**Progressive Education Society’s**

**Project ID: 17**

**Modern College of Engineering, Pune-411005**

**Department of Electronics and Telecommunication**

**B.E. E & TC -2019-20**

**Project Title: Automatic Fruit Sorting System Using Raspberry-Pi.**

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**Objective:** To design automatic fruit sorting mechanism which sort the fruit according to the size and quality at a time with image processing techniques.

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| **Methodology:**  1. The hardware of system is made up of a wood which contain conveyor belt. There is partition for sorting of an apple and an orange with the quality and size.  2. The fruit will be kept on conveyor belt, which is detected by IR sensor and DC motor will stop. Servo will operate as a gate  3. Image will capture by pi-camera. This image is analyzed with different image processing techniques like edge detection, image segmentation, object recognition etc.  4. After analysis the gate will open and we come to know whether the fruit is an apple or an orange. Also the quality which is high or low.  5. After the analysis DC motor will start. According to this result servo motor will operate to slide the fruit to respective side.  6. On the both side of conveyor belt, circles are made with different diameter which will sort the fruit according to size.  7. This similar process will continue for next fruit. | **Block Diagram:**  Fruits  High Quality Apple    Raspberry - Pi  High Quality Orange    IR Sensor Pi- Camera  Servo motor With Slider  Conveyor belt with DC motor  Rack and Pinion  Raspberry-Pi  Power Supply  DC Motor  DC Motor  Conveyor Belt  Servo Motor  Low Quality Orange  Low Quality Apple  Size Sort | | |  |  |
| **Testing & Debugging:**   1. Ensure that IR sensor is detecting the fruit and according to that DC motor stop or not. 2. We capture the images from different distances. After that position of Pi-camera is fixed. 3. With the help of simulation software testing of servo motor is carried out. We came to know how to deflect the slider for sorting of fruit. 4. The individual codes were then clubbed. 5. Debugging of software issue. | **Specifications / Features:**   1. Pi-camera :- 2. 5 MP resolution 3. Compatible with any raspberry-pi module 4. 15-pin camera serial interface plugs directly into raspberry-pi board 5. IR sensor :- 6. Operating voltage 3.0V-5.0 V and current consumption 23mA-43mA 7. Object detection range 2cm - 30cm 8. On board detection LED indicator 9. Servo motor :- 10. Operating voltage 5V 11. Rotation in between 00 -1800 12. DC motor 13. Operating voltage 12V 14. 120 RPM | **Results:** | C:\Users\DELL\Desktop\Capture f.PNGFig a. Side view Fig b. Top view    Hardware of the system | | |

**Conclusion:** The product sort the fruit according to size and quality at a time. Real time fruit detection is the difficult task for us also it’s little difficult to build mechanical design. We tried to reduce the errors to its minimum value. Finally we succeed in making the product which reduce human effort and sort the fruit on the basis of two parameters.