

Detection of Cardiac Arrhythmia Using Principal Component Analysis and Xgboost Model

Authors : Sujay Kotwale, Ramasubba Reddy M.

Abstract : Electrocardiogram (ECG) is a non-invasive technique used to study and analyze various heart diseases. Cardiac arrhythmia is a serious heart disease which leads to death of the patients, when left untreated. An early-time detection of cardiac arrhythmia would help the doctors to do proper treatment of the heart. In the past, various algorithms and machine learning (ML) models were used to early-time detection of cardiac arrhythmia, but few of them have achieved better results. In order to improve the performance, this paper implements principal component analysis (PCA) along with XGBoost model. The PCA was implemented to the raw ECG signals which suppress redundancy information and extracted significant features. The obtained significant ECG features were fed into XGBoost model and the performance of the model was evaluated. In order to valid the proposed technique, raw ECG signals obtained from standard MIT-BIH database were employed for the analysis. The result shows that the performance of proposed method is superior to the several state-of-the-arts techniques.

Keywords : cardiac arrhythmia, electrocardiogram, principal component analysis, XGBoost

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