

## AN ANDROID DEVICE TO PREVENT HEART ATTACK PATIENTS USING CLASSIFICATION ALGORITHM

**D. Kanmani<sup>1</sup>**

**D. Christy Sujatha<sup>2</sup>**

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### Abstract

Large number of android apps have been detected in the past years for the benefits of the society. Many detection techniques have been proposed in the literature for health care android app. Data Mining is an interesting field of research whose major objective is to find interesting and useful patterns from huge data sets. These patterns can be further used to make important decisions based on the result of the analysis. In this paper classification algorithm is applied and using an android device to monitor and detect the heart attack of the patients and to inform the information to the Hospital, Physician, and Medical Service.

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### *Keywords:*

Data Mining;

Classification;

Heart Attack Prediction;

Physician;

Medical service.

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<sup>1</sup> V Year, Department of Software Engineering, PeriyarManiammai Institute of Science and Technology, Periyar Nagar, Vallam.

<sup>2</sup> Assistant Professor, Department of Software Engineering, PeriyarManiammai Institute of Science and Technology, Periyar Nagar, Vallam.

## 1. Introduction

In recent years, medical technology has been developed rapidly by using ICT components. Researchers have developed various algorithms, programs and devices to detect heart attack of patients earlier. Most of them have used conventional medical equipment to produce their result and detect heart attack accurately. Monitoring of heart function, accurate diagnosis of cardiac conditions, and prevention of heart disease are important goals. The electrocardiogram (ECG) is the standard method to detect cardiovascular abnormalities [1]. It is a noninvasive diagnostic technique that records the electrical activity of the heart and enables diagnosis of a number of abnormalities and conditions based on a few simple features.

Data mining classification algorithm applies machine learning and statistical methods in order to discover areas of previously unknown knowledge. Several data mining techniques are used in the diagnosis of heart disease such as naïve bayes, neural network, kernel density, bagging algorithm, support vector machine showing different levels of accuracies[2]. One of the most popular classification models is the Decision tree algorithm. Decision Tree algorithm belongs to the family of supervised learning algorithms which creates a training model used to predict class by learning decision rules inferred from prior data. The health condition of a heart attack patient is monitored and detected the dangerous condition of the patient and informed to various service providers.

This paper is organized as follows : Section 2 contains the literature review of the related problems. Section 3 contains the architecture, module description and logical diagram of the proposed model . Section 4 has the implementation part .Section 5 ends with conclusion .

## 2. LITERATURE REVIEW

Hlaudi Daniel Maseth predict heart disease diagnosis using classification methods predicts and diagnose heart disease by using different data mining algorithms such as J48, REPTREE, Naïve Bayes, Bayes Net, Simple CART. The author analyzes the performance of these algorithms through evaluation criteria such as Kappa Statistics, Mean Absolute Error, Root Mean Squared, Relative Absolute Error and Root Relative Squared Error. Accuracy of J48, REPTREE,

Naïve Bayes, Bayes Net and CART are 99.0741%, 99.0741%, 97.222%, 98.1481% and 99.0741% respectively. [ 4]

Shantakumar B. Patil applied K-mean clustering algorithm on the pre-processed data for heart Attack Prediction System. The recurrent patterns applicable to heart disease are mined with the MAFIA algorithm from the data extraction. The neural network is trained with the selected important patterns for effective prediction of Heart Attack on the basis of computed significant weightage. [5 ]

P.K. Anooj has proposed a weighted fuzzy rule based CDSS for the diagnosis of heart disease. It automatically obtains the knowledge from the patient clinical data. The proposed CDSS for risk of heart patients consists of two phases. First is an computerized approach for generation of weighted fuzzy rules and decision tree and the second is creating a fuzzy rule based decision support system.[6]

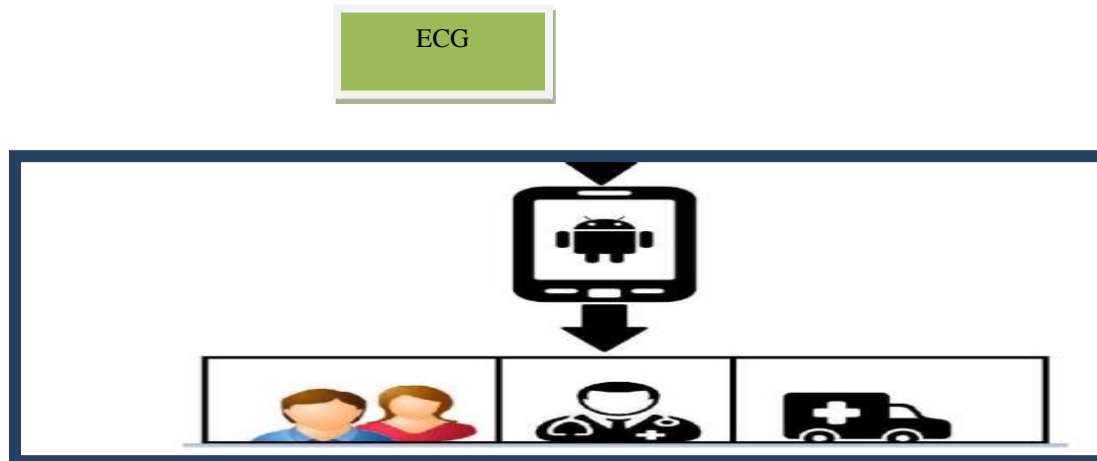
V.Manikandan et al. extract the item set relations by using association rule for the heart disease prediction system. The data classification was based on MAFIA algorithms which resulted in better accuracy. The data was evaluated using entropy based cross validation and partition techniques and the results were compared. MAFIA (Maximal Frequent Itemset Algorithm) used a dataset with 19 attributes and the goal of the research work was to have highly accurate recall metrics with higher levels of precision. [7]

R. Chitra et.al. Present Hybrid Intelligent techniques for the prediction of heart disease. Some Heart disease classification system was reviewed in this study and concluded with justification importance of data mining in heart disease diagnosis and classification. The classification accuracy can be improved by reduction in features. [8]

### **3. PROPOSED SYSTEM**

Fig 1. Shows the proposed architecture which contains smart accompanied device to detect heart attack. If the device finds any problem in heart beat of the patient, it sends the message through SMS to near by hospital, Physician and Medical servicer whose contact numbers are already

stored in the device. So this system help to reduce the risk of the heart diseased patients that allows users to get instant guidance on their heart disease.

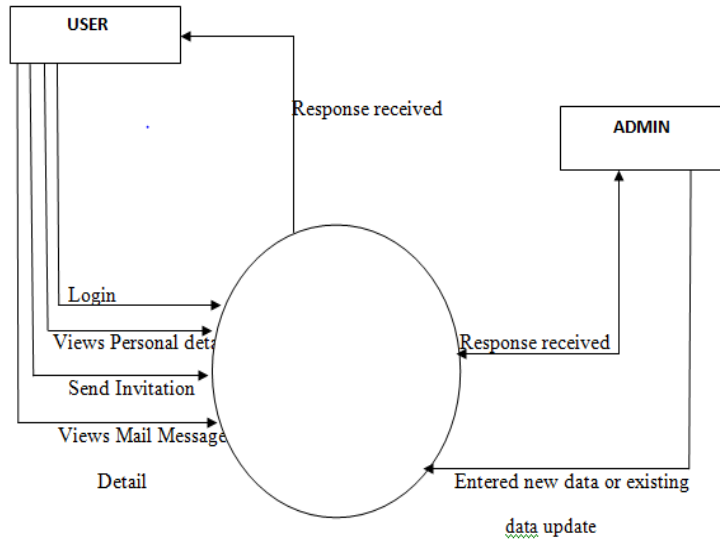


**Fig 1. Architecture of the android device**

The proposed system has 3 modules

1. **Registration** :In the registration module the patients who need the service requirement of this mobile device has to register with their name and their health details like pressure level ,sugar level, Age , Height, Weight and get the log in ID from the admin.
2. **Monitor** :In this module the device monitors and gets ECG signal from the registered patient and analyses through decision tree classification algorithm and build the tree model to find out the risk level of the patients. It classifies the dataset into 3 levels namely Normal, Warning and Dangerous based on the ECG measures of the patients.
3. **Intimation** :If the device finds warning class it sends warning message to the patient to take care of their health and to prevent them from the risk of getting heart attack. If the device finds Dangerous level about the patient, it sends SMS to near by hospital, Physician and Medical servicer to find out and save the patient as early as possible.

Figure 2 Represents the logical diagram of the proposed system. This diagram represents the user to connect with admin. The centralized circle deals with two ways first one is user side login, views personal data, send invitation and view mail message detail. Second one is admin side received response, entered new data or existing and data update.



**Fig 2. Logical diagram of the proposed system**

## ADVANTAGES AND DISADVANTAGES OF THE SYSTEM

### Advantages

- Alert the user by sending quick notes on mobile and tells him how to perform first aid.
- Alert the ambulance service along with the location.
- Alert the physician so he can prepare for the treatment.
- Frequent visit to hospital reduces.

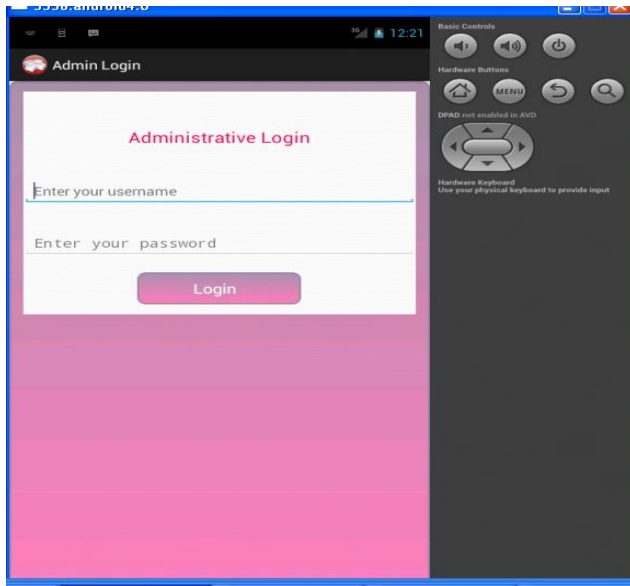
### Disadvantages

- Report should be uploaded to a computer for transferring it to the physician.
- The ECG monitor, an automatic detection algorithm is bulky and costly.

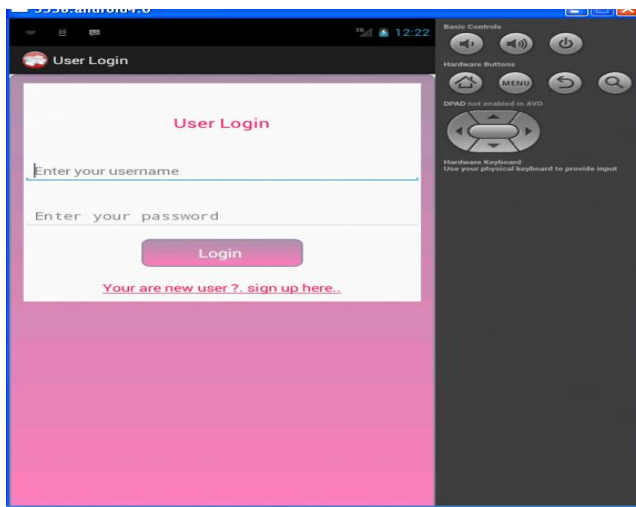
## 4. PROPSOED SYSTEM IMPLEMENTATION

The proposed system needs Dual core processor 2.6.0 GHZ, 1GB RAM, 160 GB Hard disk, Android OS and ANDROID SDK (JAVA) . The data set is obtained from the admin data base who collects the details of al the registered patients .

Fig 3 shows the admin login who enters the details of all the emergency contact number . Fig 4 is the user login to enter their personal and health details.

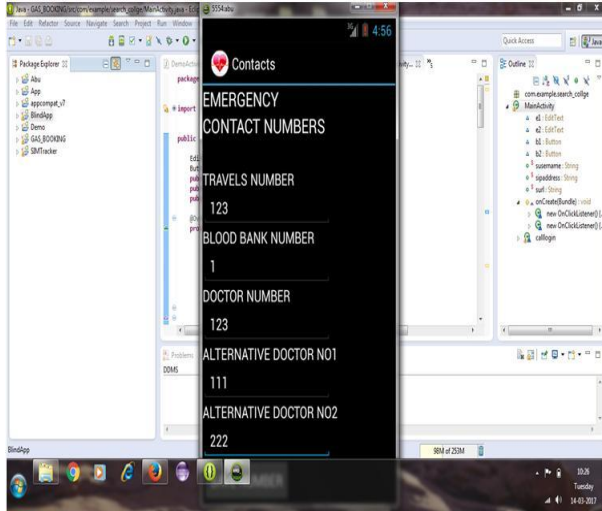


**Fig 3. Admin login.**

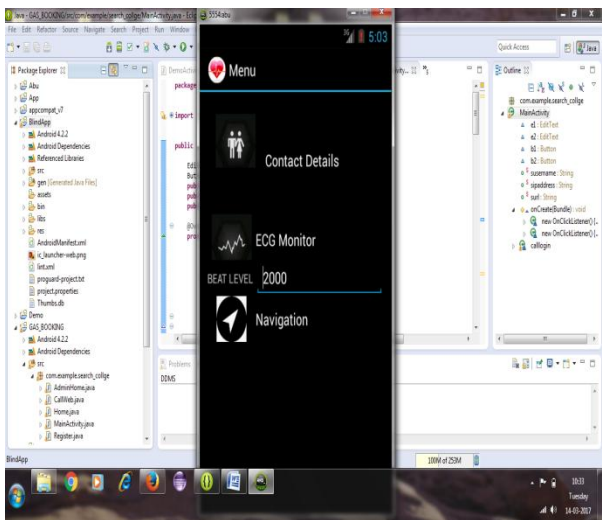


**Fig 4. User login.**

Fig 5 shows the emergency contact numbers of the receives which are already stored by the admin. When the device finds Dangerous position of the patients , the device sends ALERT SMS to these contact numbers in order to save the patients. And fig 6shows the ECG monitoring page.



**Fig 5. Contacts login.**



**Fig 6. ECG Monitor.**

## 5. Conclusion

There are numerous heart attack detection techniques have been introduced so far, but they are very expensive and time consuming. Since this modern age is the era of smart phone, we believe and deserve that our proposed technique can reach to the door steps of people of every level in the society. Any level of our society who have smart phone, can easily take precaution for heart attack. Our Application is efficient and suitable from other non-medical application. Proposed device is introduced which monitors the ECG levels of the patients and classifies the dataset

using decision tree to find the dangerous condition any patient and intimate various service provides to take immediate action to save the patient .

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