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Cardiovascular Disease Long-Term Care Risk Prediction by Claims Data Analysis Using Machine Learning

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ABSTRACT

Heart disease is a major global health concern, especially in predicting cardiovascular issues. Machine learning (ML) and the Internet of Things (IoT) offer new ways to analyze healthcare data. However, current research lacks depth in using ML for heart disease prediction. To fill this gap, we propose a unique method that uses ML to identify key features for better heart disease prediction accuracy. Our model combines various features and classification techniques to achieve an accuracy of 88.7% in predicting heart disease, with the hybrid random forest and linear model (HRFLM) proving particularly effective. This study advances heart disease detection by integrating ML and IoT technologies.

Keywords :- Machine Learning, Internet of Things, HRFLM, Healthcare, Cardiovascular Disease Prediction

I. INTRODUCTION

Coronary disease is a significant global health issue affecting millions worldwide annually. Early detection and timely intervention are vital for improving survival rates and reducing complications. The fusion of Artificial Intelligence (AI) and the Internet of Things (IoT) holds promise in transforming healthcare by enabling more precise and prompt diagnosis of coronary disease. Through data analysis and real-time monitoring, this combined approach empowers healthcare providers with valuable insights into patient health, facilitating informed decision- making and personalized care.

Our project aims to develop a system that uses AI algorithms and IoT technology to detect coronary disease, with the primary objective of enhancing patient outcomes. The healthcare sector is increasingly interested in leveraging AI and IoT technologies, particularly for early detection and prevention of chronic diseases like coronary illness. By harnessing advanced analytics and the vast data from IoT devices, we can create predictive models that identify heart disease early, enabling timely intervention and treatment.

Recent advancements in patient monitoring systems have been substantial. Our system utilizes various sensor data to compute essential parameters such as

ECG, temperature, heart rate, pulse, and blood pressure. Research underscores a rising mortality rate due to heart disease, underscoring the need for an intelligent prediction system to address this trend. Heart disease can have diverse origins, including lifestyle factors and environmental influences. While data mining techniques have been employed to predict heart disease based on parameters like blood pressure, heart rate, and ECG, extracting meaningful insights from extensive clinical data remains a challenge. The heart is fundamental to human life, and maintaining good health relies on its proper function. Our primary aim is to create a comprehensive system for predicting and monitoring coronary disease to support healthcare professionals in delivering timely interventions, ultimately leading to improved health outcomes and enhanced quality of life for patients.

II. Literature Audit

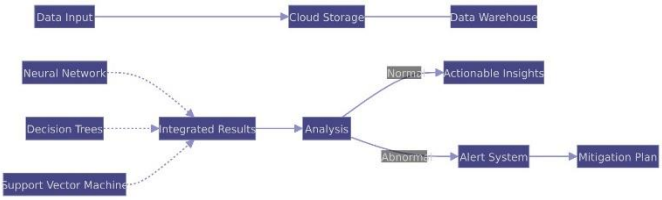
Senthilkumar Mohan and colleagues introduced a hybrid machine learning approach to enhance heart disease prediction accuracy. Their novel method identifies key features to improve cardiovascular prediction by utilizing various machine learning techniques. The model incorporates different feature combinations and established classification methods to process raw data, offering a fresh perspective on heart disease through machine learning analysis.

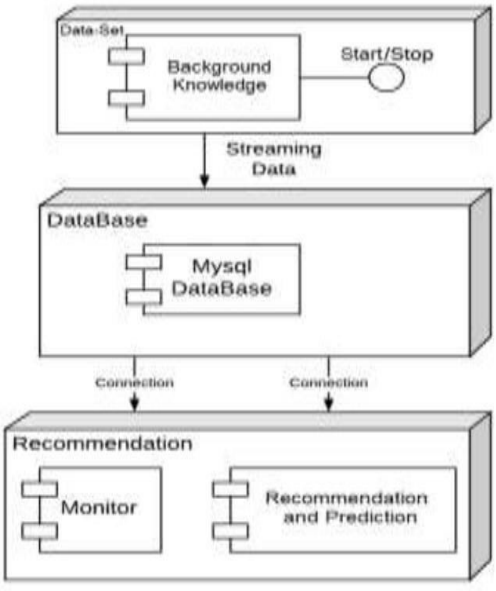
Additionally, Li Yang and colleagues employed various methods to construct a prediction model, continuously monitored using an electronic health record system. They developed a three-year risk assessment prediction model for cardiovascular disease (CVD) based on a large high-risk population in Eastern China.

Later on, Shadman Nashif and team devised a disease prediction system based on cloud technology. They created a continuous monitoring setup using an Arduino microcontroller to track health metrics such as blood pressure, temperature, heart rate, and humidity. This proposed system demonstrates effectiveness in precisely forecasting heart disease and enhancing patient outcomes.

III. System Engineering

The suggested framework is structured into two key phases: training and testing, with the goal of achieving precise disease prediction through AI methods. The accuracy of the classification process significantly hinges on the dataset employed throughout the procedure. Two datasets were formulated for this study: one sourced from IoT devices for heart disease prediction and another derived from an IoT setting. To capture real-time user body data, a variety of sensors were deployed and connected to a microcontroller, which stored the acquired data in a database.





IV. CONCLUSIONS

In conclusion, the integration of AI techniques in disease prediction systems holds significant promise

for enhancing healthcare outcomes. The effectiveness of these systems is closely tied to the quality and relevance of the datasets utilized during training and testing phases. By leveraging IoT devices to collect data for heart disease prediction and environmental factors, researchers can develop more accurate and reliable models. Real-time monitoring using sensors and microcontrollers further improves the precision of disease forecasting. As advancements in technology continue to drive innovation in healthcare, the development of robust AI-driven prediction frameworks offers a pathway to more personalized and effective patient care.

V. REFERENCES

[1]. Youness Khourdifi and Mohamed Bahajm," Coronary illness Expectation and Arrangement Utilizing AI Calculations Improved by Molecule Multitude Streamlining and Insect State Enhancement", Global Diary of Smart Designing and Frameworks, Vol.12, No.1, 2019 DOI: 10.22266/ijies2019.0228.24.

[2]. Shadman Nashif, Md. Rakib Raihan, Md. Rasedul Islam and Mohammad Hasan Imam," Coronary illness Location by Utilizing AI Calculations and a Constant Cardiovascular Wellbeing Observing Framework", DOI: 10.4236/wjet.2018.64057 Nov. 22, 2018 World Diary of Designing and Innovation.

[3]. Li Yang, Haibin Wu, Xiaoqing Jin, and Pinpin Zheng4 et al., "Investigation of cardiovascular illness forecast model in view of arbitrary backwoods in eastern China ", Logical Reports (2020) 10:5245

[4]. S. Mohan, C. Thirumalai, and G. Srivastava, "Powerful Coronary illness Forecast Utilizing Cross breed AI Strategies," in IEEE Access, vol. 7, pp. 81542-81554, 2019, doi: 10.1109/ACCESS.2019.2923707.

[5]. Amin Ul Haq and Jian Ping Li, Muhammad Hammad Memon, Shah Nazir , and Ruinan Sun , "A Half and half Keen Framework Structure for the Expectation of Coronary illness Utilizing AI Calculations", Hindawi Portable Data Frameworks Volume 2018