PROJECT ALTO

ALTO: Advanced Learning Techniques for Almond Sorting and Optimization

TEAM MEMBERS:

PRATHAM SINGLA (102115190)
RAHUL GOYAL (102115191)
NAMAN KAKKAR (102115192)
GAURAV GARG (102295003)

FACULTY COORDINATOR:

Dr. Surbhi Sharma
Associate Professor, ECED

ELC Summer Internship-2023, Experiential Learning Centre, Thapar Institute of Engineering and Technology (TIET), Patiala

Overview

THIS PROJECT AIMS TO ACHIEVE ALMOND SEGREGATION USING OBJECT DETECTION.

ALMOND SEGREGATION BASED ON **DEFECTIVE** AND **NON-DEFECTIVE** ALMOND

NEED ANALYSIS

Manual Segregation

Almost majority of almond segregation is done manually

Reliability

There is always a chance that almond can go unchecked in manual screening

Time and Cost efficient

The time and money consumed between manual and automated screening is huge

SYSTEM MODEL

OBJECT

PROCESSING

INPUT

The Input to the Model is Provided using a camera module
In the form of live video format

DETECTION

The input is passed to the trained model for object detection. The detected class is passed to another function along with the instance of detection

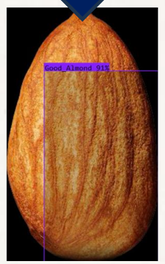
POST DETECT

1. For the User interface, the input at the instance of detection is labeled with its object class and given as output.
2. A command is issued to motor

SEGREGATION

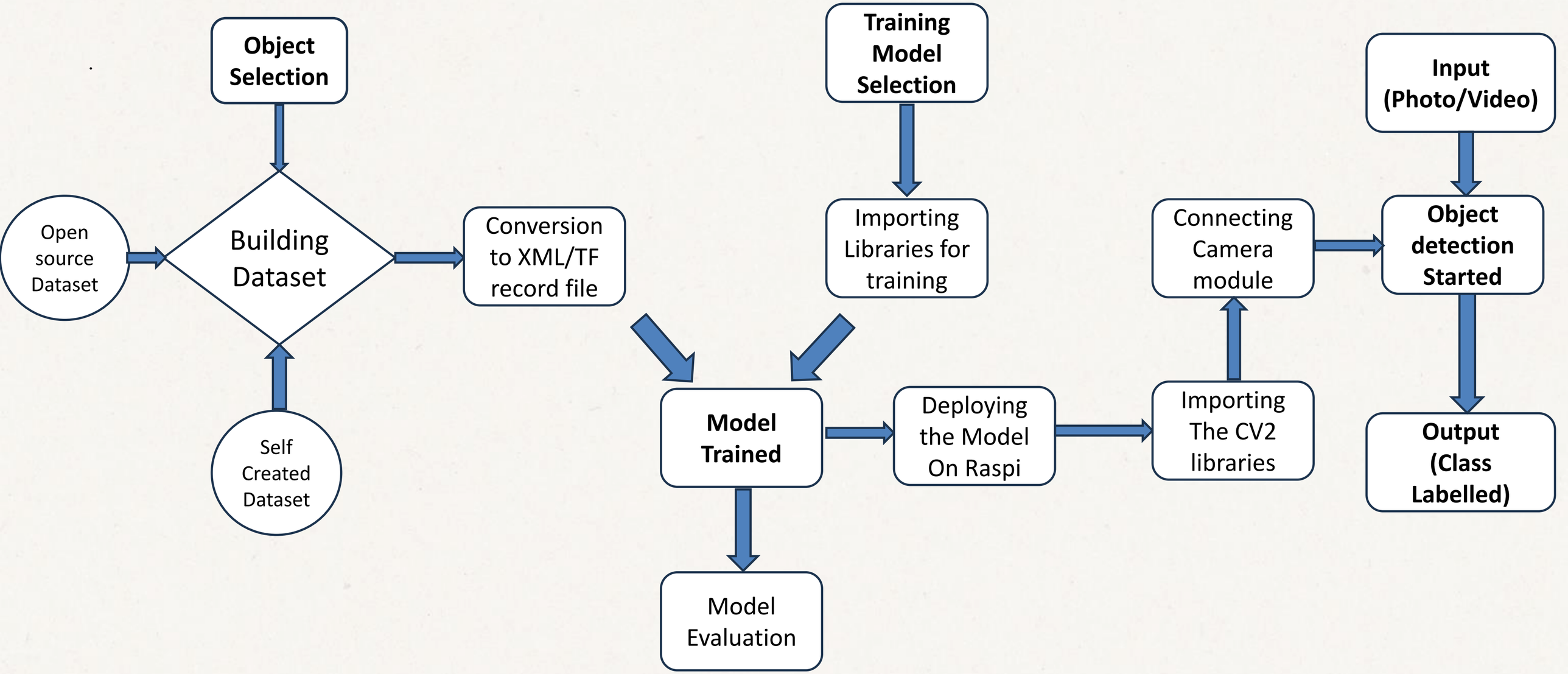
After obtaining the command, the segregator mechanism places the object in its dedicated location.

REPEAT CYCLE

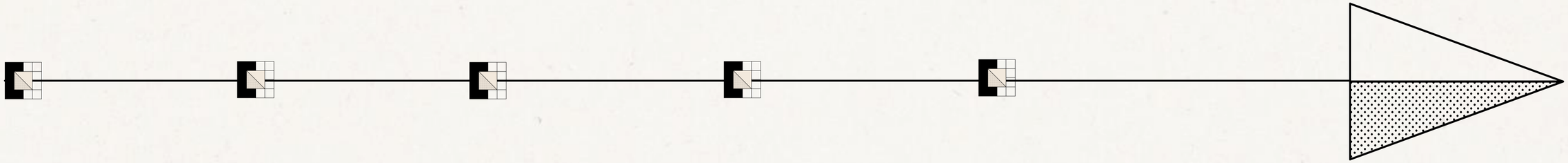


OBJECT DETECTED

Flow Chart of Model



Timeline



Week 1

Study of ML

Week 2

Studying TensorFlow

Week 3

Creating Dataset and Training Model

Week 4

Various Model Trained and testing begins

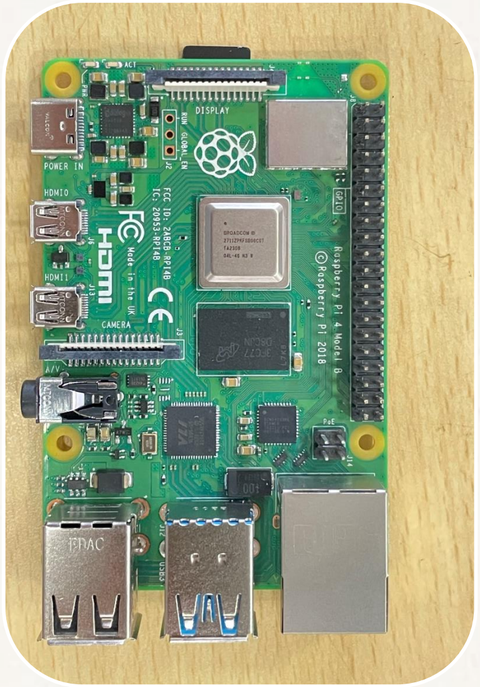
Week 5

Results Subpar, Shifted to YOLO Model

Week 6

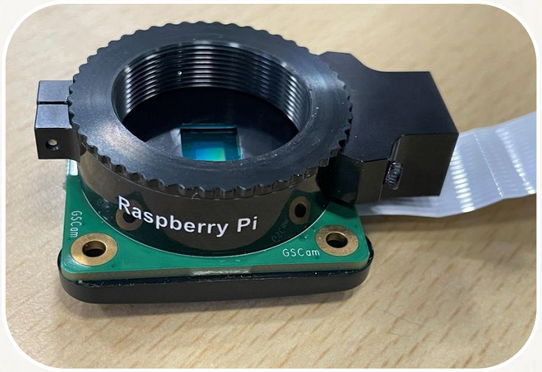
YOLO model trained with better mAP and Precision

Components

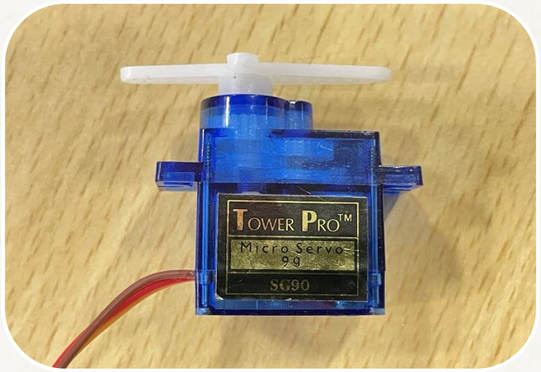


Raspberry Pi 4

Camera Lens

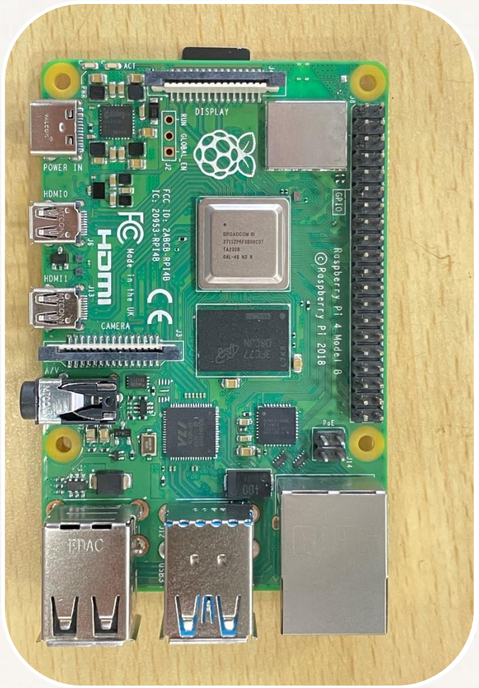


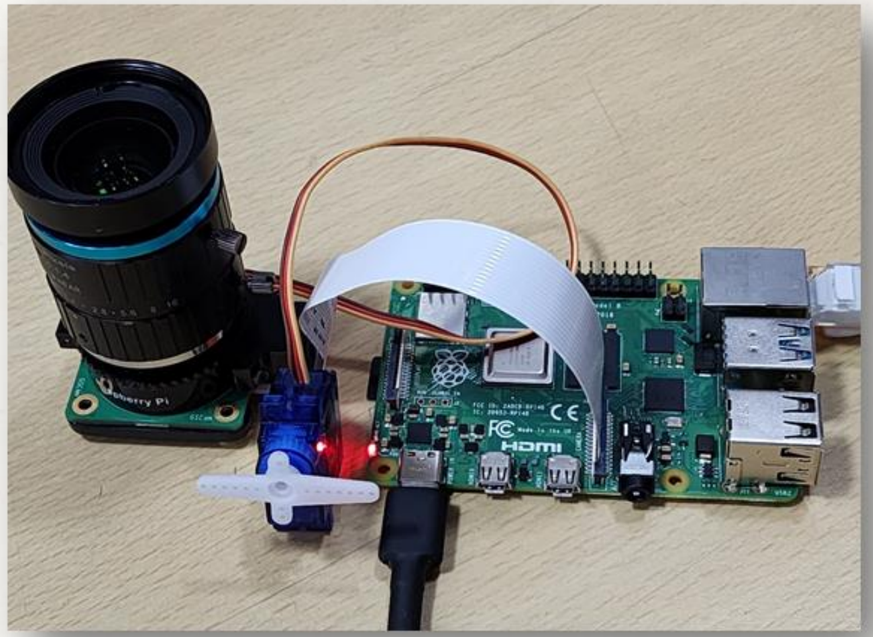
GS Camera



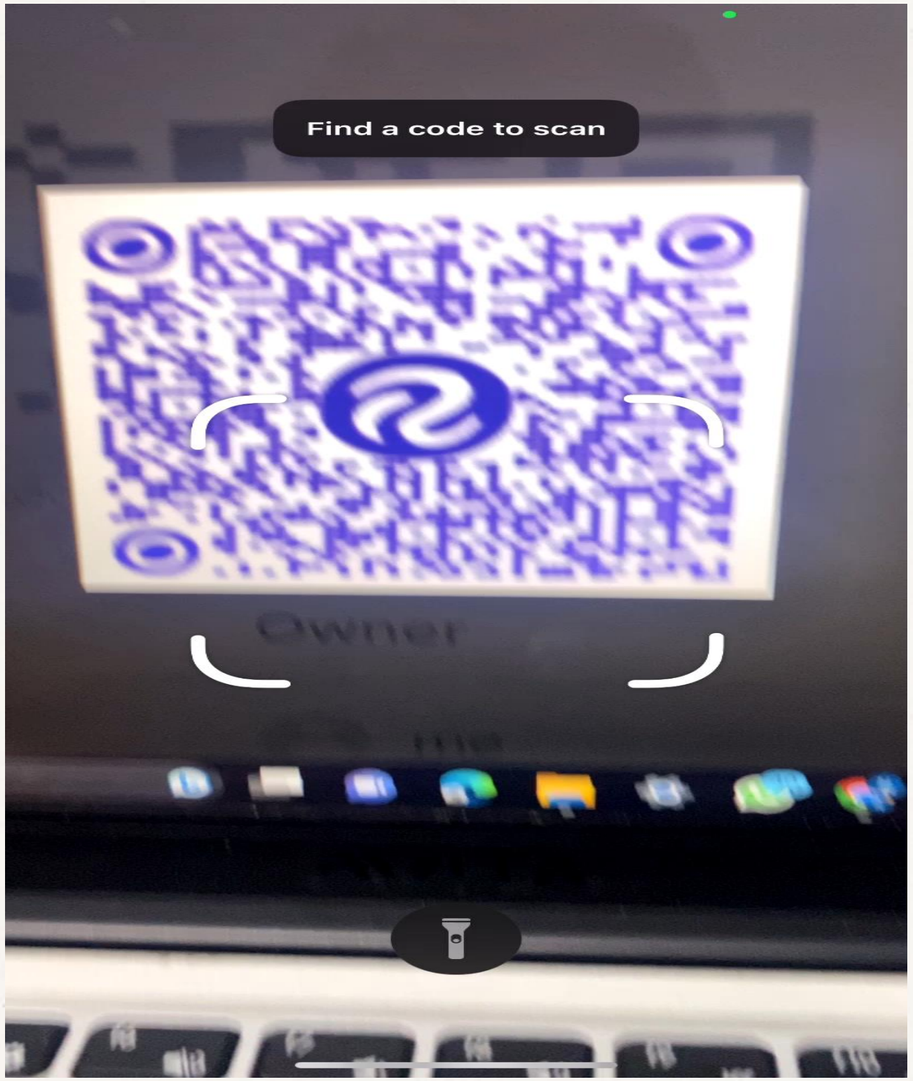
Servo

Components

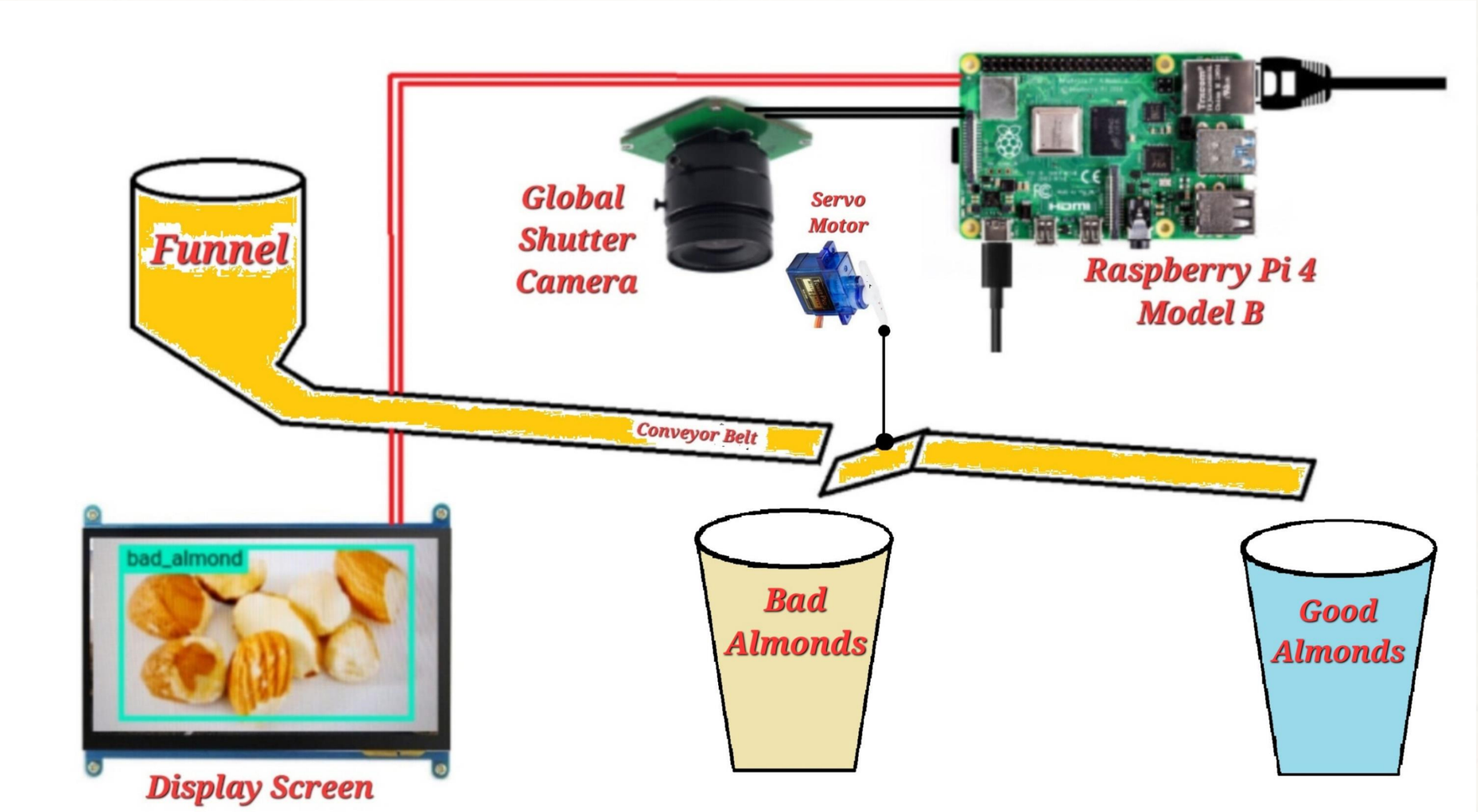




Assembly


Find a code to scan

Proposed Model



Future Scope

- Model
  - Integration with Internet of Things (IoT)
  - Enhanced Efficiency
- Market
  - Accessibility
  - Adoption in Other Crops

Thank you