Program-Based Interpretation of Electrocardiograms to Diagnose Cardiac Conditions

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Heart disease is one of leading causes of death in the United States. Electrocardiograms (ECG or EKG) are often used to diagnose cardiac conditions. The actual output from an ECG is not easy to interpret, given that there are twelve leads and many patterns in the output that may be indicative of problems. It requires a person who is specially trained to be able to detect these problems. It is quite possible that a person could overlook something, or make an error in interpreting the ECG. This paper presents ECG-Interpret, a program written to interpret the patterns present in an ECG to diagnose various cardiac conditions. The program was developed in Visual Basic, and uses the characteristics of the ECG as input. The knowledge needed to diagnose cardiac conditions is encoded in the form of production rules. Using a forward-chaining approach, the program utilizes the inputs to detect any abnormalities in the ECG and specify the underlying cardiac condition. The program was tested out using 46 actual ECGs. The accuracy of the program was 90.5%, representing correct diagnosis in 57 out of 63 possible instances of cardiac conditions.

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