goal is, having read the accompanying paper and using the information within, to design your own models.

The report must have:

1. A problem statement.
2. Data processing (data pre-processing, data splitting) used, etc.
3. Model used. You should use one shallow and a deep-learning model.
4. Training algorithm(s) employed, including hyperparameters selection.
5. Results obtained and discussed.
6. Comparison with results in the paper
7. Conclusions
8. References