Student Assignment: Vision-Based Predictive Maintenance using auto-encoders (Drive Chain)

(2nd Semester 2026)





Background

Scania Productions Zwolle (www.scania.nl) is a lean manufacturer of trucks. Each day, around 200 trucks are assembled, and each truck is configured to specific customer requirements. This demands strict production control, where smooth coordination between people, machines, and logistics is essential.

The current production uptime is 97%, which means that for 3% of the time the line cannot produce. Reducing this downtime is an important goal for Scania .

To support this goal, Scania and the Ambient Intelligence research group have started a collaboration. Ambient Intelligence is a research group of Saxion focusing on “smart environments”, with a strong interest in safety, smart industry, and sports.

In this project, we explore a vision-driven approach: using camera images/video to detect early signs of problems before they cause downtime. In specific, the transport chain is monitored for this use-case.

Assignment

Based on previous work, the use of auto-encoders for monitoring chain link health seems to be a promising technique for detecting changes within individual links. An auto-encoder is a well-known machine learning concept which makes distinctive low dimensional representations from input data. In our case it is used to create a low dimensional representation for each link based on image data. This assignment will further explore this technique.

Research Questions / Tasks

- A task is to collect a second dataset of video from the transportation chain at the Scania factory.
    - Based on this new dataset, explore the generalizability of the previous auto-encoder model
- Investigate the variation within images of the same link and between a single link and the entire population of links.
- Explore other auto-encoder architectures
- Explore if (artificial) alterations to the links can be detected

Contact

Bram Ton (T: 0648956169 | M: b.t.ton@saxion.nl)

Saxion | University of Applied Sciences | Academie Creative Technologie

Van Galenstraat 19, Enschede | room G4.27