Movie Song suggestion with CNN.

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Introduction:

Problem Statement

Colour Detection with letter recognition and movie name suggestion.
What does our project do: In our project, we write a letter on air with the help of coloured fingertips (red in our case) in real-time using a webcam. The program recognizes that written letter and also recommends us movie or song names that start with the letter that we wrote on air by voice as well as text written on a window(with random images in the background). Also when you double click on a particular name on that window, the program will automatically bring you to google and it will automatically show the results that google gives.

Importance:

This project was really important to us in terms of learning various new things and exploring them thoroughly. We learnt various new things in the ML field. We learnt how to train our own model using TensorFlow and Keras. We learnt how to play with images and video using OpenCV. We also used basic Matplotlib and Pandas. We also went through some fun libraries like pyttsx3(for adding voice). Also, we got a chance to get familiar with GitHub.

Motivation:

Our main motivation was always to learn some new. We intentionally chose Machine Learning and Computer Vision fields because they are really very important fields. Also, we always wanted to improve our pythonic skills and learn some important libraries like NumPy, matplotlib and pandas.

Implementation Details:

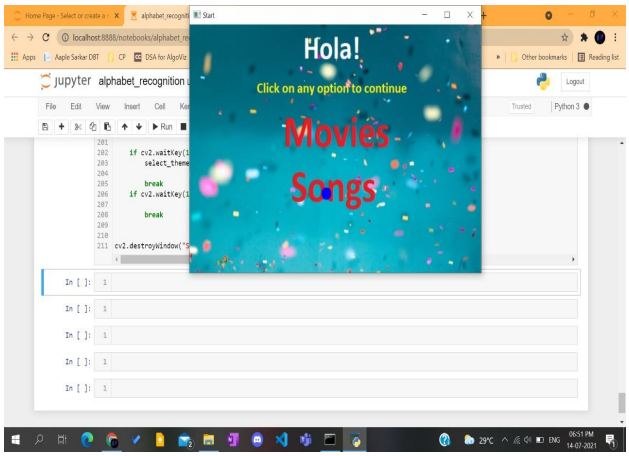
We did the project by dividing it into the following parts:

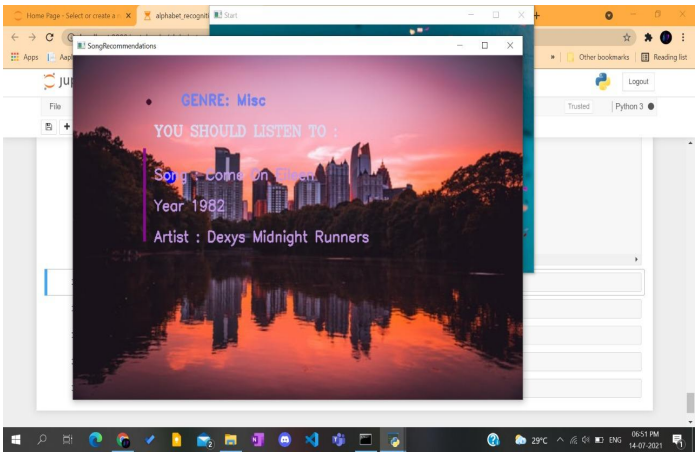
1) Training our own model using NumPy, TensorFlow.
2) Writing a letter on the screen in real-time and also on a blackboard(a black background) using OpenCV and NumPy.
3) Reshape the given blackboard into (28,28) image and give it to the trained model. Predict the letter and print it on a real-time screen(frame).
4) Suggest movies or songs that start with the given letter.
5) Search them automatically on google.

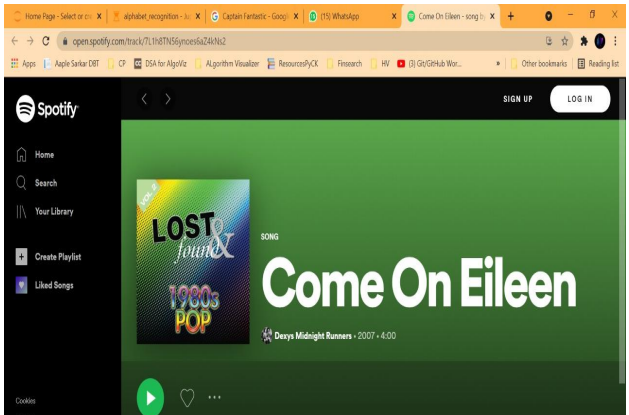
No	Feature	Libraries used	Method of implementation	Problem Faced
1)	Training the model	TensorFlow, NumPy, Matplotlib, EMNIST dataset	Steps: ● Load data from emnist dataset ● Use matplotlib to plot any random alphabet from the dataset. ● Normalize the dataset ● Use **one Hot encoding** to make a binary class. ● Build a model, compile it, train it and finally save it.	Training the dataset took lots of time. Our laptops used to hang while training them.
2)	Writing a letter on screen in real-time	OpenCV, NumPy	Steps: ● Open the cam and detect the required colour. ● Detect contour made by that colour and also find its centroid ● Collect all those points wherever the centroid moves in a double-ended queue. ● Connect all those points to draw a letter on frame and blackboard	
3)	Predict the	OpenCV, NumPy	Steps:	Combining part

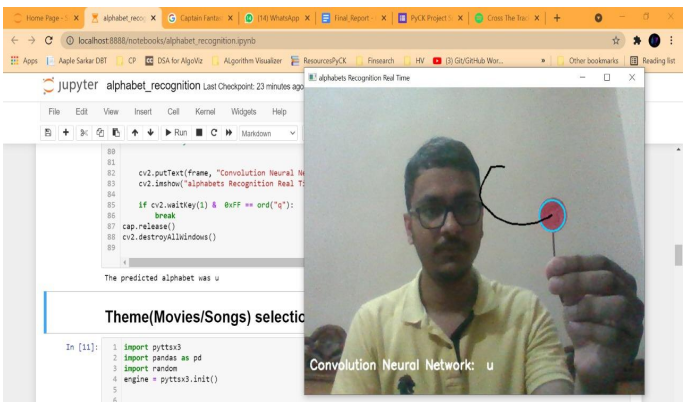
	letter		• Load the already trained model in part 1 • Reshape the blackboard and give it to model • The model will predict the given letter and print it on the screen.	one and part two was tough. Older versions of TensorFlow don't support loading of the model.
4)	Suggest the movies and songs	Pandas, random	Steps: • Read the csv files using pandas • Generate a random image, as well as 3 random names of movies or songs, and print names on random images • We also have an option to hear the names of songs and movies on our computer if we don't want to read.	
5)	Opening url	Webbrowser, pandas.	There is URL of the movies or songs in csv file. we are opening this URL using the webbrowser library. It takes the position where we click and search the URL of the movie or song on which we have clicked.	

ScreenShots:









Conclusion:

The final conclusion is that we will be writing some letter on the screen. The program will predict that letter using CNN model. Also, it will suggest some movies or songs names that we can directly search without going into google. We just have to double-click on that name. The program will automatically redirect us to google and search for us.