

Object Sorting System Using Affordable Robotic Manipulator

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In modern world, automation and robotic are at a high demand as both directly affect the rapid development in various industries. Also, quality and flexibility of products are becoming significant criteria. Robots will be the best solution for substitution of cost of labor wages and higher customer demands. Automation is the most preferred technique to replace the human labor that perform complex tasks in complex and risky environments. Pick and place operations are required in many of manufacturing processes, and it can be automated. Therefore, this study aims to sort and place different objects according to their shape and color using image processing techniques. The main objective is to provide a solution for any manufacturing process which require sorting based on shape, color or their combination. In this study, low cost, servo motor controlled, CNC machined 5 DOF robotic manipulator with electromagnetic end effector is used for the object sorting. The shape detection and color detection algorithms were implemented using MATLAB 2016 and a high-quality USB web camera. The robotic manipulator is controlled through an Arduino Mega via serial connection to MATLAB. Since, higher processing power is required for the algorithms, a computer was used. A graphical user interface was developed with customization options. Objects were successfully detected based on shape and color and sorted using the robotic manipulator.

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