Sorting Machine

Done by :
Mohammad Yahya
Radwan El-Boom

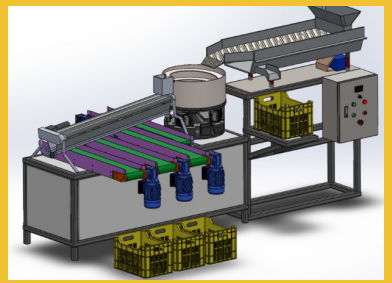
Supervised by:
DR.Suleiman Abu Kharmeh &
DR.Hanal Abuzant

Contents

- Introduction
- Contribution
- Project Parts
- General structure
- Implementation
- Challenges and Constraints
- Future Work

INTRODUCTION

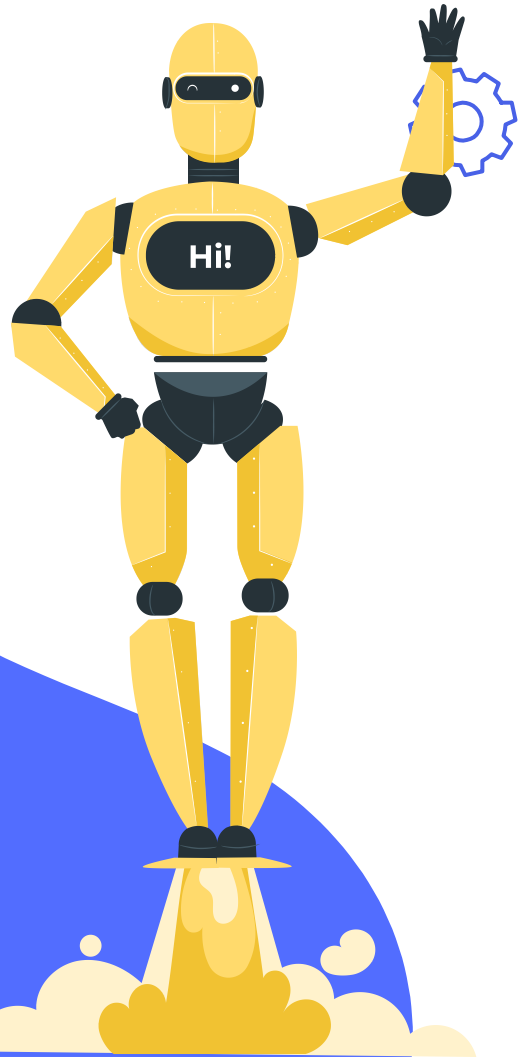
- Sorting machines are essential things in factories for the following reasons:
  - Accomplish sorting task without human efforts.
  - Not constrained by human limitations.
  - Reduces costs, effort and time.



Contribution

We have built a sorting machine consisting of:

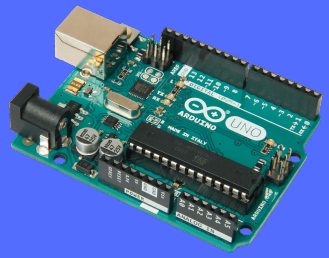
- A web server that can be accessed from any smart device and used to display streaming content remotely.
- The web server allows the user to control the operation of the machine remotely by turning it on or off.
- The arm that is used to move products from its storage place to the conveyor belt in order to sort them.

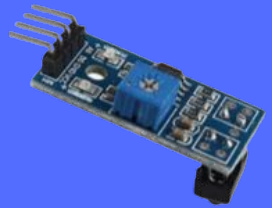


Contribution(Cont.)

- The conveyor belt that was used to move the product to reach out the camera and allow the controller to take a picture of this product.
- The controller (raspberry pi) was used to establish the streaming server.
- Also, the controller was used to do the image classification for sorting with the vgg16 classification network and to send suitable control signals to other components.
- Lastly, the simple hand that was attached to the end of the conveyor belt was used to sort products and put them into the right place by rotating into a specific direction.

Project Parts





General Structure

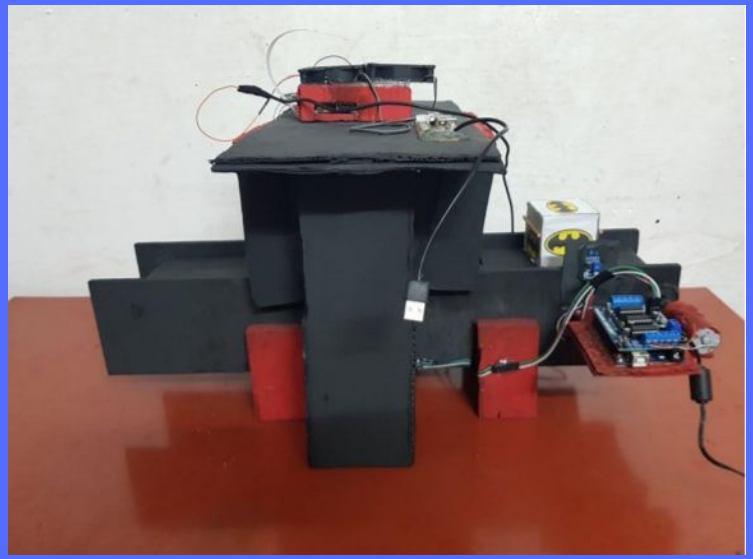
- **The Whole Design :**

General Structure(Cont.)

- **Arm :**
  - It is used to transport the products from the storage place to the conveyor belt for sorting.

General Structure(Cont.)

- **Conveyor Belt :**
  - It is used to move the product to reach camera and allow the console to take a picture of this product.
- **Controller :**
  - It is used to establish the streaming server and to do the image classification for sorting products.



- **Streaming Server:**
  - It is used to display the streaming contents.
  - it contains information about the sorted objects such as their names, the number of each, and the time taken to classify each one of them.
  - It also contains a button to start/stop the system remotely via HTTP request.

General Structure(Cont.)

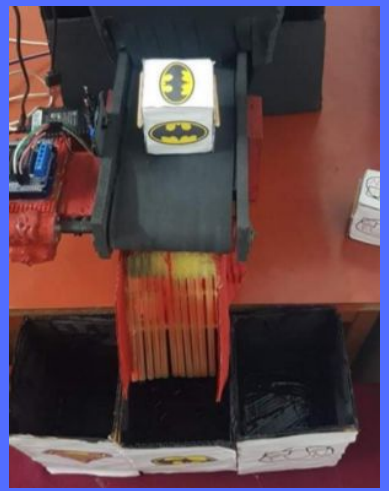
- **Sorting Hand :**

  It is used to sort products and put them into the right place by rotating into a specific direction.

(1)

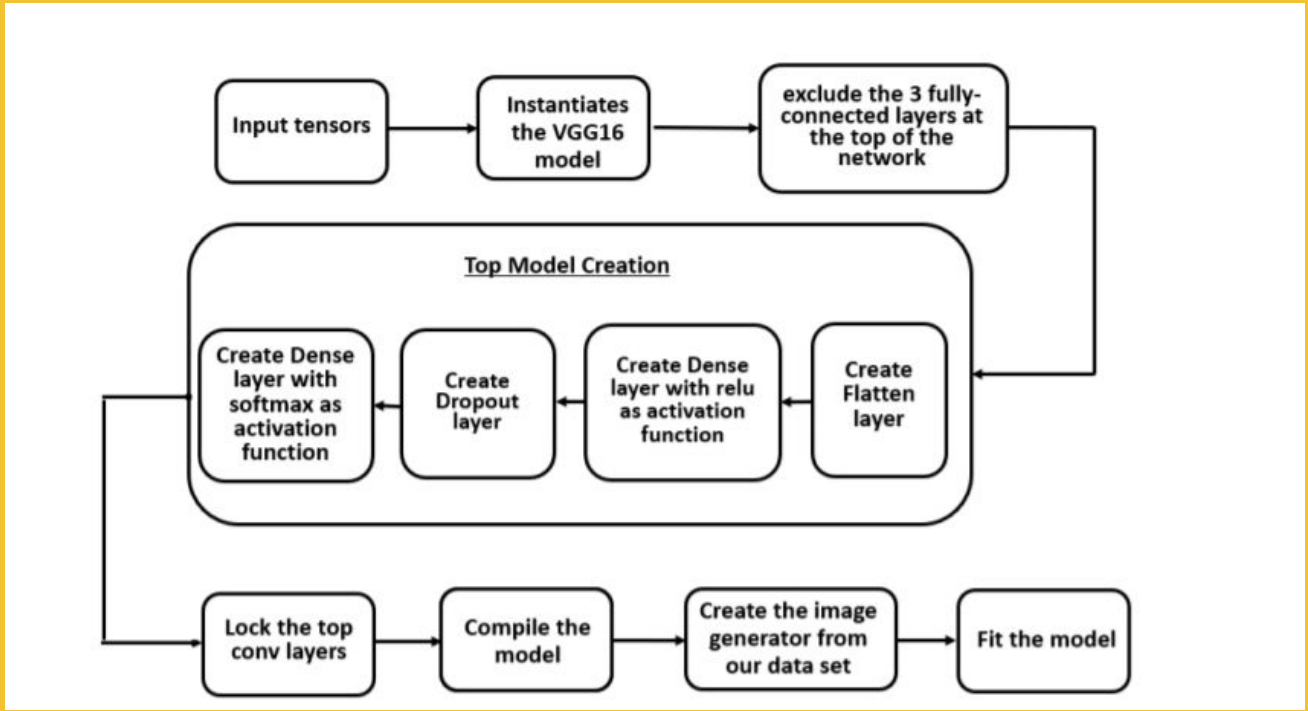
(2)

(3)

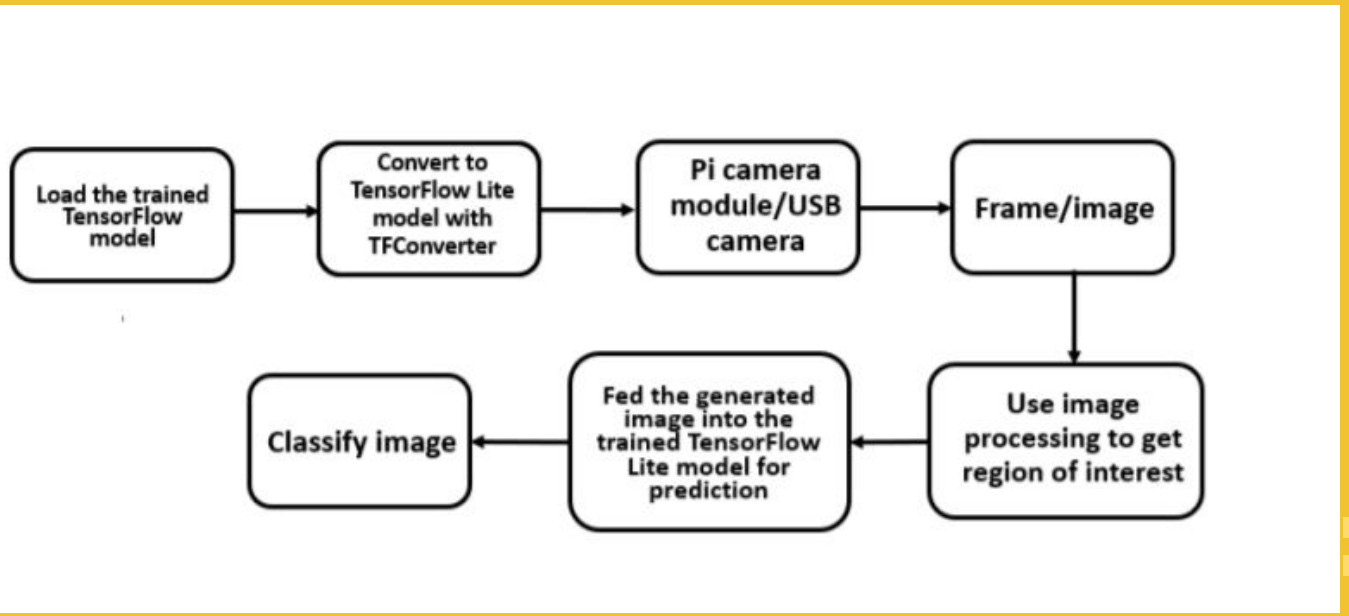


VGG16 – Convolutional Network for Image Classification

Training Model



Testing Model



Constraints

Cost Of Material

Servo Motors Failure

Power Supply

Sensors Quality

Future Work

1 - Find more powerful and better servo motors that match our design criteria.

2- Extend our model and train it on more items, so our sorting machine can sort more items.

3- Extend our system functionality by integrating our design with other modules.

4- Test new techniques for image classification so we can get more accurate results.

THANKS for watching !