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| **Module Name** | | **Data Analytics Major Project** | |
| **Assessment** | | **Assessment Element – 010 - Project Proposal** | |
| **Module Code** | | **MOD007894** | |
| **Student ID** | | **2171181** | |
| **Full Name** | | **Kokhila Shanmugam Yuvan Bharathi** | |
| **Placement Provider** | |  | |
| **Placement Supervisor** | |  | |
| **Academic Supervisor** | |  | |
| **Project Title (15 words Max)** | | | |
| **Human Identification from spoken digits using Convolutional Neural Network** | | | |
| **Project Summary (200 words)** | | | |
| This project mainly involves the detection of humans based on their speech and accent. We have similar works already but now in this project, we are implementing speech recognition with the autoencoder and also trying to clean and increase the existing dataset. We are using Convolutional Neural Network to train the model with the dataset available globally. Through this project, we can generate a waveform and spectrogram of any audio files with autoencoders and also we can detect a person’s vocal speech. It is also helpful in detecting the speaker's accent and making the autoencoders work with various accents by increasing the dataset. Implementing autoencoders and increasing and cleaning the dataset is our major contribution to the existing speech recognition models. This project makes us automatically get the waveform of any audio and also helps detect the person with respect to his speech. Implementing the autoencoders with a high accuracy rate is the main implication of the project. | | | |
| **Project Aim (50 words)** | | | |
| The aim of the project is to design a convolutional neural network and implement an autoencoding human speech recognition system that helps in detecting the speaker in an audio file and also to convert those audio files into waveform signals using the Convolutional Neural Network and achieve the best accuracy with tuning the hyperparameters. | | | |
| **Project Objectives (Outline 2 to 4 Objectives)** | | | |
| Objective 1: To create an autoencoder that will convert all the audio signals into waveform and spe\ctrography  Objective 2: Create a Convolutional Neural Network with various hyperparameters for image processing  Objective 3: Train waveform images as input parameters into the neural network to detect the person’s frequency.  Objective 4: Synchronize the neural network model with the autoencoder for enhancing the model to work automatically | | | |
| **Methodology (200 words)** | | | |
| This project will help us to classify a person based on his digit speech using a convolutional neural network. The project is mainly based on the existing image classification technique with autoencoder and tuning hyperparameters. The input dataset will consist of raw audio files that consist of digits on it. The initial step is to create an autoencoder that will convert these raw audio files into a machine-readable waveform which can further be used to do image classification. After the autoencoder, we need to create an image-recognizing Convolutional Neural Network which will classify the input waveform data and classify them according to their frequency. Now we need to split the dataset into test, train, and pass them into the Neural Network to train and validate the accuracy. With accuracy, we can understand whether the model is under or overfit and tune the hyperparameters accordingly. Then obtain the evaluation metrics to test the accuracy of the model. Now merge the autoencoder with the neural network model so that the necessary input would be an audio file which will automatically be converted into a spectrogram image and later run those images in the neural network to detect the person. | | | |
| **Expected Contribution (100 words)** | | | |
| The final output of the project would be a Neural Network model with an autoencoder which generates unique digits sound by training them with the existing digit audio files available globally. The model also helps us to find the speaker with their voice and also to find the also to classify them with respect to the accent of the speaker.  This project can help an individual to find the difference in the accent of various speaker, can help to create new unique audio files that can be used to train a children or increase the existing dataset  The final output can generate various digit audio files which can be used to train further models, speech therapy or practices and so on. | | | |
| **Ethics Course Completion Certificate** | | | |
| A blue and white certificate  Description automatically generated with low confidence | | | |
| **Stage1 Research Ethics Submission Evidence** | | | |
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| **Research Plan** | | | |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | | Research Plan | hours | Evaluation  form | Timeline | | | Framework Reading | 20 | Report | 14/05/2023 | 20/05/2023 | | Initial project proposal | 20 | Report | 16/05/2023 | 20/05/2023 | | Literature survey | 55 | Report | 22/05/2023 | 10/06/2023 | | Collecting data and research papers required for the proposed topic | 5 | Report | 04/06/2023 | 10/06/2023 | | Research on the significant technology | 25 | Report | 12/06/2023 | 18/06/2023 | | Completing the project proposal sheet | 30 | Report | 01/06/2023 | 26/06/2023 | | Dataset collection for the proposed model | 10 | Code | 27/06/2023 | 28/06/2023 | | Testing the existing proposed model | 15 | Code | 28/06/2023 | 30/06/2023 | | Start Writing paper | 30 | Report | 01/07/2023 | 01/08/2023 | | Try building a neural network system | 60 | Code | 01/07/2023 | 15/07/2023 | | Try building an autoencoder | 20 | Code | 01/07/2023 | 10/07/2023 | | Train and Test data | 10 | Code | 11/07/2023 | 16/07/2023 | | Analysis and troubleshooting of problem | 10 | Code | 17/07/2023 | 22/07/2023 | | Writing thesis | 80 | Report | 01/07/2023 | 10/09/2023 | | Presentation preparation | 10 | PPT | 24/07/2023 | 26/07/2023 | | Conclude the results | 5 | PPT and Report | 08/09/2023 | 10/09/2023 | | Present the Master thesis | 5 | PPT and Report | 10/09/2023 | 13/09/2023 | | Defend Master thesis and bring weensy changes | 5 | Report | 10/09/2023 | 15/09/2023 | | Future work and updations | 10 | Report | 10/09/2023 | Future | | | | |
| **Signed and approved by:** | | | |
| **Academic Supervisor Feedback:** |  | | |
| **Academic Supervisor signature** |  | | **Date:** |
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