Programming a robotic manipulator for a computer vision application

Basic information

Project ID: AEE-2016-18
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Objective

The first task was to update the control computer running Ubuntu 12.04 and ROS Groovy to Ubuntu 14.04 and ROS Indigo.

Then an application for transforming features from visual system to point features was to be made.

Finally these point features needed to be transferred to robot movement.

Summary of results

The upgrade of the system took a lot of time as existing documentation of the system was lacking and needed to be rediscovered. The update also meant that other components, such as OROCOS, needed similar updates and the way the OROCOS and ROS packages were built was also updated.

These updates and build systems needed to be tested and some of the existing packages on the old system were ported to support the new build system and deprecated features were converted to new standard on OROCOS components.

Transforming visual information to point features was done by using existing OpenCV libraries.

To visualize the point features on the robot, a drawing method was selected. An OROCOS component was written to move the robot arm drawing the point features with linear interpolation.

A ROS node was also written that was used to teach the size and orientation of the target paper for the robot. A different node was made to send the point features to the OROCOS component and final node was composed to command the component to start drawing the features on paper.

The system was deemed to be working and later the updated system was set as the default for new applications for the robot.

Documents

Poster
Final report