Master Thesis Proposal: 3D Surface Reconstruction with stereo vision
Husqvarna Construction
Primary Development Department

Background
With over 325 years of innovation and passion, Husqvarna provides construction professionals with support, service and a wide range of machines, diamond tools and all accessories that you need to cut, saw, drill, demolish, grind and polish concrete. We let high performance meet usability and safety, making you ready to get the job done efficiently. Our best reward is seeing Proud Professionals succeed.

Assignment
This project will focus on assessment of the grinding results by a concrete floor grinding machine. The grinding process involves the usage of grinding pads of varying grit levels. The grinder starts at a low grit number and works its way to up to finer grit levels. The lower grit level removes more material, causing surface scratches, while higher grit levels remove less materials, making the surface less rough and removing the scratches from lower grit levels. For the grinder to function properly and efficiently the pads must be changed at the right time. The choice of pads is then a function of the surface roughness, and thus the roughness needs to be measured. Due to the large surface area of concrete slabs in e.g. warehouses, the system has to be able to perform quick measurements of large areas so that the grinding process may continue with the least amount of interruption. Furthermore, the system must be precise, as the surface roughness from coarse grinding stages is at most 100 µm.

The purpose of this project is then to develop a 3D reconstruction of a floor surface to evaluate the surface roughness of concrete floors. This will involve a literature and technology study of current solutions, developing a stereovision system and algorithm. Finally, the solutions can be tested by performing measurements on concrete slabs.

Students
2 students from Systems, Control and Mechatronics or equivalent, with knowledge and interest in computer vision.

Info
Start: January 2022
Location: Jonsered. There is a train station near the office.
How to apply: Please send your resume to jacob.larsson@husqvarnagroup.com
If you have any questions, do not hesitate to contact us.