

Implementation Of Real Time Processing and Transferring ECG Signal by A Mobile Phone

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Abstract -

Electrocardiogram (ECG) monitoring is essential for diagnosing and managing cardiovascular diseases. This project focuses on real-time processing and wireless transmission of ECG signals using a mobile device. The system captures ECG signals via sensors, processes them using an Arduino and transmits the data via Wi-Fi to a healthcare provider. The mobile application enables real-time visualization, storage, and alert notifications in case of abnormalities. This approach enhances remote patient monitoring.

Key Words: mhealth, wi-fi Communication, Smart Healthcare Solution

1. INTRODUCTION

In today's healthcare industry, real-time monitoring of physiological signals has become essential for diagnosing and preventing critical health conditions. The Electrocardiogram (ECG) is one of the most widely used diagnostic tools for monitoring heart activity and detecting abnormalities such as arrhythmias and cardiac disorders. Traditional ECG machines are often bulky, expensive, and require patients to visit hospitals or clinics for monitoring. This creates a need for a portable, real-time, and mobile-based ECG monitoring system that enables continuous health tracking and remote diagnosis.

A real-time ECG monitoring system consists of sensor electrodes placed on the patient's body, which capture the heart's electrical signals. These signals are processed using an Arduino, and transmitted wirelessly to a mobile application. The mobile interface allows users to view real-time ECG waveforms, analyze data, and store information for medical consultation. Additionally, cloud integration enables remote access, providing healthcare professionals with real-time patient data for timely intervention.

2. PROBLEM STATEMENT

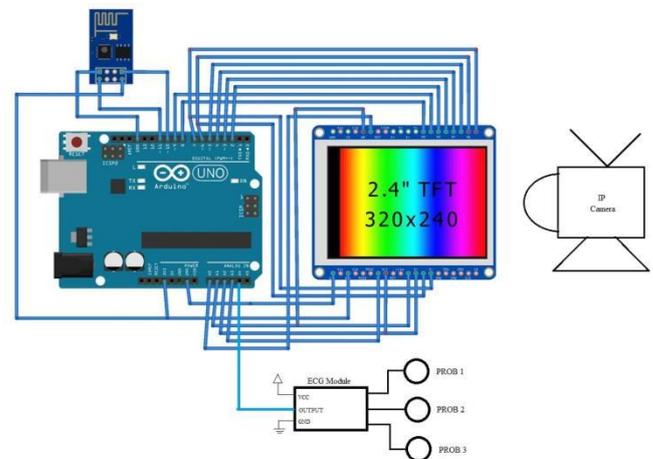
With the increasing prevalence of cardiovascular diseases, continuous monitoring of patients' heart health has become crucial. Traditional ECG monitoring

requires patients to be physically present at a medical facility, limiting accessibility, especially for those in remote or underserved areas. Additionally, for patients who need regular monitoring, frequent visits to the hospital can be burdensome and costly

3. METHODOLOGY

1. ECG Signal Acquisitions And Processing
2. Wireless Communication And Mobile Application
3. CCTV Interagtion For Remote Monitoring

4. CIRCUIT DIAGRAM



5. CIRCUIT OPERATION

ECG Probes (1, 2, 3): Collect real-time ECG signals from patients.

ECG Amplifier Module: Amplifies the weak ECG signals collected by the probes for further processing.

Temperature Sensor: Measures the body temperature of the patient.

MAX30100 Sensor: Measures additional physiological parameters such as heart rate and blood oxygen saturation (SpO₂).

Arduino Uno:

Serves as the central processing unit of the system.

Collects signals from the ECG amplifier, temperature sensor, and MAX30100 sensor.

Processes the data to filter out noise and extract relevant features.

Displays the processed data on a 2.4-inch color display for local monitoring.

Wi-Fi Module:

Transmits the processed data wirelessly to a remote server for storage and further analysis.

Ensures real-time data transfer for multiple patients.

Server:

Stores the incoming data from the Arduino system.

Makes the data accessible via an online website for healthcare professionals or users.

IP Camera:

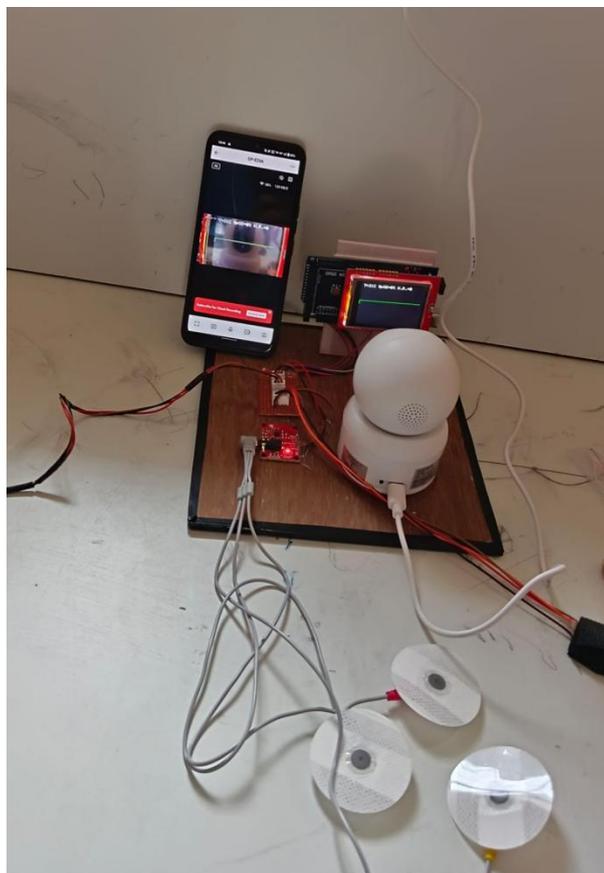
Provides real-time video monitoring of the patient for additional remote observation, which is synchronized with the physiological data.

Website:

Allows end-users (e.g., doctors or caregivers) to access the data.

Displays ECG graphs, temperature readings, heart rate, and SpO2 levels.

6.RESULT



7.CONCLUSION

The purpose of this project is to develop a real-time ECG signal processing and transmission system using a mobile device. This system enables continuous monitoring of a patient's heart activity, facilitating early diagnosis and remote healthcare applications. By integrating advanced signal processing techniques and wireless data transmission, the system ensures reliable and accurate ECG readings.

The proposed solution replaces traditional wired ECG monitoring systems, allowing for increased mobility and comfort for patients. The mobile device acts as a processing and transmission unit, ensuring seamless data transfer to healthcare professionals for real-time analysis. Through the implementation of this system, medical professionals can monitor patient health remotely, reducing the need for frequent hospital visits while improving response time in critical situations.

8. ACKNOWLEDGMENTS

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