Assignment

Riwo Engineering BV is a company located in Oldenzaal, the Netherlands. They are specialized in the design and production of industrial automation solutions, e.g. autonomous mobile robotics for internal transport in green houses, automatic loading platform for (un)loading of products for trucks and trailers, et cetera. For a large customer in the greenhouse industry, they are developing a pick and place unit that picks potted plants by the thousands and places them on an autonomous vehicle. This works for relatively large pots, but for smaller pots their solution is too unstable. Their proposed solution for the smaller pots is to pick and place them individually from conveyer belts using a robotic arm (see Figure 1). For this application, it is fundamental to detect, localize, and track the pots in a live image feed. Due to the variance in plant size, shape, and color, and their tendency to overgrow the (more easily detectable) pots, a classical rule-based vision application is not feasible. To solve this, Riwo and Saxion are collaborating in the RAAK MKB project Focus on Vision.

Figure 1 Incomplete plant handler.

Task description

The aim of this graduation assignment is to investigate the applicability of machine learning in the perception of pots and their plants, and to integrate the perception into the existing setup located at Riwo in Oldenzaal (see Figure 1). The student will have to become acquainted with state-of-the-art frameworks such as Robot Operation System (ROS) and TensorFlow, and will have to dive into the theory of machine vision system design and artificial intelligence. The student will advise Riwo about potential changes to the existing setup that could improve performance and will apply these changes to both hard- and software. A possibility exists to work at the company in Oldenzaal. At Saxion, there will be a close collaboration with at least three of the researchers from different specializations.

Practical Information

Student Profile: Mechatronics, Computer Science, Mechanical Engineering
Duration: September 2020 – February 2021
Compensation: €230 per month, before taxes
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