



CARDIAC HEALTH DIAGNOSIS USING HEART RATE VARIABILITY SIGNALS – A COMPARATIVE STUDY

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ABSTRACT—The electrocardiogram (ECG) is a representative signal containing information about the condition of the heart. The shape and size of the P-QRS-T wave, the time intervals between its various peaks etc. may contain useful information about the nature of disease afflicting the heart. However, these subtle details can not be directly monitored by the human observer. Besides, since bio-signals are highly subjective, the symptoms may appear at random in the time scale. Therefore, the signal parameters, extracted and analyzed using computers, are highly useful in diagnostics. This paper deals with the classification of certain diseases using Artificial Neural Network (ANN), Fuzzy relations and statistical classifier. The heart rate variability is used as the base signal from which certain parameters are extracted and presented to the ANN for classification. The same data is also used for Fuzzy classifier and statistical classifiers. The Fuzzy classifier and statistical classifiers are seen to be correct in about 90% of the test cases, and the radial basis classifier yields correct classification in over 95% of the cases.

Key Words: electrocardiograms, Fuzzy classifier, ANN, HRV, Lyapunov exponent

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