Speech-Based Emotion Prediction

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Introduction

- **Objective** – Model predicts human emotions using audio input.
- **Motivation** – Enhances human-computer interaction, mental health analysis, and AI-driven applications.
- **Approach** – Start with text-based emotion detection, then integrate audio (speech + pitch) system.

Planning

- **Audio Processing:**
  - Speech-to-text conversion and tone/pitch analysis for emotion detection.
- **Text-Based Emotion Prediction:**
  - Initial model predicts probability of emotions from text input.
- **Tone & Pitch Analysis:**
  - Extracts vocal features (eg. pitch) to assess emotional state.
- **Final Model:**
  - Combines text based and vocal analysis for accurate emotion detection.

Workflow

- **Text based Emotion Detector:**
  - Tokenization of sentences
  - Removing the repeating lables in the dataset
  - Tokenization of emotion lables in the dataset
  - Mapping tokenized sentences to emotion labels
  - Model training using mapped data
  - Predicting emotional probability using user input

Probability

w=0.3

w=0.7
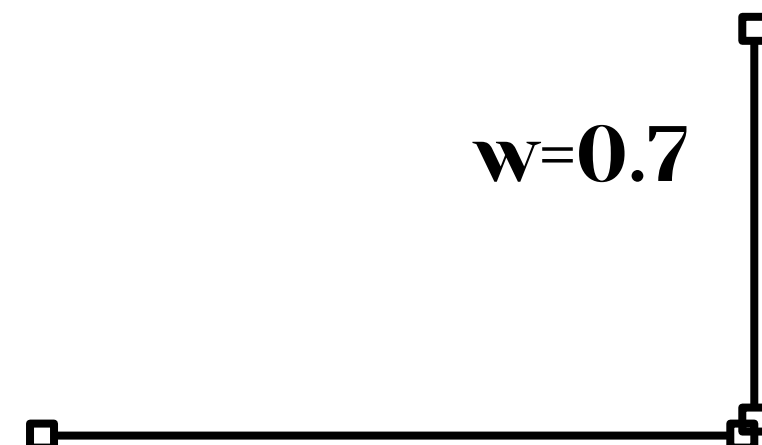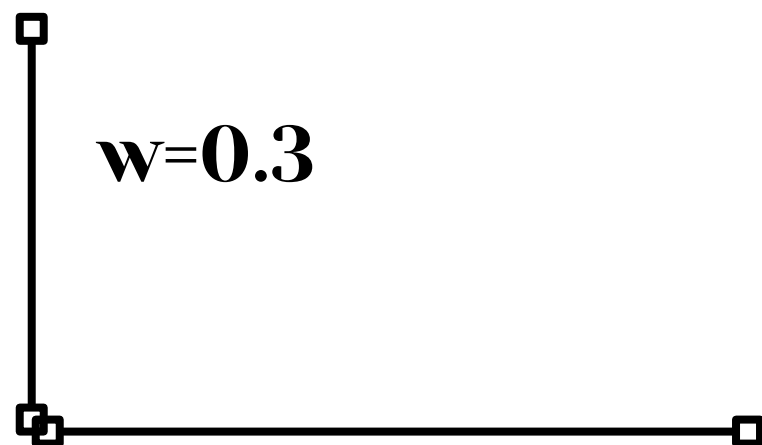
Literature Review

Text-based emotion detection: Advances, challenges, and opportunities-2020.

Francisca Adoma Acheampong, Chen Wenyu, Henry Nunoo-Mensah

📌 Emotion Datasets
Public datasets contain social media texts labeled with emotions like happiness, sadness, and anger.
These datasets help train models to recognize emotional patterns in language.

📌 Existing Models
Early models used statistical techniques to classify emotions based on word usage.
Deep learning models improved accuracy by understanding context and sentiment in text.

Emotion Detection Using Audio Data Sample-2019.

Ameya Ajit Mande,Sukrut Dani,Shruti Telang,Zongru Shao

📌 Dataset:
Collected from a university speech dataset with 2651 voice recordings of different emotions.
Features speech from two female speakers (young & old) expressing seven emotions like happiness, sadness, and anger.

📌 Processing:
Voice recordings were analyzed to extract key patterns and characteristics that help in identifying emotions.
A machine learning model was trained using most of the recordings, while a smaller portion was kept for testing accuracy.

📌 Objective:
A detailed study of 7 different emotions, using 3 different algorithms

Thank You