OBJECT SORTING SYSTEM USING AN AFFORDABLE ROBOTIC MANIPULATOR

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Abstract

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Industrial automation and robotics are at a high demand in the industry in present as both of them directly affect the growth of the industry. Quality and flexibility of the product is becoming significant criteria for the industry. Robots are the best solution for future cost of labor wages and higher customer demands. Robotics and automation are combining in order to replace human labor to perform their tasks that are routine, dangerous, complex and in hazardous area. Pick and place operations are needed in every kind of manufacturing process and it can be automated. So, this project aims to sort and place different objects according to their topside shape using image processing technique. In this project, low cost, servo motor controlled, CNC machined 5 DOF robotic manipulator with pneumatic suction end effector is used for the object sorting. The shape detection is implemented using Matlab 2016 and a high quality logitec web camera is used for image capturing. The robotic manipulator is controlled through an Arduino Mega via serial connection to Matlab. A graphical user interface is developed with customization options. The main objective is to provide a solution for any manufacturing process which require sorting based on shape, color or their combination.

Keywords: Robotic, Matlab, Arduino, Automation, Shape, Sorting