



# Visual assistant object detection for blind person

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**Abstract :** The technique presented in this paper uses a stereo camera system based on structural light to measure item size automatically and accurately. The four steps of the approach are depth interpolation, object detection, preprocessing, and key point extraction prior to size calculation. Initially, during the preprocessing stage, the RGB and depth frames are matched.

## INTRODUCTION

Vision is one of the very important senses on which every person in this world depends to interact with the different objects and people in the real world. Normal people view into the surrounding and immediately know which objects are there in the surrounding, how far they are, and how to interact with them [9]. It is not difficult for vision enabled people to do their everyday tasks since they are able to see all the surrounding objects, any other people they come across, any obstacles in the path and hence it is easy to interact with surrounding objects. At the same time, visually challenged people have to work hard to interact with real world due to the chore in their daily life. There are more than a million visually impaired people in this world. Many daily duties are hindered by being vision impaired. Thus it is one of the very necessary things for visually challenged people to understand their surroundings, and to get information about the objects they come across [3]. In past few years, many technical supports have been provided for visually challenged human beings. Hands free systems work very well on the user audio input. There isn't any requirement of any kind of visual or touch interaction, which works very well for the blind people. There are various screen reading options available to help blind people read different screens on devices. But, these devices are not sufficient to help make the personal and professional life of visually challenged people easy. These devices only take input in the form of audio and when users want to know the different objects in their surroundings or texts, these devices are not much useful. Researches are still making researches on how to make mobility as easy as possible for visually challenged people to tackle any hurdle or danger on the road. Blind people are always dependent on someone, who guides them throughout their day, even for some basic activities such as catch a bus, cross a road and many other activities. The main motive of developing this website is to assist visually impaired people. This website aims to help the blind people to know the objects in the surrounding that could be just basic daily objects or can create an obstacle in their everyday activities. The website is developed to recognize or detect some objects inside a house like table, bed, chair, laptops, refrigerator etc. and others on outside items such as people, motorcycles, potted plants, automobiles, etc.

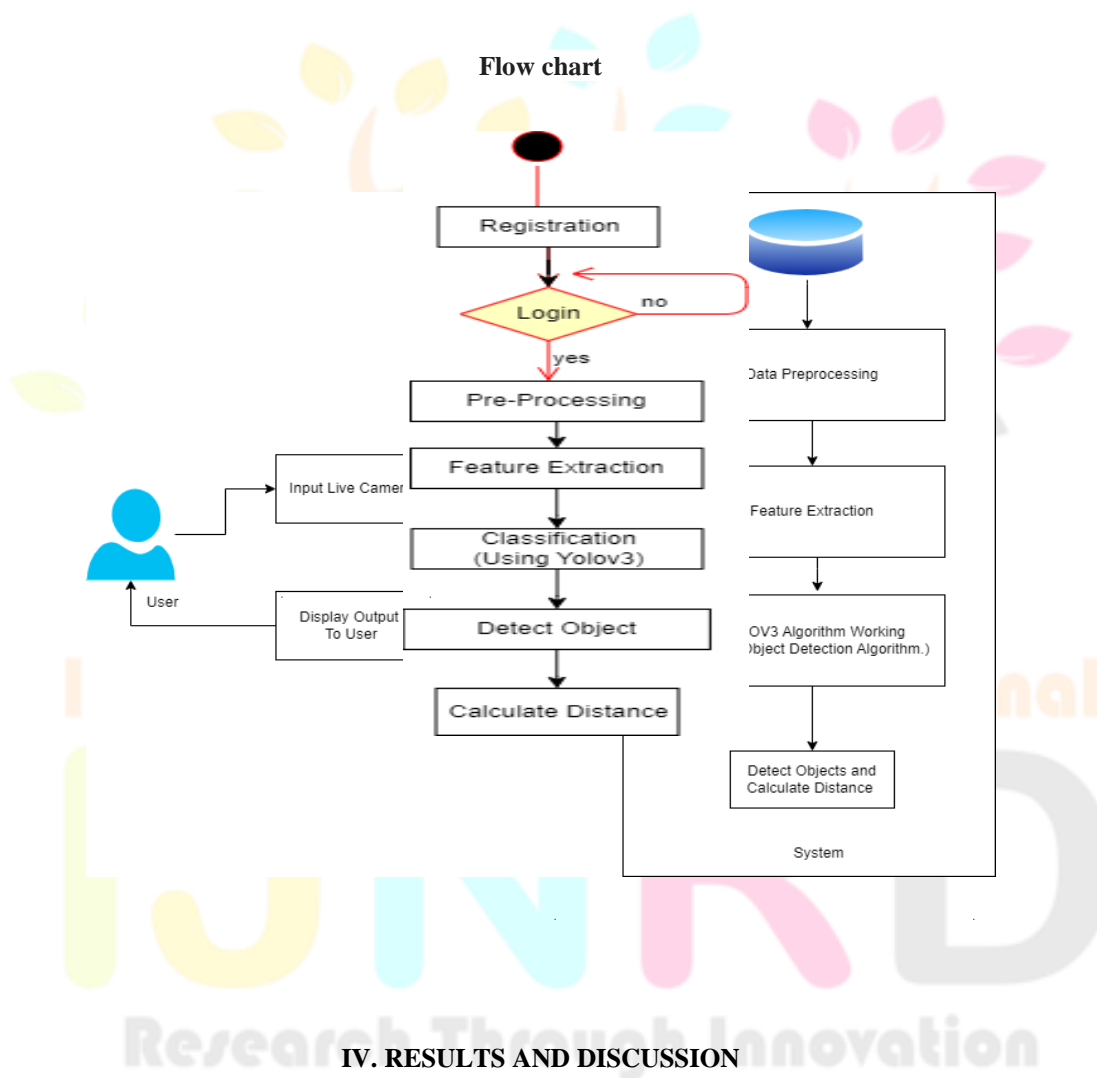
The application will use the camera of the system on which this website is loaded, to capture the real time objects in the surrounding and it will keep on taking frames from the ongoing video. These frames then will be sent to the next module where the bounding boxes will be created around the objects in the frame by YOLO algorithm and classify the objects into the given categories. In the end, the application will generate an audio output of the detected object in the frame which has the maximum confidence score among all other objects present in the frame. These frames are selected at a specific time interval to avoid any kind of hindrance in the audio output.

## NEED OF THE STUDY.

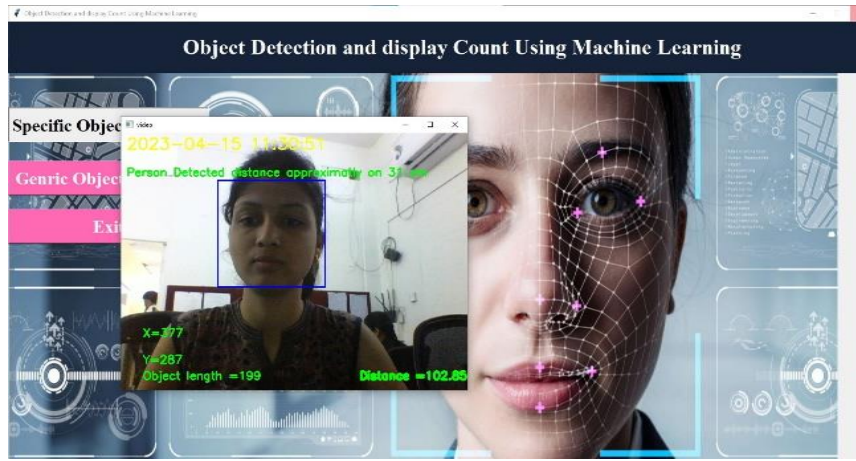
Paper 1: "Real Time Object Detection using YOLO Algorithm" Authors: I.V.Sai Lakshmi Haritha, M. Harshini, Shruti Patil, Jeethu Philip  
 Paper 2: "YOLO-Green: A Real-Time Classification and Object Detection Model Optimized for Waste Management" Authors: Wesley Lin  
 Paper 3: "YOLO-compact: An Efficient YOLO Network for Single Category Real-time Object Detection" Authors: Yonghui Lu<sup>1</sup>, Langwen Zhang<sup>2</sup>, Wei Xie<sup>3</sup>  
 Paper 4: "Real-time Object Detection with Deep Learning for Robot Vision on Mixed Reality Device" Authors: Jiazhen Guo; Peng Chen; Yinlai Jiang; Hiroshi Yokoi; Shunta Togo

**RESEARCH METHODOLOGY**

This system is a real-time object discovery algorithm that identifies specific objects in vids, live feeds, or images. The YOLO machine literacy algorithm uses features learned by a deep convolutional neural network to descry an object. YOLO is a Convolutional Neural Network( CNN) for performing object discovery in real-time. CNNs are classifier- grounded systems that can reuse input images as structured arrays of data and fete patterns between them( view image below). YOLO has the advantage of being important faster than other networks and still maintains delicacy. It allows the model to look at the whole image at test time, so its prognostications are informed by the global environment in the image. Some convolutional neural network algorithms, such as YOLO, "score" areas based on how similar they are to predetermined classifications. High- scoring regions are noted as positive findings of whatever class they most nearly identify with. For illustration, in a live feed of business, YOLO can be used to descry different kinds of vehicles depending on which regions of the videotape score largely in comparison to predefined classes of vehicles.



**IV. RESULTS AND DISCUSSION**



Visual Assistant Object Detection for Blind People is a groundbreaking solution designed to enhance the autonomy and safety of visually impaired individuals. Utilizing advanced computer vision algorithms, this technology enables real-time identification and description of objects in the user's surroundings. Through the integration of cutting-edge sensors and machine learning techniques, the system accurately detects obstacles, signage, and other relevant objects, providing instant auditory feedback to the user via a wearable device or smartphone app. This innovative approach empowers blind individuals to navigate their environment with greater confidence and independence, ultimately improving their quality of life. By bridging the gap between visual perception and auditory interpretation, Visual Assistant Object Detection revolutionizes accessibility and inclusion for the visually impaired community.

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