AGGREGATOR SYSTEM

Introduction

- In future systems, the wind energy penetration is expected to increase. The energy generated by the wind turbines can only be predicted and controlled to some extend. With renewable resources, we can have some predictability in the generation, but less than with conventional generating units. Now we have to turn to the demand.

- The idea behind the demand response is that we plan for generation forecast errors, and contract a certain amount of fast and controllable resources → to preserve to balance in the network by increasing or decreasing consumption.

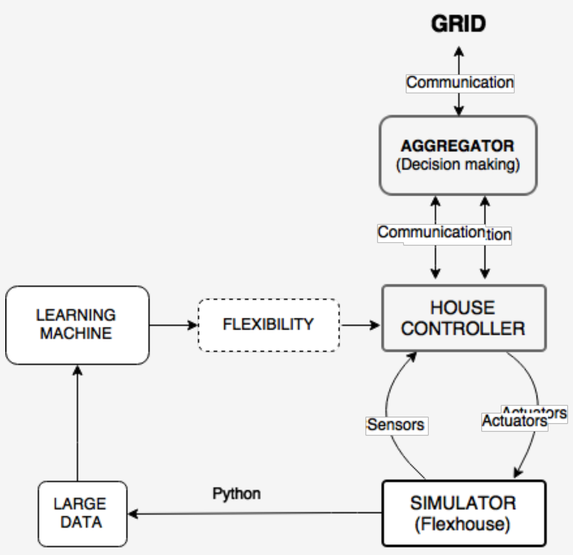
Problem

The resources investigated are the electric heating systems in residential houses.

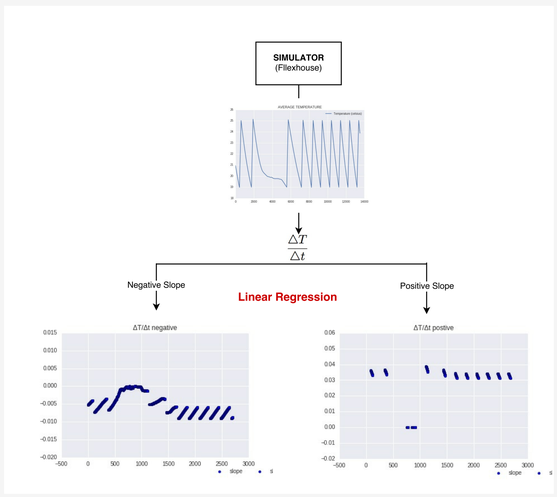
Develop an aggregator system that:

- Control a certain number of houses
- Offer the service of demand response to the transmission system operator (TSO)
- To participate, the houses have to be subscribed to the aggregator.
- The aggregator offers a flexibility range for a certain period of time

How it is solved?

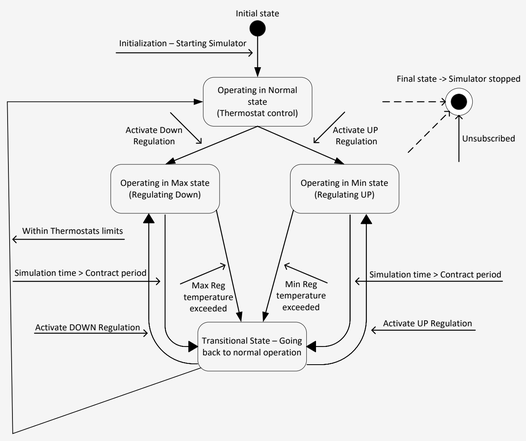


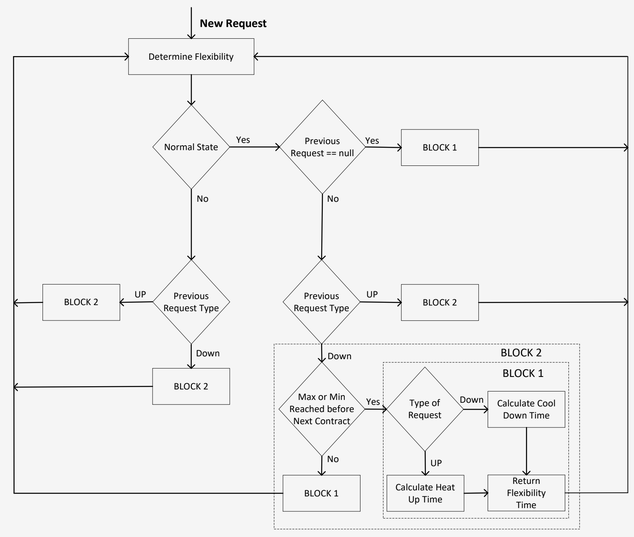
Machine learning

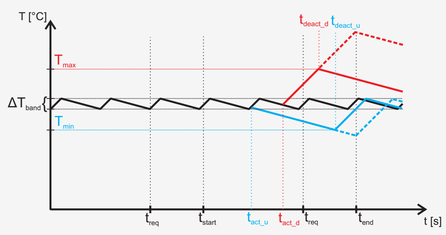


With the simulated data and some implementation in python, it is possible to apply the Linear Regression in order to obtain the model needed.

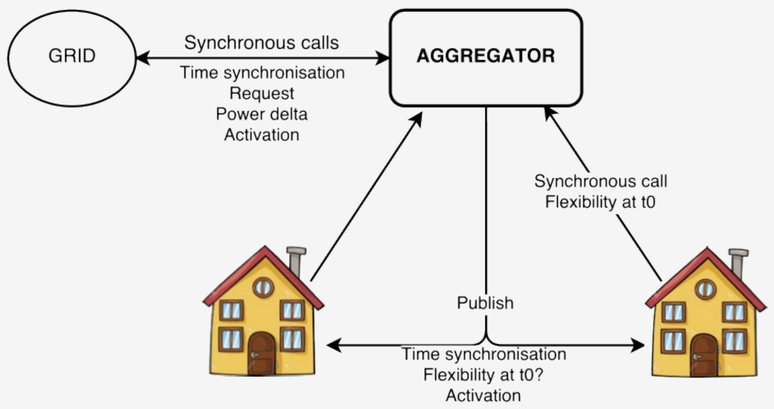
House controller

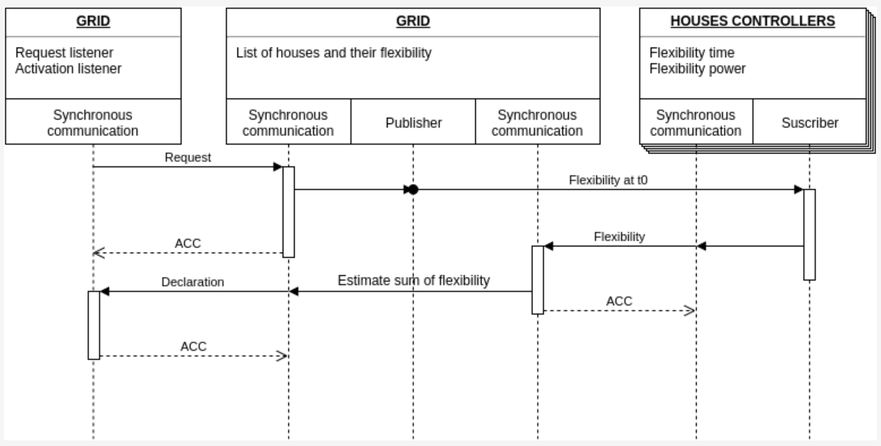


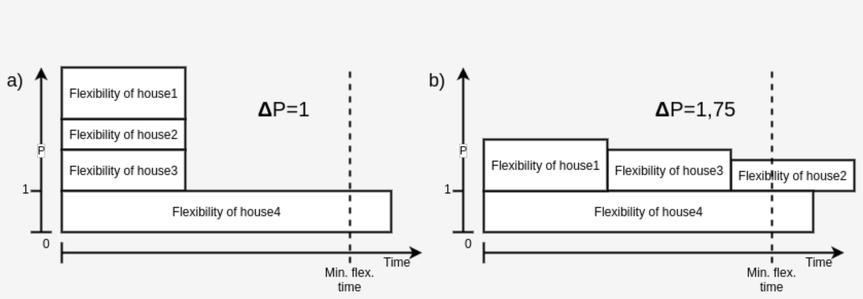




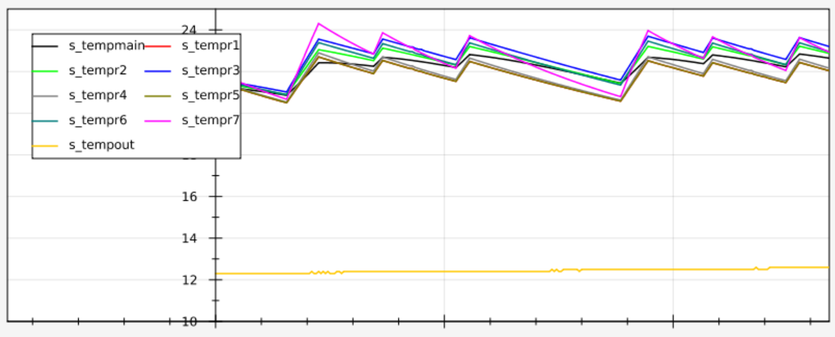
Communication

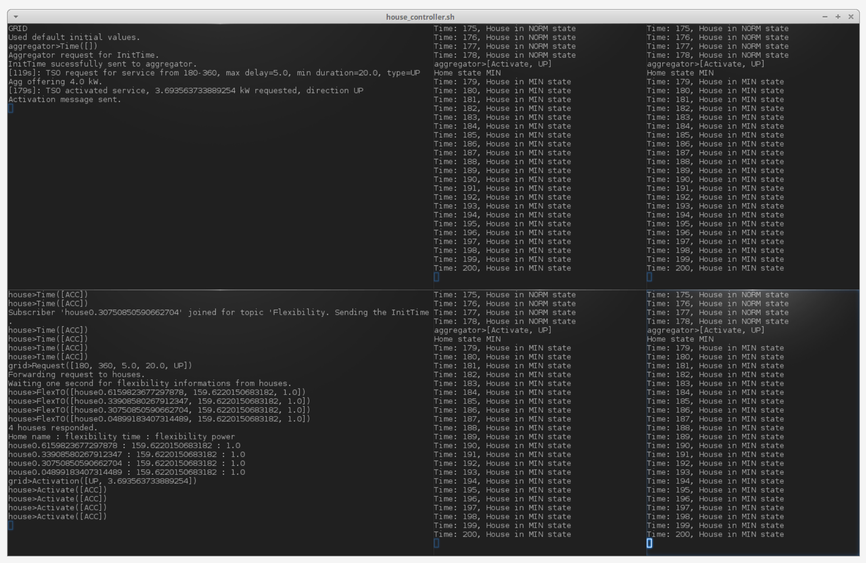


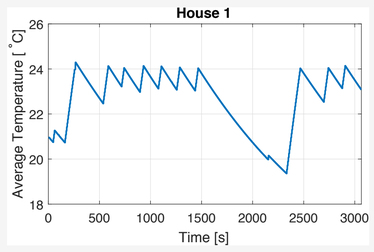


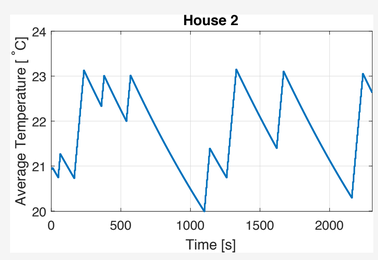


Results









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