

HiWi project:

Analysis of optimal power flow algorithm

Context:

During research projects of the ACS Institute a fully distributed optimal power flow (OPF) algorithm has been developed, suitable for different kinds of power systems (AC, DC, AC/DC). In addition, sensitivity analysis of the OPF problem has started, which investigates the propagation of variations of certain variables or parameters to the OPF solution. The proposed HiWi project will continue this work by modifying the already developed distributed OPF algorithm to improve its performance, and produce the final results of the sensitivity analysis.

Your tasks:

The tasks include:

- The improvement of the OPF algorithm/tool: improvements in the solver, as well as in parameters of the algorithm, to facilitate its faster convergence to a more accurate optimal solution;
- The functions of sensitivity analysis and the suitable scenarios for this kind of studies have been defined already and now the simulations should be performed for the final results.
- The integration of additional features: a method to handle communication failures has been already developed for the OPF algorithm for DC systems, and now should be expanded to deal with these issues in the OPF algorithm for AC and AC/DC systems

The work will be conducted in Python as the algorithm is already developed in Python code.

Your profile:

- Good knowledge of Python is a prerequisite
- Knowledge of the OPF problem (not necessarily the distributed algorithm, but the mathematical problem formulation) is not necessary, but preferable skill

Our offer:

The work is expected to be completed in a period of 3-4 months with a workload of 15-17 h/w. The students, who are close to finish their MSc studies and want to continue for a thesis in the field of the OPF algorithms, are strongly encouraged to apply for this HiWi project. The work can be extended in a MSc thesis on the development of stochastic distributed OPF algorithm. The collaboration with the supervisor will be done in English.

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