COVID-19 AUDIO CLASSIFICATION

Capstone Team 1:

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1. Introduction:

Ever since the emergence of COVID-19 virus in 2019, the virus has mutated several times. Detection of the carriers/infected people is crucial in stopping the virus. The current methods available for the detection of covid-19 is expensive and time consuming. A non-invasive, easy to deploy method to detect covid can play a huge role in stopping the spreading of the virus.

The aim of the project was to detect if a person is covid positive, healthy or symptomatic using audio samples.

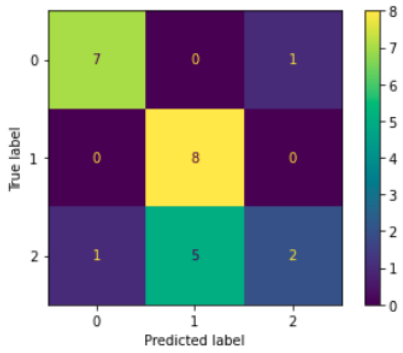
2. Materials and methods:

The covid -19 audio dataset contained a total of 27550 out of which 16224 samples were labeled [1]. The data was preprocessed by removing non relevant data and filling zeros for missing data. The labels, and non numerical columns were converted to numerical data using the Label Encoder. The StandardScaler was used to scale the data. The **Mel-frequency cepstral coefficients & DSR** for the audio samples with labels were generated using the Librosa python library. The scikit-learn library was used to develop a multiclass classification model. The best model from several models was selected to predict the test data.

3. Results and discussion:

The best classification model with optimized parameters was found to be Random Forest Classifier by grid search and was selected for training. The trained model was used to predict the test set. The metrics are represented below:

The accuracy score was: 0.7083333333333334
The precision score was: 0.719017094017094
The recall score was: 0.7083333333333334
The roc_auc score was: 0.8619791666666666
The kohen kappa score was: 0.5625
The MCC score was: 0.6031355196718399
The log loss score was: 0.7968821524362394
The confusion matrix for the test set:



4. References:

1. Orlandic, L., Teijeiro, T., & Atienza, D. (2021). The COUGHVID crowdsourcing dataset, a corpus for the study of large-scale cough analysis algorithms. *Scientific Data*, *8*(1). https://doi.org/10.1038/s41597-021-00937-4