Power System Load Modeling

Simulation is the basic tool in power system analysis and control. The bases of the simulation are component models. Without correct models, simulation results are not reliable. In this project, you will develop insights and techniques on how to develop a model for a power system component by modeling load for power system dynamic analysis specially.

Meanwhile the importance of load model to power system stability analysis and control has been well recognized. Nevertheless, it’s also widely known that modeling load is quite difficult due to the uncertainty and the complexity of the load. So you will challenge yourself in this project on how to develop a load model generally used in the power industry and understand the applicability of the load model.

Since all models will be applied in the power system simulations, you are expected to master one simulation software for power system analysis and investigate how various load models will affect the system dynamics.

You are required to have:
1 Solid mathematical background, especially in differential equations since the dynamic load component will be represented by DAE equations (Differential Algebraic Equations) and you have to build this mathematical model from scratch.

2 Excellent programming techniques. You need program to simulate the dynamics of the load components and you are also expected to program using optimization algorithms to identify the model parameters.

3 A deep understanding on power system dynamics. You are supposed to design various scenarios to simulate the power system dynamics and analyze the effects of the load model on them.

4 Master a power system simulation package, either some free simulation software for academic purpose, such as PowerCon; or a commercial based power system analysis software, such as Powerfactory/PSSE.

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