

Master Thesis with ZF Group

Development of a Generative AI-Driven Tool for maintenance repair recommender

Question:	How can Generative AI be used to recommend repair actions for a defect machine using ZF and or vendor documentation
Start:	Immediately
Application:	Send your CVs and a letter of motivation to Benedikt Blümelhuber

Background

ZF is exploring the use of Generative AI (GenAI) to reduce the repair time of defect machines and assets. Every machine comes with vendor documentation. Along the life cycle ZF creates maintenance logs to document the defect history of the asset. Once a machine unexpectedly broke down, the maintenance technician locates the problem area and investigates through documentation the solution. This time consuming process might be speed up by the use of GenAI.

Goal

The primary goal of this thesis is to develop a Generative AI-driven tool that automates the generation of valid repair suggestions based on a given sub-location of an asset (e.g. the spindle, the oil pump, etc.). Furthermore, it should be explored if external resources (in the web) might bring extra repair insights. And if structural changes in the F documentation might reduce hallucination.

Your tasks

- Review existing ZF and vendor documentation about the machine history
- 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 The ZF history data (free text field), vendor data (PDF) and ideally external web resources.
- Recommend to ZF changes in the ZF machine documentation for result improvement
- 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