Your MSc Project title (Module Code and Title):
7COM1039-0109-2022 - Advanced Computer Science Masters Project
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Project Title:

Human Emotion Detection from the audio using Deep Learning and Natural Language Processing.

Aim of the project: This project's aim is to develop a deep learning model using NLP techniques to identify the emotion of the human audio and classify it accurately.

Research question/ hypothesis:

Will the high emotion level audio provide more accurate emotion detection (Anger, Disgust, Fear, Happy, Neutral, and Sad) compared to low and medium emotional level audio?

Short description of your idea:

Recognizing human emotion has been a crucial task for robots, many techniques are being developed to resolve this issue and recognize audio emotion accurately. I want to do this project because I am interested in developing an audio assistant which can support humans as a friend emotionally, to do that firstly it has to understand human emotion correctly, so I have taken up the idea of this project to build a deep-learning model using NLP techniques to recognize the human emotion from the audio. This project is a multi-class classification task with six emotions (Anger, Disgust, Fear, Happy, Neutral, and Sad) and with emotion levels (High, Medium, Low, and Unspecified). All the classification metrics like Accuracy, Precision, Recall, F1 Score, Confusion Matrix, and ROC curves will be used to analyze the performance of this project. Mainly Accuracy will be considered for evaluation.

Objectives:

1) To Extract the Classification of the audio file names and label them.
2) Check the Imbalances of the categories.
3) Find out ways to Tune the audio to get the maximum clarity for processing.
4) Read research articles about speech processing techniques.
5) Find out ways to convert from audio to text and use of NLTK Library and text pre-processing techniques.
6) Find out the best suitable algorithms for training and testing the model.
7) Find out the best parameters.
8) Track the performances of the algorithm using assessing metrics.
9) Understand Project Report Structure and write a detailed report.
10) Keep track of every reference visited along with the date of access.

Specify how you plan to conduct your research:

The following are the steps assumed to investigate this research question.

Dataset:

https://www.kaggle.com/datasets/ejlok1/cremad

1) Understand the semantics of the secondary data chosen from the above link and understand it for processing.
2) Check imbalances for the classes and resolve any differences.
3) Converting the audio files to text using speech recognition techniques using the research paper and blogs.
4) Pre-processing the text using NLP techniques like lemmatization, Stop words, etc.
5) Try out various suitable machine and deep learning algorithms to train and test.
6) Track the performance of the algorithms on training and test set.
7) Final step is to make a Dissertation report w.r.to structure along with intext, image citations, and references.