



Real-Time Object Detection Application for Visually Impaired People:

THIRD EYE

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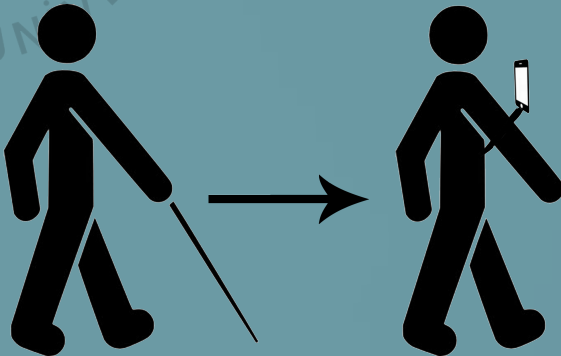


Description of Project

- Android Platform
- Visually Impaired People
- Easily Accessible



Free as in Freedom



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User Audience

Number of visually impaired people according to the Social Security Administration data

220 thousand in Turkey,

40 million all over the world.

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Fundamentals of the Project

- Machine Learning
- Image Processing

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Machine Learning



Step 1

Gathering data from various sources

Step 2

Cleaning data to have homogeneity

Step 3

Model Building-
Selecting the right ML algorithm

Step 4

Gaining insights from the model's results

Step 5

Data Visualization-
Transforming results into visuals graphs





Image Processing

- Importing the image to the system,
- Analyzing and manipulating the image by data compression, image enhancement and spotting patterns,
- Output as an altered image or image analysis report.

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Steps of the Implementation

1. Determination of objects.
2. Prepare negatives and positives image of objects.
3. Make ready dataset, and transfer to Android. Create profiles, add voice command.
4. Supply chest strap and printed apparatus with 3D printer..
5. Created demo.

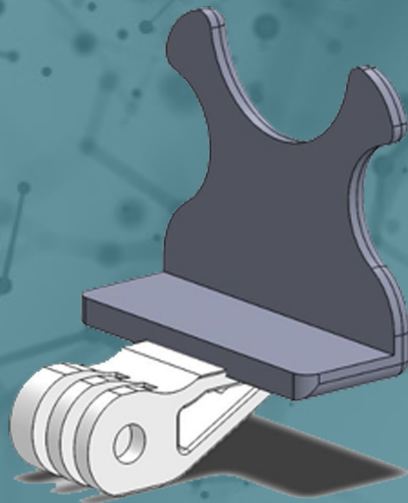
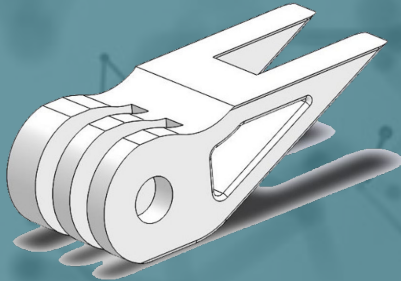
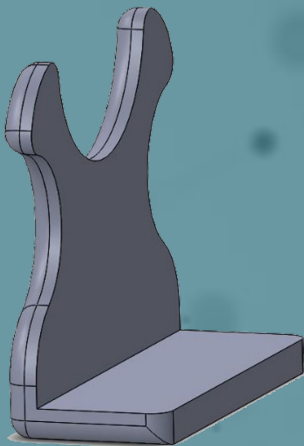
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Chest Apparatus

3D Desings



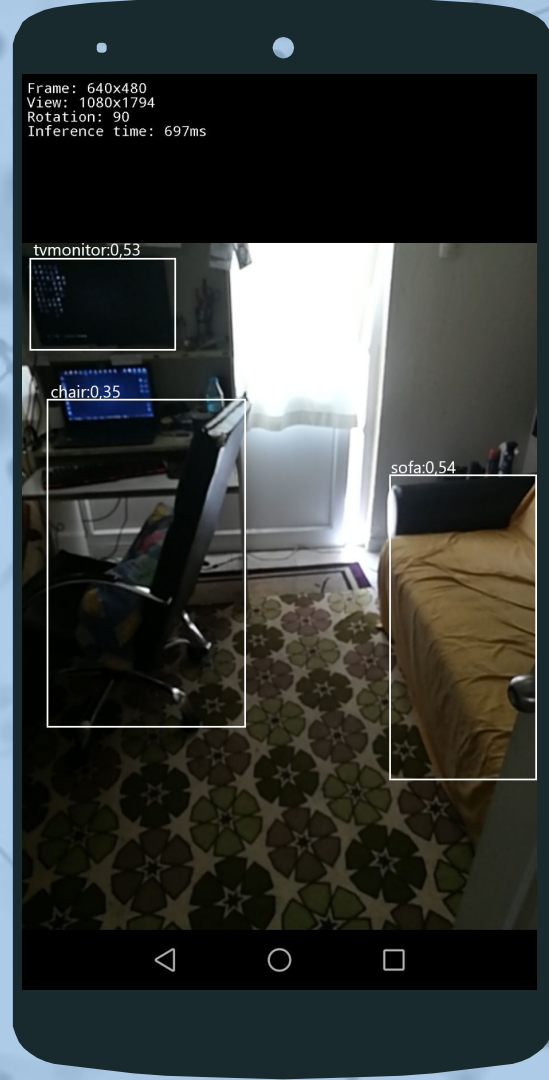
HOW DOES PROJECT WORK?





Screenshot of App

Indoor Profile



Screenshot of App Outdoor Profile

Frame: 640x480
View: 1080x1794
Rotation: 90
Inference time: 946ms



DATA SET

Detection Model	Train	mAP	FPS
Tiny YOLO	COCO trainval	23.7	244

YOLO

Currently there are totally 20 classes in the dataset.

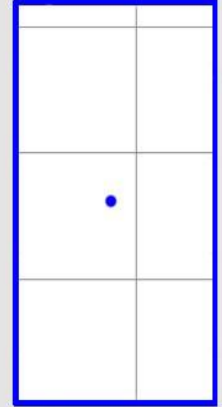
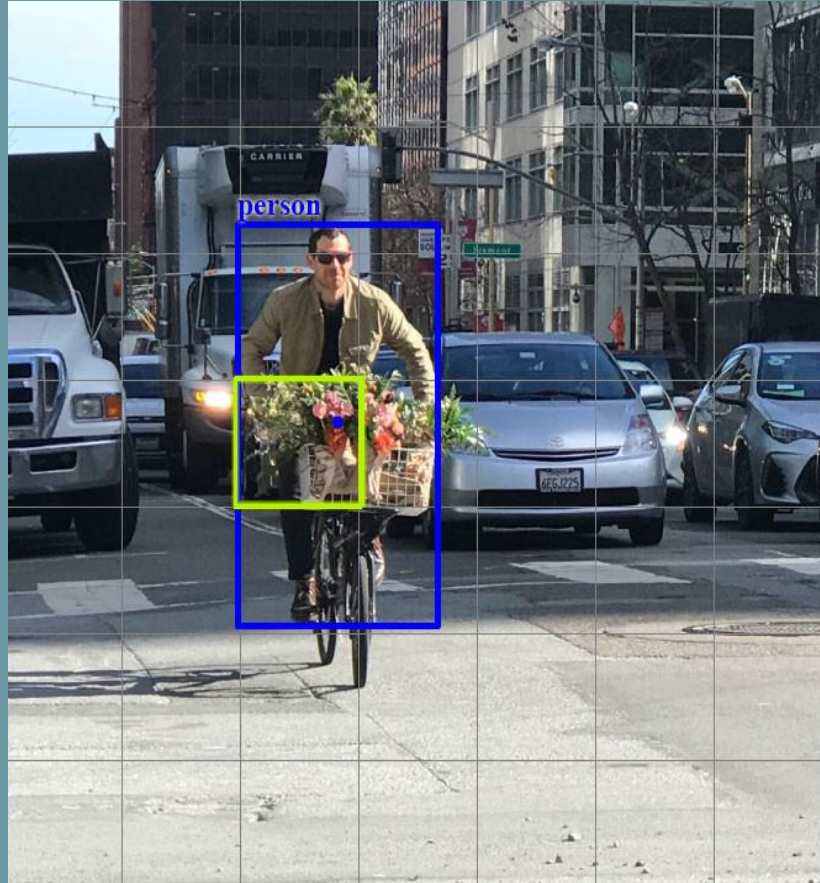
Indoor classes: bottle, cat, chair, dog, person, potted plant, sofa, tv monitor, dining table.

Outdoor classes: car, bus, bicycle, motorbike, train, boat, aeroplane, person, cat, dog, bird, cow, horse, sheep.

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How the detection process works?



Related Works

	Voice Feedback	Location	Barcode Detection	Object Detection	Color Detection	
Microsoft Seeing AI	X		X	X	X	Microsoft Seeing AI is the application closest to the purpose of our project. It designed for the blind and low vision community, uses the power of AI to describe people, texts, currencies, colors and objects.
Camfind	X			X		Camfind scans the image and search the internet about objects information. And provides a voice feedback.
Mobile Alert System for Visually Impaired People	X	X				That system identifies the current location of mobile devices by using the GPS feature and informs the disabled people about the infrastructure and construction works through web services on the internet.
LCW Sense	X		X			By reading the barcodes of the products, It gives information about the features of the product to user.



FUTURE WORKS

make profile
transitions
automatically by using
sensors

notify the
distance and
the direction of
the detected
objects

custom profile
creation

THANKS!

Any questions?

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Project Source Code

