TECHNOLOGY PROJECT 2

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GENDER RECOGNITION OF VOICE SAMPLES

END PROJECT REPORT

VERSION 1.0

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PURPOSE OF THE PROJECT

A Human has natural tendency to identify the difference between male and female voice. But a computer cant't predict the difference between male and female voice. For computer to identify the difference, we need to teach it by providing inputs, methodology or different training data and make it learn. This project basically focuses on training computer to identify the gender based on input of acoustic attributes using various Machine Learning algorithms and get the accurate results.

As we all know, the basic means of communication is speech signal. The recorder speech of male or a female can be served as our input to the system. This speech signal is processed by the system and from that signal we get various acoustic attributes. Various applications of Gender recognition includes :
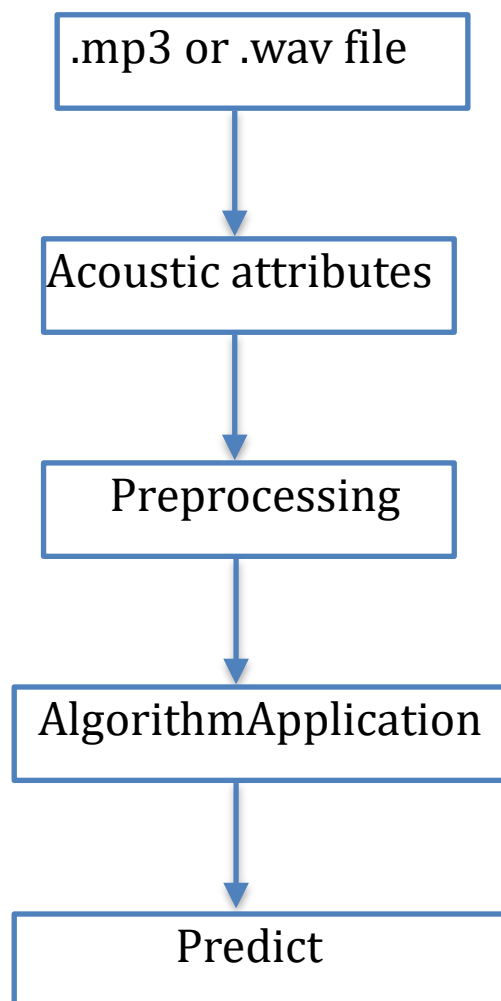
1) Male and Female laughing sounds.

2) Help personal assistants like Siri, Google Assistant to answer question with male or female generic results.

3) Muting / saving sounds for a gender

4) Categorize audios / videos by adding tags

As there is a basic definition in ML, there is direct relation between data and model and so a model is only good as good as data. Here we have recorder audio samples of 10 people - 5 male and 5 female as our dataset. We have .mp3 recordings of all 10 people as our basic dataset. From this dataset we generate a comma separated value files from sound waves which has 21 attributes. This problem falls under supervised learning as the system is trained by providing number of labelled inputs for both the genders. Also , it is a classification problem as the output is based on classifying into male or female.

A male and a female speech has some difference in frequency and hence we can say from that whether what gender the speech is of. After we get the features as csv files from R , we push that features into our SVM model from which the model is trained and tested and we get the result.Here is a simple workflow to recognise the gender of the voice.

```
        .mp3 or .wav file
               │
               ▼
        Acoustic attributes
               │
               ▼
         Preprocessing
               │
               ▼
       AlgorithmApplication
               │
               ▼
            Predict
```

OBJECTIVES ACHIEVED/NOT ACHIEVED

- Objectives achieved are recognising gender (male or female) from training model with features extracted from audio samples recorded.

- Objectives to be completed are detecting silence in speech in version 1.1.

System Requirements :

Make sure you have the latest Python, R for proper installation and smooth execution

ORDER OF EXECUTION

1. Record the audio files in .mp3 or .wav format of both genders (Male and Female)

2. Create 2 folders Male and Female in default working directory for R and paste .wav or .mp3 files in respective folders.

3. Run extractfeatures_from_wav.R file to extract features in form of csv file from the Audio files.

4. Read the csv file in Jupyter after heading ''Prediction using real time voice samples"

5. Run MLProject -VoiceRecognition.ipynb file for modelling the data via the SVM algorithm. This will predict the voice samples whether it is male or female in 0's and 1's form.