**Abstract**

The Electrocardiogram (ECG) is of significant importance in assessing patients with abnormal activity in their heart. ECG Recordings of the patient taken for analyzing the abnormality and classify what type of disorder present in the heart functionality. There are several classes of heart disorders including Premature Ventricular Contraction (PVC), Atrial Premature beat (APB), Left Bundle Branch Block (LBBB), Right Bundle Branch Block (RBBB), Paced Beat (PB), and Atrial Escape Beat (AEB).To analyze ECG various feature extraction methods and classification algorithms are used. The proposed work employed discrete wavelet transform (DWT) in feature extraction on ECG signals obtained from MIT-BIH Arrhythmia Database. The Machine Learning Techniques, Support Vector Machine (SVM) and Extreme Learning Machine (ELM) have been used to classify four types of heart beats that include PVC, LBBB, RBBB and Normal. The Performance of the classifiers are analyzed and observed that ELM-Radial Basis Function Kernel taken less time to build model and out performs SVM in predictive accuracy.