Speech Emotion Recognition

Abhishek Sharma	41113302717
Kanishk Gupta	41713302717
Parth	41013302717

CSE-7B

Outline

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- ➔ Audio Visualization
- ➔ Log Mel Spectrogram
- ➔ Model Architecture
- ➔ Hardware
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- ➔ Arduino Program
- ➔ Hardware Model
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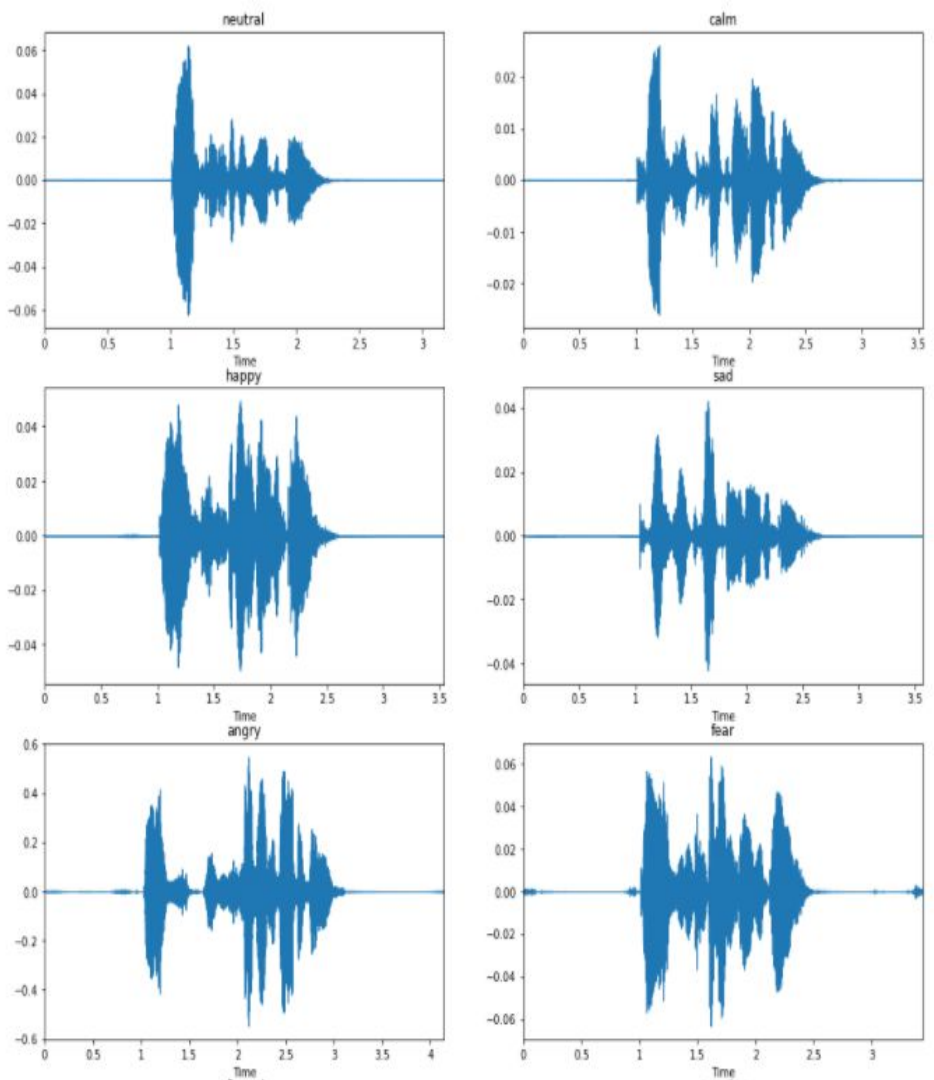
The Problem

- Build an end-to-end hardware-software solution
- Extracts features such as pitch, loudness, spectrum, and cepstrum
- Recognize the emotions of the speaker through voice in real-time
- Provide a suitable response.

Ravdess Dataset

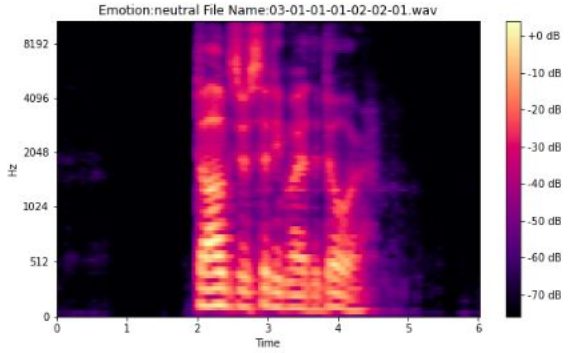
	path	intensity	gender	emotion
0	/kaggle/input/ravdess-emotional-speech-audio/a...	1	male	happy
1	/kaggle/input/ravdess-emotional-speech-audio/a...	1	male	fear
2	/kaggle/input/ravdess-emotional-speech-audio/a...	1	male	sad
3	/kaggle/input/ravdess-emotional-speech-audio/a...	1	male	fear
4	/kaggle/input/ravdess-emotional-speech-audio/a...	2	male	surprise

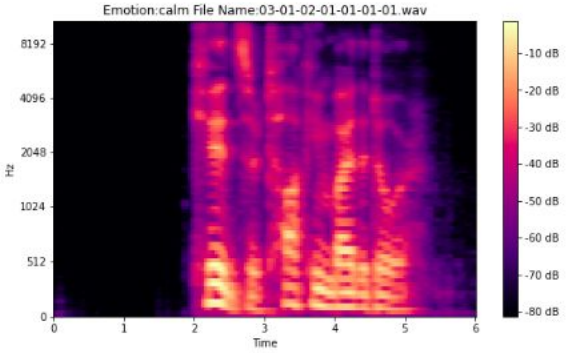
Audio Visualization

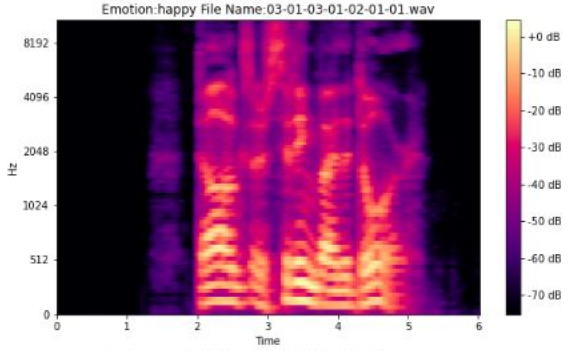


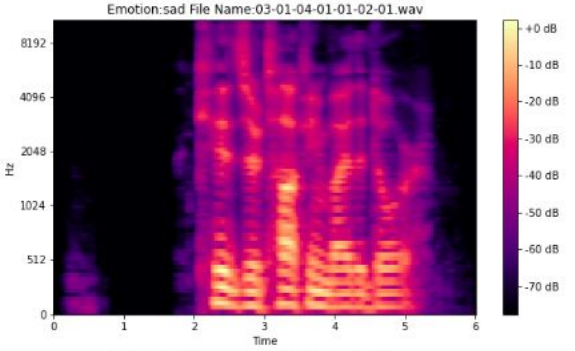
Log Mel Spectrogram

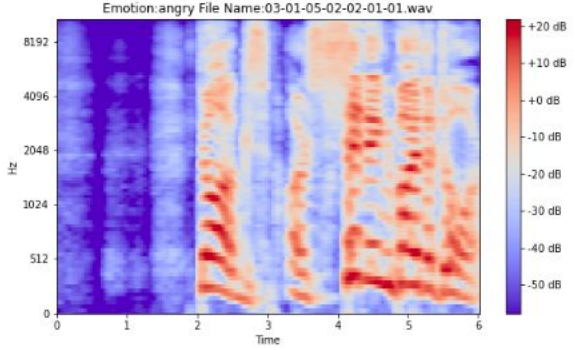
Log Mel Spectrogram visualizes the sound in both time and frequency domain simultaneously.

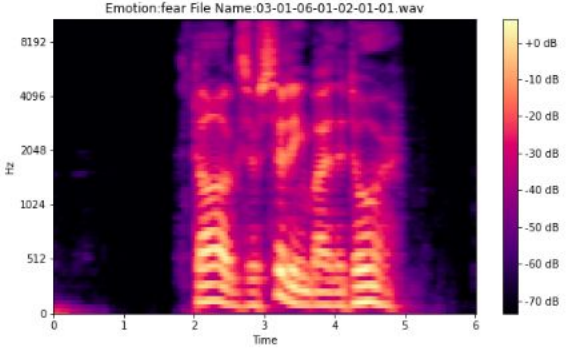






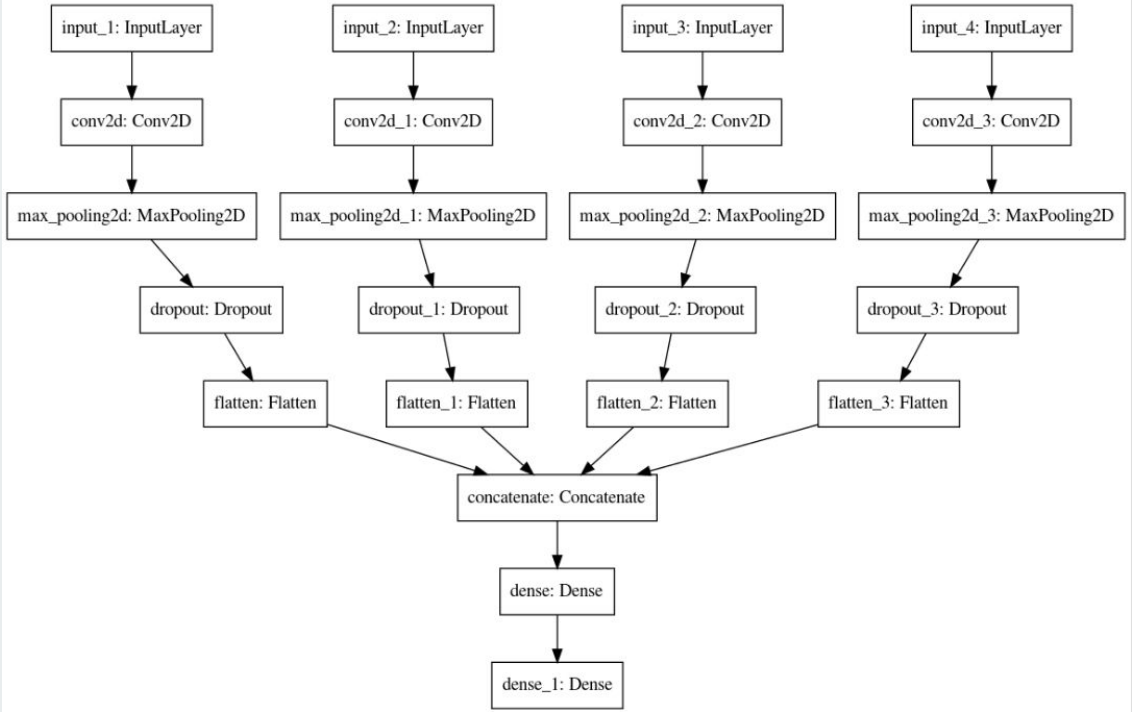






Model Architecture

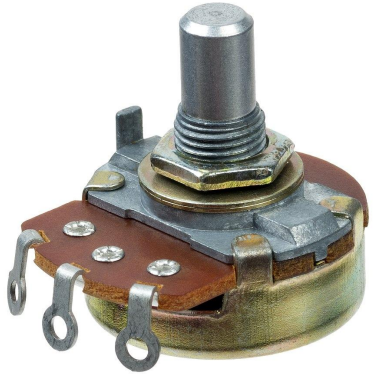
It uses 4-channel CNNs and then fully connected layer to predict the output.



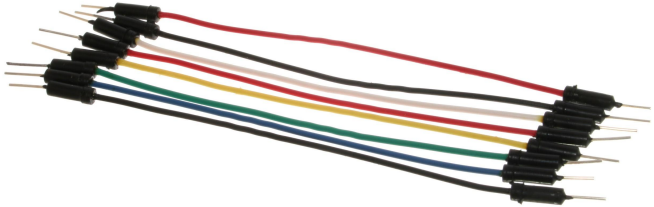
Hardware

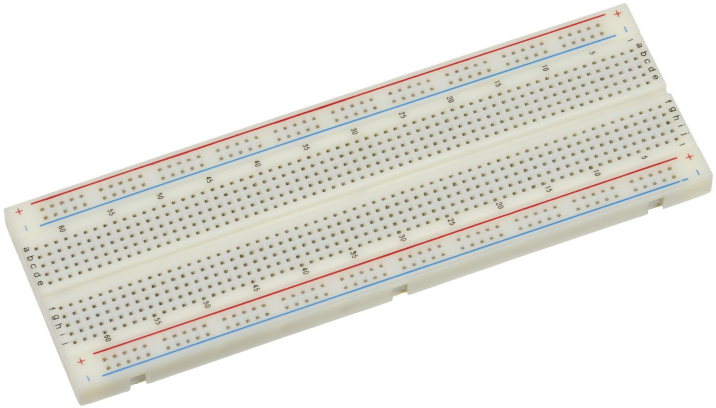
Arduino UNO

Potentiometer

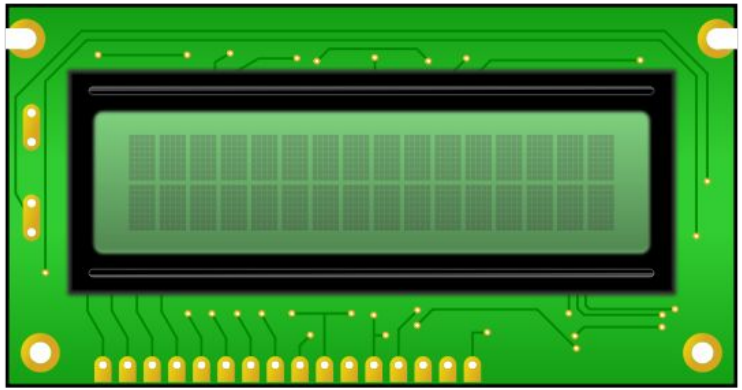


Jumper Wire & Breadboard

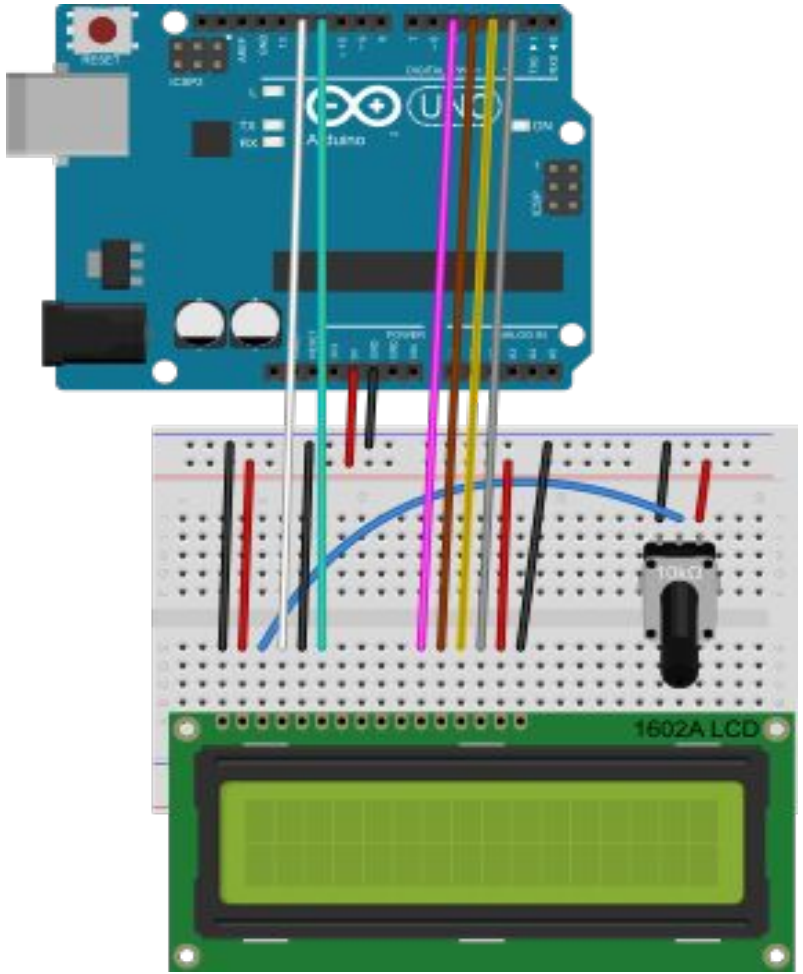




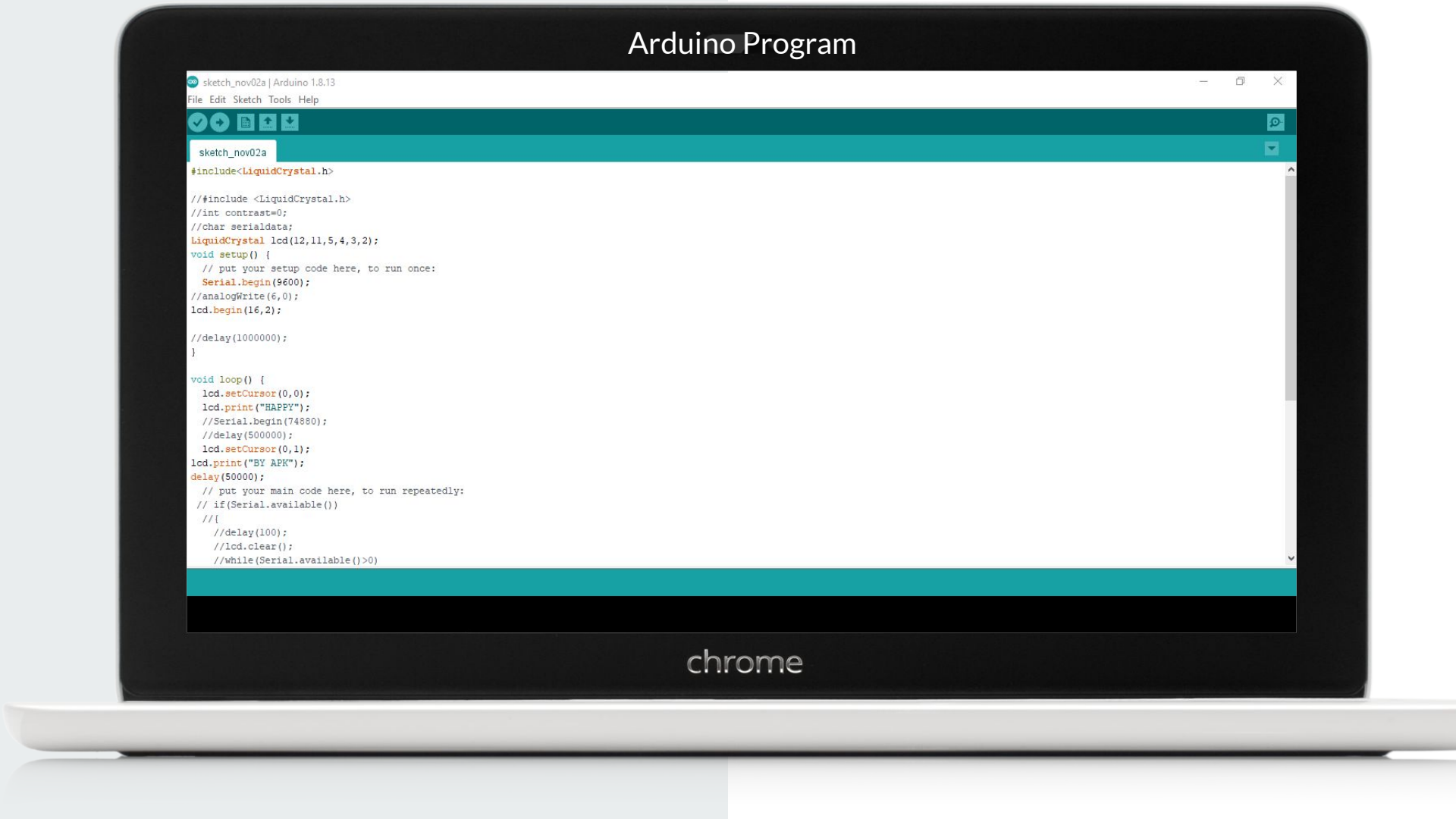
Hitachi HD44780 LCD Display



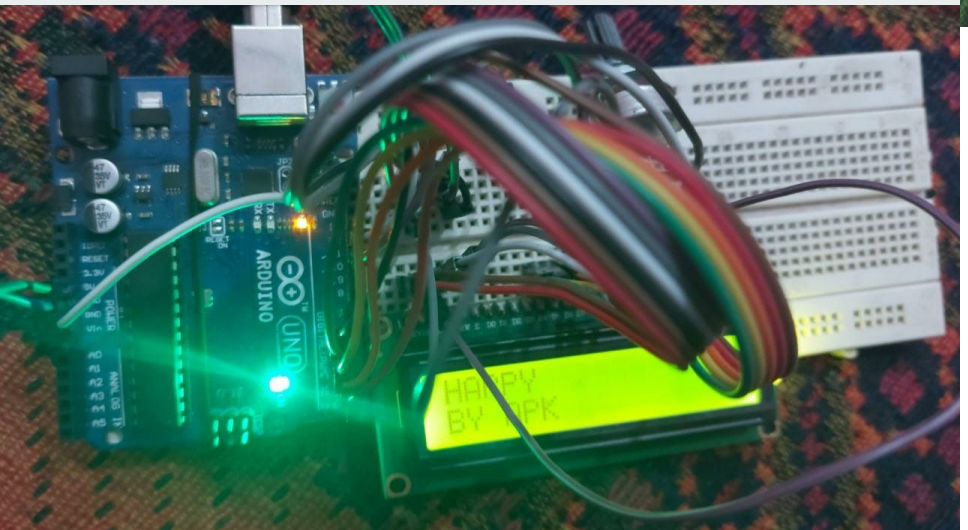
Circuit Diagram



Arduino Program



Hardware Model

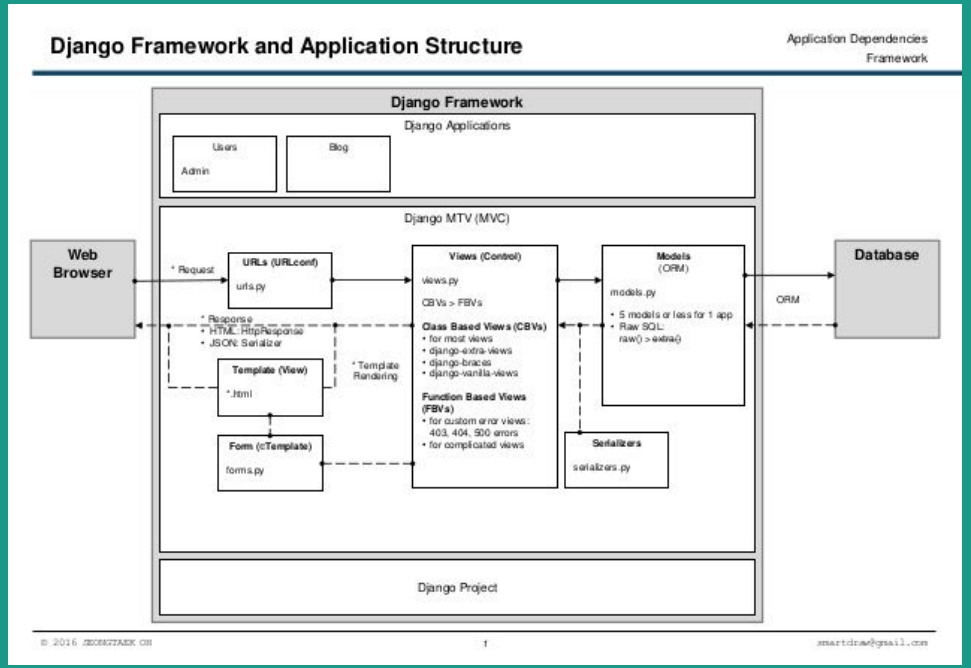


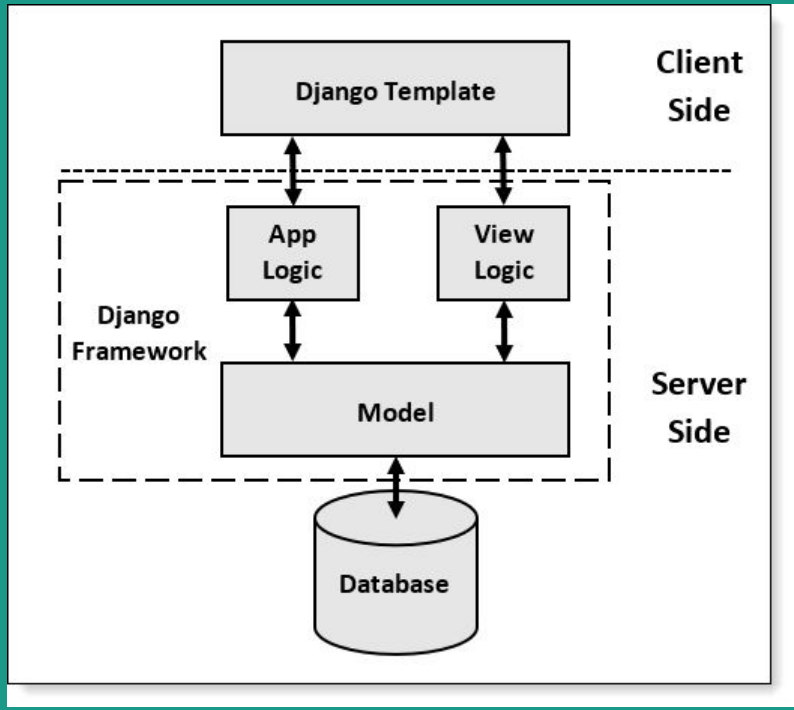
DJANGO

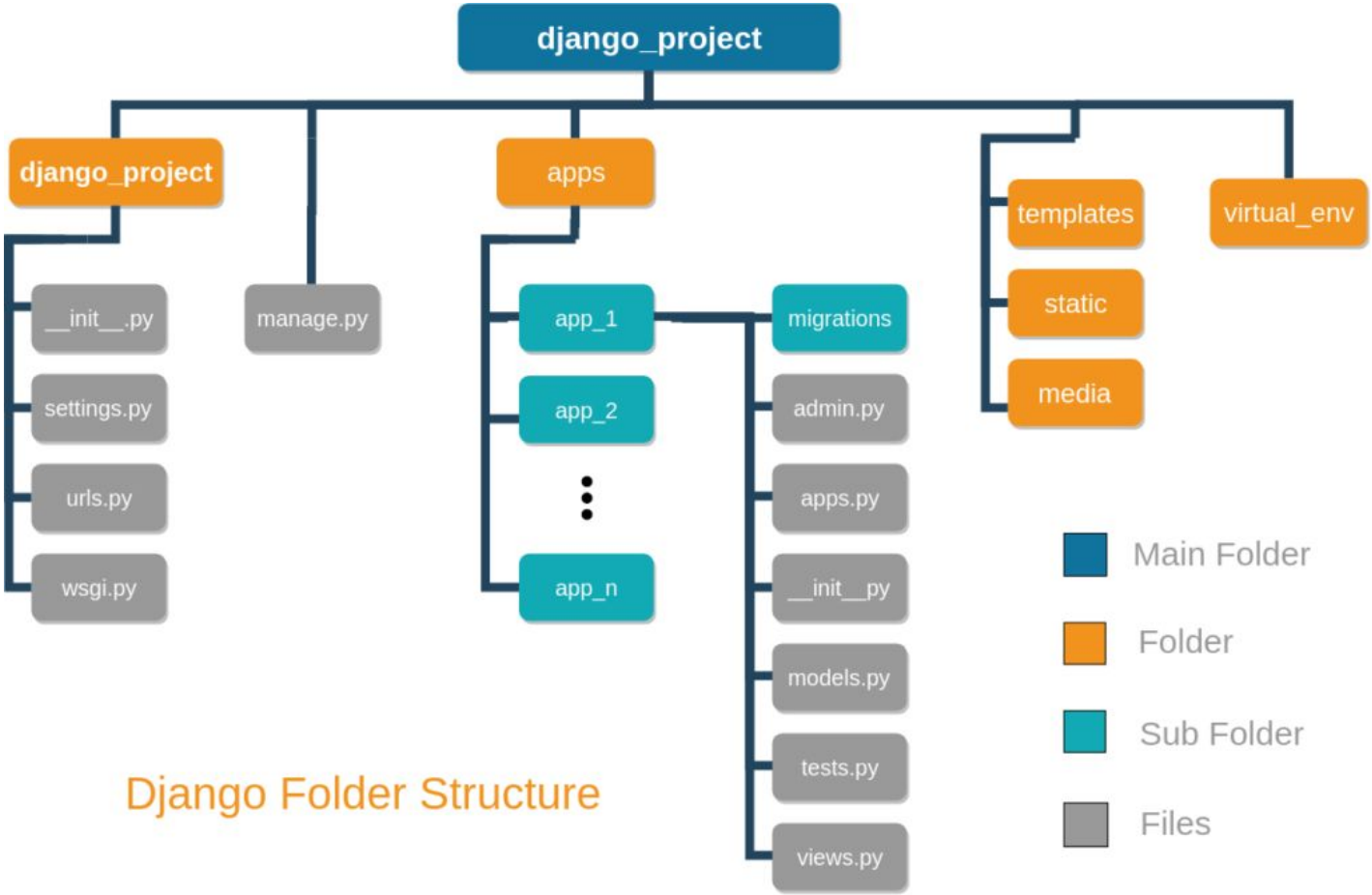
Django framework

- **Django** is a Python-based free and open-source web framework that follows the model-template-views (MTV) architectural pattern. It is maintained by the Django Software Foundation (DSF), an American independent organization established as a 501 non-profit.
- Django's primary goal is to ease the creation of complex, database-driven websites. The framework emphasizes reusability and "pluggability" of components, less code, low coupling, rapid development, and the principle of don't repeat yourself.
- Python is used throughout, even for settings files and data models. Django also provides an optional administrative create, read, update and delete interface that is generated dynamically through introspection and configured via admin models.

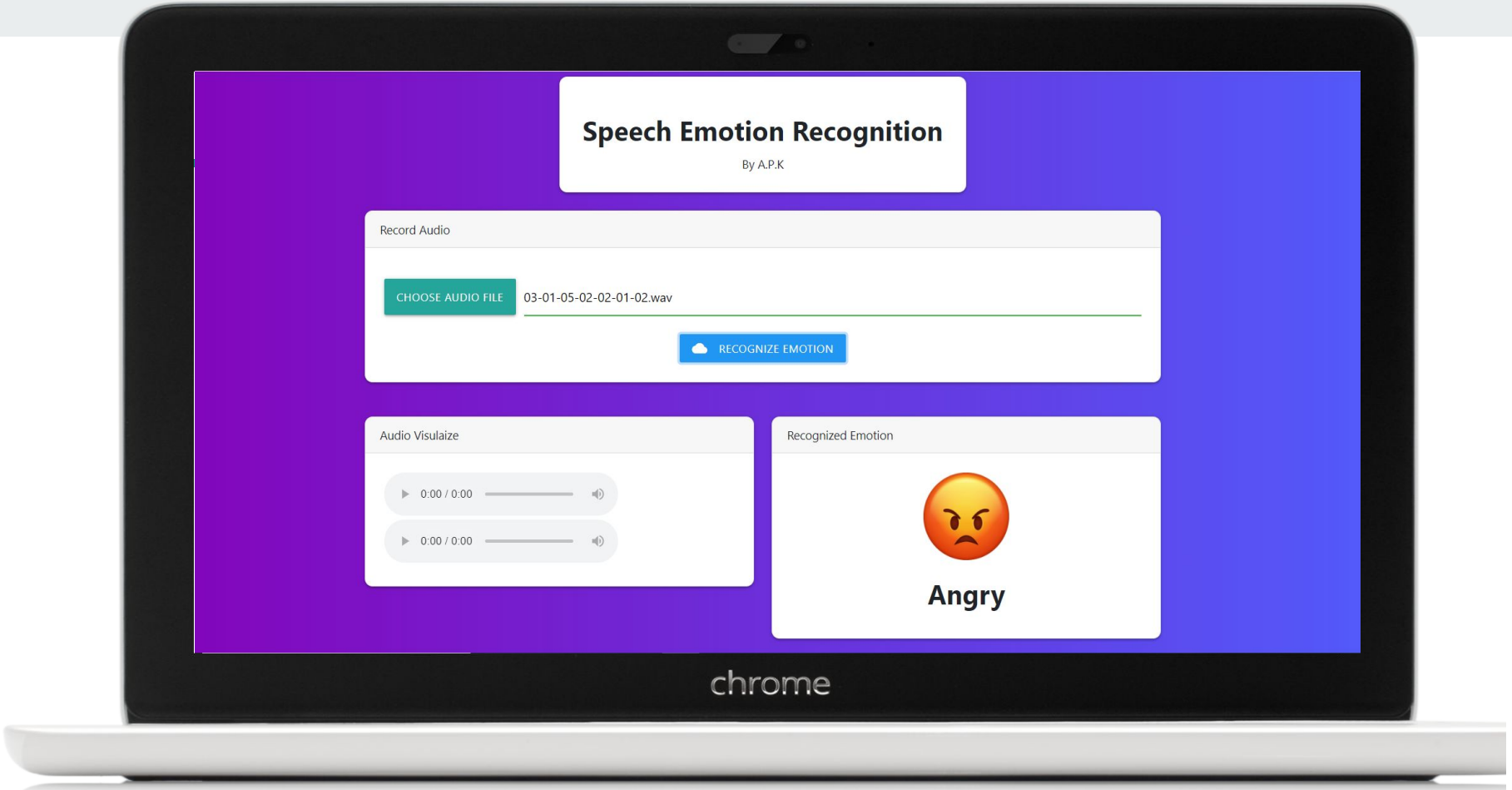
Django Workflow







Django File Structure


Speech Emotion Recognition
By A.P.K
Record Audio
CHOOSE AUDIO FILE
03-01-05-02-02-01-02.wav
RECOGNIZE EMOTION
Audio Visulaize
0:00 / 0:00
0:00 / 0:00
Recognized Emotion
Angry
chrome


Thank
You

APK

01

Abhishek

Data Science Expert

APK

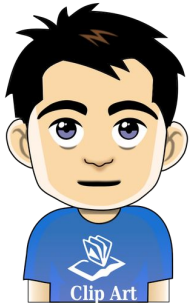
02

Kanishk Gupta

Full Stack Expert, Developer

APK

03



Parth

Hardware design