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GSM BASED REAL TIME HUMAN HEALTH MONITORING AND ALERT SYSTEM FOR CARDIAC

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Abstract

Cardiovascular diseases are a leading cause of mortality worldwide, often requiring immediate medical attention. Traditional hospital-based monitoring systems are inadequate for real-time tracking and emergency response, especially in remote areas. This project proposes a GPS and GSM-based Real-Time Human Health Monitoring and Alert System for Cardiac Patients. The system uses wearable sensors to continuously monitor vital parameters such as ECG, heart rate, blood pressure, and SpO2. In case of abnormalities, it automatically sends alerts along with real-time location data to healthcare providers and emergency contacts via GSM/GPRS. Integrated with IoT technology, the system enables remote access to health data through a mobile application, facilitating timely medical intervention. Designed to be cost-effective and user-friendly, this solution aims to enhance the safety and care of cardiac patients outside traditional healthcare settings.

Introduction

Cardiovascular diseases (CVDs) are one of the leading causes of mortality worldwide. The timely detection of abnormal cardiac conditions and prompt medical intervention can significantly improve patient survival rates. Traditional health monitoring systems rely on hospital-based checkups, which often fail to provide real-time health status updates. To overcome this limitation, we propose a GPS and GSM-Based Real-Time Human Health Monitoring and Alert System for Cardiac Patients. This system continuously monitors key physiological parameters such as heart rate, blood pressure, oxygen saturation (SpO_2), and ECG signals using wearable sensors. In case of any abnormalities, an automated alert is sent via GSM (Global System for Mobile Communications) and GPRS (General Packet Radio Service) to healthcare providers and emergency contacts, along with the patient's real-time location through GPS (Global Positioning System).

1.Definition

The GSM-Based Real-Time Human Health Monitoring and Alert System for Cardiac is a wearable health monitoring device designed to continuously track vital cardiac parameters such as ECG, heart rate, blood pressure, and oxygen saturation (SpO_2). In the event of any abnormal readings, the system

automatically sends emergency alerts via GSM (Global System for Mobile Communications) to healthcare providers and family members. Utilizing IoT technology for remote data access, the system aims to provide a cost-effective, reliable, and real-time health monitoring solution for cardiac patients, particularly in remote areas where hospital access is limited.

2. Purpose

The purpose of this project is to design and develop a GSM-based real-time health monitoring and alert system specifically for cardiac patients. The system aims to continuously monitor vital signs such as ECG, heart rate, blood pressure, and SpO_2 using wearable sensors. By utilizing GSM technology, the system can send instant alerts to medical personnel and family members whenever abnormal conditions are detected. This ensures timely medical intervention, reduces dependency on hospital-based monitoring, and provides a cost-effective solution for continuous cardiac care, especially in remote or underserved areas.

3. Methodology

1. Sensor Data Collection: Wearable sensors monitor ECG, heart rate, SpO_2, and blood pressure.
2. Data Processing: A microcontroller analyzes the data for any irregularities.
3. GSM Alert Transmission: If abnormalities are detected, alerts are sent via GSM to emergency contacts.
4. Real-Time Display: A 16x2 LCD shows vital readings and system status updates.

4. Need of Study

Cardiovascular diseases (CVDs) continue to be a major cause of mortality worldwide, with many cases going undetected until it's too late. Traditional healthcare systems depend heavily on hospital-based monitoring, which is not feasible for continuous observation, especially in rural or remote areas. Moreover, most existing wearable devices rely on internet connectivity, limiting their functionality where such infrastructure is lacking. There is a pressing need for a low-cost, GSM-based real-time health monitoring system that can function independently of the internet. This system should continuously monitor critical health parameters such as ECG, heart rate, blood pressure, and SpO_2, and instantly alert healthcare professionals or family members in case of abnormalities. The study aims to fill this gap by designing a user-friendly, portable solution that enhances early detection, ensures quicker response times, and ultimately saves lives.

5. Objectives

1.To develop a wearable, real-time cardiac health monitoring and alert system that:
2.Continuously monitors heart rate, ECG, blood pressure, and SpO2 using sensors.
3.Uses GSM technology to send automated alerts (via SMS) to healthcare providers and emergency contacts when abnormalities are detected.
4.Integrates IoT for remote access to patient data by medical professionals.
5.Aims to be an affordable, user-friendly, and effective solution for cardiac patients, particularly in remote or underserved areas.

6. Scope of Study

This project aims to develop a compact, affordable cardiac health monitoring system that continuously measures vital signs such as heart rate, ECG, blood pressure, and SpO2. It uses GSM technology to send real-time SMS alerts to doctors and caregivers in case of critical abnormalities. The system supports remote monitoring through IoT integration, helping reduce hospital visits. Designed for accessibility, it is especially beneficial for patients in remote and underserved areas.

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