
Master's Thesis Project: Machine Learning-Based Imaging System for Inspection of Visible Defects on Inserts – Industry 4.0

Sandvik Coromant is the world's leading supplier of tools, tooling solutions and know-how to the metalworking industry. With extensive investments in research and development we create unique innovations and set new productivity standards together with our customers. These include the world's major automotive, aerospace and energy industries. Sandvik Coromant is highly active in digital machining and invests internal and external resources in research and development to meet the challenges related to Smart Factories with new digital products and solutions.

Background

Industry 4.0 is the next step in a long process of development. The term Industry 4.0 was first introduced during the Hannover Fair event in 2011 and it comes from an initiative launched by the German Federal Government as part of its comprehensive High-Tech Strategy. Industry 4.0 introduces the digitalization of processes, the Internet of Things, the installation of widespread sensors in the physical environment and the ability to rapidly enhance production economics through real-time performance-data analysis.

Machine learning is one of the required component of Industry 4.0 and it is a field of artificial intelligence that uses statistical techniques to give computer systems the ability to "learn" (e.g., progressively improve performance on a specific task) from data, without being explicitly programmed. Using the concept together with smart sensors and cameras to gather visual data is a key element for the visual inspection of parts on a production line that has been today manually inspected by people.

Work Description

The objective of the thesis is to investigate the application of a machine learning-based imaging system for inspection of visible defects on inserts. The purpose of the project is

- to have better capabilities on visual defect detection
- to decrease man-hour that is put on visual defect detection
- to have a reliable autonomous system on visual inspect detection
- and kick-start of using machine learning in production
- to decrease number of defected inserts delivered out Gimo Insert Production Plant
- to detect defects that is not possible to by detected by human eye.

It is expected that the thesis work would

- reveal the different cases that a machine learning-based imaging system can improve the efficiency and decrease the costs
- define the requirements for a successful implementation of such system
- implement a proof-of-concept at the selected production department/line or machine.
- define a road map and strategy for a future implementation of technology at GH.

Student Background

We are looking for a student in a Master's of Science program in Engineering, or equivalent. We actively work to create a workplace that is characterized by diversity and inclusion.

Duration

The project lasts 20 weeks full-time, and should include project planning, project execution, report writing and oral presentation. The thesis work is planned to start as soon as possible; latest January 2019.

The work is to be performed for Sandvik Coromant in Gimo; however, distant working or home office is possible during the later stage of the work. We have the possibility to assist with accommodation.

Application

Your application should include a motivation letter, CV, transcript of records and possible references. The last day for application is November 30th, 2018. Please send the application to:

Yalcin Efe, yalcin.efe@sandvik.com.

Contact Information

For more information about this master's thesis, please contact:

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Sandvik is a high-tech and global engineering group offering advanced products and services that enhance customer productivity, profitability and safety. We hold world-leading positions in selected areas – tools for metal cutting, equipment and tools for the mining and construction industries, stainless materials, special alloys, metallic and ceramic resistance materials as well as process systems. In 2015, the Group had about 46,000 employees and sales of about 91 billion SEK in more than 150 countries.