

Project / Bachelor Thesis / Master Thesis

Fault Detection and Classification in MVDC Grids Using Machine Learning

Context:

The medium voltage dc (MVDC) grids based on power electronics technology are promising solution for the integration of renewable energy sources (RES) and flexible power distribution. However, the complex topology and flexible operation modes of MVDC grids pose higher challenges to the protection techniques. In order to protect MVDC grids from the irreversible damages of short circuit fault, the fast and accurate fault detection and isolation are of significant importance. In this context, the data driven fault detection have been introduced. On the basis of historical measurement data, the new measurement of fault data can be promptly detected and classified through supervised / unsupervised machine learning approaches.

Task:

The primary target of this thesis is to develop a fault detection and classification tool for the MVDC grids using machine learning algorithm. To achieve this goal, following tasks are included:

- Development of the optimal machine learning method for fault detection and classification in MVDC system.
- Simulation of MVDC system during normal and fault conditions using MATLAB / Simulink.
- Training / test of the fault detection and classification method with the offline data (in MATLAB, etc.).
- Online test of the fault detection and classification method under real-time simulation with RTDS / Opal-RT platform.

The student will receive an introduction in order to start quickly with the required tools. During the work, the student will be supervised by the research associates in the ACS institute.

Profile:

For this task the student should be familiar with at least one of the programming tools (MATLAB is preferred). And the knowledge in the machine learning algorithms is advantageous.

How to apply:

Please send the following documents:

- letter of application (just briefly explain your interests and relevant experiences)
- CV
- transcript

per email to the contact below.

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