Speech Task № 1

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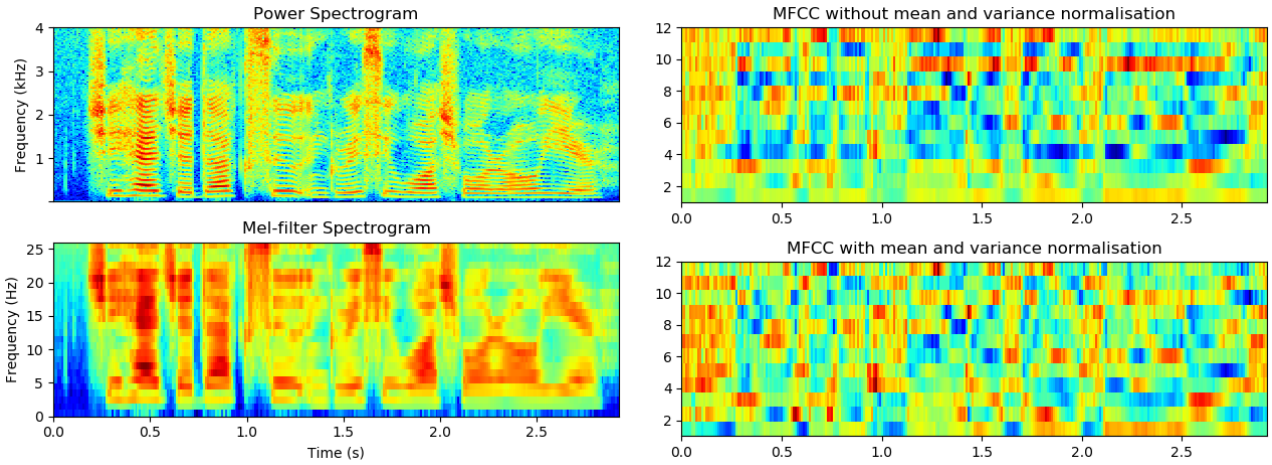
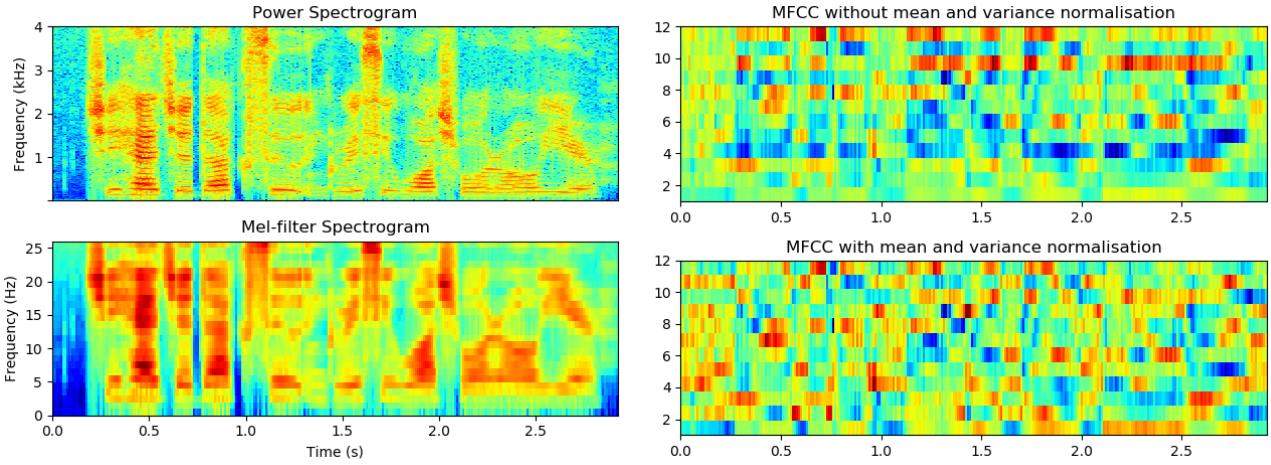
Baseline MFCC



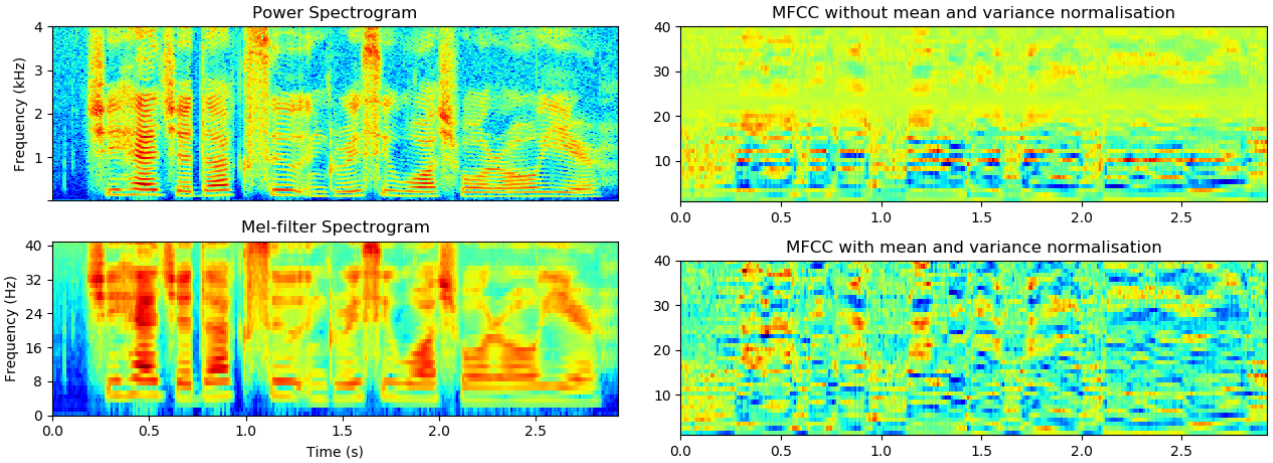
No Hamming Window

The most noticeable effect of having no hamming window can be observed on the edges of the MFCC where some features are dampened in comparison to the baseline. This is mostly due to loss of information that occurs during the FFT often called spectral leakage.



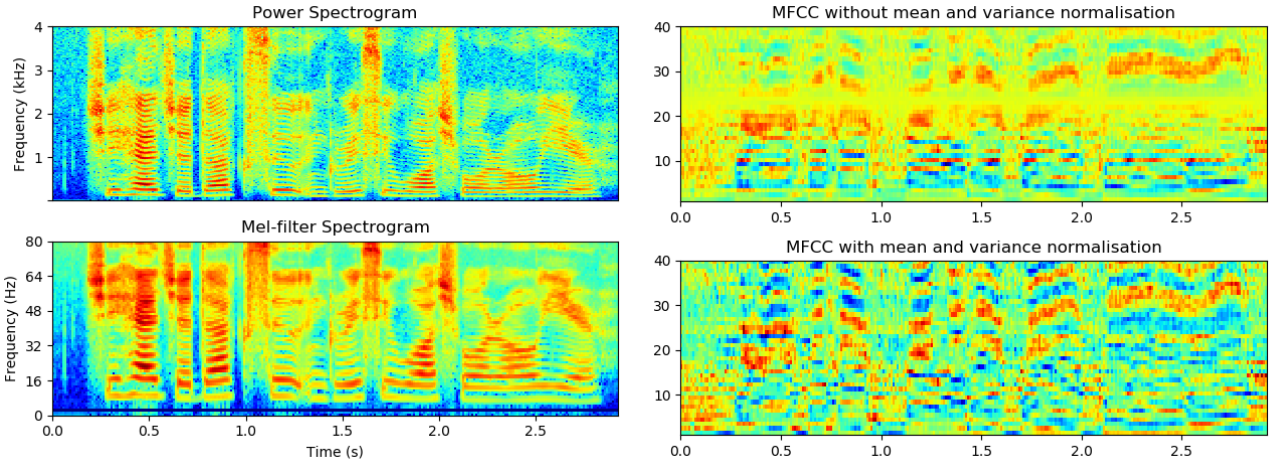
40 MFCCs

With 40 MFCCs parts of the Mel-filter Spectogram are becoming more noticeable as higher frequencies are encapsulated within it. It becomes even more evident after standardization. The MFCC also looks denser, but that is just due to a more compact figure having to fit almost double the vectors within the same dimensions.



80 Filter-banks, 40 MFCCs

By doubling the number of filters from the previous approach, it seems like the resolution of the MFCC increased. It likely increases because of the addition of some very narrow bank filters. Resulting MFCC could be highly ineffective for the Machine Learning algorithm due to high correlation still being preserved between features.



No Pre-emphasis

Without pre-emphasis, the spectrum gets imbalanced where higher frequencies are dampened as they usually have a smaller magnitude in comparison to lower frequencies. This is noticeable in the top of the MFCC where there is not as much intensity as in the baseline MFCC.