

AN ACOUSTIC ANALYSIS ON PIRITH SAJJAYANA

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“Pirith” in Sinhala, “Paritta” in Pali and “Parithrana” in Sanskrit refers to the chanting (Sajjayana) of Buddhist scriptures known as “Sutra” which is a tradition in mainly the Eastern part of the world. In this study the acoustic properties of Pirith Sajjayana based on two spectral properties namely, the spectral centroid and pitch have been studied. The pitch is the frequency of an audio signal where the maximum energy is concentrated. Spectral Centroid represents the spectral richness of an audio signal. It is a known fact that, traditionally in Pirith Sajjayana, the variation of pitch is kept at minimum due to a fundamental concept in Buddhism. Therefore, in this study the variation of pitch (Standard deviation Of Pitch-SOP) and variation of the spectral centroid (Standard deviation Of Spectral Centroid - SOSC) are used for the comparison. Audio samples from 40 Pirith Sajjayana belonging to different genres have been recorded in raw audio format at a sampling frequency of 44100 Hz. Then each of the prescribed audio samples was divided into one second segments and the pitch and spectral centroid of each segment were calculated using a computer. Then the SOP and SOSC of each audio signal were calculated and plotted onto a feature space. The results indicated that different genres of Pirith Sajjayana are mapped to different regions in the feature space. It can be observed that the features (SOSC vs SOP) corresponding to pirith form mainly two clusters. It can be visually observed that SOSC of most of the Pirith Sajjayana are higher and the rest of the Pirith Sajjayana SOP is higher. However certain Pirith Sajjayanas can be found to be outlier regions. Such outliers also analyzed to find out special properties from a musical perspective. Further this study compares Pirith Sajjayana with other religious chants. The research concludes that the acoustical analysis of Pirith Sajjayana can be used to understand different genres of Pirith Sajjayana based on their acoustical properties.

Keywords: Pirith Sajjayana, Spectral Centroid, Standard Deviation, Pitch, Spectral Properties.

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