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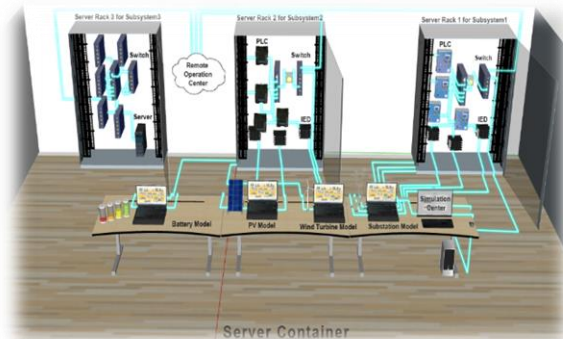
Bachelor's Thesis

Risk Assessment Process Using Fuzzy Logic at the KASTEL Security Lab Energy

Description:

The focus of "Secure Energy Systems (SES)" research group is about the cyber-physical security of energy systems. The working topics cover a broad range from hardware to the communication structure in Smart Grids (SGs). New concerns about threats, vulnerabilities and risks have emerged with the implementation of SGs infrastructure. The results of a risk assessment process improve understanding of the causes and nature of arising risks. In this study, context establishment, risk identification, risk analysis and risk evaluation are taken into consideration as steps followed in the risk assessment process.

To conduct a risk assessment process, fuzzy logic implementation seems as a promising approach that enables the handling of uncertainties and imprecision in data. For this purpose, a case study designed for the small scale IEC 61850 Substation at the KASTEL Security Lab Energy. The challenge of this approach is to specify the variables and membership functions (MFs) of a fuzzy logic with reference to SGs.



The **main tasks** are the following:

- Getting familiar with fuzzy trees and risk assessment
- Implementation of fuzzy inference systems
- Tuning the parameters of a fuzzy tree

Requirements:

- Studying Informatics/Computer Science
- Knowledge of MATLAB is a requirement
- Familiar (or motivated to work) with fuzzy logic in the power grid domain

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