

ASSESSMENT OF ANS USING HRV DATA IN DISEASED CONDITION

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ABSTRACT

Heart Rate Variability (HRV) is defined as the variation in the interval between consecutive heart beats. HRV is a powerful non-invasive tool to diagnose the cardiac diseases and also predicts the impending cardiac diseases. The present work is concentrated on such assessment of ANS using real time data acquired using Lab VIEW and processed using MATLAB. This work is to bring out the status of ANS of particular diseased patients by using HRV data by employing different analyzing techniques. Methodology: The methodology of project is to takeout the ECG data of various subjects having different health condition like healthy, diabetic, pre-diabetic, and hypertensive parameters using Lab VIEW ECG acquisition system and Lab VIEW signal express tool for real time data acquisition, and also data can be download from standard sites like Physionet, MIT-BIH database etc., then signal is manipulated with some pre-processing techniques to extract R-R interval (Inter Beat Interval) data. In next step, HRV feature extraction code yields heart rate variability features by taking text IBI input, both IBI and HRV feature extraction are done using MATLAB R2011a tool by developing an appropriate code for it. The obtained parameters are fed into Alyuda NeuroIntelligence neural network tool to classify data by analyzing it with a suitable network structure to find out condition of patient. The collected real time ECG data are analyzed quantitatively and classified as healthy, diabetic, pre-diabetic or hypertensive data. Lab VIEW data is used for real time data acquisition and MATLAB tool is used for feature extraction and neural networks are used for data classification having user friendly feature with more accurate results. This study yields valuable results in the field of HRV to analyze, and for efficient classification of data of different diseased and healthy subjects. The work reveals that there is prominent decrease in HRV due diabetes and ageing; hence results in parasympathetic neuropathy. As tested in our laboratory conditions the obtained results are having nearly 99% accuracy.

KEYWORDS: HRV, Lab View Tool, MATLAB, Neurintelligence Network, Sympatho-Vagal Balance, Autonomic Nervous System