Using machine learning techniques to differentiate acute coronary syndrome

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Abstract

Background: Acute coronary syndrome (ACS) is an unstable and dynamic process that includes unstable angina, ST elevation myocardial infarction, and non-ST elevation myocardial infarction. Despite recent technological advances in early diagnosis of ACS, differentiating between different types of coronary diseases in the early hours of admission is controversial. The present study was aimed to accurately differentiate between various coronary events, using machine learning techniques. Such methods, as a subset of artificial intelligence, include algorithms that allow computers to learn and play a major role in treatment decisions.

Methods: 1902 patients diagnosed with ACS and admitted to hospital were selected according to Euro Heart Survey on ACS. Patients were classified based on decision tree J48. Bagging aggregation algorithms was implemented to increase the efficiency of algorithm.

Results: The performance of classifiers was estimated and compared based on their accuracy computed from confusion matrix. The accuracy rates of decision tree and bagging algorithm were calculated to be 91.74% and 92.53%, respectively.

Conclusion: The proposed methods used in this study proved to have the ability to identify various ACS. In addition, using matrix of confusion, an acceptable number of subjects with acute coronary syndrome were identified in each class.

Key Words: Acute Coronary Syndrome, diagnosis, machine learning, decision tree, bagging
References