Multiclass support vector machines for classification of ECG data with missing values

ABSTRACT

The article presents an experimental study on multiclass Support Vector Machine (SVM) methods over a cardiac arrhythmia dataset that has missing attribute values for electrocardiogram (ECG) diagnostic application. The presence of an incomplete dataset and high data dimensionality can affect the performance of classifiers. Imputation of missing data and discriminant analysis are commonly used as preprocessing techniques in such large datasets. The article proposes experiments to evaluate performance of One-Against-All (OAA) and One-Against-One (OAO) approaches in kernel multiclass SVM for a heartbeat classification problem with imputation and dimension reduction techniques. The results indicate that the OAA approach has superiority over OAO in multiclass SVM for ECG data analysis with missing values.