

**STUDY OF CRITICAL DISEASES RISK FACTOR FROM ECG SIGNAL BY
MEANS OF ARTIFICIAL INTELLIGENCE****¹Leena B. Chaudhari, ²Dr. Dhananjay E. Upasani, ³Dr. Anupama Deshpande**

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ABSTRACT

Health study analysis is sometimes supported a comparison of derived health measures to predefined thresholds. Symptoms are often discovered if a worth is on top of or below a threshold. Early detection of signs of heart stroke permits the prediction of strokes of cardiopathy and may so forestall these. Therefore, the characteristic "accurate" criteria is that the most vital task. The accuracy of associate degree experiment depends powerfully on the accuracy of the standards used. Symptom cardiopathy (CHF) happens once the guts cannot pump enough blood for a stable physiological state. CHF typically happens once the arteria blockage causes the guts tissue to become acidic. {the knowledge /the info/the information} accustomed analyze data like rectilinear regression, Missing Enrollment knowledge, Search Signal, Clinical knowledge Protection Programs, and Early accommodative Alarm. The projected system involves the models which will take input such as ECG readings, patient's medical history (Blood Pressure level, Diabetics and Cholesterol). It will process the patient data with this system's master database (historical data of thousands of Patients) by applying Data analysis and Machine learning algorithm to predict patient's Risk level and suggestions (Low/Med/High Risk and suggestions for diseases)

Keywords:- CHF, ECG.**1. INTRODUCTION**

According to the World Health Organization (World Health Organization, 2016), chronic diseases like coronary cardiovascular disease, cancer, chronic preventative pneumonic sickness and DM sort a pair of represent the leading reason behind mortality within the world, representing regarding hr of all deaths. Chronic diseases square measure primarily because of cardiopathy, presently the most reason behind death in most western countries. The 2016 cardiovascular disease and Stroke Statistics update of the yank Heart Association (AHA) reportable that fifteen.5 million individuals within the USA suffer from upset, this prevalence increasing with age for each girls and men[1]. In Europe, within the last twelve months the prevalence of individuals reportage heart issues was nine.2% for each sexes [2]. Specially, in Italian Republic vessel diseases square measure the most reason behind death, answerable for a quarter mile of all deaths. Deaths because of vessel diseases in Republic of India enhanced from one 1.3 million in 1990 to a pair of 2.8 million in 2016, and over maximum of the deaths caused by memory ailments.

Healthcare is a pending issue that is challenging at an international level [3]. Moreover, healthcare structures in growing nations confront serious difficulties in imparting care and assistance, basically due to shortage of personnel and resources. Information and communications applied sciences show up in this context to revolutionize this area and to supply innovative, efficient, and lower priced solutions. In fact, a sturdy effort is being put through companies, lookup institutions, fitness organizations, governments, and different entities all over the world into promoting, showcasing, and

catalyzing the use of new applied sciences in healthcare. Current developments show that the aggregate of the ultra-modern medical understanding with the latest technological know-how paves the route to a new dimension of fitness and social care. The use of automated units for monitoring organic parameters in actual time is an high quality device for enhancing the great of existence of patients. The integration of cellular conversation with wearable units has facilitated the transition from clinical-oriented monitoring to patient-oriented monitoring. A real-time monitoring machine is conceptualized for the presenting an instrument for patients, with the assist of which they can effortlessly monitor, analyze and shop their very own crucial symptoms the use of wearable sensors and Android gadgets such as clever telephone or tablet, providing an fantastic answer in phrases of reduce in time, human error and cost.

CURRENT GOAL

To develop a system for individuals suffering from chronic diseases that extracts health parameters from patients who are travailing from heart failure disease. Secondly, outline an analysis approach that mechanically computes and updates health inception values at run time.

MOTIVATION

WHO declared that Cardiovascular Diseases (CVD) takes lives of 17.9 million people every year i.e 31% of global health. Conduct involves continuous and long term observation to control the threat. Professionals and researchers in cardiac medicine recommend observing and tracing patients' indications on an regular basis in order to prevent emergencies. A health monitoring system with medical ought should serve useful for witnessing patients with CHF.

ATRIAL FIBRILLATION ARRHYTHMIA

Atrial fibrillation (AF) has been portrayed by doctors as the commonest cardiovascular arrhythmia in clinical daily schedule, with an expected predominance of 1.5%–2% of everyone in the created world. The presence of AF is related with a five-overlay danger of stroke and a three-crease frequency of congestive cardiovascular breakdown, subsequently inciting that AF patients have double the danger of death than sound individuals of a similar age. Early discovery of AF may assist with decreasing that hazard by reconstructing typical heart beat. Cardiovascular signs from both surface and intracardiac accounts have been broadly utilized in AF considers expecting to comprehend the atrial electrical conduct to improve viability of interventional removal treatment.

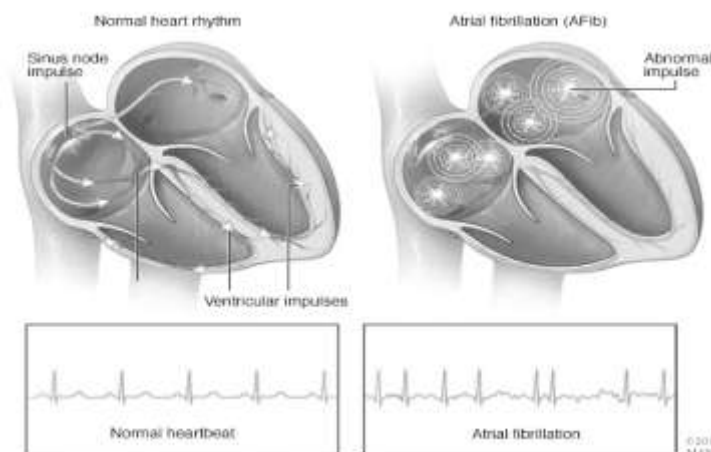


Figure 1: Atrial Fibrillation arrhythmia

VENTRICULAR FIBRILLATION CARDIAC ARRHYTHMIA

Ventricular fibrillation is the quick, scattered, and offbeat constriction of ventricular muscle. Ventricular fibrillation (VF) is a significant reason for horribleness and abrupt demise (SD), yet it is quite possibly the most troublesome arrhythmias to adequately treat. The implantable cardioverter defibrillator (ICD) offers delayed endurance by securing against death because of arrhythmia and is the best quality level treatment for essential and auxiliary avoidance for in danger patients. Besides, up to 20% of patients with an ICD experience intermittent scenes of VF or thunderstorms, bringing about various gadget treatments, which break down the nature of life as well as increment related mortality.

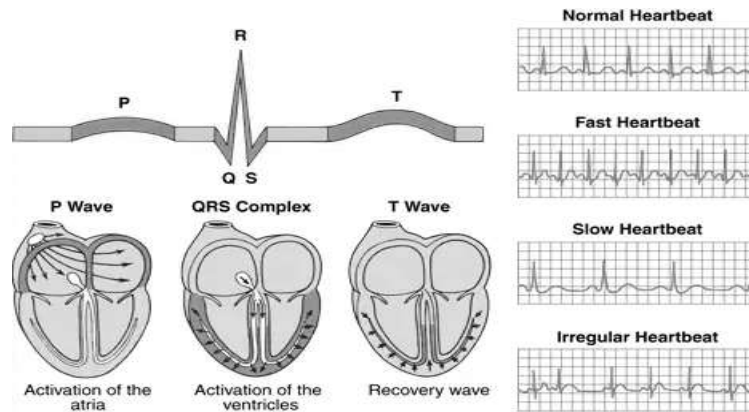


Figure 2: Ventricular Fibrillation arrhythmia

2. OBJECTIVES

1. To develop system for people suffering from chronic diseases that enable the collection, sharing and exchange of physiological data, such as blood pressure, heart and respiration rate and ECG signals and predict heart failure strokes by detecting related symptoms.
2. To notify the cardiologist and the patient when a heart failure stroke has been predicted and compute automatically and update thresholds according to recorded historical data by analyzing and to update the threshold values as per requirement.
3. To do the analysis and save the original files, that can be visualized whenever the user wants and are sent to the medical specialist.

3. PROPOSED MODEL OF THE SYSTEM.

The system uses MIMIC II waveform database, it matched subset from the Physionet benchmark. This database is available online and it is collected from bedside patient monitors in adult and neonatal ICU (Intensive Care Units).

- 1) The system monitors the patients who are suffering from the cardiac disease.
- 2) It will take input such as ECG readings, patient's medical history (Blood Pressure level, Diabetics and Cholesterol)
- 3) It will process the patient data with this system's master database (historical data of thousands of Patients) by applying Data analysis and Machine learning algorithm to predict patient's Risk level and suggestions (Low/Med/High Risk and suggestions for diseases)

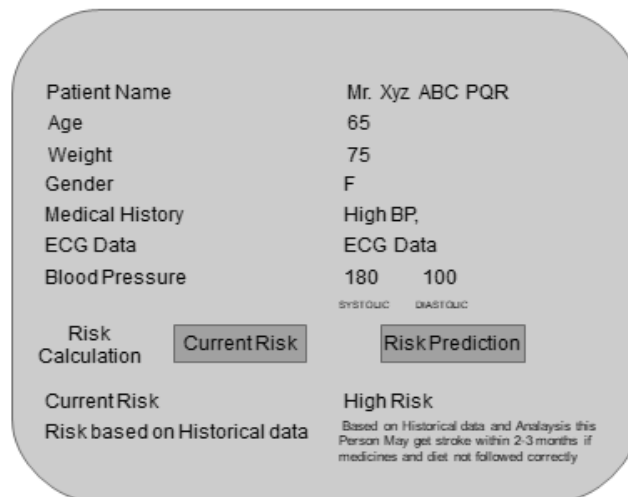


Figure 3:High Risk Factor

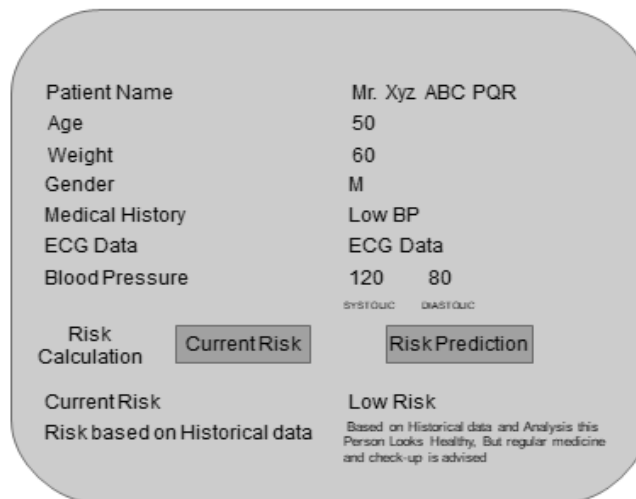


Figure 4: Low Risk Factor

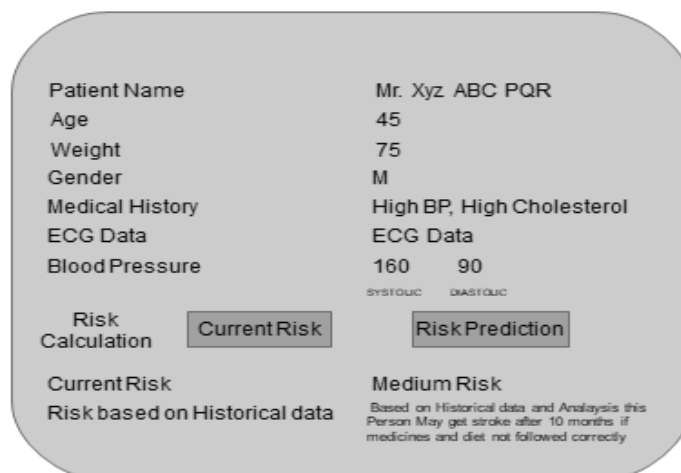


Figure 5: Medium Risk Factor

4. WHY TO IMPLEMENT?

- 1) The system monitors the patients who are suffering from the cardiac disease.
- 2) Predicts Atrial Fibrillation and Ventricular Fibrillation
- 3) Warns to patients when the critical condition occurs.
- 4) Automatically computes and updates thresholds according to recorded historical data.

5. SCOPE

It can be used to predict heart failure strokes. It can be helpful for CHF patients through daily monitoring along with guidance and feedback. Patients who have cardiovascular system disorders can measure their weight, blood pressure, activity, and other health related measurements by using wireless health applications whenever and wherever they need to.

6. CONCLUSIONS

Create framework for individuals experiencing constant illnesses. Rules depend on conversation with cardiologist and contrasting extricated boundaries and limit. Highlight estimations of information are determined utilizing the key part investigation (PCA) strategies. Rules depend on conversation with cardiologist and contrasting removed boundaries and edge. This method can be utilized to the forecast of Atrial Fibrillation and Ventricular Fibrillation.

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