



An Experimental Investigation Towards the Detection of Cardiovascular Disease at an Early Stage by Employing Techniques of Machine Learning and Deep Learning.

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ABSTRACT:

Human body prioritizes the heart as the second most important organ after the brain. Any disruption in the heart ultimately leads to disruption of the entire body. Being the members of modern era, enormous changes are happening to us on a daily basis that impact our lives in one way or the other. A major disease among top five fatal diseases include the heart disease which has been consuming lives worldwide. Therefore, the prediction of this disease is of prime importance as it will enable one to take a proper and needful approach at a proper time. Data mining and machine learning are taking out and refining of useful information from a massive amount of data. It is a basic and primary process in defining and discovering useful information and hidden patterns from databases. The flexibility and adaptability of optimization algorithms find its use in dealing with complex non-linear problems. Machine Learning and deep learning techniques find its use in medical sciences in solving real health-related issues by early prediction and treatment of various diseases. In this paper, five machine learning algorithms are used and a deep learning algorithm is used which are then compared accordingly based on the evaluation of performance. The primary aim of this research study is to analyze comparatively the various machine learning algorithms and a deep learning algorithm for heart disease prediction. The various algorithms used for the study are: Support Vector Machine (SVM), Linear Regression (LR), Naïve Bayes (NB), Decision Tress (DT), Artificial Neural Networks (ANN) and Convolutional neural networks (CNN). After analysis, CNN outperforms over other algorithms with a testing accuracy of 98.24%.

DOI Number: 10.14704/nq.2022.20.13.NQ88351

Neuro Quantology 2022; 20(13):2820-2829

Introduction:

The muscular organ known as the heart may be found in the middle of the chest, and it has a small leftward tilt. It transports all of the blood that is depleted of oxygen to the lungs, where it is transformed into blood that is rich in oxygen and the body exhales carbon dioxide [1]. After that, the oxygenated blood is sent to the rest of the body via the lungs through the circulatory system. The heart circulates approximately 72,000 liters of blood throughout the body in a 24-hour period, and it pulses 3 billion times [1]. The heart's job is not limited to just pumping blood, however; it also has to circulate other fluids. These fluids include nutrients and hormones that are created by the body's tissues.

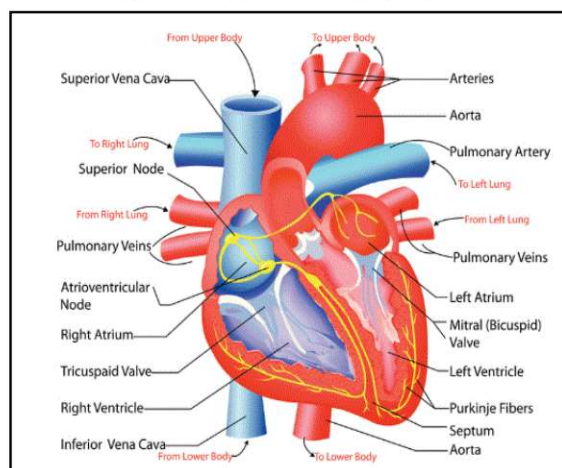


Fig 1: Anatomy of Heart

