Cover page

Project title: Smart Sorting System

Academic Year: 2024 - 2025

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Department Name: Computer Engineering

Project Type Software or Hardware (Choose one)

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Format:

- Single space, Times New Roman.
- 12 pt,
- Maximum 1 page.

Abstract Body:

Items must be provided in the Abstract:

- Why do you think this project is important? Please explain the significance of this Project in brief.
- In your point of view what are the important aspects that should be covered in the project?
- Objective(s): In your view, please explain the main objectives of the project.
- Methodology: Give a brief outline of the application development process.
- Had this project been done before? Are there any similar applications available today?
-
- **Note:** Please deliver this abstract early to ensure that your Project has been approved by the department's projects committee. **Registration will not be done without this approval.**

Project's Abstract:

The proposed project is an automating sorting system that sort the items according to its color or shape. The system based on image processing using raspberry pi camera that will be synchronized with a belt controlled by a DC motor.

Main Features:

1. **Real Time Object Detection and Sorting:**
   A Raspberry Pi camera will be used to detect the items to be sorted according to their color, size or shape. The system will lead the item into its right path that will be three servo motors, if we suppose we have three different items and three different paths, those servos will change the path of the item on the belt.
2. **Conveyor Belt and DC Motor Control:**
   The belt generally will be powered by a DC motor. Also, there will be sensors placed at some location to detect where the item reaches with feedback for the Arduino which is responsible to control the servo motors.
3. **Servo Motors Driven Sorting Path:**
   Servo motors that are responsible for pushing the products or lead them into their right path are independent. So, every servo will manage one path only. The servo will return to its normal position as the sensors in the needed path gave feedback to the control unit.
4. **Load Monitoring:**
   The end of any bath will lead to a specified load box. Those boxes will be designed to make sure there is no overload on them. So there will be sensors to detect the load capacity on those boxes.
5. **Strategy to Free Up the Full Boxes.**
6. **Asynchronous System.**

Practical Applications:

This sorting machine system is automated and could be used in various applications in industries like Logistics Warehousing to sort the items based on destination or type. Also, the Recycling Centers could use such a thing to sort recyclable materials like plastic, metal and glass.

There are more applications that could be using such a sorting system like Food and Beverage Industry, Manufacturing and many others.