UNIVERSITY OF APPLIED SCIENCES UPPER AUSTRIA
OBERÖSTERREICH

Master's Thesis Energy Informatics	**Supervision Agreement**	**B**

Student

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Master's Thesis

Preliminary thesis title

BUILDING A DIGITAL TWIN FROM AN INTELLIGENT ELECTRONIC DEVICE

Short thesis abstract

This thesis aims to describe and present an approach for building a digital twin solution for the increasingly complex automation in the Energy Industry. The distributed grid 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. 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. The complex infrastructure can be simulated and tested remotely available to integrate into production devices safely.

600-900 characters – add a more detailed description on a separate document ("Thesis Outline")!

Internal/staff advisor

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External/company advisor (if applicable)

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Guidelines for thesis work within a company

- The student must be given time off to attend courses required by the University of Applied Sciences Upper Austria, such as seminars for graduating students, special courses, etc.
- The student has to be given sufficient time to perform independent research and to write his/her Master's Thesis.
- The company must provide the necessary expertise and time resources to supervise this Master's Thesis.

Supervision modalities

Thesis supervision is agreed to take place as follows:

- Regular meetings should be scheduled every 2–3 weeks. Students are responsible for scheduling these meetings.
- Students are required to submit an agenda for each meeting to their thesis supervisor at least one day in advance. Otherwise the supervisor may cancel the appointment.
- Students and advisors agree upon the definition of milestones and their according deliverables. The following deliverables have been agreed upon by both parties:

Due date	Deliverable
31.12.2020	Read the General Information, Timeline, Thesis Guideline, Project Guideline to get basic understanding.
31.12.2020	Submit Project Abstract, Specification, and Description.
08-02-2021	Submit Thesis outline and FORM-B
28-02-2021	Submit preliminary results for project presentation

Thesis submission

The **due dates for the submission** of the **preliminary version** and the **final version** of the Master's Thesis can be found at the course "ENI604 Master's Thesis" on the e-learning platform.

Please note:

- The electronic version (PDF file) of the Master's Thesis must be uploaded onto the same course at the e-learning platform. The internal/staff supervisor may also require a printout of the thesis.
- The submitted preliminary version of the Master's Thesis must meet all requirements of the final version regarding contents, volume, and form.
- According to the feedback of the supervisor and the copy editor the necessary amendments must be made before the final submission. Otherwise, the thesis will not be approved.

Comments

Declaration

I accept all of the above requirements and understand that any changes must be documented in writing and agreed upon by all parties.

08-02-2021 M. Lp

Date | Signature (Student)

Status

Title, abstract, exposition and a detailed table of contents (including an estimate of the number of pages) have been

❍ Accepted ❍ Rejected because: _____

Resubmission until _____-_____-_____.
YYYY MM DD

Approval

	8. 2.2021			
	Date		Signature (Assigned internal/staff advisor)	
	Date		Signature (External/company advisor) + Company stamp (if applicable)	