ARRHYTHMIAS CLASSIFICATION WITH MLP NEURAL NETWORK AND STATISTICAL ANALYSIS

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Abstract

This paper presents a classification system for cardiac arrhythmias using Artificial Neural Network (ANN) with back propagation algorithm. Classifiers based on Multi Layer Perceptron (MLP) and Discriminant analysis study using XLSTAT statistical classifier software are thoroughly examined on the UCI Machine Learning Data Base for cardiac arrhythmias. For this multi class classification we used one against rest method to classify 16 different arrhythmias which include normal sinus rhythm, Ischemic changes, myo infarction, sinus bradycardia, sinus tachycardia, premature ventricular contraction, supraventricular premature contraction, bundle branch block, atrial fibrillation, atrial flutter, left ventricular hypertrophy and atrioventricular block. From exhaustive and careful experimentation, we reached to the conclusion that proposed MLPNN classifier ensures true estimation of the complex decision boundaries, remarkable discriminating ability and does outperform the statistical discriminant analysis and classification tree rule based prediction. Taking the cardiologist's as gold standard we aim to minimize the difference by means of machine learning tools.