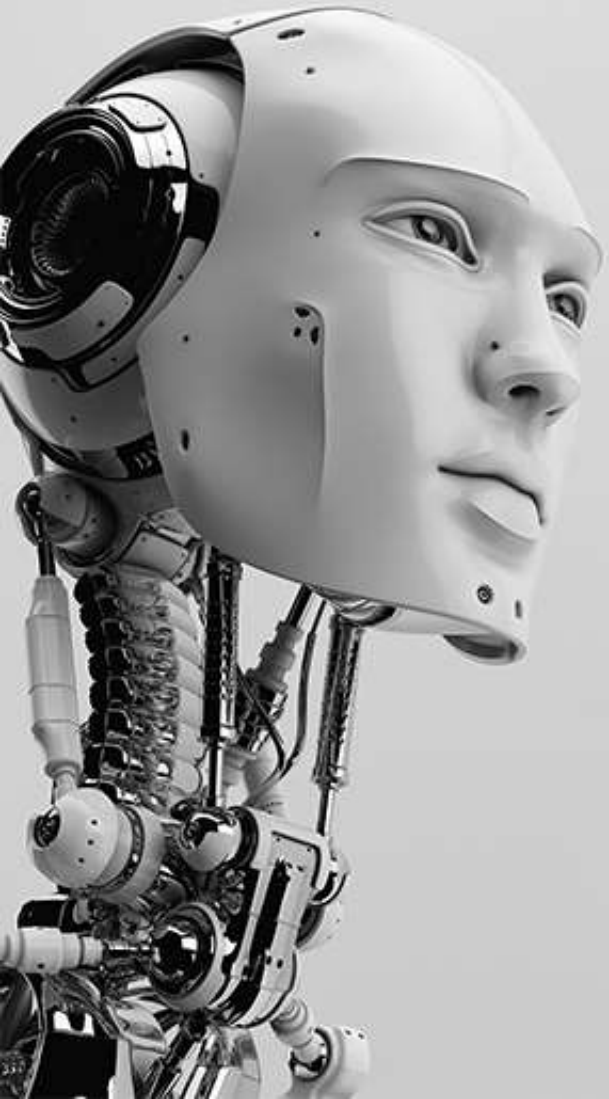


# Department of Artificial Intelligence



## HEART FAILURE PREDICTION SYSTEM

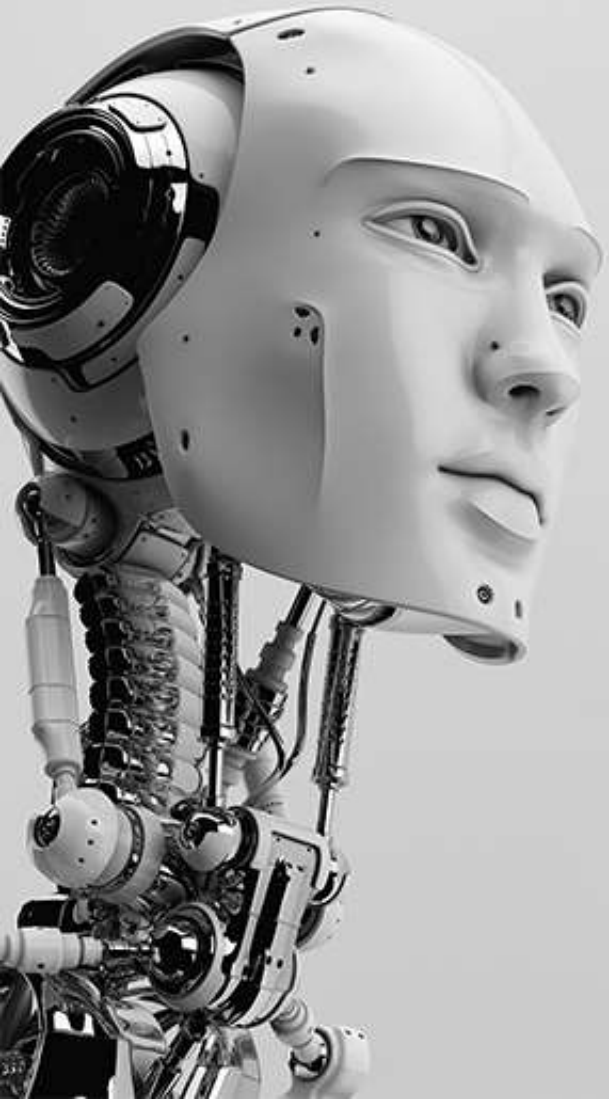
### Guide Details

Dr.R.RAJA GURU  
HOD/AI

### Batch Details

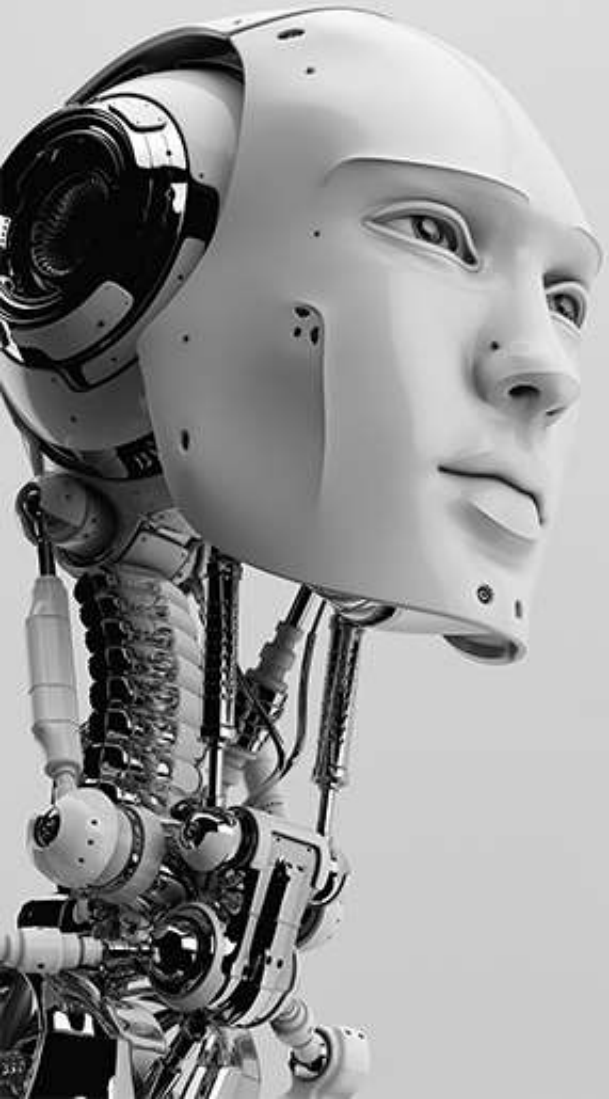
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# ABSTRACT



- Heart disease is one of the most significant problem that is arising in the world today. Cardiovascular disease prediction is a critical challenge in the area of clinical data analysis.
- Hybrid Machine learning (ML) has been showing an effective assistance in making decisions and predictions from the large quantity of data produced by the healthcare industries and hospitals.
- We have also seen ML techniques being used in recent developments in different areas of the Internet of Things (IoT). Various studies give only a glimpse in predicting heart disease with ML techniques. In this paper, we propose a narrative method that aims at finding significant features by applying machine learning techniques that results in improving the accuracy in the prediction of cardiovascular disease.
- The prediction model is proposed with combinations of different features and several classification techniques. We produce an enhanced performance level with an accuracy level of 92% through the prediction model for heart disease with the hybrid random forest with a linear model.

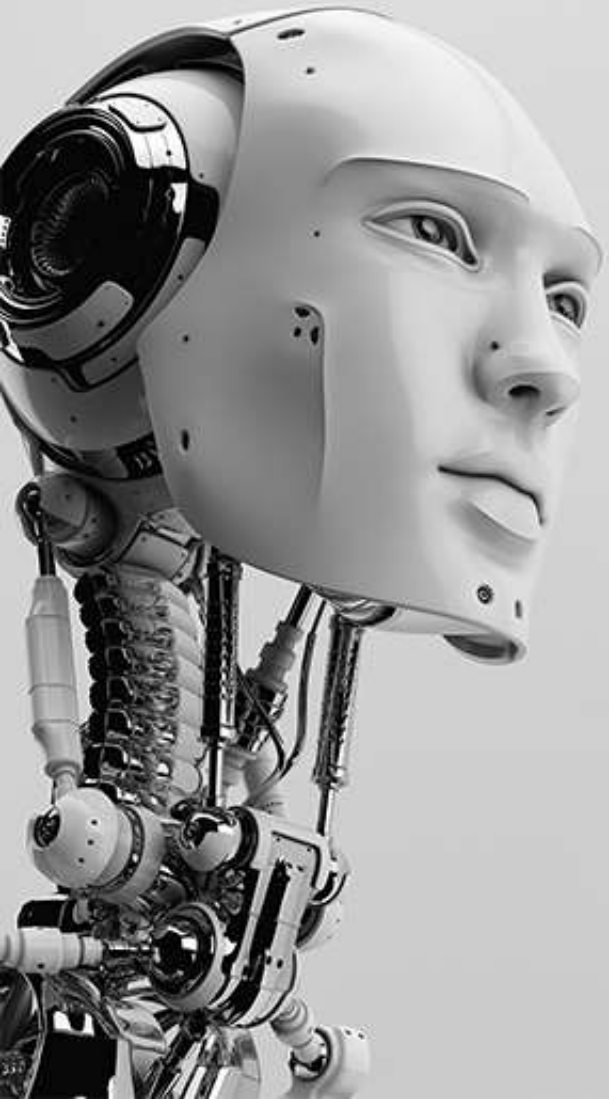
# INTRODUCTION



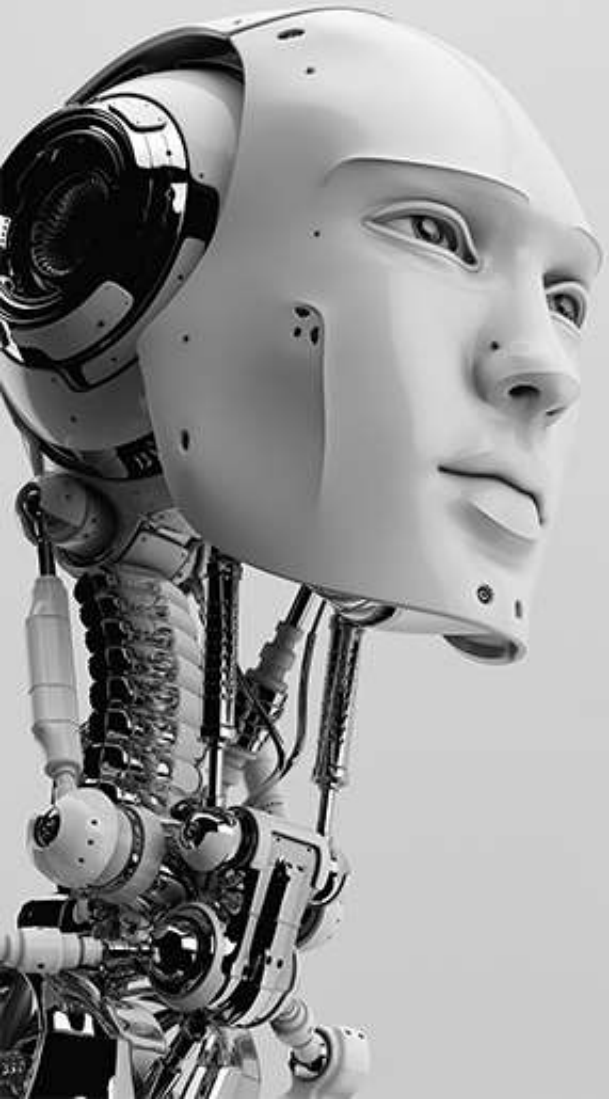
- Heart failure is a serious problem which has a huge impact on people's life. With the accelerated pace of life, increased portion sizes and inactivity, most people always ignore their health. Moreover, because of the environmental deterioration, those factors can lead to the issue of heart failure which can become more and more common in the future. If people did not pay attention to the issue of heart failure, it would finally cause the death. In the past years, different researchers used different methods to collect and analyze data with the aim to predict heart failure.
- These data include electronic health record (EHR) data of patients with heart failure in different hospitals from different countries, Cleveland heart disease dataset, biomedical science datasets from UCI, etc. Based on these data, various methods are being applied, e.g., predicting the survival of patients by utilizing classifiers of machine learning, using supervised deep learning and machine learning algorithms, training a boosted decision tree algorithm, utilizing machine intelligence-based statistical model, random under-sampling method and deep neural network models, using bioinformatic explainable deep neural network (BioExpDNN), etc.

# OBJECTIVE

- Heart failure is a serious condition that affects millions of people worldwide. Early detection and intervention can help to improve patient outcomes and prevent complications. A heart failure prediction system can play an important role in early detection and intervention by providing clinicians with information about a patient's risk of developing heart failure.

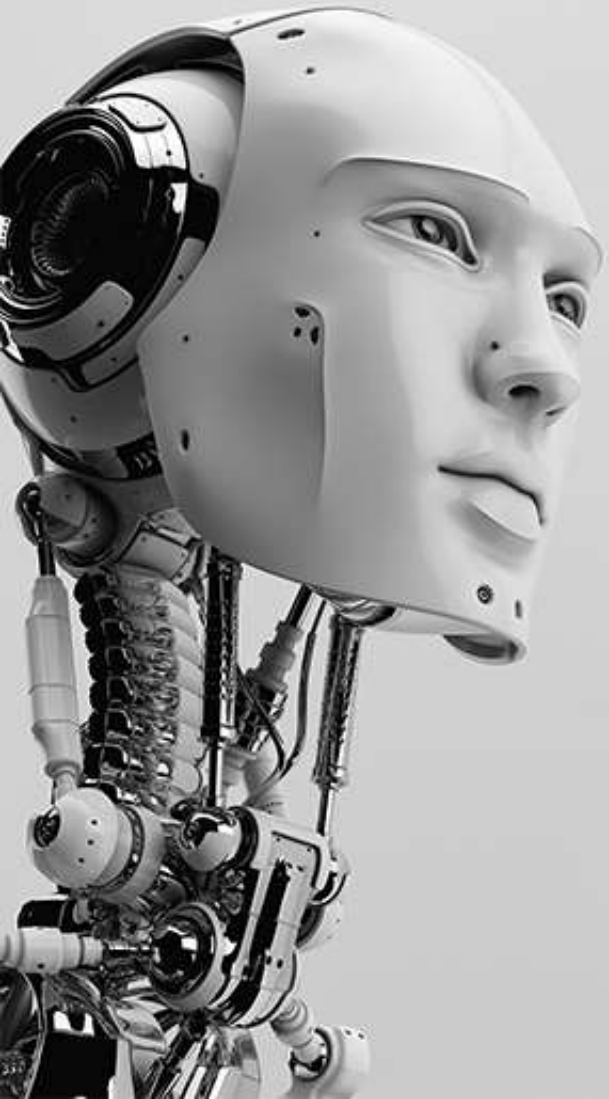


# LITERATURE SURVEY



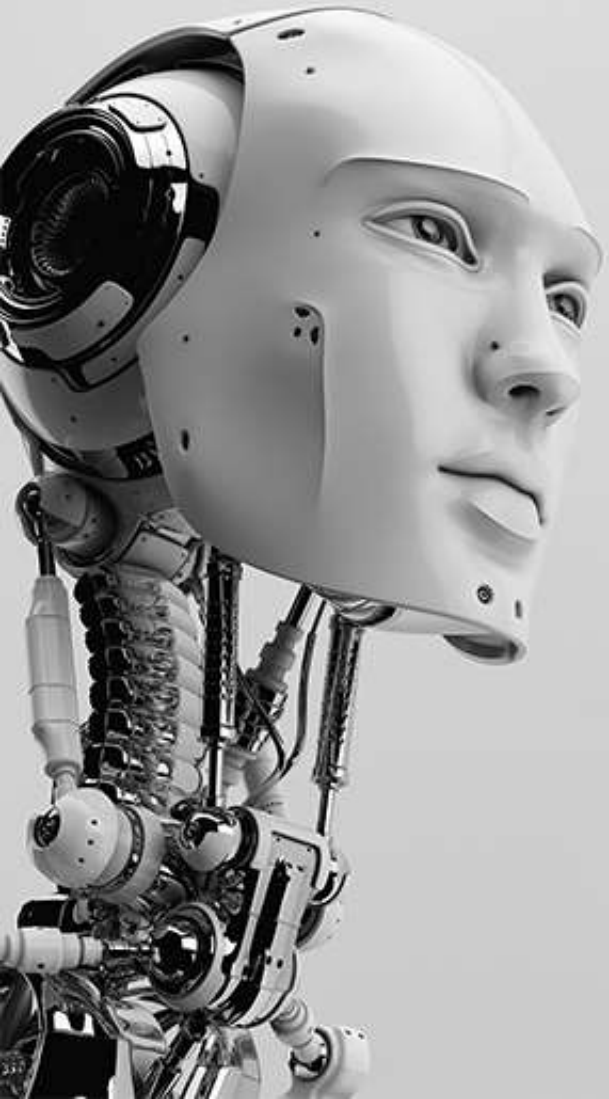
- In recent years, the healthcare industry has seen a significant advancement in the field of data mining and machine learning. These techniques have been widely adopted and have demonstrated efficacy in various healthcare applications, particularly in the field of medical cardiology. The rapid accumulation of medical data has presented researchers with an unprecedented opportunity to develop and test new algorithms in this field. Heart disease remains a leading cause of mortality in developing nations [[12](#),[13](#),[14](#),[15](#),[16](#)], and identifying risk factors and early signs of the disease has become an important area of research. The utilization of data mining and machine learning techniques in this field can potentially aid in the early detection and prevention of heart disease.

# Contd...



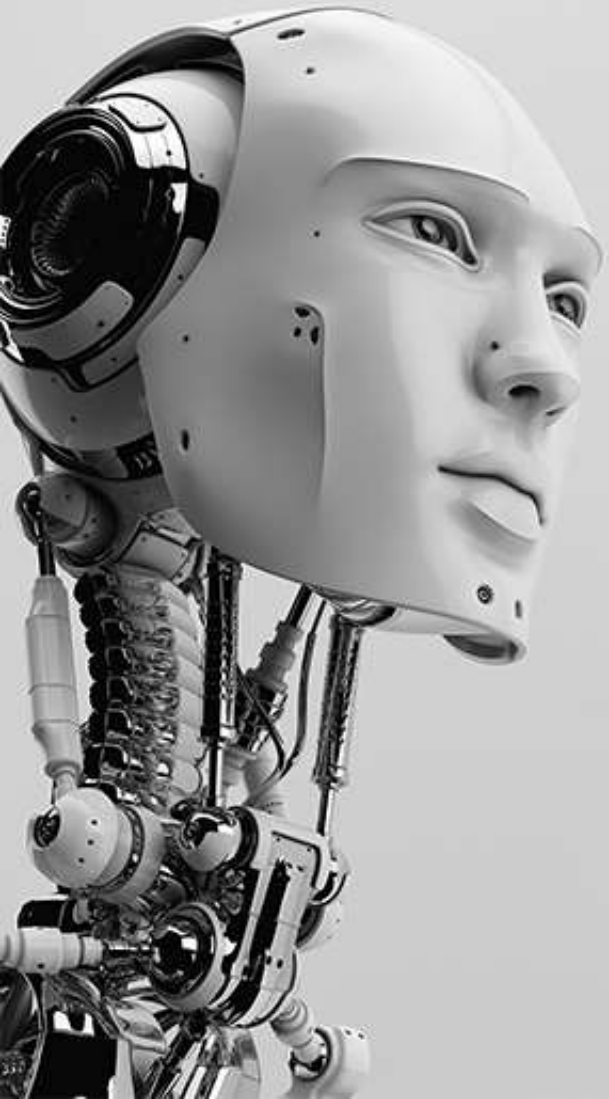
- The purpose of the study described by Narain et al. (2016) [[17](#)] is to create an innovative machine-learning-based cardiovascular disease (CVD) prediction system in order to increase the precision of the widely used Framingham risk score (FRS). With the help of data from 689 individuals who had symptoms of CVD and a validation dataset from the Framingham research, the proposed system—which uses a quantum neural network to learn and recognize patterns of CVD—was experimentally validated and compared with the FRS. The suggested system’s accuracy in forecasting CVD risk was determined to be 98.57%, which is much greater than the FRS’s accuracy of 19.22% and other existing techniques. According to the study’s findings, the suggested approach could be a useful tool for doctors in forecasting CVD risk, assisting in the creation of better treatment plans, and facilitating early diagnosis.

# PROPOSED SYSTEM



- After evaluating the results from the existing methodologies, we have used python and pandas operations to perform heart disease classification for the data obtained from the UCI repository. It provides an easy-to-use visual representation of the dataset, working environment and building the predictive analytics. ML process starts from a preprocessing data phase followed by feature selection based on data cleaning, classification of modelling performance evaluation. Random forest technique is used to improve the accuracy of the result.

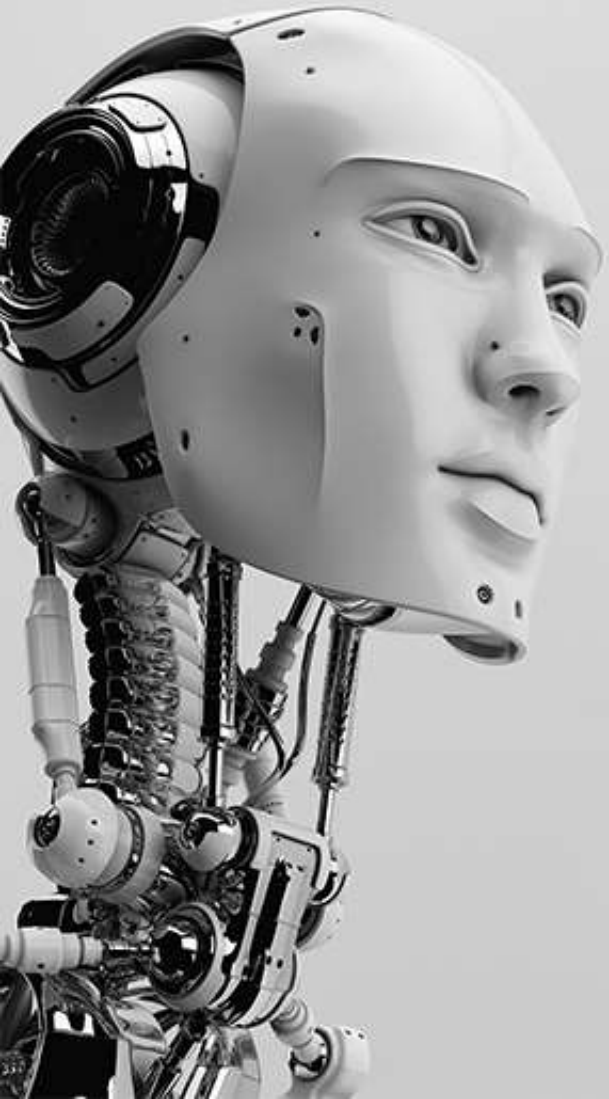
# EXISTING SYSTEM



- In this system, the input details are obtained from the patient. Then from the user inputs, using ML techniques heart disease is analyzed. Now, the obtained results are compared with the results of existing models within the same domain and found to be improved. The data of heart disease patients collected from the UCI laboratory is used to discover patterns with NN, DT, Support Vector machines SVM, and Naive Bayes. The results are compared for performance and accuracy with these algorithms. The proposed hybrid method returns results of 87% for F-measure, competing with the other existing methods.



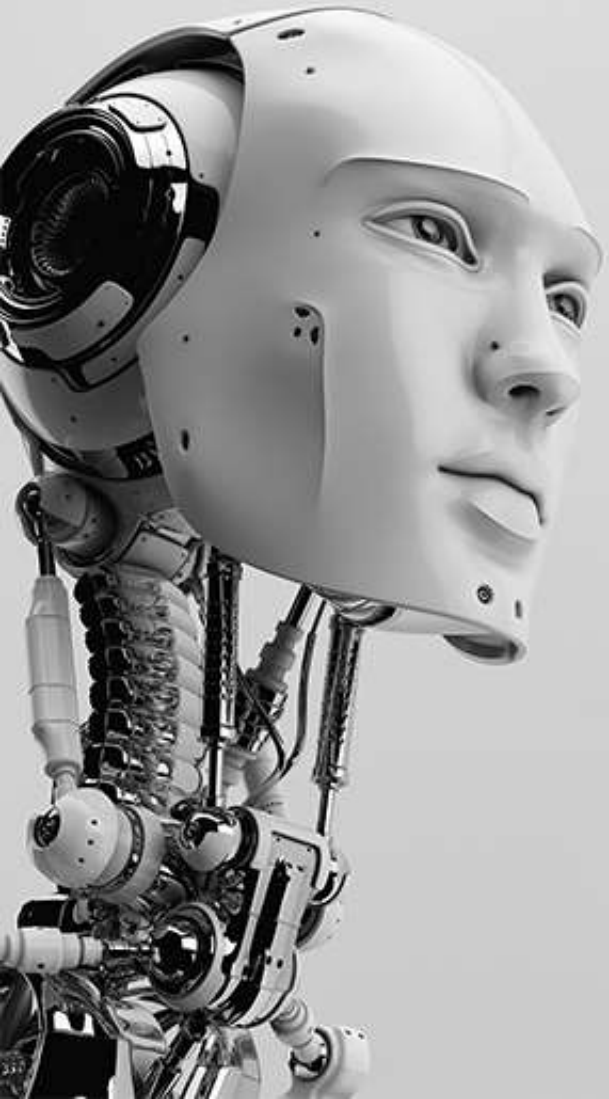
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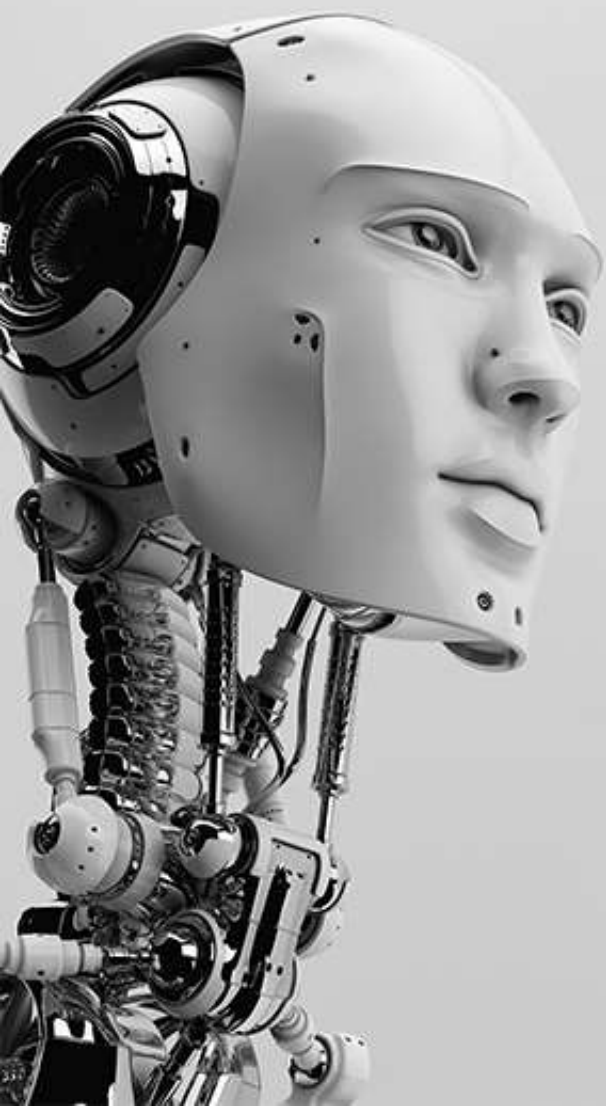


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# CONCLUSION

- In this paper, we proposed a method for heart disease prediction using machine learning techniques, these results showed a great accuracy standard for producing a better estimation result. By introducing new proposed Random forest classification, we find the problem of prediction rate without equipment and propose an approach to estimate the heart rate and condition. Sample results of heartrate are to be taken at different stages of the same subjects, we find the information from the above input via ML Techniques. Firstly, we introduced a support vector classifier based on datasets.





*Thank  
you*