



## FEATURES OF SLEEP APNEA RECOGNITION AND ANALYSIS

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*Abstract- Sleep apnea is a growing sleep disorder issue and estimate to affect 7% of the adult population in Malaysia. In this study, the electrical activity of the brain is studied using Electroencephalogram (EEG). The data obtained was then decomposed using three methods; Empirical Mode Decomposition (EMD), Bivariate EMD and finally Ensemble EMD. The Index of Orthogonality (IO) was obtained which shows EMD performed the most poorly, EEMD the best and Bivariate in between. The performance of EMD greatly improves when the number of samples was greatly decreased and very high peaks and more complex parts of the signal were excluded in the analysis. Segmentation was also conducted and the segmentation error revealed when an Event Related Potential (ERP) has happened which is when apnea occurred.*

**Index terms:** Sleep apnea, Electroencephalogram (EEG), Empirical Mode Decomposition (EMD), Bivariate EMD, Ensemble EMD