

Title Feedback control of manipulator using machine vision for robotic apple harvesting
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Abstract

The challenges in developing a fruit harvesting robot are recognizing the fruit in the foliage, detaching the fruit from the tree, and the coordination of the vision system and the hand system. This paper presents the development of a feedback control of manipulator using machine vision. To measure the distance of the fruit from the camera, the laser ranging sensor is used. The detected fruit should be in the center of the image for its distance to be measured, so the camera should be positioned using the manipulator to position the fruit in the center of the image. A feedback control using machine vision is used for this positioning procedure. Two controllers are considered; three position on-off controller and proportional controller with variable gain. Both controllers were implemented in a simulation. Simulation results showed that both controllers were able to guide the manipulator to position the fruit in the center of the image.