

Open Thesis / Project:

AI-Assisted Predictive Maintenance for Industrial Machines

Motivation & Summary

Predictive Maintenance has become a crucial topic in the industry, enabling early detection of potential machine failures through changing measurements. Vibrations, current, and temperature are key metrics analyzed to prevent downtime. Despite its importance, understanding how faults influence measurements remains challenging, often requiring detailed knowledge of machine structures and components. This thesis explores the potential of AI to enhance damage detection and localization, leveraging innovative techniques to improve industrial maintenance processes.

Recommended Prior Knowledge

- Basics of Machine Learning and AI
- Embedded Systems and Microcontrollers
- Signal Processing and Analysis
- Programming Skills (e.g., Python, C/C++)

Thesis Type

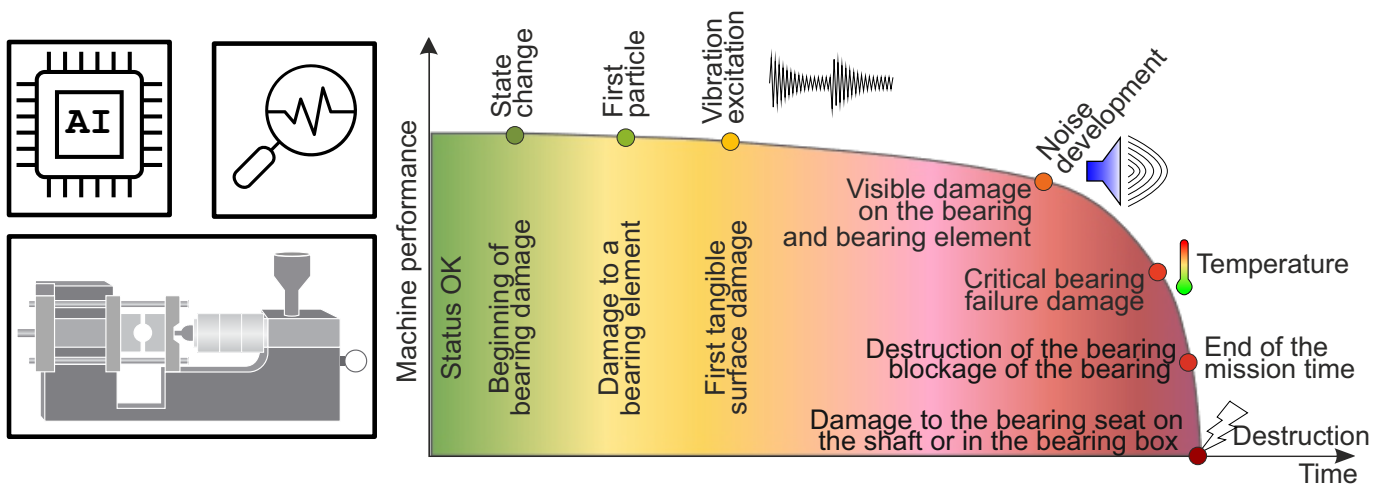
- Master's Project
- Master's Thesis

Student Target Groups

- Computer Science (CS)
- Information and Computer Engineering (ICE)
- Electrical Engineering (EE)

Goals & Tasks

- Investigate existing AI methods for Predictive Maintenance (e.g., Classification, Anomaly Detection).
- Compare MCU platforms for AI implementation.
- Develop a Predictive Maintenance system using the X20AI4632 module and Renesas R7FA4M2AB3CNE.
- Evaluate system performance and reliability on real-world hardware setups.



Contact & Information

Dr. Tobias Scheipel (tobias.scheipel@tugraz.at)
 Dr. Martin Haidacher (martin.haidacher@br-automation.com)

