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Computer Science and Engineering Department

Blind assistant system

UNDER GUIDANCE
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Prepared by

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Outline for presentation

- Introduction
- Literature survey
- Problem statement
- Objective and proposed system
- Project plan
- **MISCELLANEOUS**
- References

Introduction

- We considered the number of visually impaired individuals in the world and decided it was a worth while project to create an assistive device for visually impaired Individuals Assisting devices for the blind have been around for a while, but it wasn’t until recently
- with the advancement of semiconductor technology that these devices really started to take off.
- Though there are many devices that help the visually impaired, these devices often only serve
- one purpose.
- The advantage one have by using APIs is it provides us with a set of common operations. Because of which we don’t have to write the code for program from scratch . We can say they are quite helpful as well as efficient . APIs provides us convenience and hence they are time saver . The TensorFlow object detection API is basically a structure build for creating a deep learning network that solves the problems for object detection

- Now, a bunch of pre-trained models are with Tensorflow . we can use any one of them. They are pretty good and depending upon the system specifications we can choose one. SSD DETECTION provides faster accuracy and for better accuracy we can go with MASK RCNN .

Problem statement

Design A Portable Device For Visually Impaired Individuals That Will Provide Direction To New Locations And Alert The User Of Obstacles In Their Path During Outdoor Navigation.

This System Should Provide-

- Detects The General Objects
- Give Voice Alerts To The Users Of Obstacles In Their Path.
- Calculates Distance To Provide Warnings Whether He Or She Is Close Or Far Away From The Object.

LITERATURE SURVEY

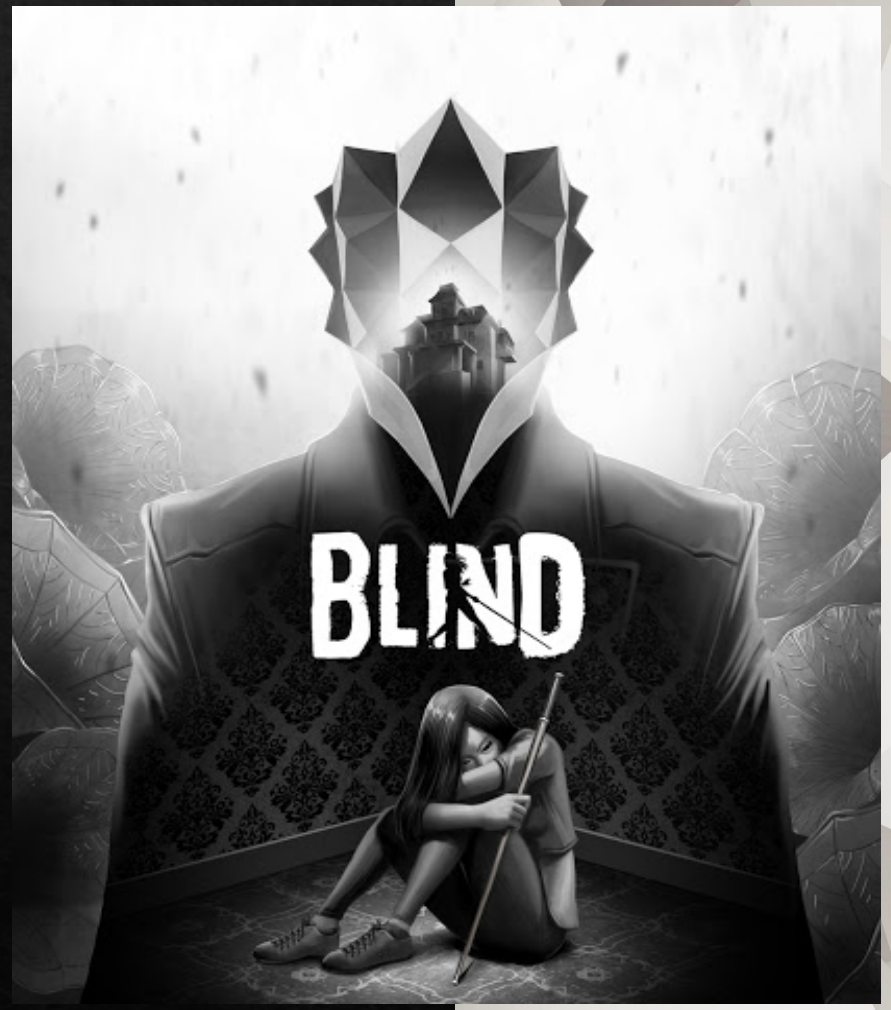
S. No.	Title	Strategy	Advantage	Limitation
1.	Trekker	The Trekker Breeze is a handheld talking GPS that can be controlled with one hand. It consists of perosnal digital asssisstant , gps receiver , external speaker , speech output software It verbally announces the names of streets, intersections, and landmarks as you walk.	It allows you to easily retrace your steps if you get lost, with the addition of a simple push button.	In order for a GPS system to provide accurate information to a traveler, it must be able to receive a signal from a minimum of four satellites.
2.	Kapten Plus Voice Activated GPS	It features high-performance GPS along with free navigation modes that provide real time voice description of what's around you. It has automatic speech recognition that allows you to control the device just through your voice.	It also features a multitransport navigation mode that differentiates between pedestrian, bike, motorbike, and car modes. The Kapten also features a voice-controlled FM radio and MP3 player.	In order for a GPS system to provide accurate information to a traveler, it must be able to receive a signal from a minimum of four satellites.

Literature Survey (Sample-use latest references only- preferably after 2017)

S. No.	Title	Strategy	Advantage	Limitation
3.	WuFu - The WuFu is a proximity measuring device	This device makes use of ultrasonic distance measurements. It uses ultrasonic sensors that sense obstacles in front of the user	It alerts the user of the obstacle by vibrating the device on the wrist of the wearer	In order for a GPS system to provide accurate information to a traveler, it must be able to receive a signal from a minimum of four satellites.
4.	HandGuide	Uses high-tech, infrared sensors to detect objects within four feet. it offers a choice of two modes to detect objects and provide a sense of their distance.	Audio modes uses pitch variation and vibration mode uses vibration variations.	Does not provide GPS directions

Objective

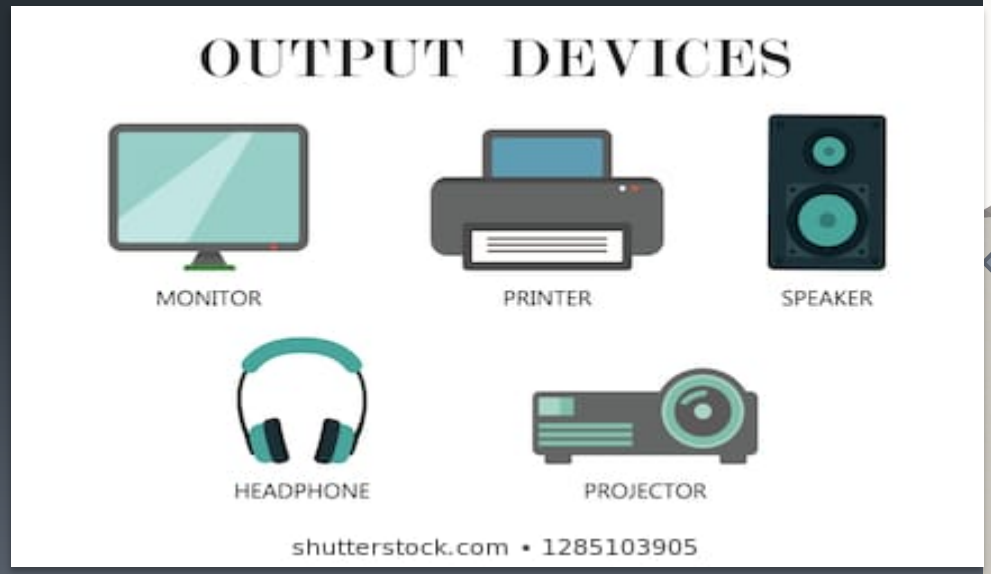
the purpose of this project, we streamlined the problem defined above to assisting blind individuals with getting around outdoors. We believe a project like this will create the case for further investment in creating smarter electronic devices to assist visually impaired individuals with getting around. By smarter we mean that the device is able to safely navigate. Additionally, the device is not intended to replace the use of walking canes or guide dogs. There are many object detection devices available in the market but they are mostly high priced , our objective is to build an economical device which can accessible by anyone



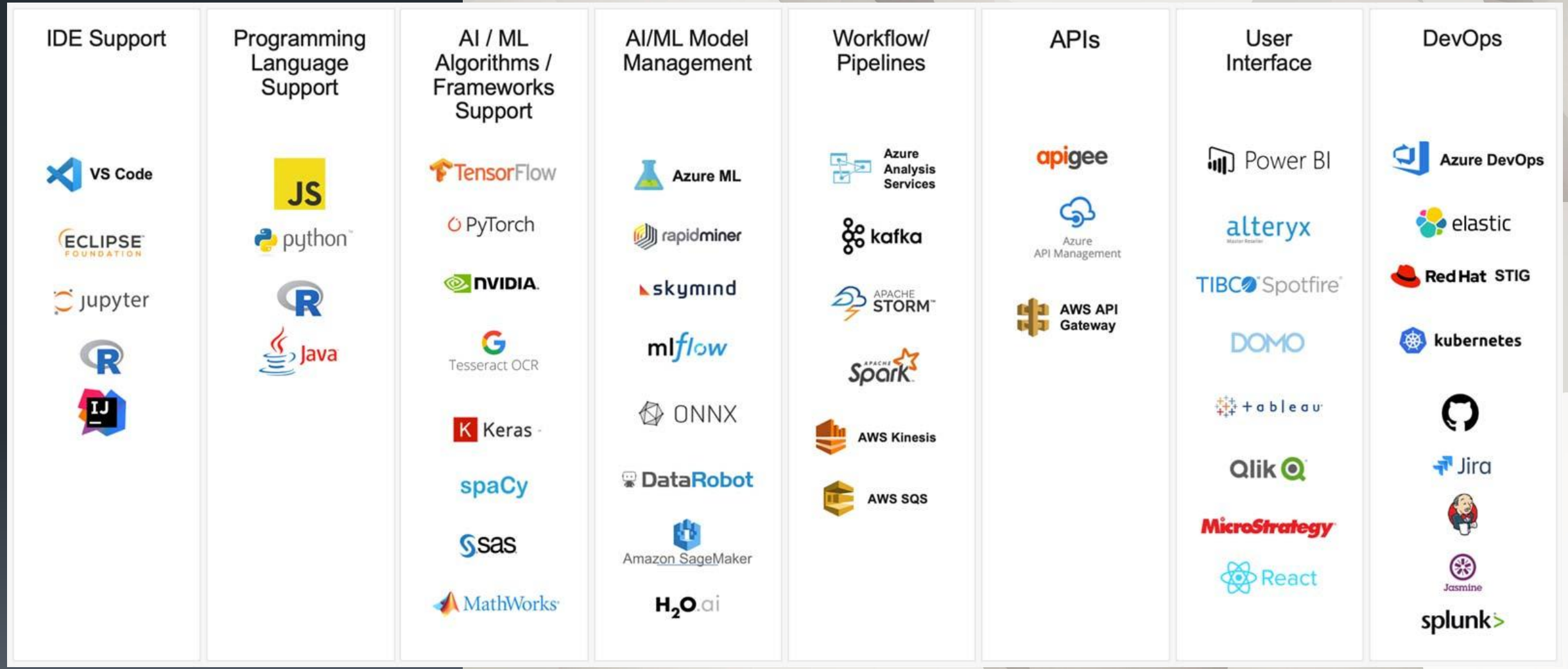
Project planning table

ACTIVETY	PLAN START (Week/days NO)	PLAN DURATION (NO. Of Week/days)	ACTUAL START(Week/ days)	DURATION (NO. Of Week/days)	COMPLITION IN %	STATE OF ACTIVITY
Problem definition	1 day	7 days	1 week	1 week	100%	Done
Abstract	8 day	5 days	2 weeks	5 days	95%	Done
Literature Survey	14 day		5 weeks	6 days	80%	Done
Project development	50 days	6 days	6 weeks	50 days	95%	Done
System Analysis	30 day	7 days	4 weeks	7 days	80%	Done
Documentation &PPT	36 day	5 days	8 weeks	5 days	98%	Done
Review 2	15 days	2 days	2 weeks	_____	_____	Up Coming

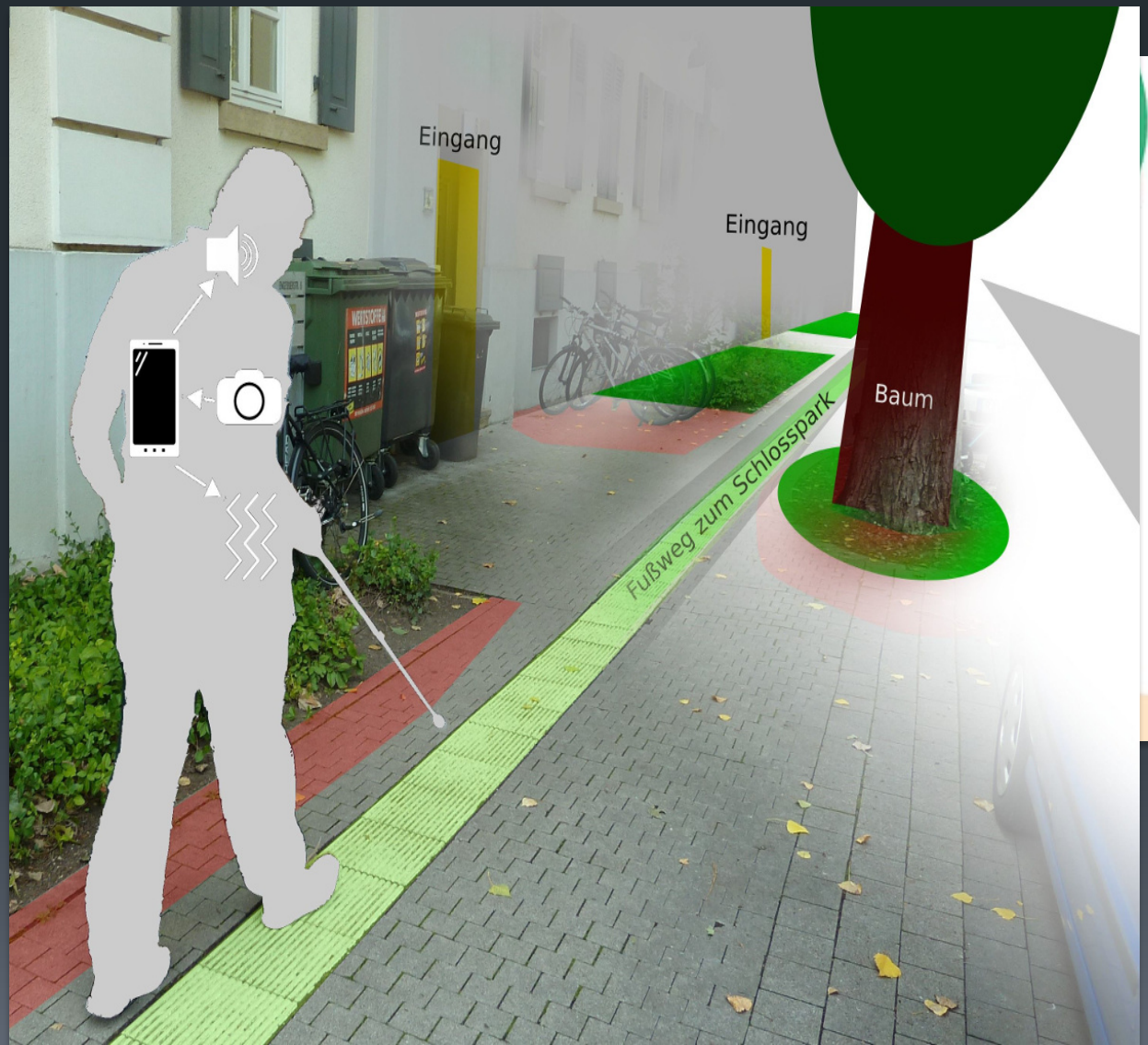
Hardware system

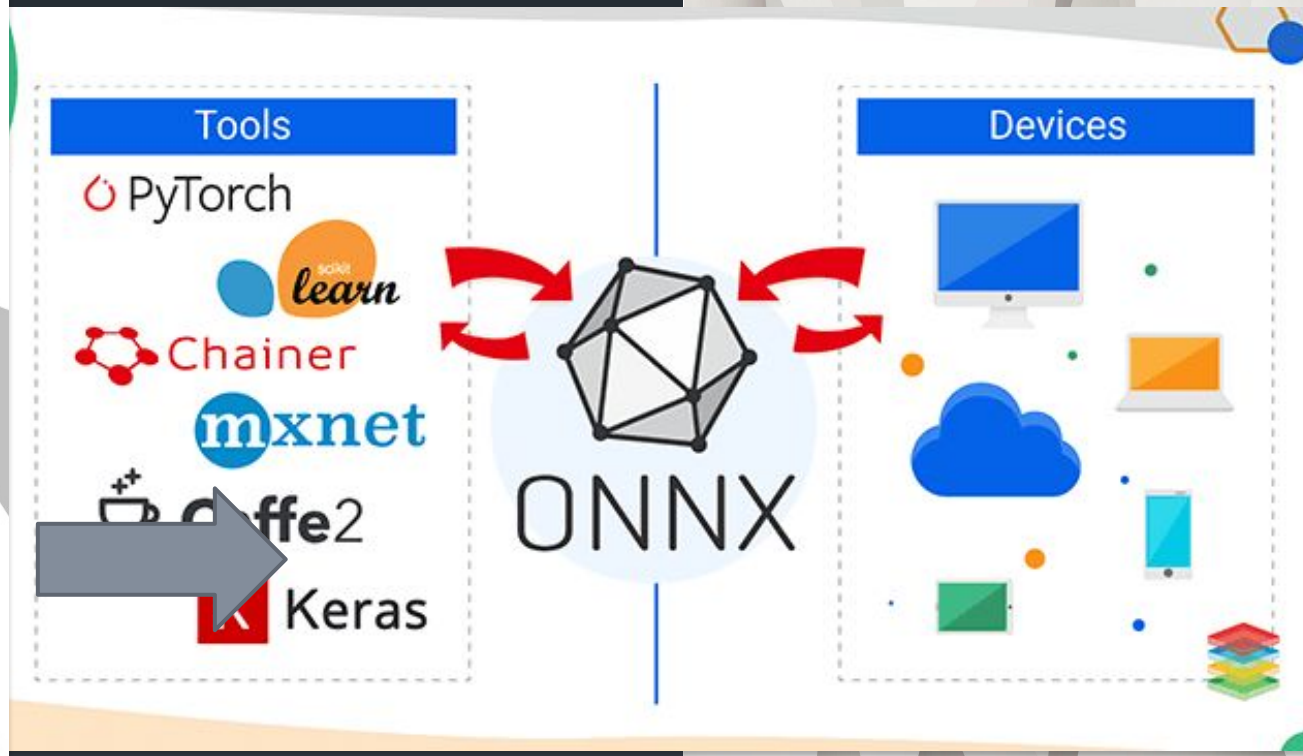


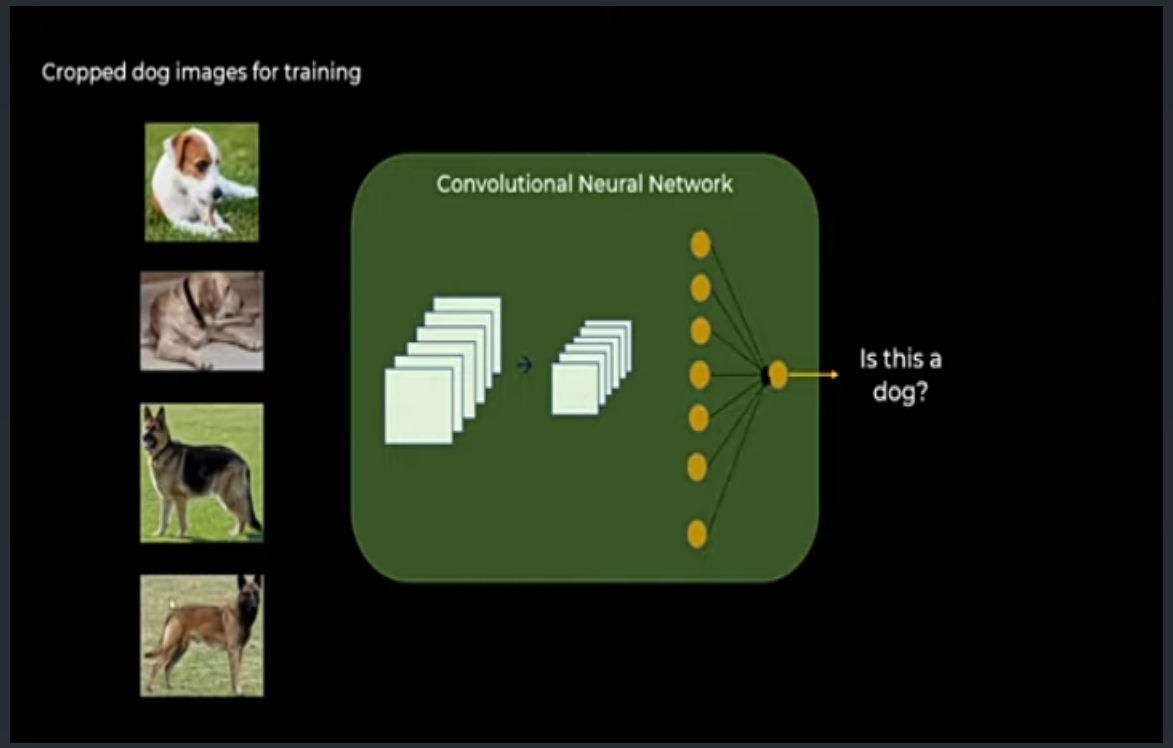
Technologies

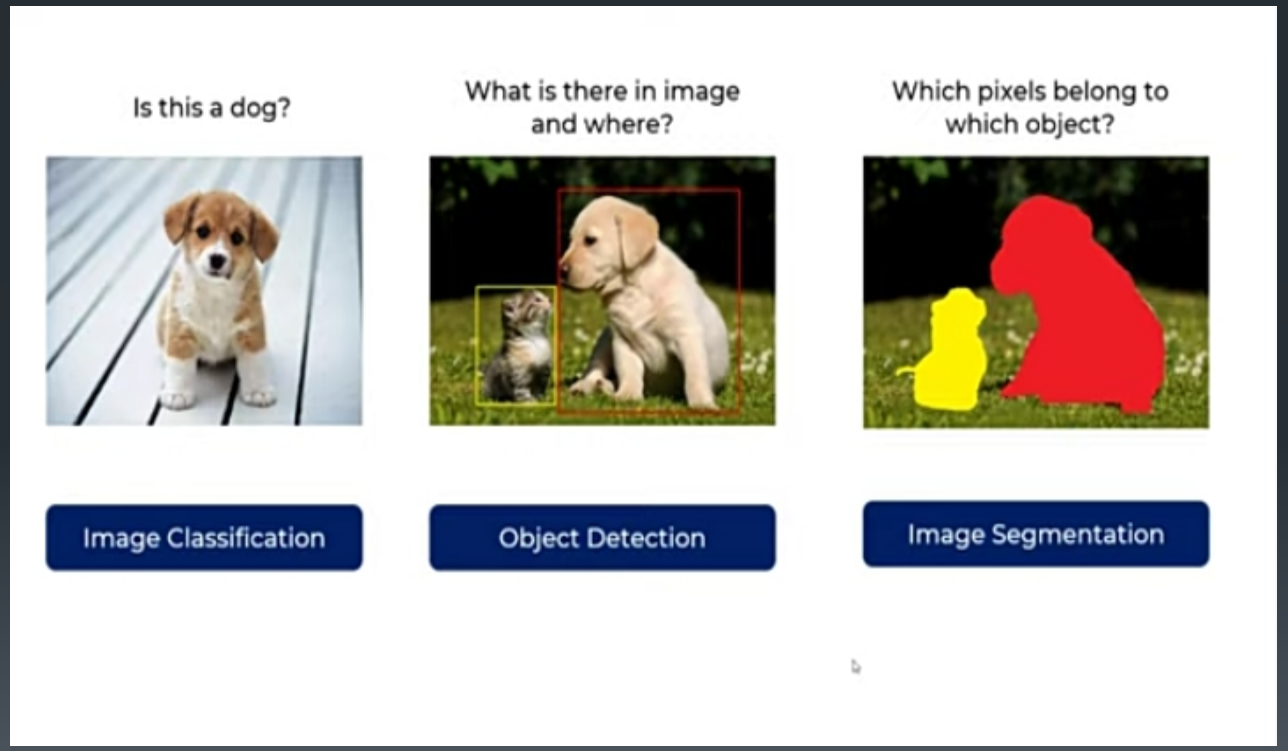


Working model

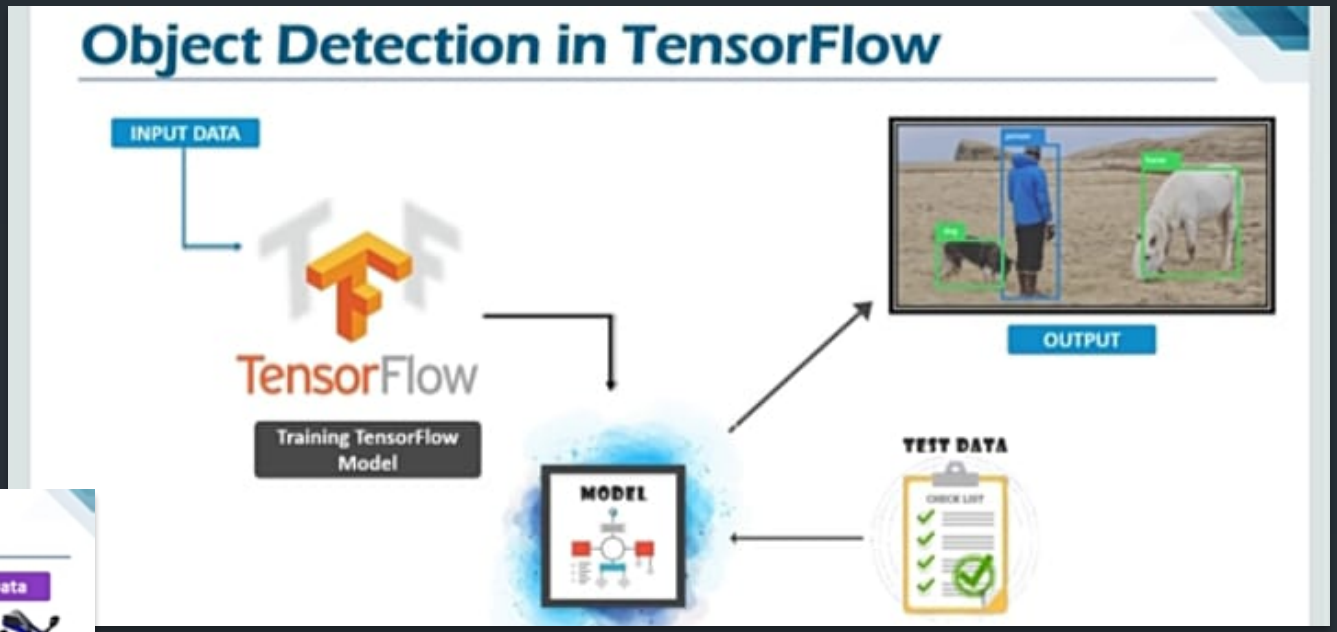


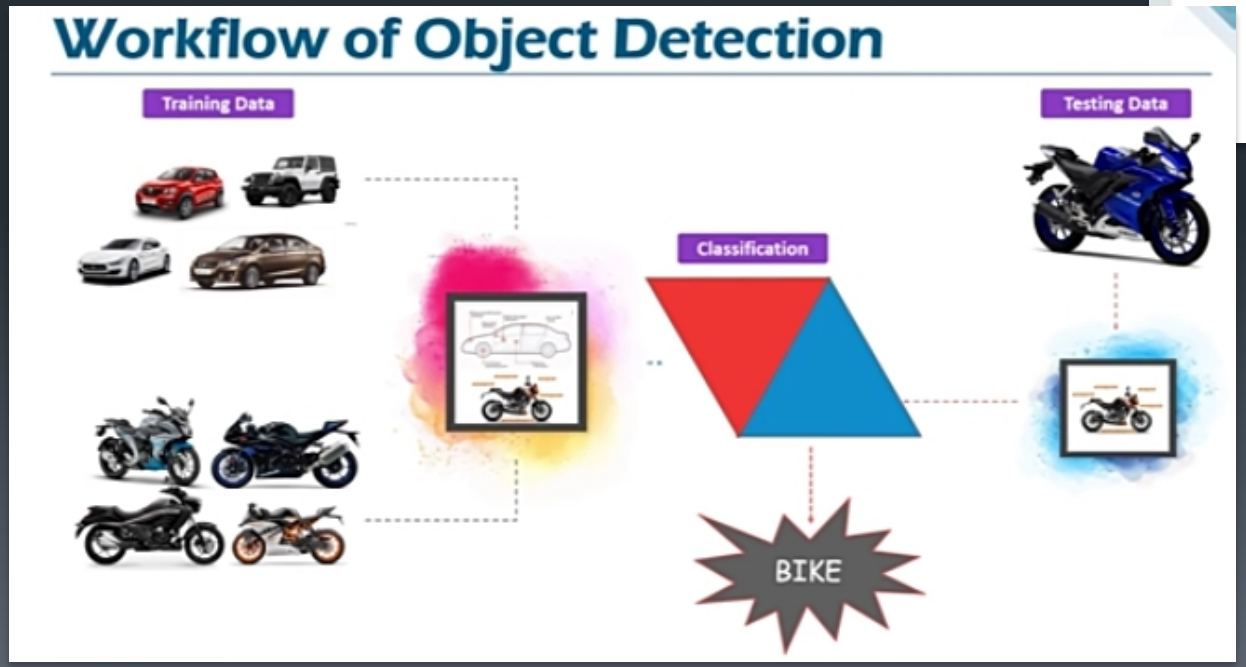


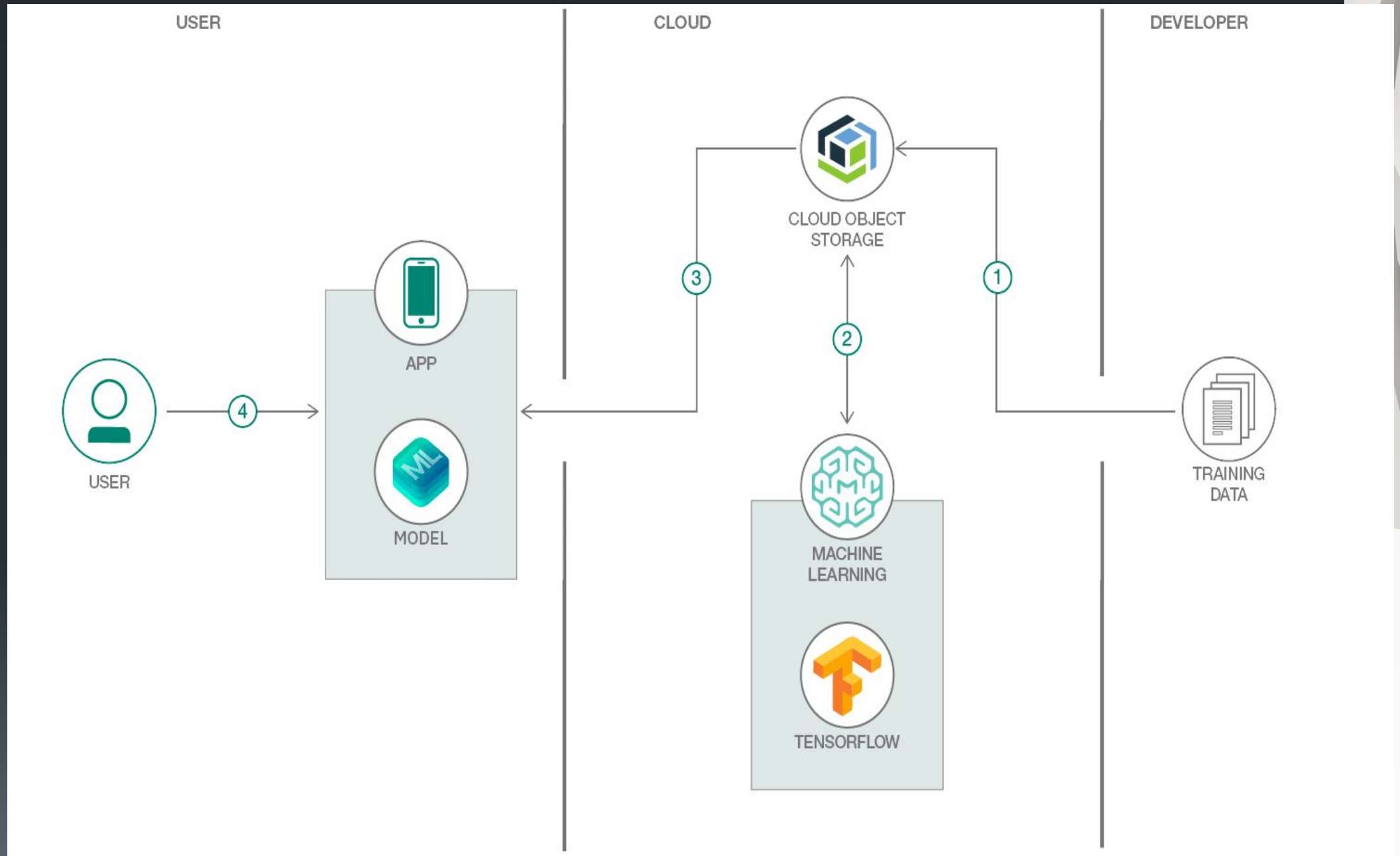

Cropped dog images for training
Convolutional Neural Network
Is this a dog?

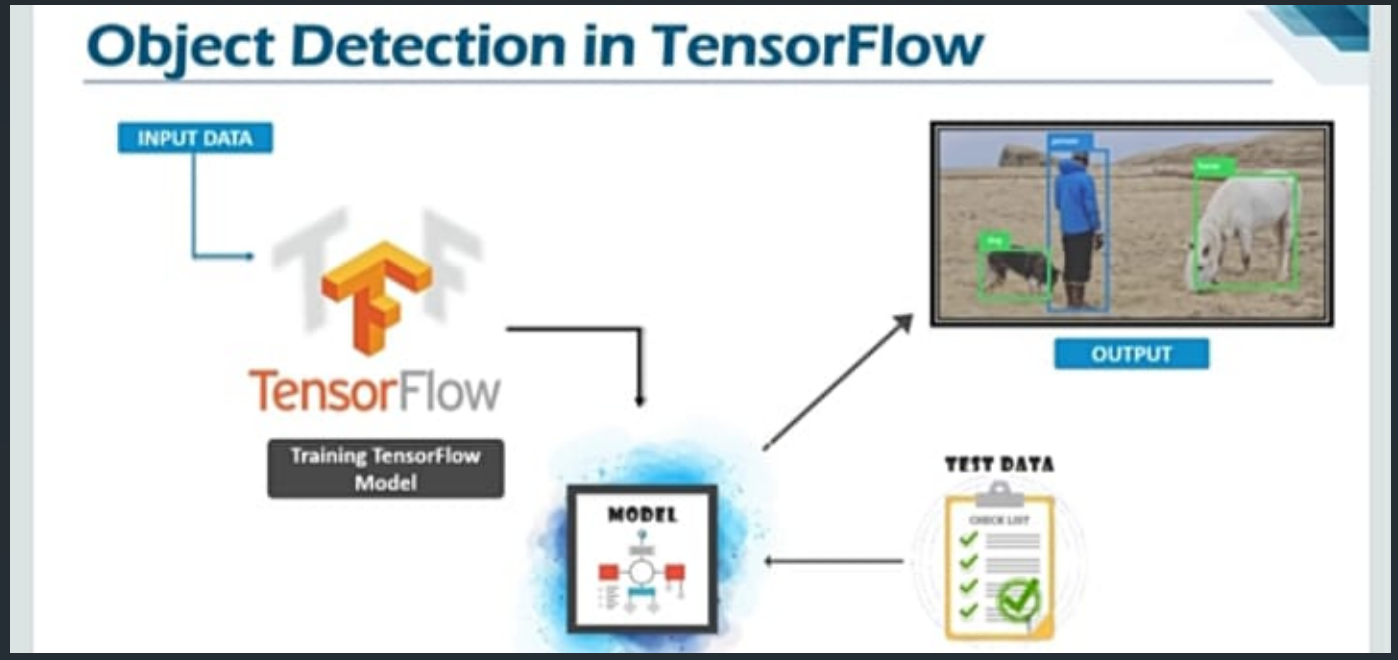

Is this a dog?
What is there in image and where?
Which pixels belong to which object?
Image Classification
Object Detection
Image Segmentation

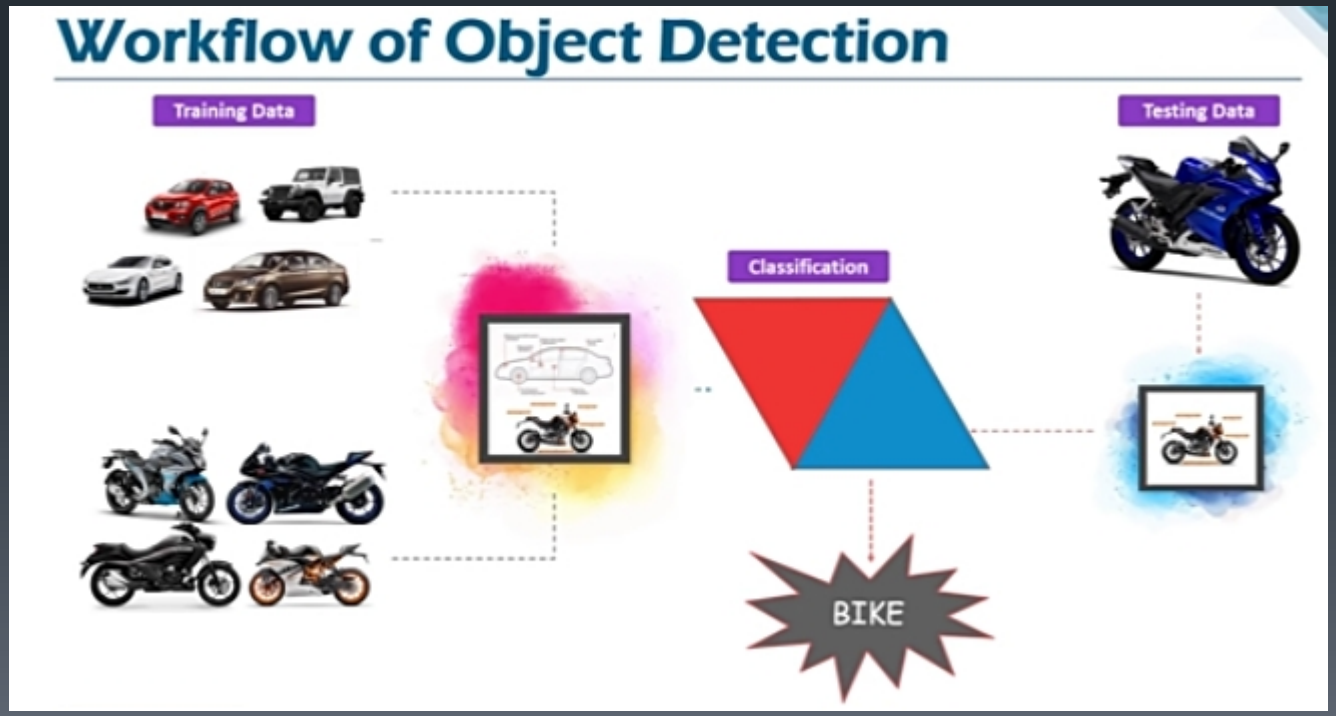
Working model



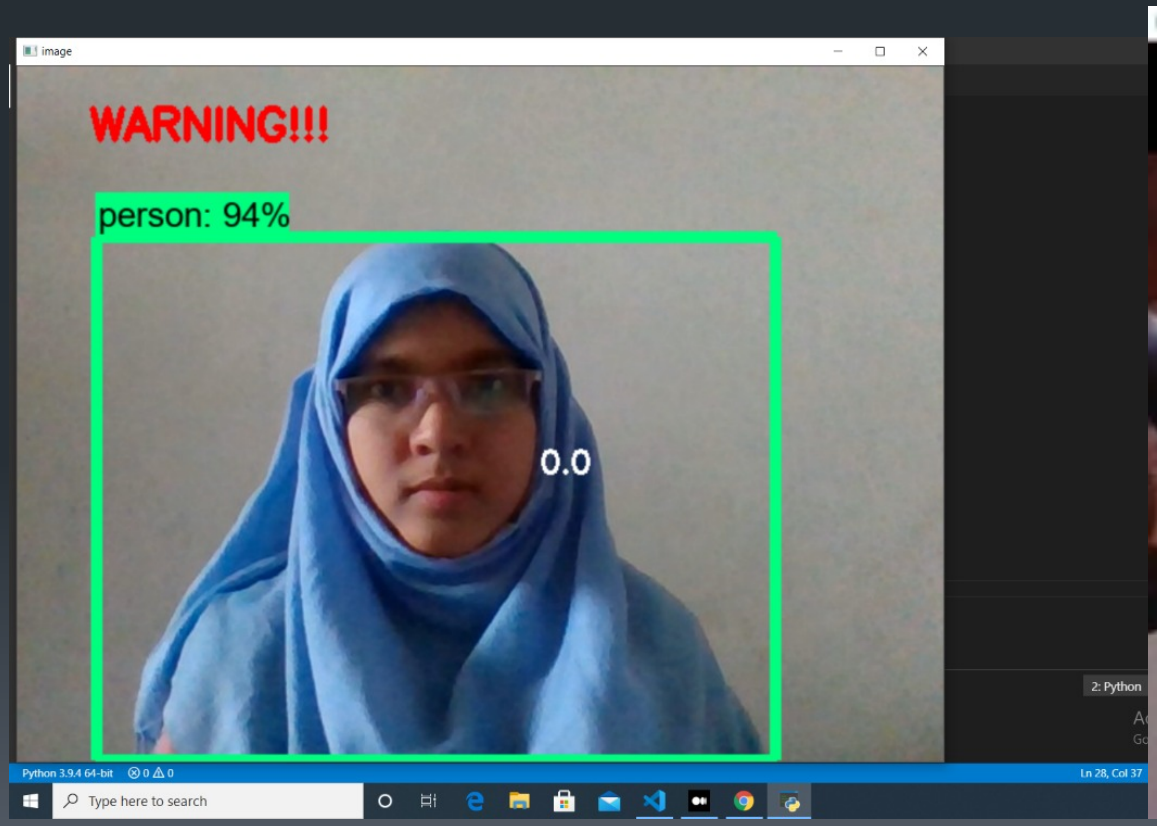


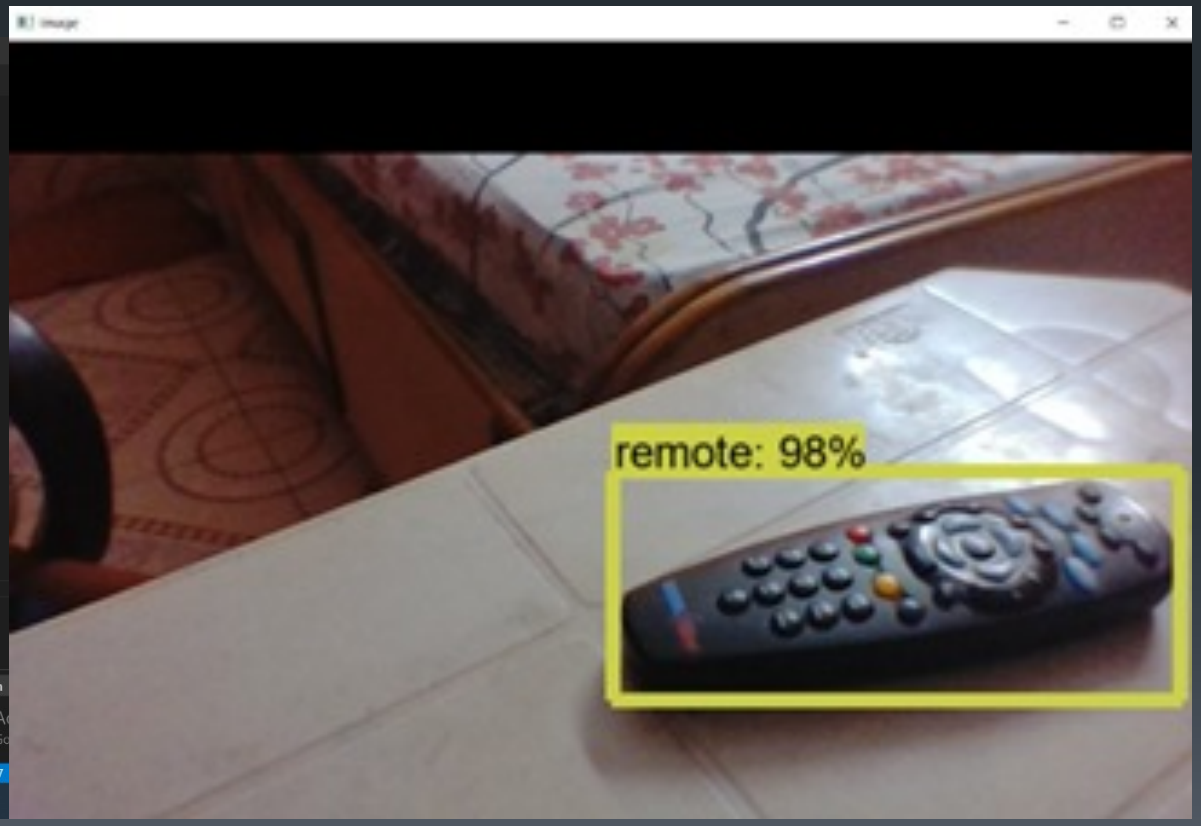

USER
CLOUD
DEVELOPER
CLOUD OBJECT STORAGE
APP
MODEL
USER
MACHINE LEARNING
TENSORFLOW
TRAINING DATA
1
2
3
4


Object Detection in TensorFlow
INPUT DATA
TensorFlow
Training TensorFlow Model
MODEL
OUTPUT
TEST DATA


Workflow of Object Detection
Training Data
Testing Data
Classification
BIKE

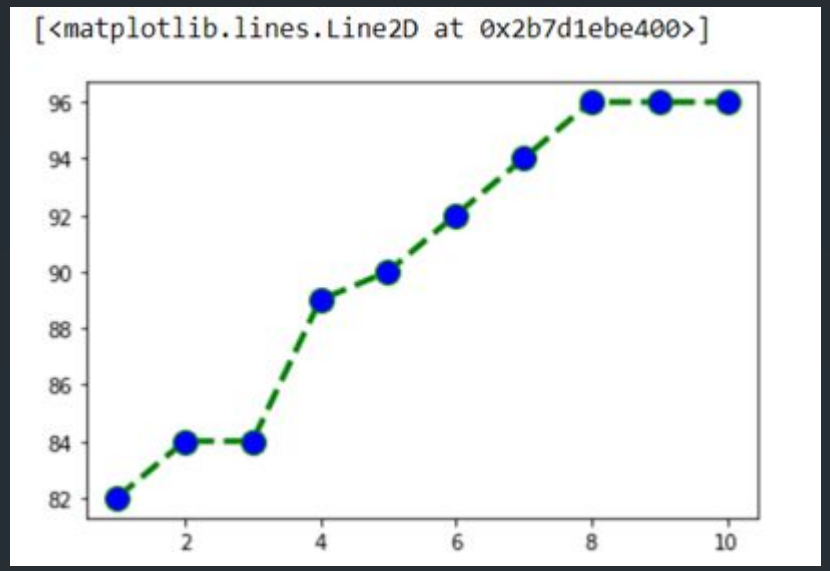
Images of the Output



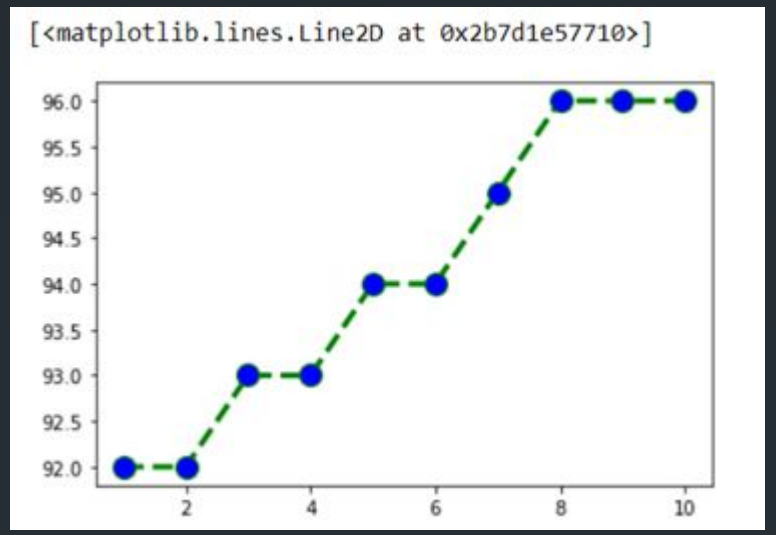


Images of the Output

Performance Analysis

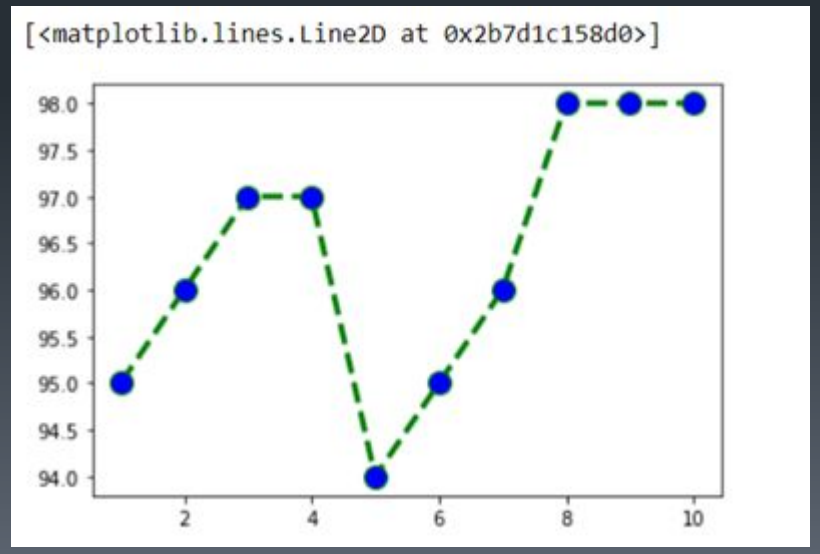


Chair

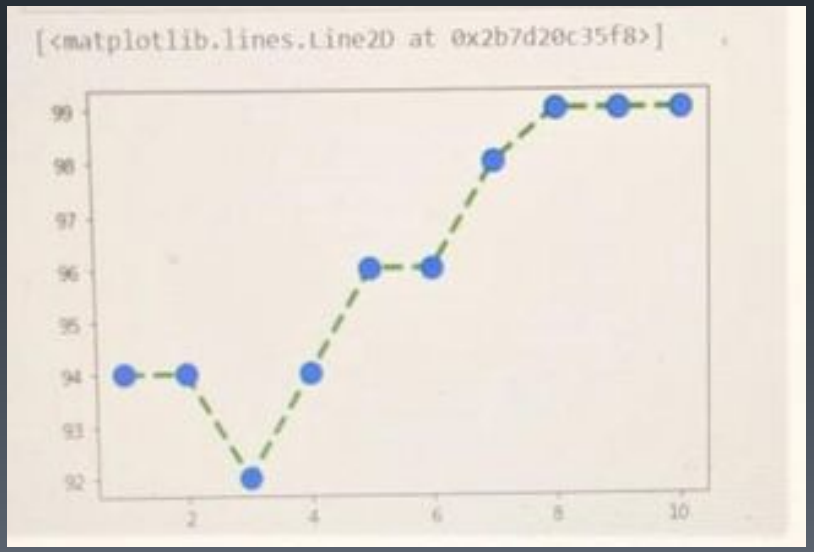


Bottle

Car.



Cell Phone



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- .Syed Faiz Ahmed, Athar Ali, M. Kamran Joyo, M. Rehan, Fahad A. Siddiqui, Jawad A. Bhatti, et al., "Mobility assistance robot for disabled persons using electromyography (EMG) sensor", 2018 IEEE International Conference on Innovative Research and Development (ICIRD)
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Conclusion

Tried from our side is that we came up with an **Integrated Machine Learning System** which allows the Blind Victims to **identify** and classify **Real Time** Based Common day-to-day Objects and generate **voice feedbacks** and calculates **distance** which produces warnings whether he/she is very close or far away from the object. The same system can be used for Obstacle Detection Mechanism

Thank you!