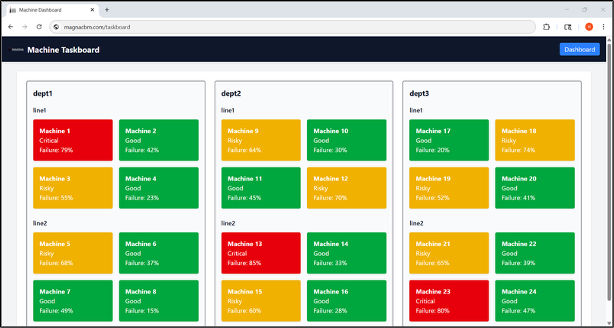
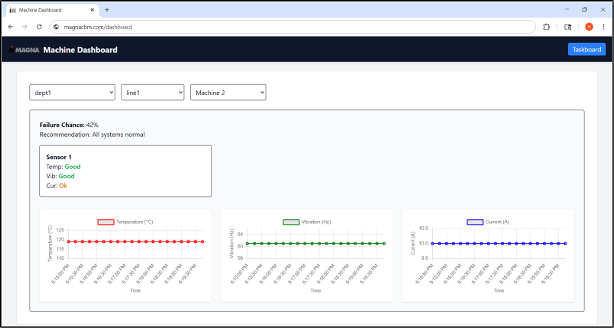
Design Day Booklet Team Page





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Magna AI4CBM

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Magna is one of the world’s largest automotive suppliers, recognized for their scale, reliability, and innovations across the entire automotive industry. They are committed to maintaining the highest standards of operational excellence and industrial leadership.

Unplanned equipment downtime is a major challenge in manufacturing, leading to financial losses and reduced productivity. Traditional maintenance—reactive or fixed-schedule—often proves inefficient. A better solution is predictive maintenance, which anticipates failures before they happen, saving costs, optimizing production, and extending equipment life.

Our ML/AI Pipeline for condition-based maintenance provides a complete system that monitors equipment health in real time and predicts future failures. Our software uses machine learning to collect and analyze sensor data from industrial machinery. The system identifies subtle changes in a machine’s performance, allowing technicians to address issues proactively.

Our system presents live sensor readings, historical trends, and predictive alerts through an intuitive dashboard. Each machine equipped with sensors has a dedicated page displaying all attached sensors and their current data readings. The interface also highlights any readings that are abnormal or potentially concerning, allowing for quick identification and response.

For each machine, the system displays the projected probability of failure within the next 30 days to help maintenance operators determine when maintenance should be performed.

The front end of our condition-based maintenance system is built with React, while the back end uses Next.js and stores data in a PostgreSQL database. The ML/AI pipeline is implemented in Python using ROS 2, with sensor data transmitted via the MQTT protocol.

3200/3300 Hallway | Third Floor, Computer Science and Engineering 8:00 a.m. – Noon | CSE498

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ML/AI Pipeline for Condition-Based Maintenance