BLIND ASSISTANT

ALI HASSAN ALI MOSTAFA, AHMED HISHAM MOSTAFA, ESRAA NAGEH OMAR ALI, ISLAM ROSHDI MOHAMED

SUPERVISED BY DR. HADEER AHMED

FACULTY OF ENGINEERING HELWAN UNIVERSITY

كلية الهندسة بحلوان

قسم هندسة الحاسبات والنظم

SEE FOR ME

جامعة حلوان

HELWAN UNIVERSITY

ABSTRACT

According to Orbis International, reports reveal that globally there are 43 million people living with blindness in 2021 which is a quite miserable statement. In most cases, these people require constant support in almost all scenarios especially in their day to day activities. Some of the major challenges include difficulty in moving from one place to another without the assistance of someone. Other challenges include difficulty in recognizing people and detecting obstacles, etc. In order to count avert these situations, we propose the "See For Me" mobile App. The App involves using a collaboration of Software, AI and Hardware with Ultrasonic sensor to detect obstacles with a reasonable detection range. The application uses voice interfaces, voice recognition, and voice dialogue management that helps blind users to function without the need of visual perceptions .

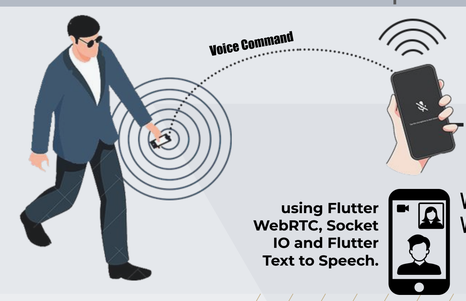
BACKGROUND

Based on our researches we have found out that there were various contributions done to help blind people that were primarily relying on a second party for help and assistance, such as creating devices and programs for calling someone or redirecting the blind to someone they know. We also found a huge effort done to create smart sticks and glasses for the blinds programmed to help them to avoid accident and detect objects. Our App combines these various available technologies and integrates them into a single multipurpose app

OBJECTIVES

- Facilitate the movement of the blind and visually impaired
- Enabling the blind to reach places and do other stuff without others help
- Reduce accidents that the blinds and visually impaired are exposed to
- Identify the location of the blind person
- Make the blind person be more confident to socialize and communicate with the world
- Provide for the blind a simulated life of an unblind person

METHODS



Banknote Recognition

in this feature we used Detecto to train the dataset Egyptian Currency with 10K labeled images of egyptian banknotes.

Hardware Smart Shoes

using Arduino uno and Bluetooth module to connect with See For Me application

Object Detection

we used Single Shot Multibox Detector(SSD-MobileNet) Model trained by COCO-dataset to detect 90 categories

Clothes Detection

we used Detecto to train a dataset that we did scrape from Google with 12000 images

Color Detection

in this feature we depended on K-Nearest Neighbors to check for the most common color in an image

Face Recognition

we used the libraries, dlib and face_recognition to encode a given face with the filename as a label then find and verify the identity of a person in any image

Scene Recognition

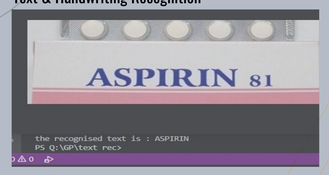
we used Tensorflow & Keras to train CVPR09 dataset with our modification to this dataset it became 26589 images belonging to 39 categories.

Text & Handwriting Recognition

we used this in order to help the blind with reading normal texts based on Paddel Ocr model and IAM dataset

RESULTS

Text & Handwriting Recognition

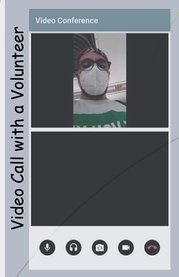


92% accuracy

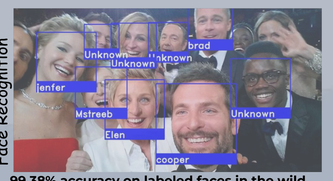
Banknote Recognition

98% accuracy

Video Call with a Volunteer



Face Recognition

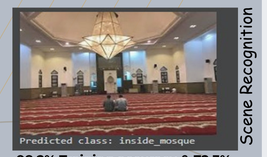


99.38% accuracy on labeled faces in the wild

Object Detection

90 categories with 97% accuracy

Scene Recognition



98.2% Training accuracy & 72.3% Validation accuracy

Smart Shoes output

Color Detection

98.2% accuracy

TEAM

ALI HASSAN ALI MOSTAFA

AHMED HISHAM MOSTAFA

ESRAA NAGEH OMAR ALI

ESLAM ROSHDI MOHAMED