

Master Thesis with ZF Group

Development of a Generative AI-Driven Tool for OPC UA NodeSet File Generation

Question:	How can Generative AI facilitate the automation of converting XLS planning data into OPC UA NodeSet XML files?
Start:	Immediately
Application:	Send your CVs and a letter of motivation to Benedikt Blümelhuber

Background

In industrial automation, standardizing data communication across diverse systems is critical. ZF is using Generative AI to automate the conversion of XLS planning data into OPC UA NodeSet XML and MQTT formats. This initiative supports around 200 plants by enhancing data integrity, reducing manual workload, and facilitating seamless updates. The project highlights the practical implementation of Generative AI to meet real-world automation challenges and align with industry standards.

Goal

The primary goal of this thesis is to develop a Generative AI-driven tool that automates the generation and validation of OPC UA NodeSet files from XLS data inputs. This tool aims to standardize data management and communication across ZF's network, enhancing integration and coordination of automation processes. It will ensure data consistency and reliability, utilizing industry expert insights and the latest AI advancements to address modern industrial data complexities.

Your tasks

- Review existing examples of OPC UA NodeSet and MQTT files and the current conversion processes.
- Engage with literature on Generative AI applications in data transformation and communication standards in industrial automation.
- Develop an AI model that can understand and convert XLS data to OPC UA NodeSet2.XML and MQTT formats.
- Test and optimize the model to handle real-world data sets and scenarios from ZF's operations.
- Document the process and create guidelines for deploying the tool across various plants.

Requirements

- Immediate availability to commence the project.
- Strong programming skills, with a preference for Python or other relevant languages.
- Solid knowledge of XML data formats and a solid understanding of OPC UA and MQTT protocols.
- A demonstrated interest or experience in Generative AI and its applications in industrial automation settings.
- Exceptional problem-solving skills and the capacity to work effectively both independently and as part of a team.

If interested, please send a brief application with resume and proof of accomplishments to: benedikt.bluemelhuber@tum.de