

# Master Project/Thesis

## Bachelor Thesis

### Black box modeling of power electronics devices

**Overview** The increase of power electronics penetration has many implications on different power quality aspects (such as harmonic instability), which needs to be thoroughly investigated in order to understand those implications to be able to provide a solution for them. One of the modeling approaches which shows promising results in terms of computational efficiency are black box modelling approach. The aim of the project is to investigate the capability of black box modeling approach in capturing the main characteristics of power electronics devices.

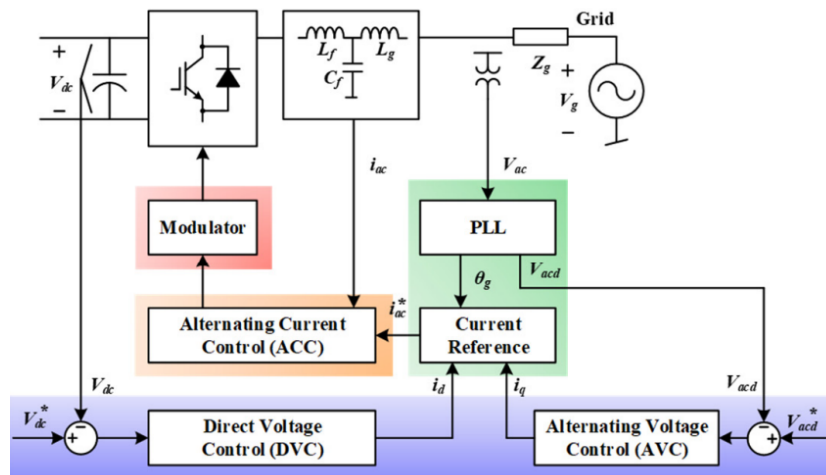


Figure 1: Generic power inverter structure[1].

#### Tasks

- Conduct a literature review about black box modeling approaches.
- Develop a black box model for a power electronics device (such as a VSC).
- Compare the results of the developed model with white box models in terms of accuracy and computational efficiency.

**References** [1] X. Wang and F. Blaabjerg, "Harmonic Stability in Power Electronic Based Power Systems: Concept, Modeling, and Analysis," in IEEE Transactions on Smart Grid.

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