

ACOUSTIC VISION

ITSP 2020

TEAM VISIONX

Suryadevara Sai Aneesh


Sai Lakshmi Shreya Ilindra

Nageswar Venkata Sai Gangadhar

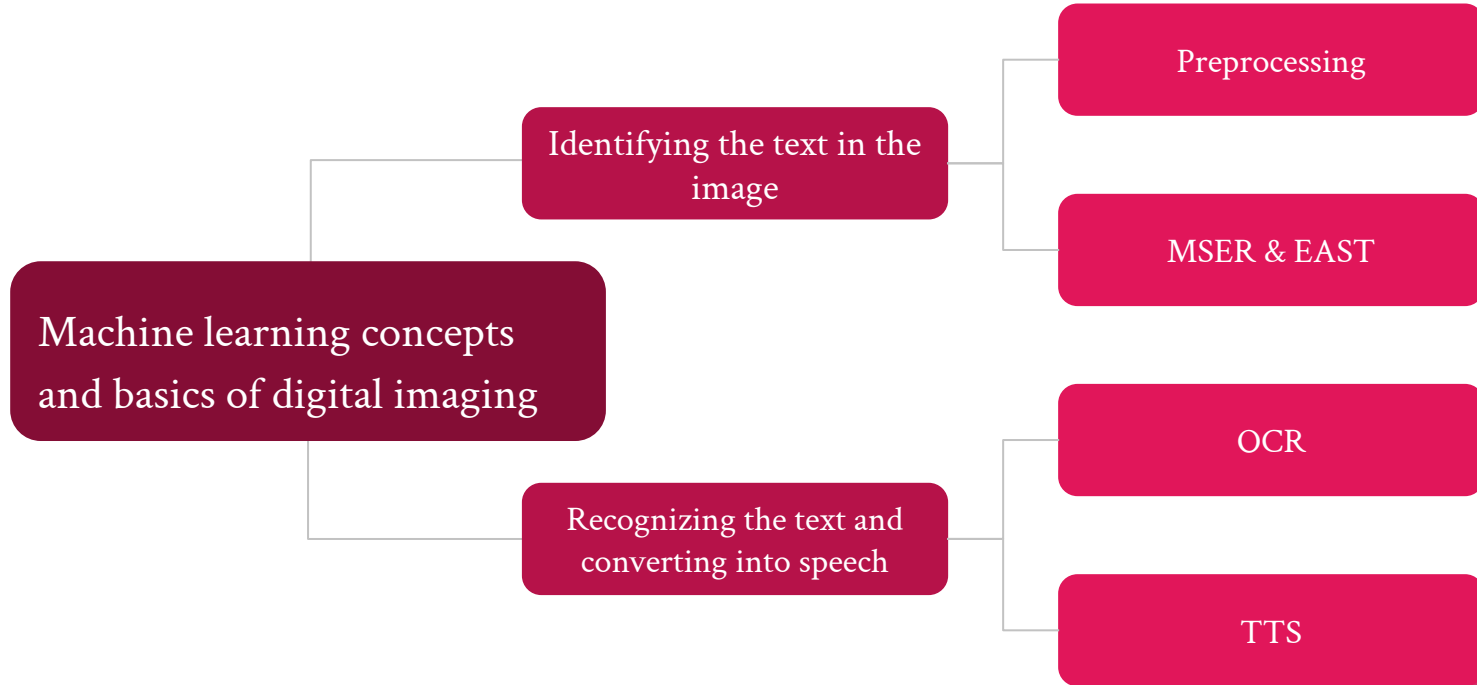
Vennapusa Indrahas

Idea behind the project

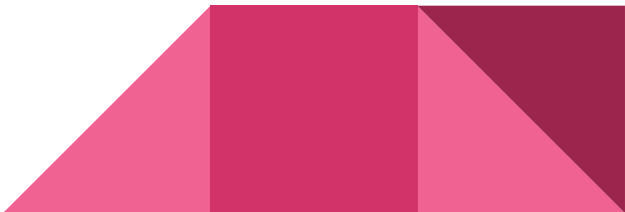
Brief explanation about the problem statement

- We want to design a device which can aid visually impaired people and read the text around them (sign boards, shop names, product names) out loud.
 - There is text all around us in our daily routine; from newspapers, commercial products, sign-boards, digital screens etc. and without being able to read all of this our lives would be very difficult.
 - Hence we wanted to create a solution to help tackle this problem and ease the lives of visually impaired people.
- 

Workflow (flowchart preferred)



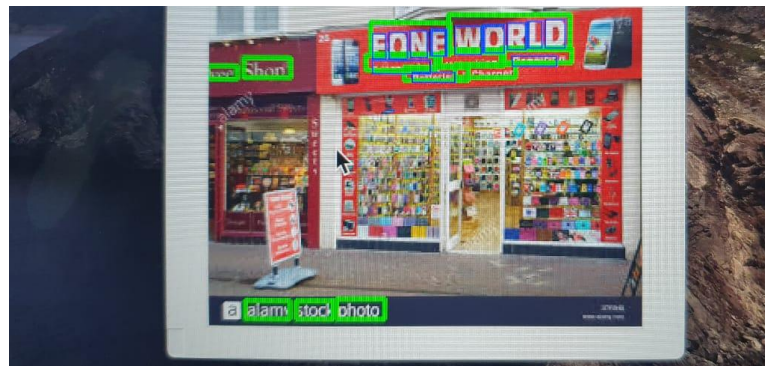
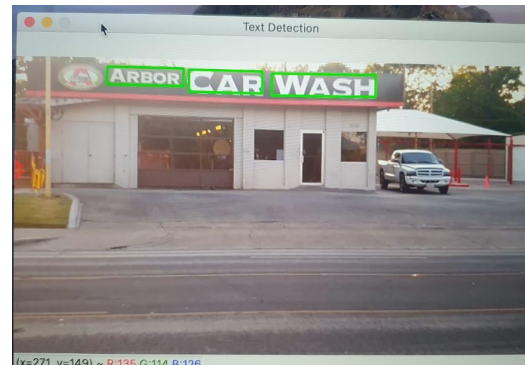
Project Details (~2 slides)

- A camera can be attached to a hat which the blind people can wear.
 - This camera will take pictures of the environment which is taken as the input by the program.
 - This input image will have to be preprocessed, and then text in the image can be detected by using MSER and EAST.
 - The identified letters can be put in a bounding box.
 - Each of the bounding box images is cropped and sent to the OCR part of the code, which uses a Convolutional Neural Network to identify which letter it is.
- 


- Now after all the letters have been identified, the string of letters is concatenated and sent to the TTS part. The TTS(text to speech), as the name suggests will read out the identified text so that the blind person can get a better understanding of his surroundings.
- However, due to the current situation, we could only complete the software part of our project. So for the demonstration, we can use our computer webcam as our camera for input and computer speakers for the output.



Results (Images/Videos)



Skills learnt

- This project was a great learning experience for all of us.
 - Firstly, it was a good application of the Machine Learning skills we learnt. We got to learn and build our own model (OCR) for recognition of alphabets using a CNN.
 - Moreover, we also explored image processing and segmentation methods in OpenCV.
 - We learnt different ways of processing images to extract different kinds of information from the images, in our case text extraction. Learned MSER which was an efficient way to detect text and how these texts are bound using OpenCV.
- 

Challenges faced

- Text extraction from a real life image is currently a hot research area. Most of the papers on it are quite theoretical and hence its implementation was a difficult task.
- A lot of experimenting for the image processing with various images was required for making a good model.
- An image with quite good resolution is required to obtain more accurate results.



Conclusion/Future plans

- Since the software part of the device is over. We would like to work on finishing the hardware part after we return to insti.

