

Commutation Failure Prediction and Control in a Hybrid AC/DC Grid using AI Neural Networks

A Study Case in China



Beijing, China



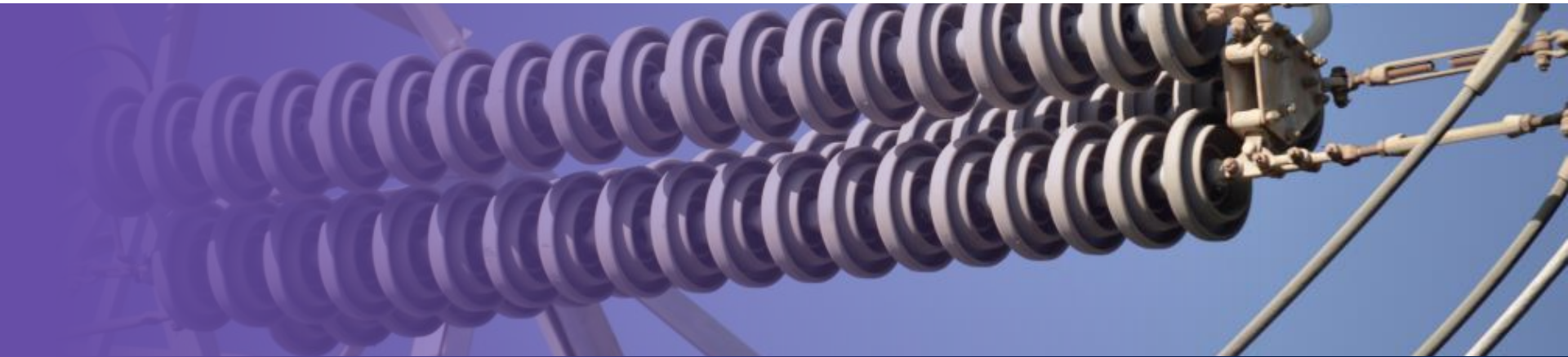
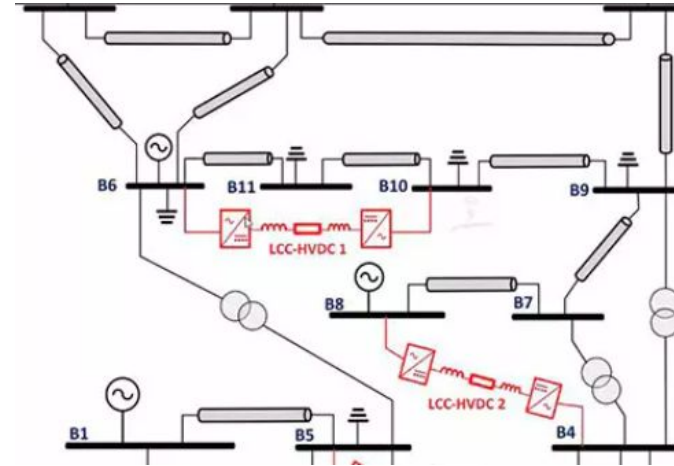
Tianjin, China



Mexico City, Mexico

Main Points

- For HVDC systems in large distances in China Mainland (SGCC);
- Optimization methods: selection of parameters to modify in the commutation process;
- PSCAD 14-bus initial modeling and CF data acquisition;
- Machine learning, convolution and AI Neural Networks;
- Control and prediction model for risk analysis of the grid.

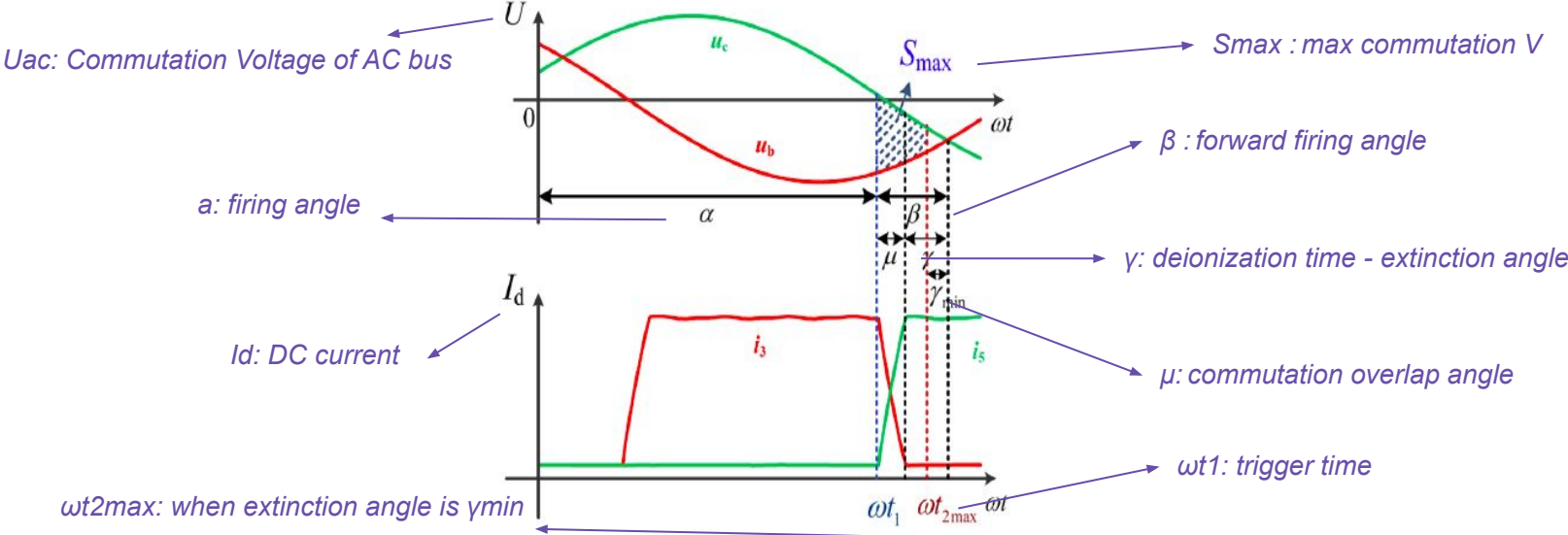


Defined problem (PS)

1. POWER SYSTEMS SIDE:

CF in thyristors while transforming from AC - (HVDC) - AC can result in **cascade failure**.

Optimization methods - selected parameters to modify in the commutation process for data acquisition:

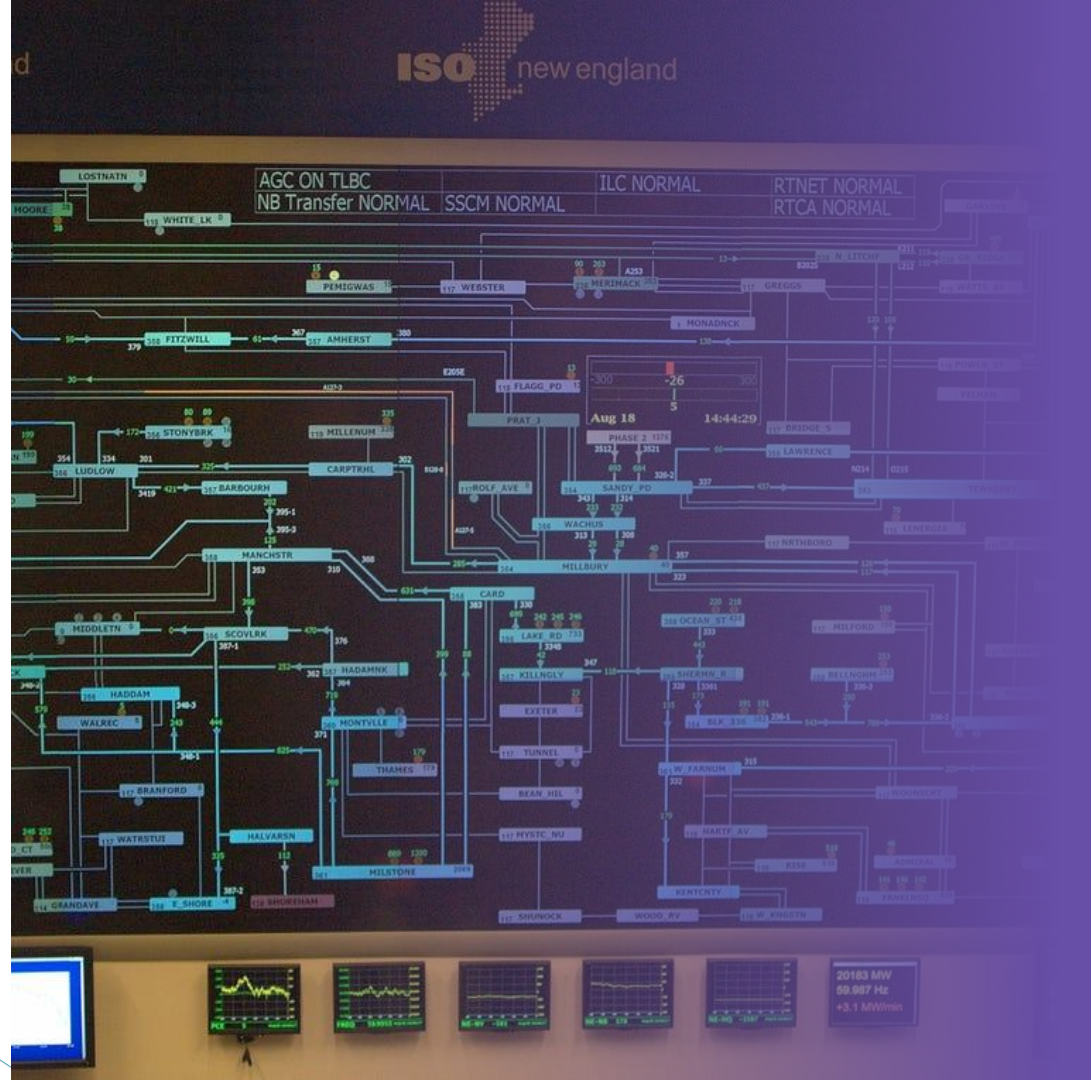


Defined problem (ML)

2. MACHINE LEARNING AND AI SIDE:

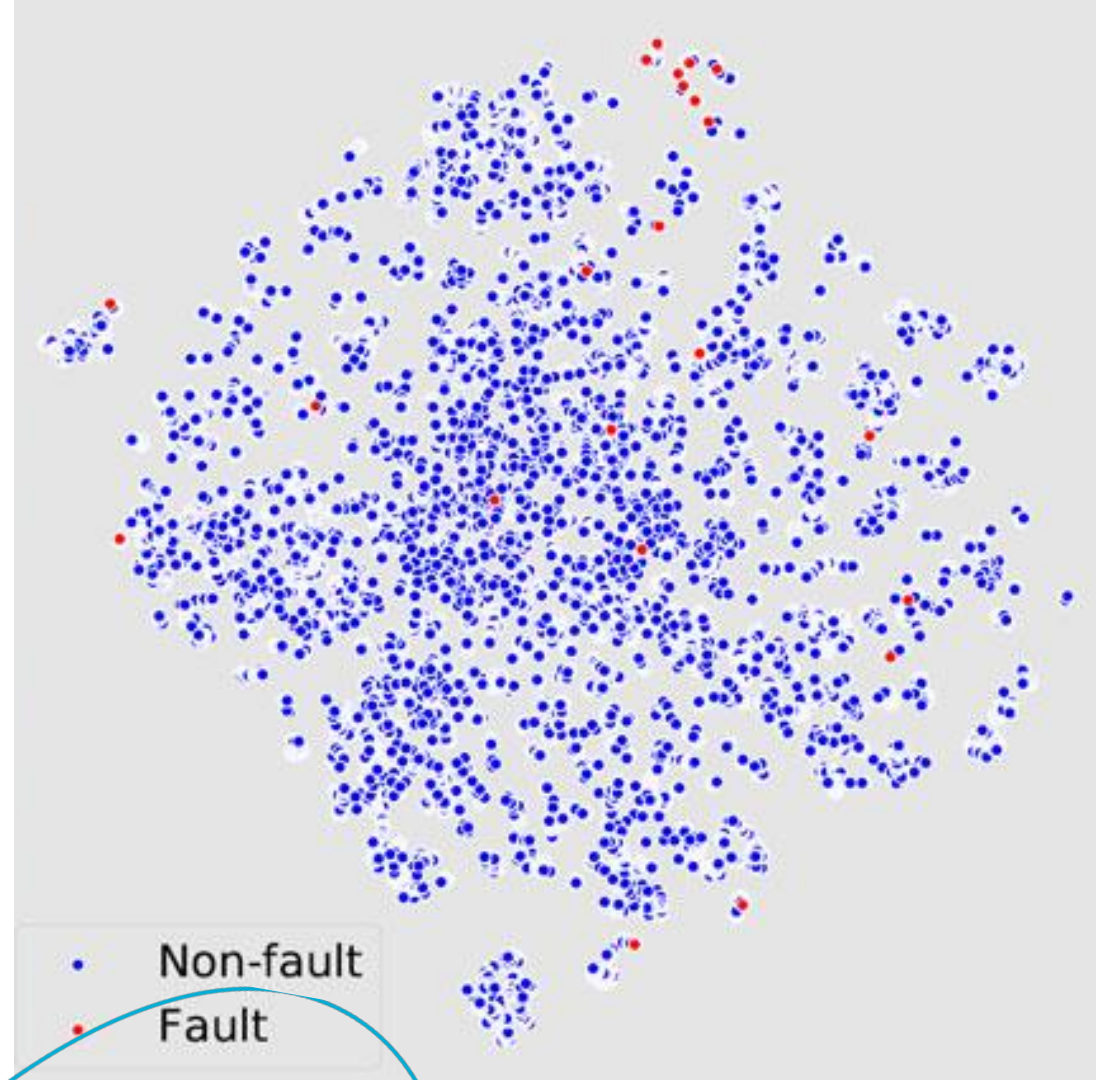
Type of AI for ML and user interface for control.

Neural Networks for finding relations between the new data created (since we have no access to the SGCC historical data).



Proposed solution

Model of data and machine learning for [risk reductions](#) in future control and prediction of commutation failures.



Implementation

Microgrids or limited areas of the grid, started by modelling 14, 30 and 60 buses.

