Robustness analysis for reinforcement actions in distribution grids

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Työn saa tallentaa ja julkistaa Aalto-yliopiston avoimilla verkkosivuilla. Muilta osin kaikki oikeudet pidätetään.
Background 1/2

- The distribution system operator seeks to protect distribution grids from external hazards
- The aim is to maintain grids’ reliability while minimizing the reinforcement costs
- The problem is represented as an influence diagram

• Cost-efficient reinforcement actions for specific parameters are found using Portfolio Decision Analysis (PDA)
• Impacts of the hazards are not known precisely
• Impacts of the reinforcement actions are uncertain
Objective

• Sensitivity and robustness analysis
  • How does the reliability of the grid depend on model parameters
  • How big a change will cause the reinforcement actions to change.
Limitations

• A compact system with two grids and three different hazards
• Only the impact of changing the effectiveness of reliability actions and hazards will be studied
Literature


Methods

- Julia package "DecisionProgramming.jl" for multi-stage decision problems
- Python interface for sampling different scenarios and solving the problem with different inputs
Schedule

• Presentation of the topic 16.6.2023
• Studying the literature and the Julia package 6/2023
• Analysis and writing the thesis 7-8/2023
• Presentation of the results in the seminar 9/2023