www.cind.se

Stefan.grufman@cind.se

CIND AB
Gjuterigatan 9
553 18 Jönköping

2019-09-10

Thesis proposal – compare algorithms for measuring log diameter distribution and evaluate machine learning as a technology

1 Background

Cind AB develops advanced measurement equipment using stereovision technology. The company has its site in Jönköping and two products on the market. TimSpect is used to measure the volume of logs stacked on a timber truck. CargoSpect is used to measure the dimensions of palletized goods while being transported on a fork-lift. More information about the products is available in the marketing videos below:

https://www.cind.se/timber-industry?wix-vod-video-id=7ab202ac5fd94414aa96a1824823e4d8&wix-vod-comp-id=comp-jwcev4jm#

https://www.cind.se/logistics?wix-vod-video-id=5e9e6b63a28e41d9bb5b962b8b0d08c9&wix-vod-comp-id=comp-jwcfbejn#

Our systems currently use passive stereovision where two or more industrial machine vision cameras are calibrated via our proprietary software. An 3D point cloud reconstruction of the object to be measured is created using pattern recognition and matching between the cameras. The software is running on a linux based computer and the image processing is done entirely on the CPU.

This link shows a more technical video that illustrates the stereovision software:

https://www.youtube.com/watch?time_continue=11&v=7pPERzs9RU4

2 Problem statement

This thesis is related to our product TimSpect. Apart from measuring the volume of the stacked round-wood we also measure the diameter distribution, i.e. the amount of volume that belongs to logs within a certain diameter class. We do that by rectifying images of the log ends and then using a 3rd party software to find and measure the diameter of each log end. The image below illustrates the process
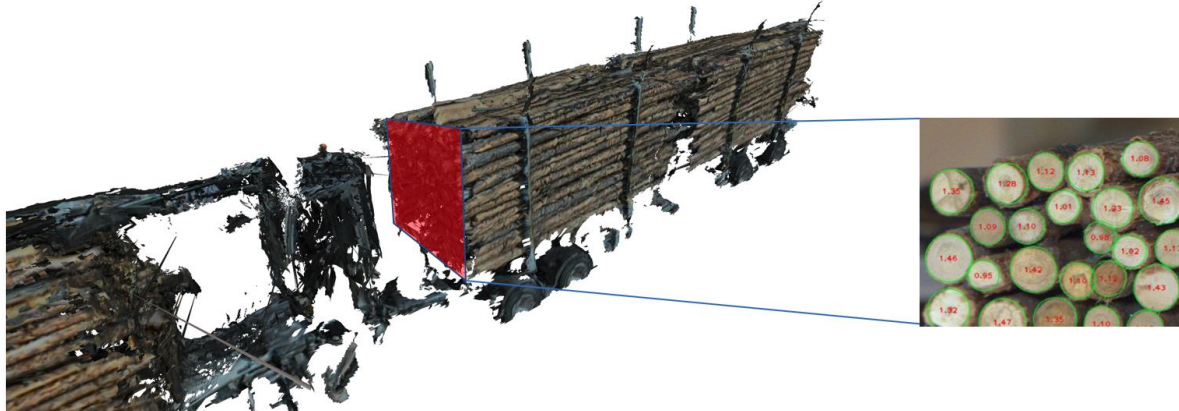
We would like to investigate the possibility to implement our own software for finding and measuring the log ends in order to be independent from the 3rd party software. This is a non-trivial task that will require several advanced machine vision technologies and most likely machine learning technologies. The goal is to implement an alternative software an evaluate the performance and accuracy with the existing solution.

Cind has available reference data in the form av video sequences with calibration data of timber loads where the diameter distribution has been verified with manual measurements of each individual log.

3 Scope

This thesis is suitable for Master Thesis Students.