



ANALYSIS OF “ANGULIMALA SUTTA” USING VOICED TO UNVOICED RATIO AND FORMANT VARIATIONS

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Pirith is a style of intoned recitation based on phonological properties of the Pali language and it is considered as a protective doctrine preached by the Lord Buddha. The aim of this study is to analyze Pirith using parameters like formant frequencies and energy variation using computer-aided methods and identify the special characteristics and patterns. In this study, two methods were used to identify special characteristics of Angulimala Sutta. First method is to calculate voiced to unvoiced ratio; divides the speech sample into several segments depending on the length of time series and counts number of frames less than reference amplitude as unvoiced and others as voiced. Results indicate around 96% of frames are voiced frames. Speech samples were further analyzed using zero crossing rate and energy content of the signal. The second method is based on analyzing formant frequencies. Voice source produces a harmonic series, consisting of the fundamental frequency (f_0) and a large number of harmonic frequencies which are called as formants (F). The values of the frequencies of F1 and F2 are sufficient to distinguish most vowel contrasts in most languages. The results suggest that higher number of vowels concentrate around the frequency range of F1, 500 Hz to 750 Hz and F2, 1250 Hz to 1500 Hz.

Keywords: *Pirith, Formant frequencies, Angulimala Sutta, voiced to unvoiced ratio, Zero crossing rate*