



Using an active learning semi-supervision algorithm for classifying of ECG signals and diagnosing heart diseases

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Abstract: Diagnosis of various heart defects and arrhythmias based on the ECG signals recorded from the patient has greatly appealed to the medical community. Biological signal processing performed by experts in the field has involved many challenges to be able to present a precise model of the recorded signals and to analyze and diagnose defects and arrhythmias based on the extracted features and to classify them into the normal and abnormal classes. It is an issue that has appealed to researcher for years to make the process of precisely diagnosing heart diseases intelligent. An efficient classification method with active and semi-supervised learning for classification of the ECG signal based on the mRMR and PCA feature selection methods has been used in this research. The extracted features include the temporal features, AR, and wavelet coefficients. Finally, the indicators of validity, precision, and sensitivity for this set of selected features have also been evaluated through application of the proposed classifier. The results of simulations in the Matlab software environment suggest that the proposed system has 98.64% validity for diagnosis of 6 class types of ECG. Comparison between the obtained precision and that of the previous research demonstrates the proper performance of the proposed method.

Keywords: classification; ECG signals; active learning; Semi-supervised learning.

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