**Project Abstract**

**Title**

**BUILDING A DIGITAL TWIN FROM AN INTELLIGENT ELECTRONIC DEVICE**

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# Motivation

This thesis aims to describe and present an approach for building a digital twin solution for the increasingly complex automation in the Energy Industry. As we all know, industry 4.0 accelerates digitalization, smart grid, and distributed mini-grids integration enabled automation, optimization, and energy efficiency. The distributed integration and massive data led to system inconsistency, non-availability, and protection issues. An additional infrastructure must be evaluated using expensive simulation devices. Operators must be at the local station to check how parameters react to protection trips can be safely validated and validated with the real device and interaction. The systems must be available as a playground for the user but limited due to the machine's modelling.

# Realization

The solution is to create a digital twin of the system that can be used for training to test changes and simulations. This twin system will be integrated into the Web engineering replicates behavior model of the IED and executed on the web using WebAssembly. WebAssembly is a promising innovative approach that enables running machine code on the browser besides Javascript and HTML. The entire model consists of several C/C ++ programs based on RTOS and Linux. The digital twin facilitates the system as a playground in the browser and provides an intuitive experience to testers, developers, and operators. Therefore, it helps to reduce the cost of simulation devices and operators. Also, the complex infrastructure can be simulated and tested remotely available to integrate into production devices safely.