**heart disease prediction and identification**

**with deep learning AND neural networks**

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Heart-related diseases are among the most widely recognized reasons for death around the world. Patients are frequently asymptomatic until a deadly occasion occurs, and in any event, when they are under perception, a prepared workforce is required to recognize a heart abnormality. Somewhat recently, there has been expanding proof of how deep learning can be utilized to recognize such oddities, because of the accessibility of Electrocardiograms (ECG) in computerized design. New advancements in innovation have permitted us to take advantage of such information to fabricate models ready to dissect the examples in the event of heartbeats, and spot abnormalities from them. In this work, master cardiologists across various clinics and nations, and can recognize 7 sorts of signs: Typical, AF, Tachycardia, Bradycardia, Arrhythmia, Other, or Boisterous.

Determining heart illness has become a troublesome clinical errand in the current clinical examination. This finding relies upon the point-by-point and exact examination of the patient's clinical test information on a singular's well-being history. The huge improvements in the field of profound learning look to make astute mechanized frameworks that help specialists both to anticipate and to decide the illness with the web of things with Deep learning. Certainty adjustment is an especially important issue in a medical care setting like the one tended to in this composition: when a neural network model makes an expectation, it is vital that this result can be relied upon.

The Deep learning algorithm will be applied in the prediction of heart disease with different types of attributes with the dataset.

**Project Execution Plan:**

The objective of heart disease identification with deep learning is to detect the heart disease in the early stage itself with the available attributes. In this work, the dataset containing heart disease will be taken into consideration. The pre-processing will be applied to the dataset and the noisy and null value data will be removed from the dataset. After the data will be analyzed and visualized for further processing. The Deep learning algorithm will be chosen to make the prediction.

The dataset will be divided into two parts. The first part of the dataset is 70% taken to provide training to the Deep learning algorithm and the remaining 30% of data is taken to the testing part.

**Contribution :**

Deep learning will be the python-based application that contributes to finding out the heart disease early stage. The project will contribute to the field of healthcare by using deep learning to detect abnormalities in electrocardiograms, which can help in the early diagnosis and treatment of heart-related diseases. This can potentially improve patient outcomes and reduce the mortality rate associated with these conditions.

The involvement of expert cardiologists from various clinics and countries in the project indicates that the model is being developed with the input of medical professionals with real-world experience in diagnosing and treating heart diseases. This can help ensure that the model is accurate and relevant to clinical practice.

The project also addresses the issue of confidence calibration, which is crucial in medical settings where accurate predictions are essential for patient safety and well-being. By developing a model that produces reliable predictions, the project aims to increase trust in automated systems and improve the efficiency of clinical decision-making.

Overall, the project's contribution lies in its potential to improve the accuracy and efficiency of heart disease diagnosis, potentially leading to better patient outcomes and reduced healthcare costs.

**Evaluation:**

The project evaluation can be tested with the deep learning algorithm prediction results. Since the Deep learning algorithm will be used to predict the disease, the accuracy of the algorithm result will be helpful to evaluate the results. The accuracy score of the algorithm in heart disease identification helps to evaluate the dataset.

The application will be developed with Google Colab Python Tool as the project can be directly executed in any type of computer system with an internet connection. There is no need for any specific software to be installed in the user system. The Colab Tool helps to develop and run the application directly inside the cloud server where the Python library files are installed. The deep learning algorithm libraries are built inside the Colab. It helps the project to use the deep learning algorithm in the finding of heart disease.

**Algorithm:**

Deep LEARNING with neural networks

**Reference:**

**1. CardioXNet: A Novel Lightweight Deep Learning Framework for Cardiovascular Disease Classification Using Heart Sound Recordings** S. B. (Shuvo *et al.*: CardioXNet: Novel Lightweight Deep Learning Framework for CVD Classification vol-9 2021)

**2. An Explainable Transformer-Based Deep Learning Model for the Prediction of Incident Heart Failure (**IEEE Journal Of Biomedical And Health Informatics, Vol. 26, No. 7, July 2022 )

**3.** **Heart Disease Prediction Using Deep Neural Network** (Proceedings of the Fifth International Conference on Inventive Computation Technologies (ICICT-2020) IEEE Xplore Part Number: CFP20F70-ART)

**4. Predicting heart failure using Deep Neural Network (**2020 International Conference on Advanced Technologies for Communications (ATC) ).