

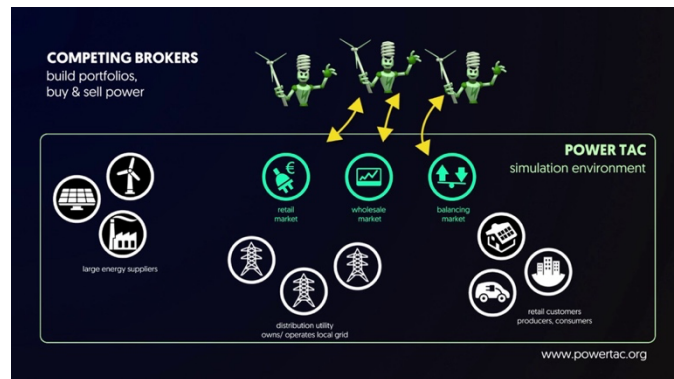


Master thesis

Power TAC: Designing an autonomous agent participating in smart retail electricity markets.

Power Trading Agent Competition (Power TAC) is a risk-free market simulation platform in which models the economic operation of an electric distribution system.

Self-interested, autonomous agents known as electricity brokers (aggregators), who aggregate energy supply and demand to make profits, play the central role within this simulation. The market structure includes a wholesale market in which the brokers can participate and buy the required energy from bulk power generators through a simple periodic double auction (PDA), balancing market in which potential grid imbalances in the retail market can be covered through a Vickrey–Clarke–Groves (VCG) auction, Distribution utility who is in charge of distribution grid infrastructure; and retail market in which the different customers with/without production capability or controllable loads are modeled, and they can choose and subscribe to the tariffs proposed by a particular broker. Therefore, brokers interact within these market components to maximize their profit.



This thesis aims to design a sophisticated bidding strategy for a broker to maximize own profit. To this end, a good prediction service, machine learning algorithms, and tariff scheme should be employed.

Key tasks and objectives of the thesis

- Familiarization with Power TAC and its components.
- Analysis of the data from previous tournaments.
- Suggestions to enhance the currently designed broker.
- Implement the proposed strategy for the designed broker.
- Derive and analyze the outcome via Power TAC experiment manager.

Your profile

- Study of mathematics, computer science, or economics with a quantitative focus
- Experiences in programming (e.g., with Python or Java)

We offer

- Intensive and reliable supervision during your thesis
- Possibility of starting a Ph.D. in case of excellent performance

Contact

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Topics



- Energy Systems
- Bidding strategy

Methods



- Data Analysis
- Machine learning
- Sensitivity Analysis