

SUPPRESSION OF ACOUSTIC NOISE IN SPEECH USING SPECTRAL SUBTRACTION

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This research paper attempted to develop a way to suppress noise using spectral subtraction. When the noise suppression algorithm is implemented, the original signal is distorted, so the spectral error appearing is reduced by using various methods like magnitude averaging, half wave rectification. This method is used for noise cancellation. It improves audio quality by reducing the noise in the background. Acoustic noise is the extra sound in the acoustic domain. Spectral subtraction is an efficient way to analyze speech signals. Speech is not a stationary signal so using magnitude averaging to reduce the spectral error over a long period of time will decrease the quality and understandable part of the speech signal. The spectral error is given by and is reduced by the following methods:

- Magnitude Averaging
- Half wave rectification
- Residual Noise Reduction
- Additional Signal Attenuation

We can conclude that spectral subtraction indeed improves the quality and comprehensibility of the speech spectrum given as input.

GRAPH FREQUENCY ANALYSIS OF COVID-19 INCIDENCE TO IDENTIFY COUNTY-LEVEL CONTAGION PATTERNS IN THE UNITED STATES

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This research paper is an attempt to study the pattern of contagion spread during the second wave of COVID-19. This paper attempts to use Graph Fourier Transform to map contagion spread to distance parameter. The paper explains whether the rapid spread of the virus was due to the movement of people across districts or within the district itself. Previous studies contain analysis based upon time only. This paper uses distance as a parameter instead of the commute flow. Methods used in this analysis are:

- Graph Fourier Transform
- Graph Filtering
- Eigenvalues and Eigenvectors of Laplacian Matrix
- Geographical plotting on MATLAB

Such an analysis would help us in predicting and maybe controlling future pandemics