



OBJECT DETECTION AND IDENTIFICATION FOR THE BLIND

*ABHIRAJ P V *KIRAN V *ARUN K *ROHITH RAMESH *DR. MAYA MOHAN,
Department of Computer Science and Engineering,
NSS College of Engineering, Palakkad

PROBLEM STATEMENT

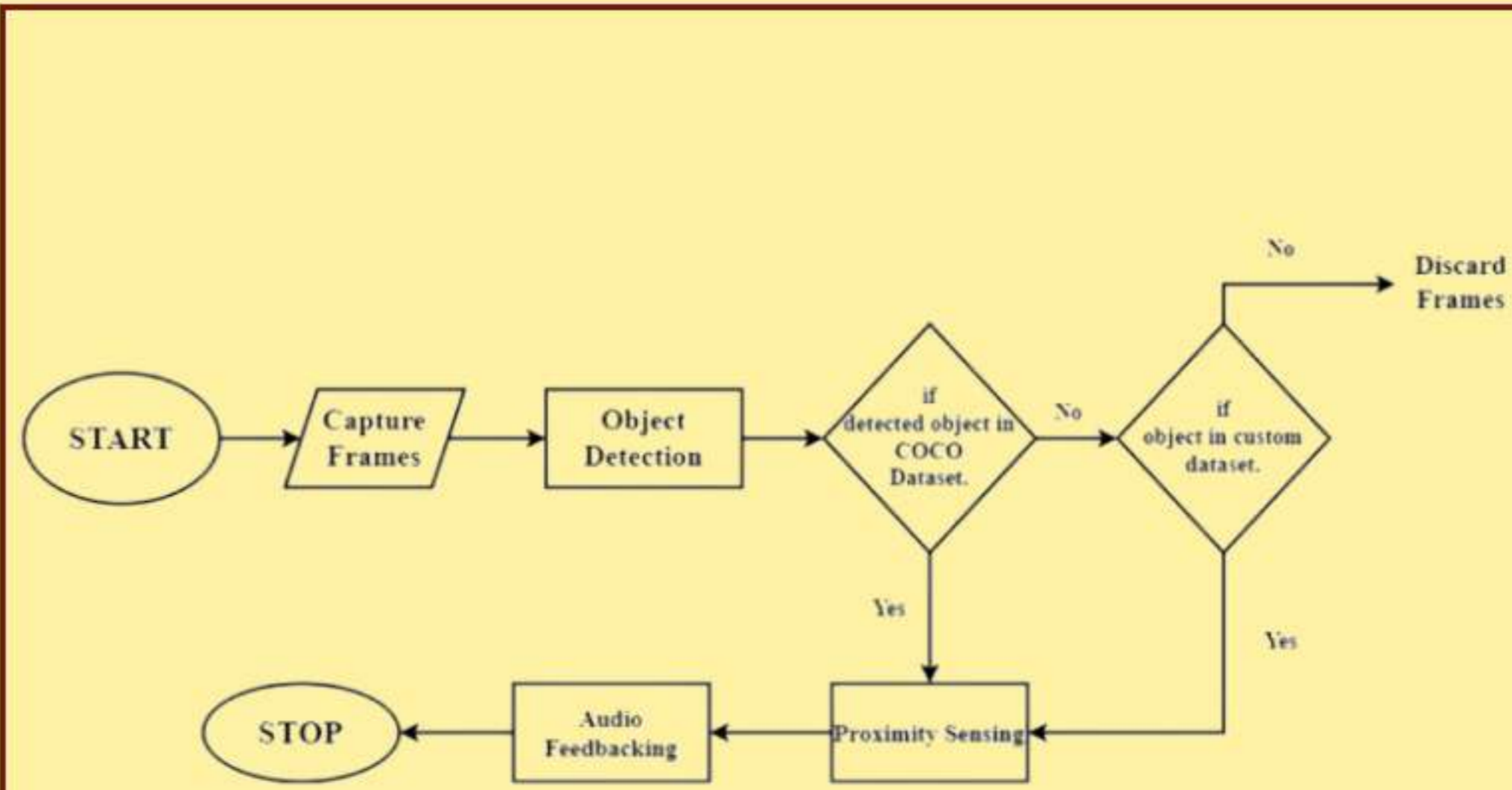
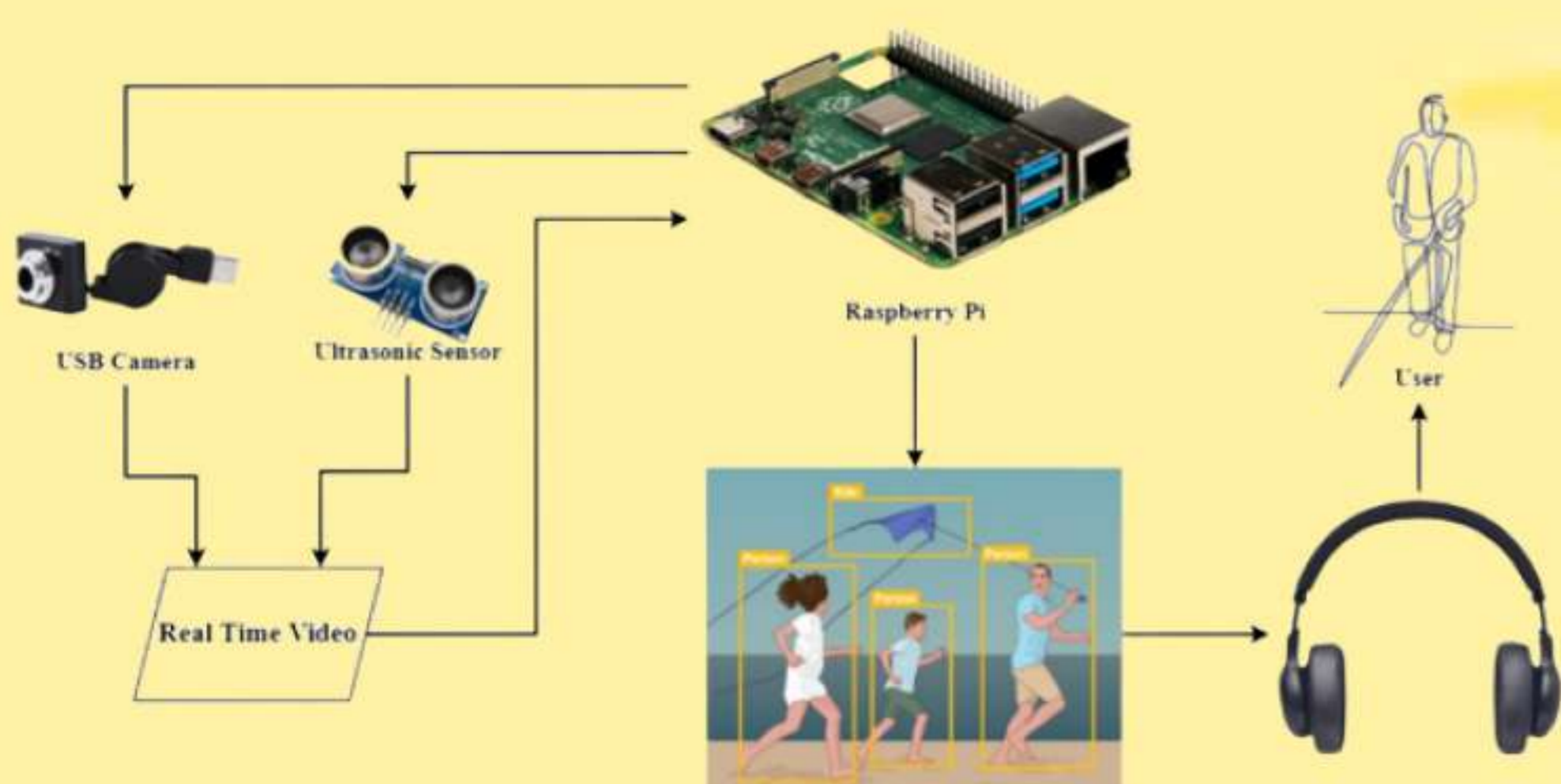
Blind people find it extremely difficult move around and navigate on their own. We propose an object detection and identification system that will guide and help the blind to detect and identify both objects and persons in front of them. The system uses machine learning for object detection and facial recognition. The identified objects are relayed to the user through an ear piece.

OBJECTIVES

- Dataset - An efficient dataset that contains day to day objects that a person generally comes across.
- Object Detection - Detect objects and persons in front of the user and identify them.
- Facial Recognition - Accurately identify the person standing in front of the user.
- Proximity Sensing - Relaying how close an object is from the user.

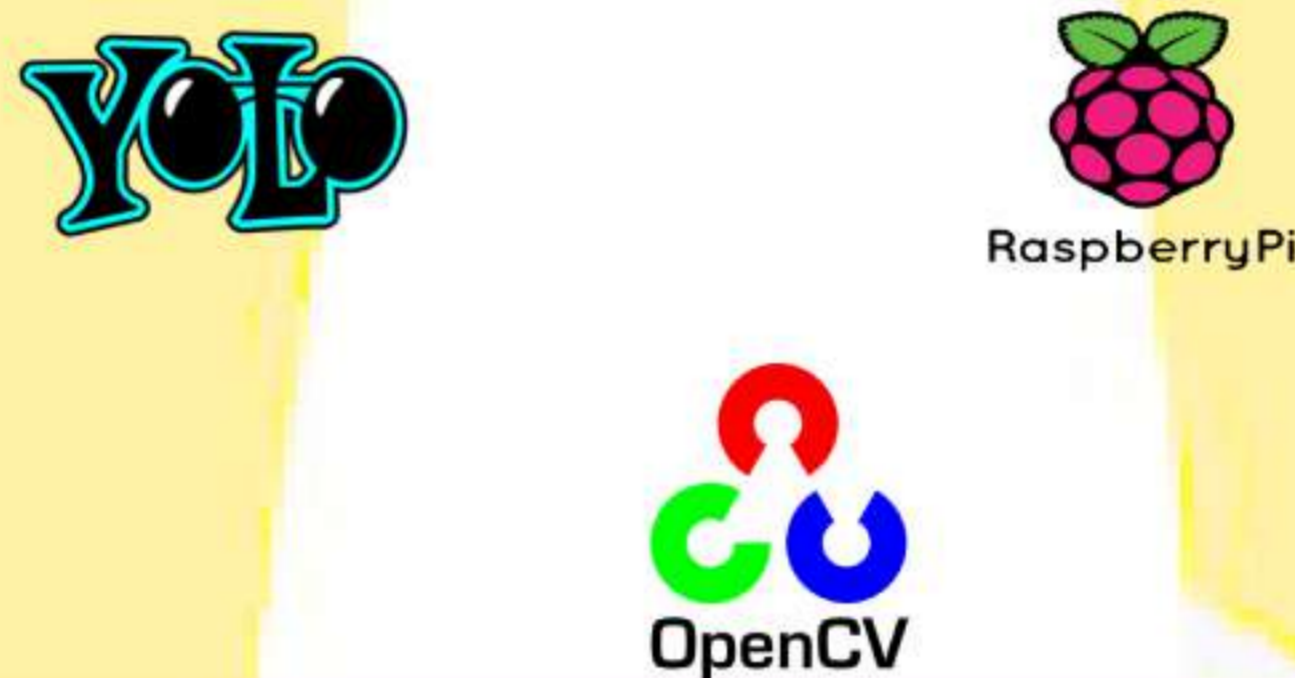
SYSTEM DESIGN

The developed model enables a user to detect and identify both objects as well as persons on a real time basis for blind individuals. The system uses a raspberry pi 4B model with an HC-SR04 sensor and USB camera to capture real time objects. Objects are detected in real time and identified along with the recognition of individuals known to the user.

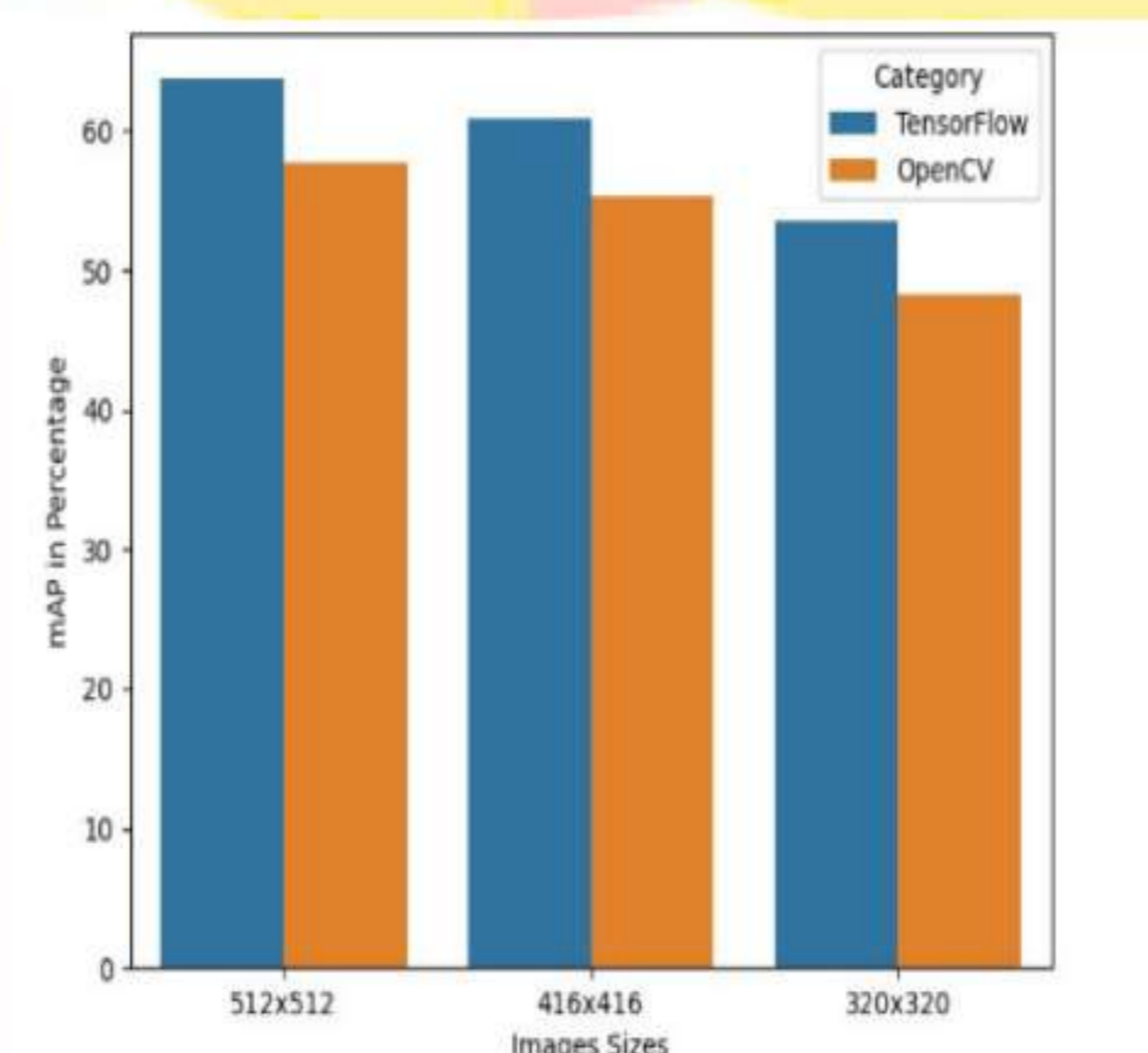
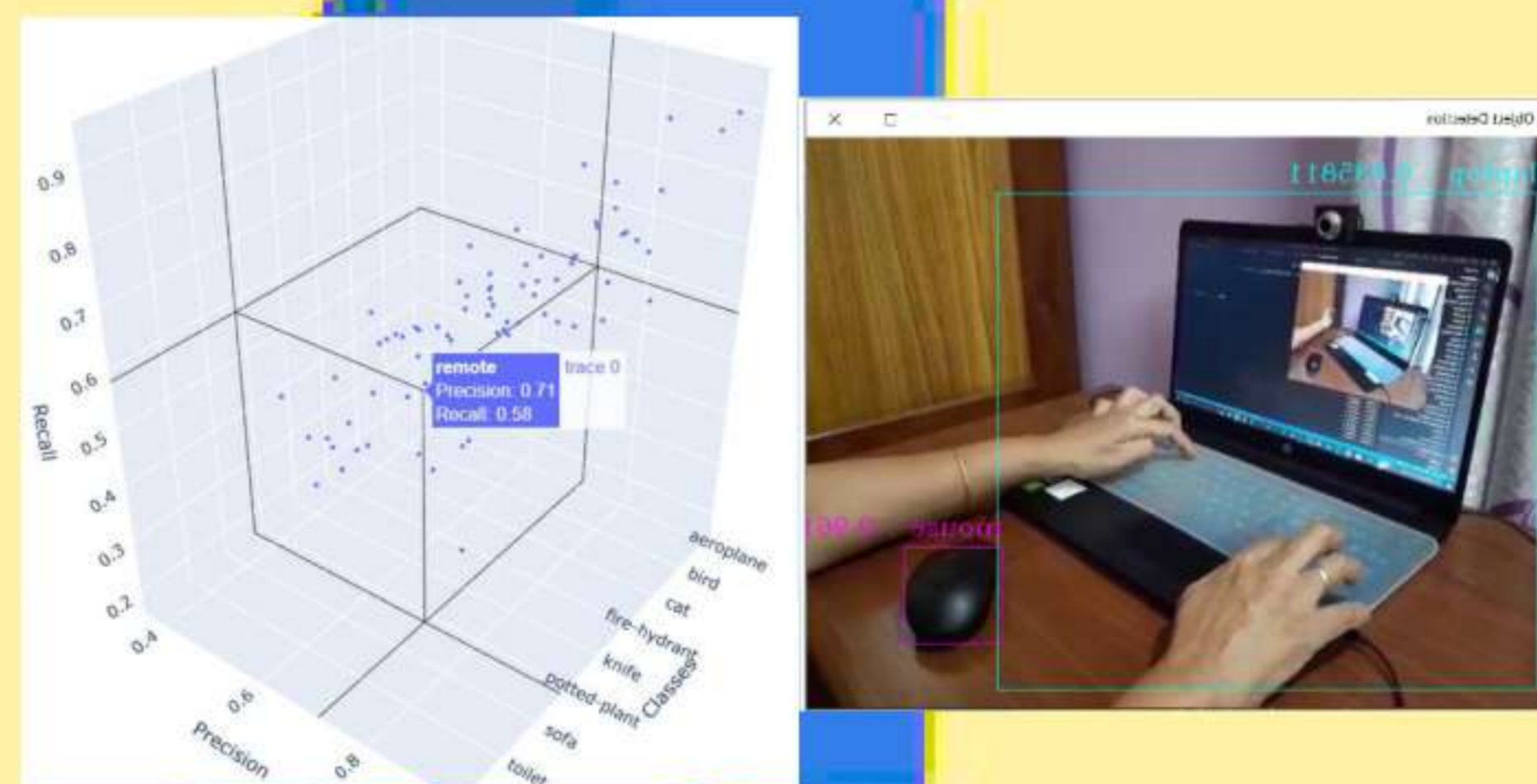
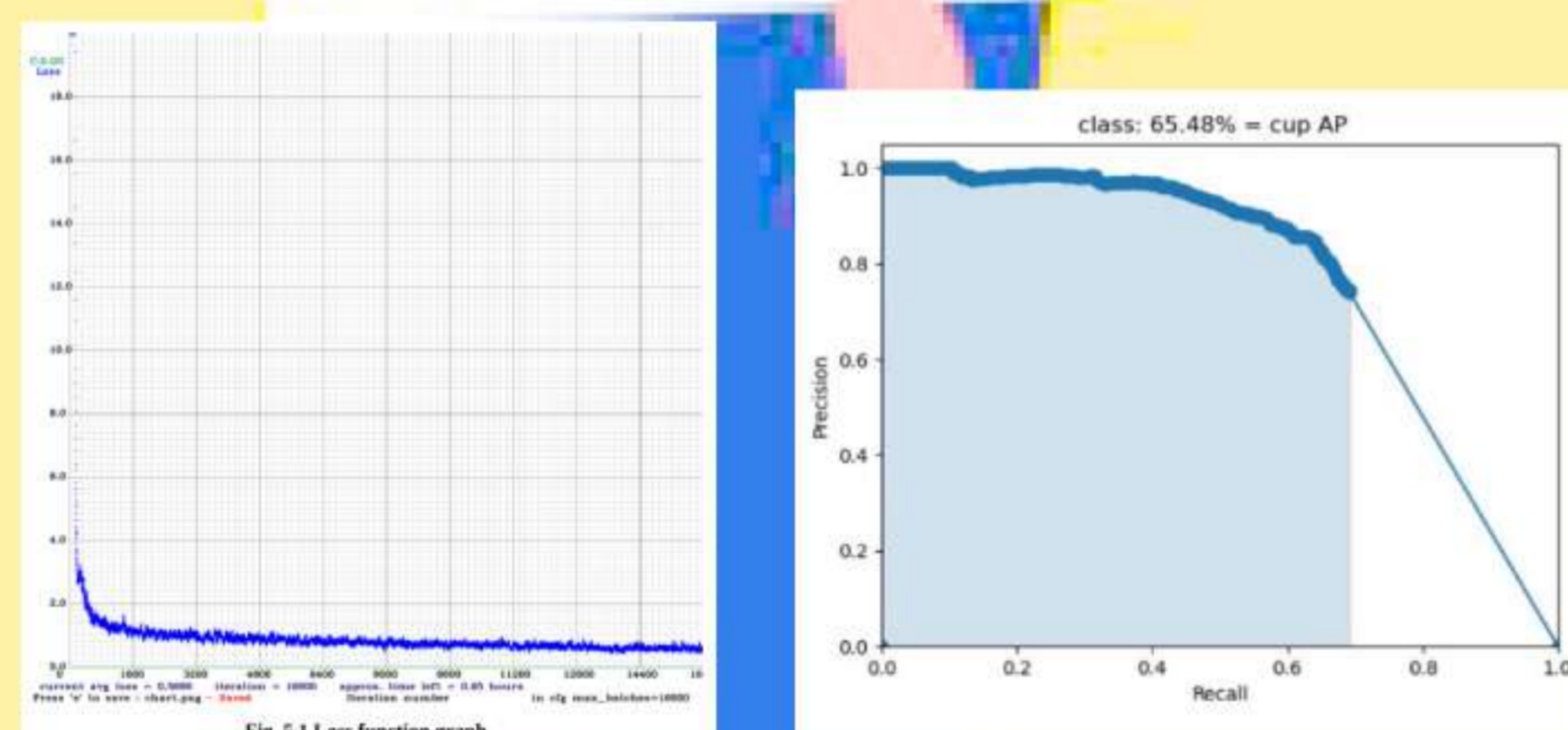


HC-SR04 sensor senses and measure the proximity of objects using ultrasonic waves. The detected object or person is relayed back to the user in the form of audio through an earpiece. The proposed system has a big impact on the lives of the blind as it will enable them to be independent and navigate on their own.

TOOL SPECIFICATION



RESULTS



CONCLUSION AND FUTURE WORKS

- Different models were tested and the Yolo series of algorithms was identified as the most optimal algorithm for real-time object detection.
- Integrated the functionality of object detection, facial recognition, custom object detection, proximity estimation, and audio feedback all in a single unit.
- Addition of a stereo camera system to the sensor will make it possible to estimate the position of objects in 3D space.
- A more specialized object detection model can be used to prevent incorrect detection's.
- Increasing the CPU clock speed can increase the performance.
- Employing better detection algorithms from the same YOLO series can improve the real-time responses.

REFERENCES

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