

HYBRID MACHINE LEARNING APPROACH TO IDENTIFY CAORONARY DISEASES USING FEATURE SELECTION MECHANISM

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ABSTARCT:

Coronary illness can be treated as one of the major causes for mortality globally. On-time and Precise conclusion on the type of disease is significant for therapy and breakdown expectancy. Research scientists are working rigorously in their respective fields to reduce the death rate. The fundamental point of our proposed work is to build up a hybrid methodology using genetic algorithm (GA) with (RBF) radial basis function (GA-RBF) for the detection of coronary sickness with increased accuracy using the feature selection mechanism. The proposed system performance achieved an accuracy of 85.40% using 14 attributes, and the prediction accuracy increased to 94.20% with nine characteristics where the functionality of the proposed system performed much better after attribute reduction.

Key words: RBF network, genetic algorithm, attribute selection, heart disease

INTRODUCTION:

Coronary artery disease, also called CAD, is a condition that affects your heart. It is the most common heart disease in the United States. CAD happens when coronary arteries struggle to supply the heart with enough blood, oxygen and nutrients[1]. Cholesterol deposits, or plaques, are almost always to blame. Coronary heart disease is the term that describes what happens when your heart's blood supply is blocked or interrupted by a build-up of fatty substances in the coronary arteries[2]. Over time, the walls of your arteries can become furred up with fatty deposits. What is coronary heartdisease Wikipedia? [3]

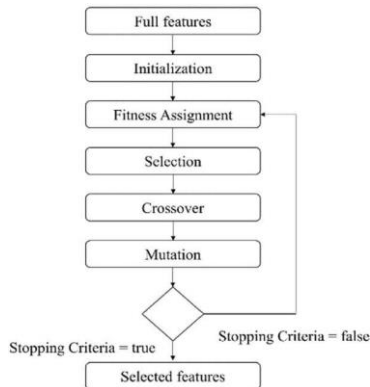
Coronary artery disease, also called coronary heart disease, is a heart disease. ("Coronary" means "the blood vessels of the heart".) Coronary heart disease causes plaque to build up inside the coronary arteries. This causes the coronary arteries to become narrower [4]. Coronary arteries: The vessels that supply the heart muscle with blood rich in oxygen. They are called the coronary arteries because they encircle the heart in the manner of a crown. The word "coronary" comes from the Latin "corona" and Greek "koron" meaning crown [5]. Coronary heart disease (CHD) is when your coronary arteries become narrowed by a build-up of fatty material within their walls [6]. These arteries supply your heart muscle with oxygen-rich blood. CHD is sometimes called ischaemic heart disease [7].

PROBLEM STATEMENT:

Coronary artery disease is caused by plaque buildup in the wall of the arteries that supply blood to the heart (called coronary arteries) [8]. Plaque is made up of cholesterol deposits. Plaque buildup causes the inside of the arteries to narrow over time. This process is called atherosclerosis. These must be classified and analyzed rigorously to treat the disease correctly [9]. Machine learning algorithms will really help the users to detect them effectively.

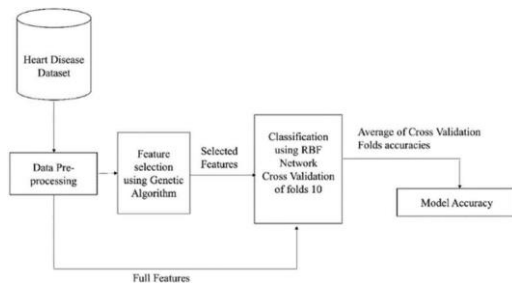
EXISTING SYSTEM:

The vulnerable atherosclerotic plaque is called a "high-risk" or "thrombosis-prone" plaque [9]. Major criteria to characterise such plaques include the presence of active inflammation (monocyte, macrophage or T-cell infiltration), a thin inflamed fibrous cap (<65 µm) covering a lipid-rich necrotic core (>40% of the total volume of the plaque), the presence of endothelial denudation with superficial platelet aggregation and the presence of haemodynamically significant stenosis (>90%) [10]. This has led the users to go for traditional methods to detect the heart disease. But these methods could not be able to improve the performance of the system [11].



PROPOSED SYSTEMS:

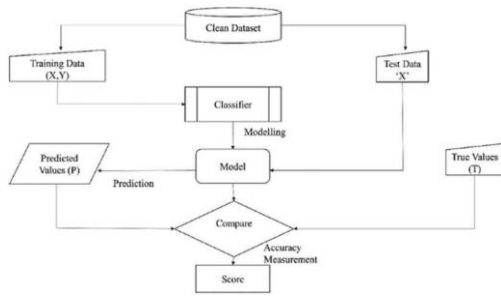
The proposed system was able to achieve an accuracy of 80%. The concept of an effective hybrid learning classifier with a feature selection approach was proposed [12]. The author applied a Genetic algorithm with a Radial basis function to achieve their study goal.



PROCESS AND WORK FLOW:

Coronary Artery Disease (CAD) Coronary artery disease is caused by plaque buildup in the wall of the arteries that supply blood to the heart (called coronary arteries). Plaque is made up of cholesterol deposits. Plaque buildup causes the inside of the arteries to narrow over time. The staging system describes patients based on either the total plaque volume or percent atheroma volume, which is the proportion of arterial walls occupied by plaque. Stages are defined as normal (no plaque), mild, moderate, and severe plaque. The coronoid process of the ulna is a triangular process projecting forward from the anterior proximal portion of the ulna. Upper extremity of left ulna. Lateral aspect.

The classic signs and symptoms of a heart attack include crushing chest pain or pressure, shoulder or arm pain, shortness of breath, and sweating. Women may have less typical symptoms, such as neck or jaw pain, nausea and fatigue. Some heart attacks don't cause any noticeable signs or symptoms. The proposed approach will mitigate the effect of the decease and detecting it simplified much.



RESULTS:

The suggested model generated results of 96.75% on the Mendeley Data Centre's cardiovascular disease dataset, 93.39% on comprehensive dataset, and 88.14% on the Cleveland dataset. Doppala et al. (2021), Presented a coronary artery disease which is leading death cause of the recent era. An accurate and timely diagnosis is critical to the success of treatment and the time it will take for the illness to break down.

CONCLUSION:

As mentioned, one of the most common chronic diseases and causes of adult death worldwide is heart disease. According to the Health Announcement, Medical Education Department: 33 to 38% of deaths in the country are due to cardiovascular diseases, and Iran has the highest rate of heart death in the world. Evidence for lifestyle changes shows that the prevalence of the Coarany disease.

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