Thesis AI Agent for Automated Machine Diagnostics and Root-Cause Analysis

Job Description

- During your thesis, you will build a reliable agent that analyzes a user's machine behavior directly from CAN measurements and derives solutions across calibrations, software bugs, or application/hardware issues.
- You will create the agent harness, custom skills, and necessary tools or MCP servers to enable it (e.g. with LangChain).
- Furthermore, you will set up automated signal and event detection routines to capture anomalies such as limit violations, oscillations, derating, and error states.
- You will prepare appropriate context for the agent, integrating relevant documentation, parameters, and domain knowledge.
- Additionally, you will benchmark the agent against established reference cases to assess its accuracy and reproducibility.
- Moreover, you will automate the simulation loop by replaying measurements within a virtual test bench (e.g., TPT) to cross-compare simulated dynamics with measured behavior.
- Finally, you will document the developed tool and present your findings and methodology to the team.

Qualifications

- **Education:** studies in the field of Electrical Engineering, Mechatronics, Computer Science or comparable
- **Experience and Knowledge:** in Python development, LangChain, Agentic Workflows; basic knowledge of control systems and signal analysis
- **Personality and Working Practice:** you excel at analyzing challenges critically, driving innovative solutions, and learning continuously while communicating openly with others
- **Work Routine:** your on-site presence is required
- **Enthusiasm:** for AI workflows, Agents and Applications
- **Languages:** fluent in English and very good in German

Additional Information

Start: February 2027
Duration: 3 - 6 months

Requirement for this thesis is the enrollment at university. Please attach your CV, transcript of records, examination regulations and if indicated a valid work and residence permit.

As a global company, we are legally required to comply with applicable EU and U.S. (re-)export control and sanctions regulations. This means that for certain, particularly sensitive positions, we may only hire individuals who have undergone an additional legal screening. This position is one such sensitive role. We will therefore ask you for additional information required for this screening as the application process continues. You can find information about the processing of your data in our Privacy Notice for the application process.

You are almost finished with your Bachelor's degree and would like to gain some practical experience before embarking on your next academic adventure with a Master's degree? Then you fit in perfectly well with our PreMaster Programm! Take a look at our vacancies here.

Diversity and inclusion are not just trends for us but are firmly anchored in our corporate culture. Therefore, we welcome all applications, regardless of gender, age, disability, religion, ethnic origin or sexual identity.

Need further information about the job?
Roland Mölle (Functional Department)
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You can also find more information about us at www.boschrexroth.de/karriere and on our social media channels, for example Instagram.

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