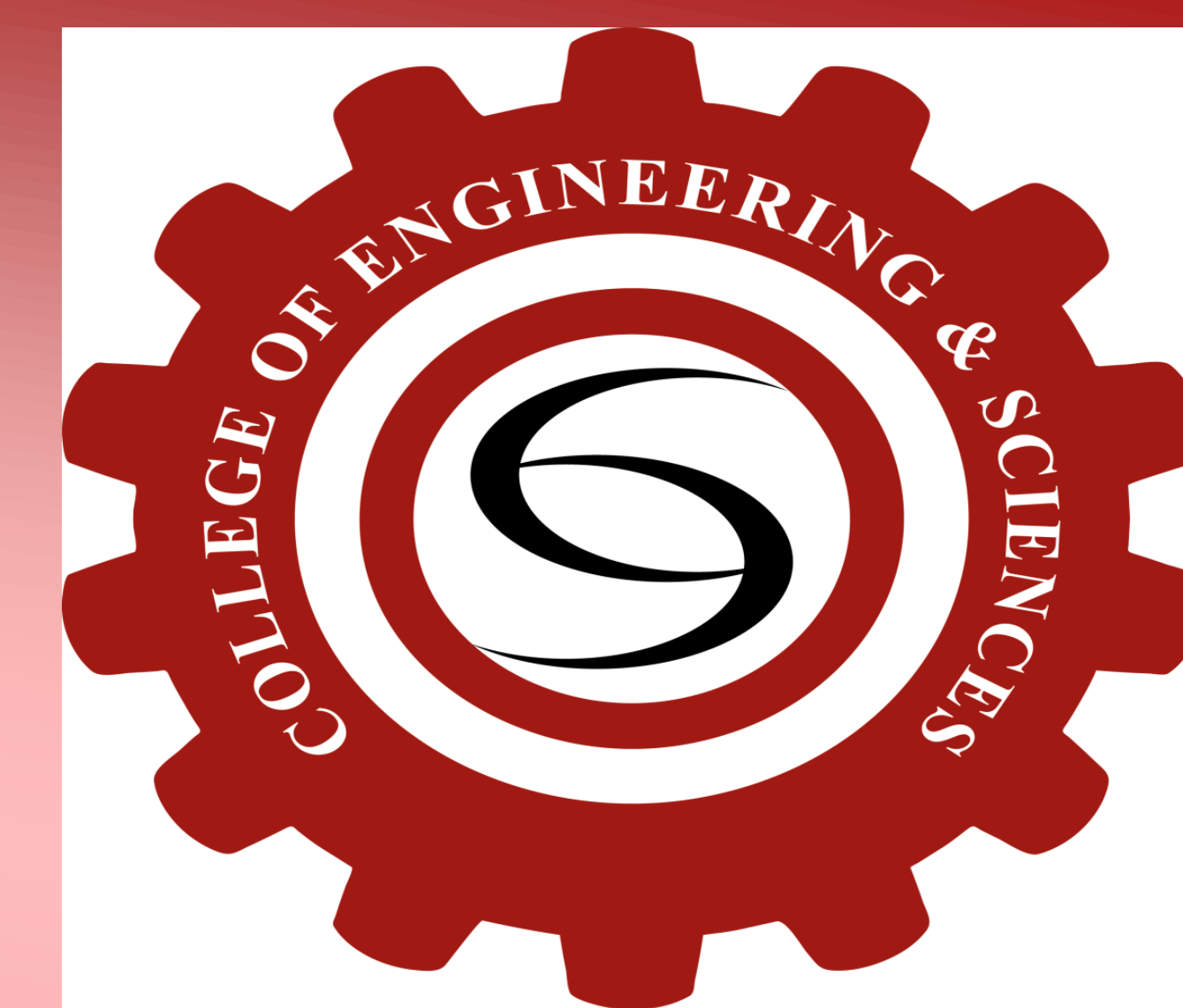




ELECTRICAL ENGINEERING DEPARTMENT

COLLEGE OF ENGINEERING AND SCIENCES

FINAL YEAR PROJECT



SUPERVISOR:
Sir Rashid Qutub

PROJECT:
**Image Processing Size Verification
Parcel Sorting Conveyor**

GROUP MEMBERS
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ABSTRACT

❖ **Image Processing** is a technique which is used to extract data, attributes and/or details from the images. Reconstructing the damaged images, improving the quality of the image, and extracting some useful data from image. Image processing is among the rapidly growing technologies. It is used for security purposes like in security cameras; astronomy, removing noise from the images got from the telescope of far-flung galaxies and black holes. Image Processing Conveyor Belt is based on the Tensorflow algorithm of object detection. This algorithm is installed in Pi, will help in identifying the object size. The DC motor pushers will sort according to the size identified.

INTRODUCTION

- ❖ **Image Processing Size Verification Parcel Sorting Conveyor** belt is an efficient technique to sort products/packages of different sizes of same/or different variety.
- ❖ **Image Processing** is the process which helps in reading attributes of the object like; size, color, dimensions.
- ❖ The goal of object recognition is to automatically detect objects through camera and Raspberry Pi and classify them according to their properties.
- ❖ **Raspberry Pi** is programmed in a way, which detects the sizes which are pre-defined.
- ❖ **Ultrasonic Sensors**, furthermore, detect the size and activate the DC motor pusher of the particular size and sort accordingly.
- ❖ This project shows errorless, efficient and short time consumed work done. Unlike the human sorting which is most likely full of error and less efficient.

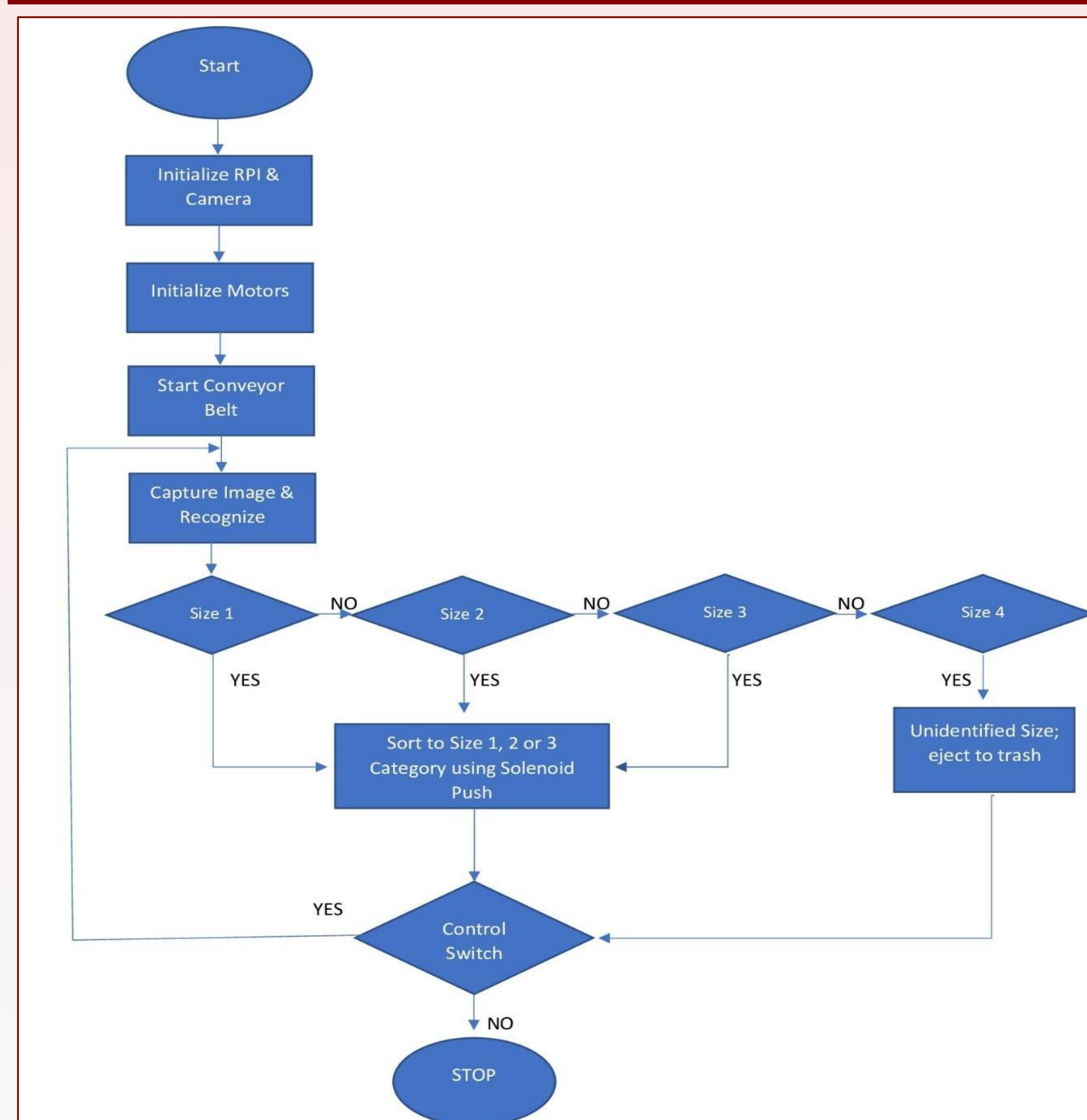
PROBLEM STATEMENT

- ❖ Sorting with image processing technique is expensive and imported technology. Thus, not used often by industries; though human labor is given preference for sorting.
- ❖ Economic, local-made, and cheaper availability of this technique/project will help industries to equip with efficient and errorless sorting as compared to human sorting.
- ❖ Existing technology is highly expensive, imported, high-cost maintenance. Whereas this project is local made and can create job employment if the production industry is set up.

PROJECT COMPONENTS

- ❖ **Hardware:**
 - **Raspberry Pi:** The Raspberry Pi is a low cost, credit-card sized computer that plugs into a computer monitor or TV and uses a standard keyboard and mouse.
 - **DC Gear Motor:** A gear motor combines an electric motor and a gearbox into a single unit. When a gear head is installed on a motor, the output torque is increased while the speed is decreased.
 - **Arduino Nano:** An ATmega328-based board, the Microcontroller is compact, self-contained, and suitable for use with a breadboard (Arduino Nano 3.x)
- ❖ **Software:**
 - **Arduino IDE:** used to write and upload programs to Arduino compatible boards.
 - **Tensorflow Object Detection Algorithm**

BLOCK DIAGRAM



IMPACT & RESULTS (SDGS, CEPS)

- ❖ **Depth of Knowledge:** Digital Image Processing, Tensorflow Object Detection Algorithms, Python, C++ and idea of technique to detect size and sorting.
- ❖ **Depth of Analysis:** Analysis required to build a sustainable, efficient, and cost-effective conveyor belt. We introduced a sorting technique using image processing through identifying the size of the parcel/object.
- ❖ Results achieved are short time consumed and accurate. It will create an attraction for the industry about the local manufacturing. It is possible that new industry might set up and hence will help increase in job creation. Reducing exports will help the economy and GDP of the country.
- ❖ Our project is environment-friendly because it does not produce any carbon emissions. Furthermore, SDGs' goal 9 (Industry, Innovation and Infrastructure) enables towards sustainability of society in providing employment to local.



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