ACADEMIA International Journal for Social Sciences
Volume 4, Issue 2, 2025 ISSN-L (Online): 3006-6638

# Chocolate Detection in Shopping Mall & Forward Data Through Cloud Computing by Humonoid Robot Using YOLOV8 with TENSORFLOW

**Farheen Iqbal**
engr_farheen@yahoo.com
Faculty/Student, NED University of Engineering & Technology Karachi
**Corresponding Author: * Farheen Iqbal** Engr_farheen@cloud.neduet.edu.pk

**Received:** 09-04-2025 **Revised:** 10-05-2025 **Accepted:** 15-06-2025 **Published:** 30-06-2025

## ABSTRACT

*Selection of chocolates or any other grocesseries in shopping mall is difficult to manupulate. Many errors or misconceptions of detect and sorting process of required item make it hard to select desirable item.There are many issues create to handle this whole process due to up and down of any labels to recognize and overlap in a tray of packaging due to timing issue or speed . In this situation,YOLOV8 model to make it possible to create labels to each item to detect and make a class of each group so that it can easily processed .The humanoid robot used to pick and draw a selected chocolate.Robotics have a sensor and cameras in which image segment of each group is saved and when we select a required chocolate from specific row,it will compare to saved one to confirm a class.an then passs to tray for packed and program a cost that is sense by item and processed to machine.One instruction gain by humanoid robot from user to select a chocolate and one instruction is used to monitor a situation and generate a voucher for payment.ROBOFLOW platform is used to deploy the training Machine learning algorithm is used for process and datasets using cloud computing. The instruction from user will be gained by voice control blue tooth module application which is connected through Arduino to the robotics.*

***Keywords:*** *YOLOV8 with TENSORFLOW,cloud computing dataset, voice control Bluetooth module,GPU's,nividia xavier and resberry pi.*

## INTRODUCTION

Many shopping malls faces rash environment due to traffic of customers to pack their grocerries.We need so much employes to manage the situation and overcomes the demand of customers.YOLOV8 uses training of model of same class and then detect at real time.Github and colab give a platform to resemble all datasets and roboflow is used for machine learning datasets in which each packet of neurons is combined to form a collection sets of data after processing.It contains coding of python and interlinks each library like scikit and numpy but coding cann not be changed with respect to data at real time so python code can also be integrate directly to hardware with yolov8.Here both methods will be entertained.Blue tooth module HC-05 is connected to mobile application to collect data and pass the link to python code in roboflow where data is trained already with yolov8 with their classes.Real time requirements when match the the label data,it will pick by humanoid robot's hand.From where it pass to another robot where it packed to deliver the customer and set the cost in machine to print voucher.Cost of the item will be sensed by machine.Voice control mobile application with blue tooth module used to control input from user.Two humanoid robots need for this purose with fix distance apart from each other.Second robot can type an amount on machine to print the voucher like atm machine or camera can sense an amount from the packet and generate a slip.Sequence of passing item from one robot to another is managed so that when first robot passed item to second,it will no entertain to user input and when second robot packed the item it will no entertain to receive item from first robot.Pick and draw of item is handled by magnet on hand on robot so that when first robot repel item then second attract.One magnet

from machine attract an an item for packaging.We can also used sensors but magnetic can do it fastly.For this purpose we used canny edge detection algorithm for image processing.It is not necessary to used any hardware on machine for image processing,just single chip with android can be used to detect image and process it.

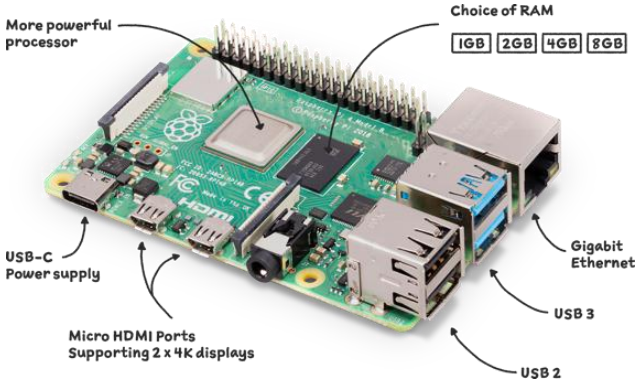



Figure 1:resberry pi with camera to integrate tensorflow

**YOLOV8 WITH TENSORFLOW**

Yolov8 is normally used for image detection,image classification and image segmentation task.We need to setup environment and install all libraries.For anaconda install and activate yolov8 environment.Then ultralytics library should be install by using pip library.It install torch automatically without cuda GP support.but install CPU support.For GP support pytorch website have to utilize so cuda GP can easily install with respect to windows.For this copy paste command link to python window.NVIDIA xavier is used for integration to support each class in parallel manner and to rebust each other.Update cuda with yolov8 and run on GPU.In command prompt write yolov8 as outer part and then task of detection as inner part is essential to define model name.For this purpose go to github repository where different parameters defined with source of image.Confidence should be manage to define speed range of detection of each item of same class.Class lebel and bounding box information save in a predict folder.In the same way video of real time object detection can be entertained.For image segmentation predict segmentation parameter from github repository and paste the model on anaconda.In the same manner classification model can be established.It contain also ONNX file for machine learning or deep learning in each case or define segmentation and classification file details. The design graph shown in figure 2.

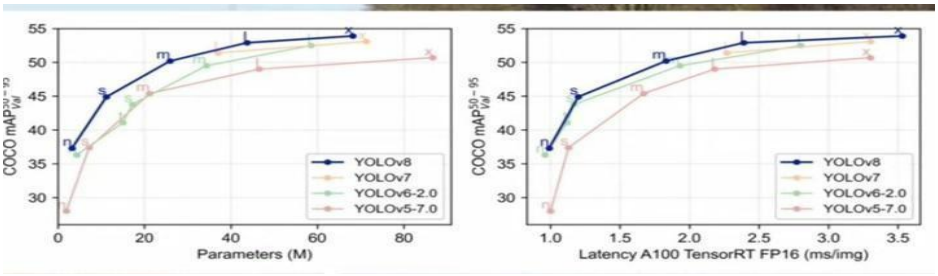
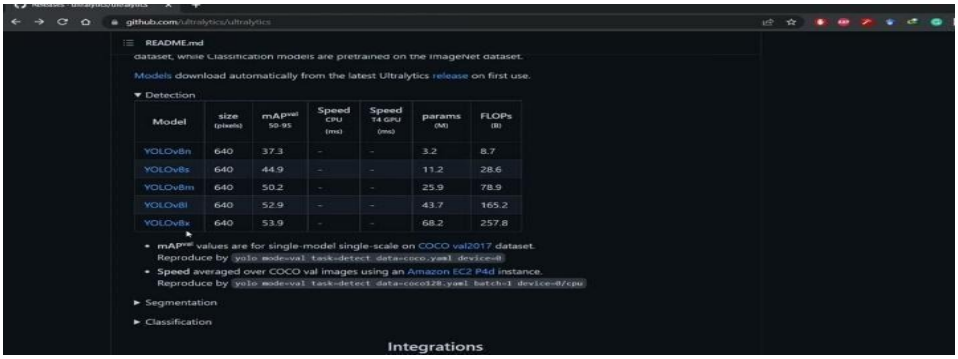



Figure 2:YOLOV8 models for detection,classification & segmentation

Custom object detection can also be followed where two or more class models can be used.For this purpose download image from google and the transfer into format of yolov8 then setup yolov8 and train it and set prediction of models.In python command create yolov8 custom dataset then from pip library download image from google.When file is created then create empty foler of image,open it an import library from any text editor.Then create new folder where all images downloaded.To annotate the images in yolov8 model use pip library again for labelling in new folder.Interface editor created where yolov8 model can be label easily by box an object and create name of it.Now label folder contain all labels of custom object and contain text file of all labels also.Now cerate train folder and well folder.Open val folder or directory to create sub directory of images and labels.Now copy last group of images like six or seven images from main directory to well directory and from labels class folder to root directory as it will need later.Copy last group of six or seven innotations to label of val directory.Now move main images inside label folder of train directory.Now data set is ready.To train yolov8 on custom dataset lets create data custom yaml folder and then open it on any teany text editor.Define train and val directory and number of classes and set the order of classes.Finally train files created.For setup of yolov8 open anaconda nad type pip install ultralyticsit install all libraries for yolov8.Now install GPU for pytorch because CPU is not suitable.Now process is same for repository models of yolov8.Select yolov8 medium and copy any where.Now go to anaconda prompt and issue command yolovtask equals to detect and mode is train.Set epochs also and data equals to datacustom yaml and paste model name which select from github repository and define image size as well.Let define complete path of images in yaml file to train.Copy to val folder as well.To check the result copy any image from val to yolov8 custom.Now issue on command with predict and run folder.It can also change to ONNX format or tf lite.

Figure 3:YOLOV8 models for detection,classification & segmentation for custom dataset

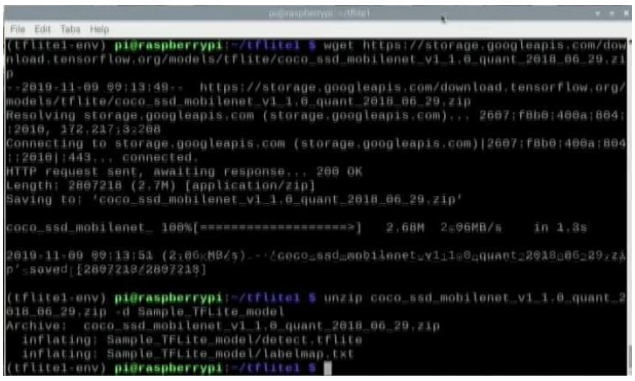



By using github or colab,first of all clone the yolov8 github repository in to ultralytics then setting the current directory and install pips library.Then setting the directory and select the video from drive and paste on colab and run yolov8 model.It detect drive's video.Output is saved in predict folder.Image or video will show with labels in a display.

To trained in an android or embedded system tensorflow is most suitable.First open LINUX terminal or command window to update and upgrade.Enable pi cameras for resberry pi and gitclone on terminal.This will create tensorflow object detection path on android or resberry pi.Activate virtual environment of tensor flow Create tensorflow and open cv on python.Tf LITE folder contains labels and detection object folder.Train the model to TFlite ,paste the link address to terminal.For custom

open tflite folder and copy tflte model folder to usb drive of resberry pi home.Activate webcame for real time and upload video or image link for saved detection in tensor flow platform.

Figure 4:YOLOV8 models for tensorflowplatform



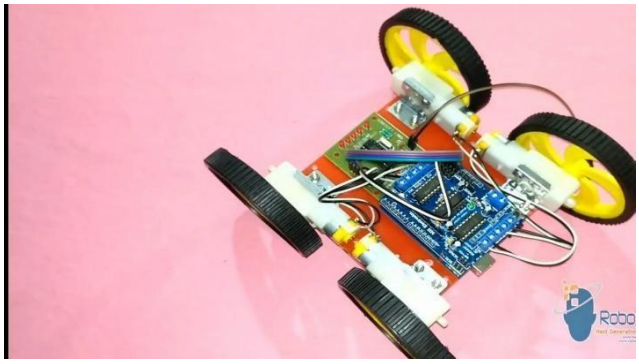

**Voice Control Bluetooth Module**

Voice control Bluetooth module having equipments

1.Arduino UNO board x 1 -2.Bluetooth module x 1

-3.L293D motor driver x 1 -4.Gear motor x 4 - 5.Robot wheel x 4- 6.Li-ion battery x 2 -7.Battery holder x 1

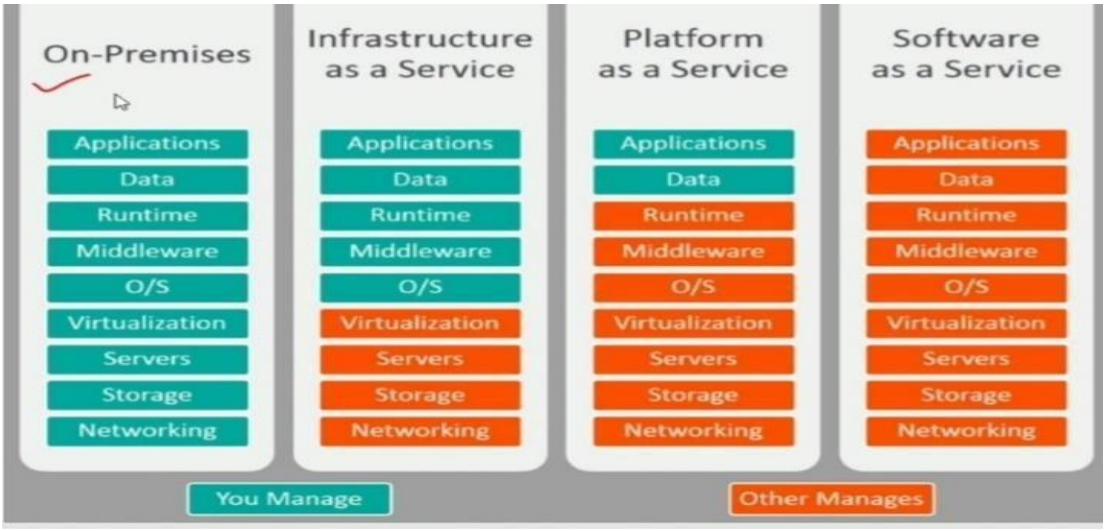
-8.Jumper wires - 9.Foam board / Cardboard / Rigifoam as shown in fgure.



Voice that is sensed in parallel criteria step by step from the customer is extract by Bluetooth application on android and through the module it transfer the robotics arm or motor to pick up required chocolates after processing with object detection process in yolov8 that is processed through nividia xavier so that each step perform in a sequence manner.In first step chocolates picked up by first robot after its compare with saved prediction and through ONNX file in GPU,it will transfer to another GPU of nividia xavier which is fixed in second robot which processed for packing from machine.The combination cannot merge each other.This can also done through mobile control graphically to take an image of chocolate and compared with saved ones.

**Cloud Computing Dataset**

Cloud computing is a way of set data in network where many software applications can link together in a sequential manner for service.It contans client infrastructure for resource using GUI.The architecture behind that consist of provider of service like IAAS,PAAS,SAAS.These service provide famous aspects for android applications or web applications.SAAS provide whole front and back structure of software application.PAAS contain coding that is link to web application to communicate user coding and requires structure.IAAS provide storage and network from aloud host.Application contains platform of user access from where humanoid robot accept data from user.and save in storage unit.Security is main concern for each step to recognize packet .Hardware components,network devices,servers virtualization devices in cloud infrastructure manage runtime access of all links in networking during execution or CR can provide execution to virtual machine or manage data between human and machine.Internet provide communication between client infrastructure and architecture components.Management system manage both in runtime process one by one.




**Interfacing Platform**

The interfacing technique connection contain github,colab,tensorflowplatform,linux terminal and Bluetooth module application.The process contain two humanoid robot with one rotation from elbow,arm and finger and second rotation is from leg to move.Every point move with its fix degree of freedom.When object detection is performed through anaconda(python) virtual environment or github and compare it with real time sense object through user define bluetooth voice application voice control which record on github or anaconda command window,it moves actuator with fix angle of rotation to pass the chocolate to another humanoid robot.

Second robot rotate its actuator with fix angle and pas to machine for packing and generate pay voucher.Cloud computing used data set to record each moment data and interlink with python with fix delay of time.

**Current Research**

The latest research shows easy way from Lightning enables you to quickly and easily deploy models like YOLOv8 on the cloud. Pythonic API that can be used to train models from any Python environment and even in an interactive Jupyter Notebook. To build a model server using PythonServer, need to create a class inheriting PythonServer and implement two abstract methods: setup(...) and predict(...).To run the model server open the terminal and enter lightning run app app.py. A browser tab will open with the API documentation. Additional power can add to your server by enabling AutoScaling, a Lightning component that scales the model server automatically based on traffic. To use AutoScaler, we need to import the component and move your YoloV8Server inside the AutoScaler component.

**CONCLUSION**

The following research make capable of researchers to train model in yolov8 by using cloud computing.The basic means of this research is to used voice control application to interface with TENSORFLOW by connecting link to hardware on two Parallel humanoid robot to perform a task.

**REFERENCES**

L. Yang and W. Lan, "On Secondary Development of PTV-VISSIM for Traffic Optimization," 2018 13th International Conference on Computer Science & Education (ICCSE), Colombo, Sri Lanka, 2018, pp. 1-5, doi: 10.1109/ICCSE.2018.8468743.

K. B. Swain, S. Dash and S. S. Gouda, "Raspberry PI based Integrated Autonomous Vehicle using LabVIEW," 2017 Third International Conference on Sensing, Signal Processing and Security (ICSSS), Chennai, India, 2017, pp. 69-73, doi: 10.1109/SSPS.2017.8071567.

S. Gatesichapakorn, J. Takamatsu and M. Ruchanurucks, "ROS based Autonomous Mobile Robot Navigation using 2D LiDAR and RGB-D Camera," 2019 First International

Symposium on Instrumentation, Control, Artificial Intelligence, and Robotics

(ICA-SYMP), Bangkok, Thailand, 2019, pp. 151-154, doi:

10.1109/ICA-SYMP.2019.8645984. https://www.researchgate.net/publication/3454431_Using_Fuzzy_Logic_in_Automated_Vehicle_Control/link/0a85e530756b3bb25e000000/download

B. Cao, R. C. Mendoza, A. Philipp and D. Göhring, "LiDAR-Based Object-Level SLAM for Autonomous Vehicles," 2021 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Prague, Czech Republic, 2021, pp. 4397-4404, doi: 10.1109/IROS51168.2021.9636299. https://www.youtube.com/watch?v=T588klKB PNo