

Cardiovascular Disease Prediction based on Physical Factors using Quantum Neural Network

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This Paper presents the intelligent system for prediction of Cardiovascular Disease. The diagnosis of Cardiovascular Disease is tedious task for a Medical Practitioner. The correct presumptions are most important for detection of heart disease which is caused due to various factors or symptoms. In order to make it effective and reliable this system automatically learns and extracts the significant patterns of the heart disease using the Novel approach of Quantum Neural Network. Our System can predict the Cardiovascular Disease at its primary stage using the Physical, physiological and clinical risk Factors, very efficiently by Quantum Neural Network (QNN). The prediction with QNN shows better results than other available algorithms using same parameters.

Keywords : Atherosclerosis, Myocardial Infarction, Physical Risk Factors, Quantum Neural Network.

1. INTRODUCTION

Cardiovascular disease is the foremost cause of mortality and disability in most of the countries. Deaths due to cardiovascular disease have declined over time in developed nations [1, 2]. Although these data are encouraging, there is a lack of knowledge about national trends in the risk factors that lead to cardiovascular disease. The future incidence of cardiovascular disease can be determined through knowledge of risk factors and their trends in younger populations in whom clinically evident heart disease has not yet developed. By the time that heart problems are detected, the underlying cause (atherosclerosis) is usually quite advanced, having progressed for decades. There is therefore increased emphasis on preventing atherosclerosis by modifying risk factors, such as healthy eating, exercise and avoidance of smoking. The importance of risk factors is further underscored by the substantial reductions in atherosclerosis that can be achieved by primary prevention [3].

Previous studies shows that people of South Asian origin have higher rates of this disease than people of European origin, a finding that cannot be explained by differences in conventional cardiovascular risk factors, such as smoking, raised blood pressure, diabetes, or high cholesterol [4,5].

2. RELATED WORK

Many risk assessments are based on relatively simplistic strategies that have a clinician identify whether a "risk factor" is present. However, national guidelines advocate the use of scoring systems for CHD risk. Sophisticated methods like the Framingham Risk Score (FRS), the European Systematic Coronary Risk Evaluation (SCORE), the Sheffield risk and treatment table allow calculation of an individual's risk as a function of the patient's values on selected established coronary heart disease risk factors [6]. Listed below are the variables used for risk score computation by the different models used:

5. CONCLUSIONS

The proposed work shows that the prediction of risk from cardiovascular diseases gives best results based on physical factors. The result generated by this system has been evaluated and validated on data of patients with the Doctor's diagnosis (predictions). This proposed system will help the doctors to plan for a better medication and provide the patient with early diagnosis as it performs reasonably well even without retraining. The QNN has been trained and tested after optimizing the input parameters. The overall predictive accuracy obtained was 98% . Data Showing Prediction accuracy of Random Testing on different Experimental values has been given in (Table 6). Hence the proposed system will work as a significant tool for doctors/ practitioners.

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