Heart Disease Prediction

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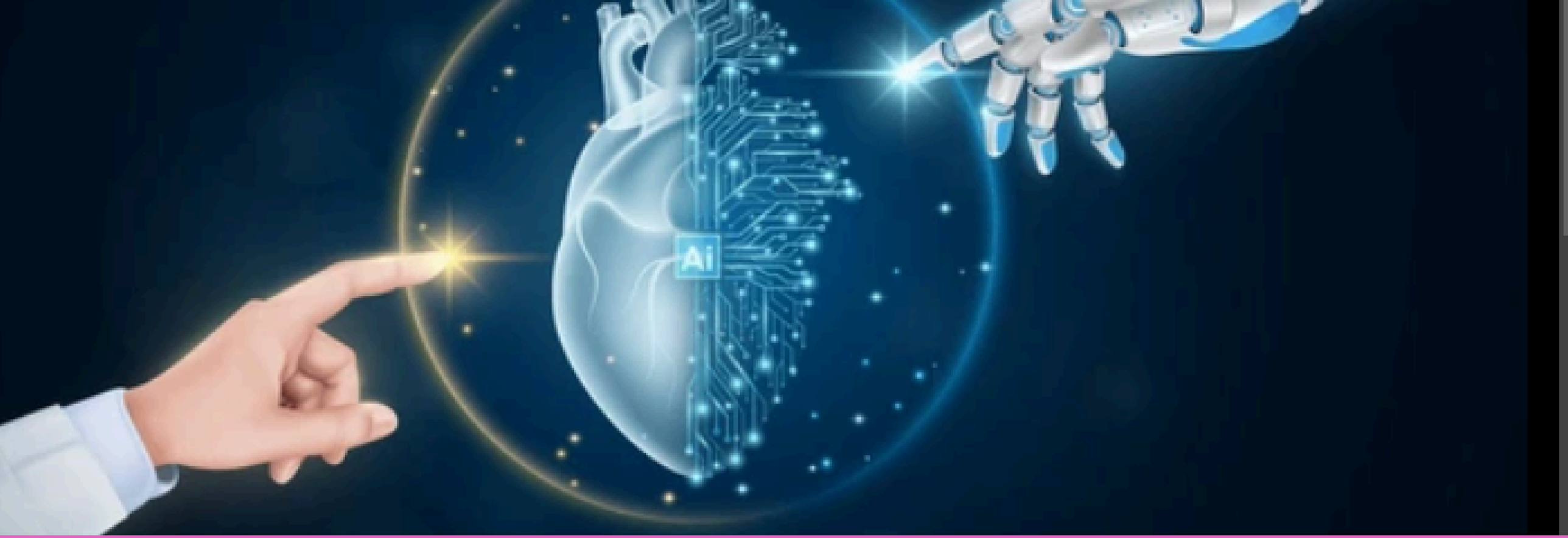
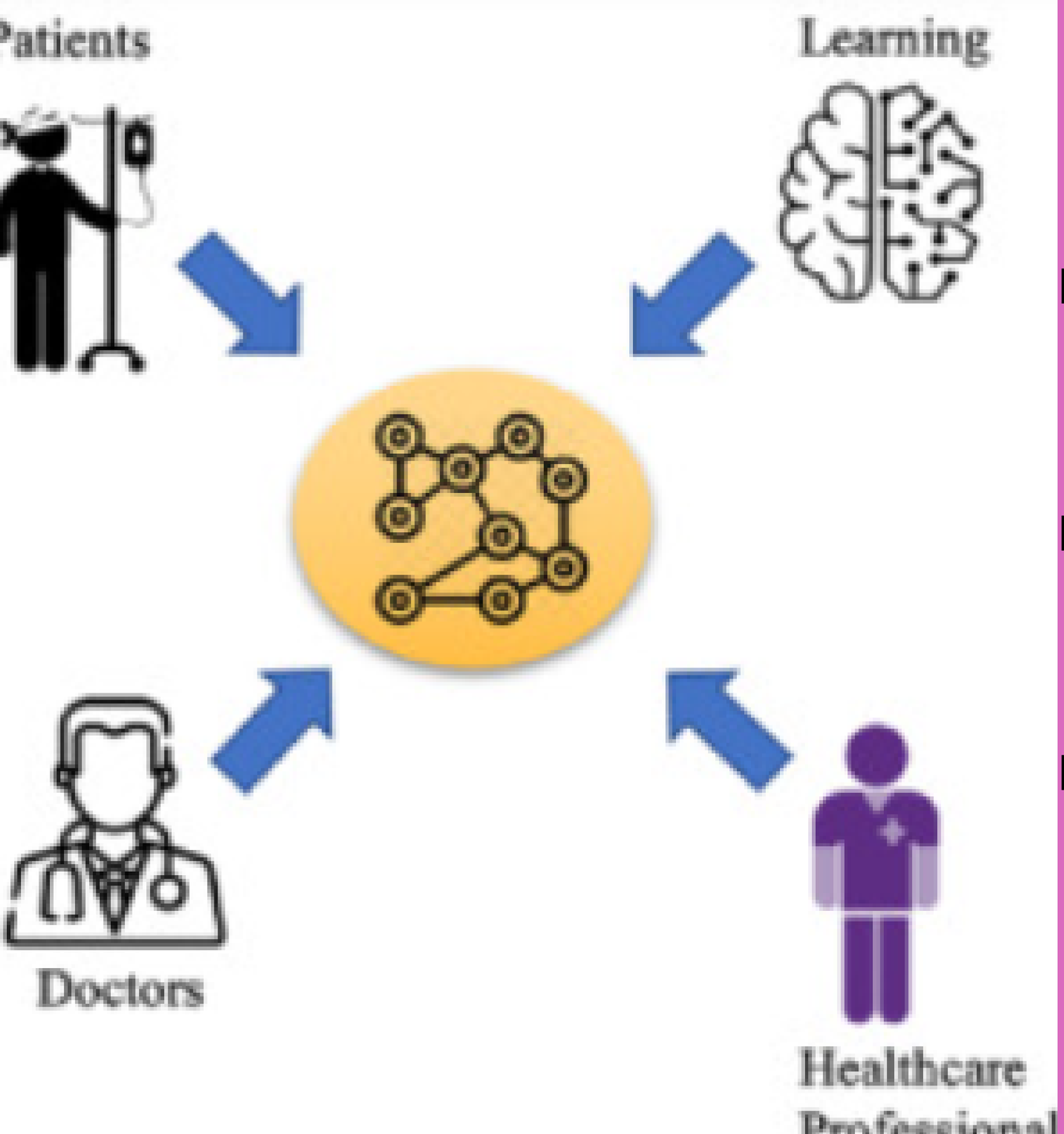


Problem Statement:

- **Given a dataset of patient medical records, can we accurately predict whether a patient is likely to develop heart disease?**

- **This involves building a machine learning model that can analyze patient data (e.g., age, gender, blood pressure, cholesterol levels, smoking habits) and identify patterns associated with heart disease.**



ABSTRACT

Machine Learning

- This project utilizes machine learning techniques to predict heart disease risk, offering valuable insights for preventive care.

Data Analysis

- The system analyzes patient data to identify patterns associated with heart disease development.

Prediction Model

- prediction model is trained on historical data to predict the likelihood of developing heart disease.

- Heart disease refers to a range of conditions that affect the heart, including coronary artery disease, arrhythmias, and heart valve problems.

- Different types of heart disease have distinct causes and symptoms, but they all ultimately impact the heart's ability to function properly.

Existing System

Rule-Based Systems

- These systems use predefined rules and algorithms to predict heart disease based on a limited set of risk factors.

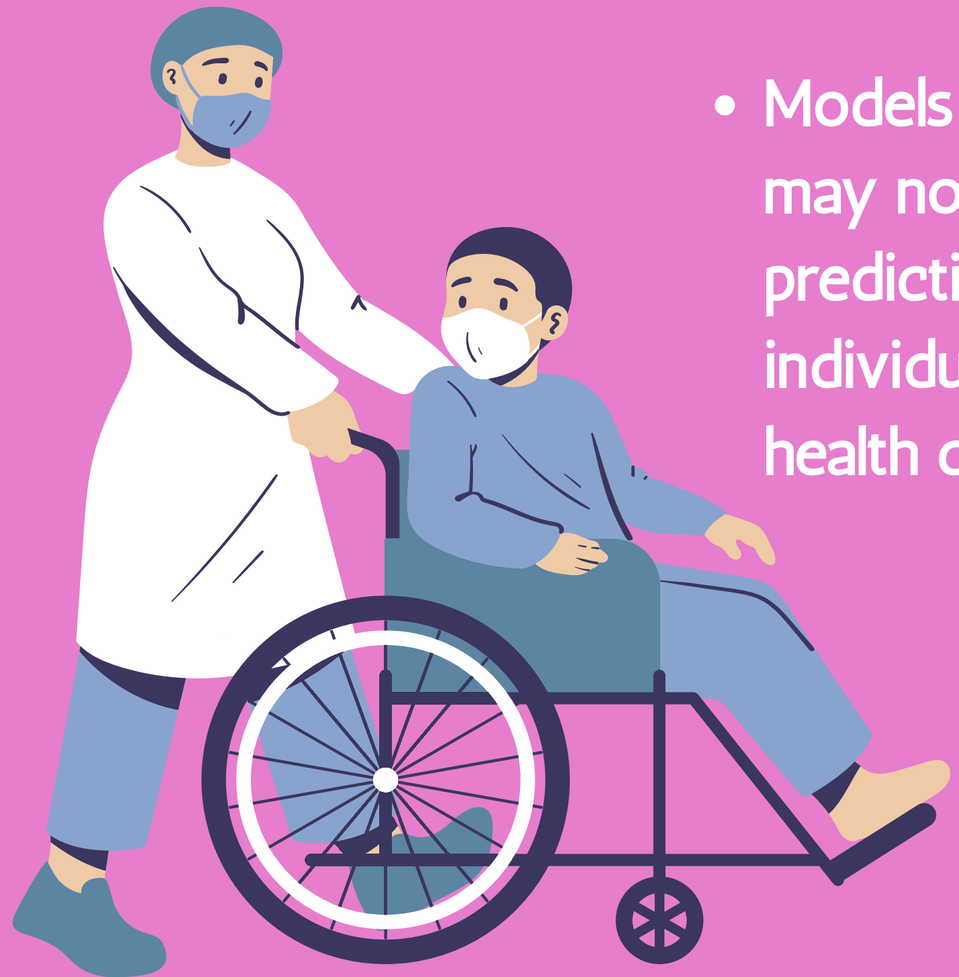
Statistical Models

- Statistical models, like logistic regression, analyze historical data to predict the likelihood of heart disease, but may not capture complex interactions between factors.

Drawback of Existing System

Limited Accuracy

- Rule-based systems and statistical models often fail to account for individual variability and dynamic risk factors.



Lack of Adaptability

- Models trained on static data may not be effective in predicting heart disease in individuals with changing health conditions.

Proposed System

Model Training

- Machine learning models, such as deep neural networks or random forests, are trained on the processed data to predict heart disease risk.

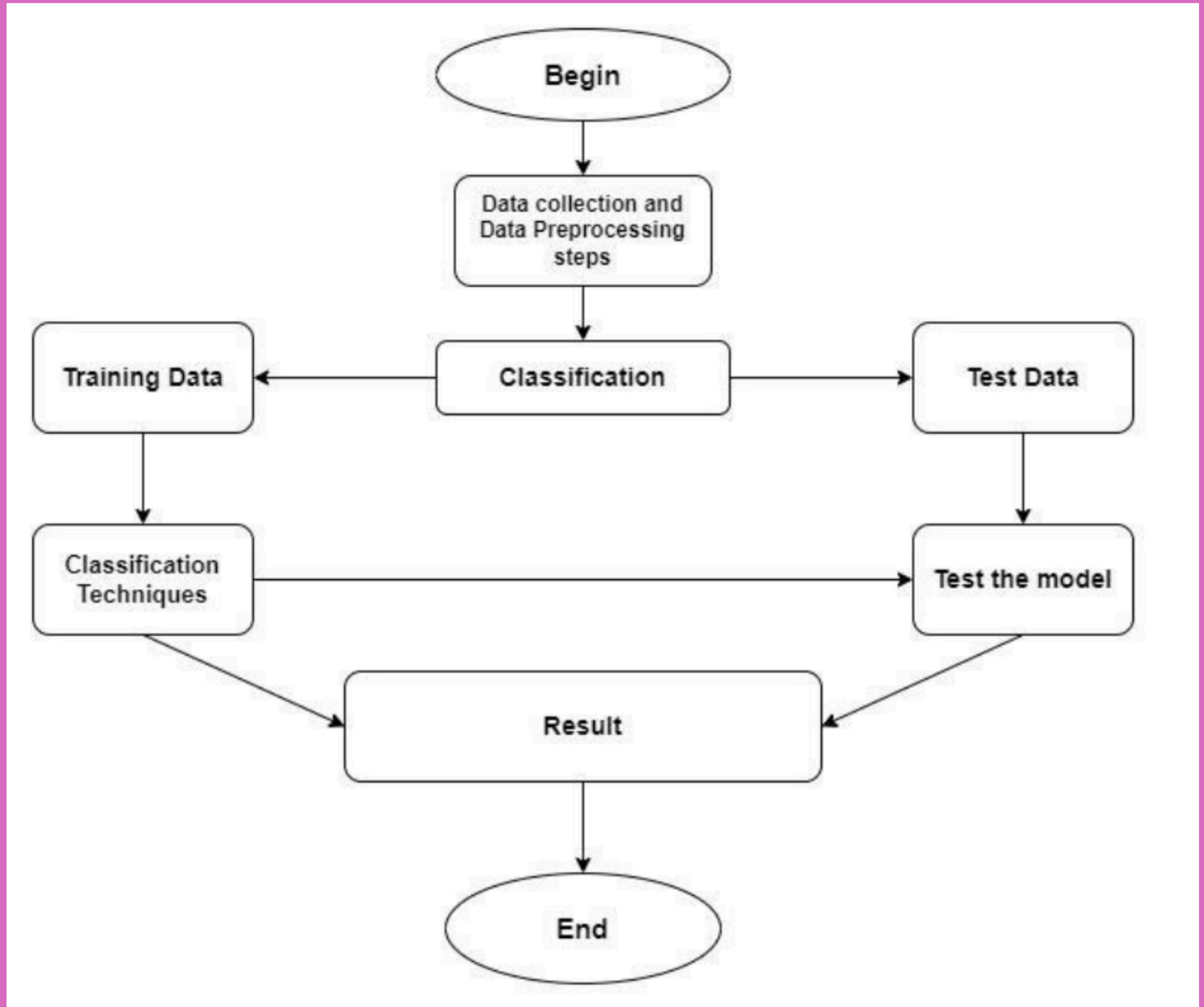
Prediction and Monitoring

- The trained model provides predictions for individual patients, enabling healthcare providers to proactively monitor and manage heart disease risk.

Literature Survey

- Title: Application of Machine Learning Techniques for Heart Disease Prediction
- Title: A Comparative Study of Machine Learning Algorithms for Heart Disease Prediction
- Title: Deep Learning for Heart Disease Prediction: A Review
- Title: Ensemble Learning for Heart Disease Prediction: An Overview
- Title: Data Mining Techniques for Heart Disease Prediction: A Survey
- Title: Heart Disease Prediction Using Machine Learning: A Comprehensive Approach
- Title: Predicting Heart Disease Risk Using Machine Learning: A Case Study
- Title: Heart Disease Prediction Using Support Vector Machines
- Title: Heart Disease Prediction Using Artificial Neural Networks
- Title: Predicting Heart Disease Risk Using Big Data Analytics

ARCHITECTURE DIAGRAM



Data Collection and Preprocessing

- Data Sources
- Gathering relevant data is crucial for accurate prediction models. Electronic health records, patient surveys, and medical databases are valuable sources.

- Data Cleaning
- Raw data often contains errors, inconsistencies, and missing values. Cleaning ensures data quality and consistency for model training.

- Feature Engineering
- Transforming raw data into meaningful features relevant for predicting heart disease is essential. This involves creating new variables and selecting relevant features.

Logistic Regression is a popular and straightforward algorithm often used for heart disease prediction. It's a statistical classification model that predicts the probability of an event occurring. In this case, the event is the presence or absence of heart disease.

- Steps Involved

- Data Collection: Gather relevant medical data, such as age, gender, cholesterol levels, blood pressure, smoking status, and other factors known to influence heart disease.

- Data Preprocessing: Clean and prepare the data by handling missing values, outliers, and converting categorical variables (e.g., gender) into numerical representations.

- Feature Selection: Choose the most relevant features that are likely to have a significant impact on heart disease prediction.
- Model Training: Train the logistic regression model using the prepared data. The model learns the relationship between the features and the target variable (heart disease).
- Model Evaluation: Assess the model's performance using metrics like accuracy, precision, recall, and F1-score.
- Deployment: If satisfied with the performance, deploy the model to make predictions on new, unseen data.

Conclusion

- This project proposes a novel heart disease prediction system that utilizes machine learning and data integration techniques to enhance accuracy and adaptability.

01.

Improved Accuracy

- The system aims to improve prediction accuracy by leveraging advanced machine learning algorithms and incorporating real-time data.

02.

Data Integration

- The proposed system enables the integration of diverse data sources, including electronic health records, wearable sensors, and medical imaging, to provide a comprehensive view of patient health.

03.

Proactive Monitoring

- the system empowers healthcare professionals to proactively monitor and manage heart disease risk, promoting early intervention and improved patient outcomes.

Reference

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Predicting probability of heart disease in patients.

kaggle.com

Thank You for Your Kindness

we express this from the bottom of our hearts