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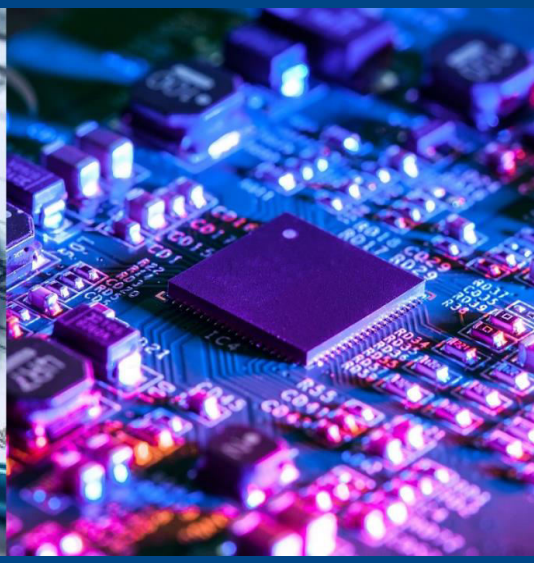

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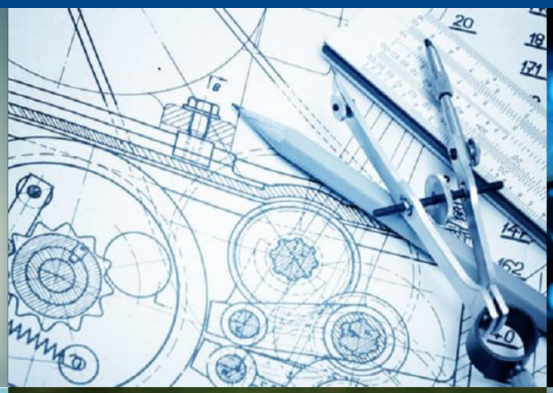

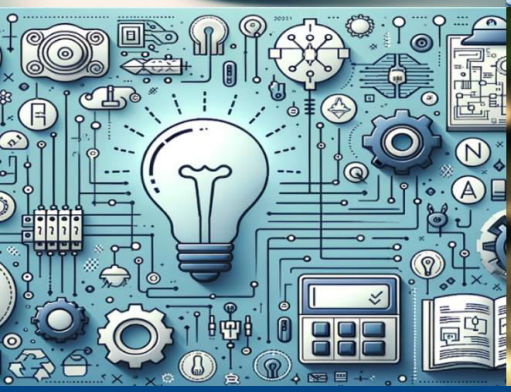

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Realtime Heart Monitoring System

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ABSTRACT: The Real-Time Heart Monitoring System Using Blynk is an IoT-based project that continuously tracks heart rate (BPM) and blood oxygen levels (SpO_2) using a MAX30100 pulse oximeter sensor and an ESP8266 microcontroller. The MAX30100 accurately measures vital signs, while the ESP8266 processes the data and sends it wirelessly to the BlynkIoT mobile app via Wi-Fi. This allows users to view real-time health data on their smartphones from anywhere with internet access. The system is designed to be simple, portable, and cost-effective, making it ideal for personal health monitoring, elderly care, fitness tracking, and sports. By integrating reliable hardware with a user-friendly app, the system empowers users to monitor their health easily and make informed decisions based on real-time data.

KEYWORDS: Health monitor, heart monitoring system

I. INTRODUCTION

The ability to monitor and track vital health parameters in real time is crucial for maintaining good health and well-being. One such essential parameter is heart rate, which plays a significant role in assessing cardiovascular health, while blood oxygen saturation (SpO_2) is vital for evaluating respiratory function. With advancements in technology, it is now possible to monitor these vital signs remotely and continuously, providing users with valuable health insights at their fingertips.

II. LITERATURE SURVEY

1. Pulse Oximeters: Traditional Methods
Traditional pulse oximeters measure SpO_2 and heart rate accurately but are bulky and lack real-time or remote monitoring features.

2. IoT-based Health Monitoring Systems
IoT health systems use sensors and microcontrollers to provide real-time, remote monitoring of vital signs like heart rate and SpO_2.

3. BlynkIoT Platform in Health Monitoring
Blynk allows users to view real-time health data on their phones, improving access and control over personal health.

4. Wearable Health Devices
Wearables like smartwatches track heart rate and SpO_2 continuously, but often have limited integration compared to flexible IoT setups.

5. Real-Time SpO_2 and Heart Rate Monitoring with Cloud Integration
Cloud-based systems store health data for long-term analysis and real-time monitoring, useful for managing chronic conditions.

6. Comparing Traditional Pulse Oximeters to IoT Solutions
IoT-based monitors offer more usability and remote access than traditional oximeters, making them ideal for continuous health tracking.

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III. EXISTING SYSTEM

Traditional heart monitoring devices, like standard pulse oximeters, are commonly used to check heart rate and oxygen levels (SpO_2). These devices are simple, accurate, and suitable for quick checks at home or in hospitals. However, they only give one-time readings and do not support continuous monitoring or remote access. Users have to manually check their health at specific times, and there's no way to track long-term health data or share it with doctors remotely. Also, these devices don't store previous results or send alerts in case of abnormal readings. This makes them less useful for people with chronic health issues who need constant monitoring.

IV. PROPOSED SYSTEM

The proposed system solves these problems using Internet of Things (IoT) technology. It uses the MAX30100 sensor to measure heart rate and SpO_2 continuously and the ESP8266 microcontroller to send this data wirelessly through Wi-Fi. The health readings are displayed in real-time on the Blynk mobile app, allowing users to view their vitals from anywhere. The system also sends alerts if readings go beyond normal levels and stores health data in the cloud for tracking long-term trends. With a user-friendly interface and customizable features, this system provides a smart and convenient way to manage heart health remotely and effectively.

V. SYSTEM DESIGN

The Real-Time Heart Monitoring System Using Blynk provides an efficient and user-friendly solution for continuously monitoring heart rate and blood oxygen saturation (SpO_2) levels, which are critical indicators of cardiovascular and respiratory health. In today's fast-paced world, having the ability to monitor these parameters in real-time empowers individuals to take proactive steps toward better health and prevent potential complications.

This project integrates the MAX30100 Pulse Oximeter Sensor with the ESP8266 microcontroller to monitor heart rate and SpO_2 levels. The collected data is wirelessly transmitted via the ESP8266 to the BlynkIoT platform, where it is displayed on a mobile application, allowing users to monitor their health from anywhere.

The primary goal of this project is to provide a convenient way to track vital health metrics remotely. By leveraging IoT technology, this system ensures continuous monitoring and serves as an early warning tool for abnormal health readings, enabling users to take timely action. The system combines the accuracy of pulse oximetry with the flexibility of IoT to support proactive health management, offering peace of mind by allowing users to monitor their health at any time

Figure 1

VI. IMPLEMENTATION

The Real-Time Heart Monitoring System is implemented using a combination of hardware and software components that work together to measure, process, and display health data in real-time. The system starts with the MAX30100 pulse oximeter sensor, which detects the user's heart rate and blood oxygen saturation (SpO_2) levels. This sensor is

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connected to the ESP8266 microcontroller, which acts as the brain of the system. The ESP8266 reads data from the sensor and uses its built-in Wi-Fi capability to send the data wirelessly to the internet.

To display the health data, the system uses the Blynk IoT platform, which provides a mobile app for real-time monitoring. The app shows live readings of heart rate and SpO_2, along with historical data for tracking trends. Users can open the Blynk app from anywhere with internet access to view their health status. Alerts can also be configured in the app to notify users when their readings are outside the normal range.

The code for reading sensor data and sending it to Blynk is written and uploaded using the Arduino IDE, with necessary libraries like the MAX30100 and Blynk libraries included. The system is compact, easy to set up, and user-friendly, making it ideal for home-based health monitoring, fitness tracking, or elderly care.

VII. RESULT

Heart Rate Monitoring:
Real-time heart rate measurements displayed continuously on the Blynk app.
Heart rate readings updated live, presented in beats per minute (BPM).
Users can monitor their heart rate in real time, staying informed about their heart health throughout the day.

SpO2 Monitoring:
Continuous measurement of oxygen saturation (SpO2) levels, displayed in real time on the Blynk app.
SpO2 readings shown as a percentage, allowing users to track their oxygen levels continuously and be aware of their health status.

Real-Time Monitoring:
Provides continuous feedback to users without alerting mechanisms or historical data tracking.
Ensures users have immediate access to their heart rate and SpO2 levels, offering clear and reliable health insights throughout the day.

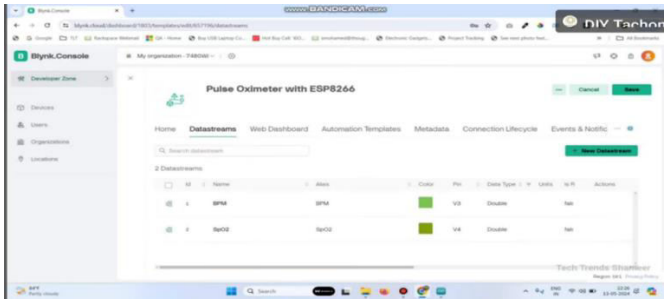

Figure 1:Screenshot of Blynk Dashboard Overview

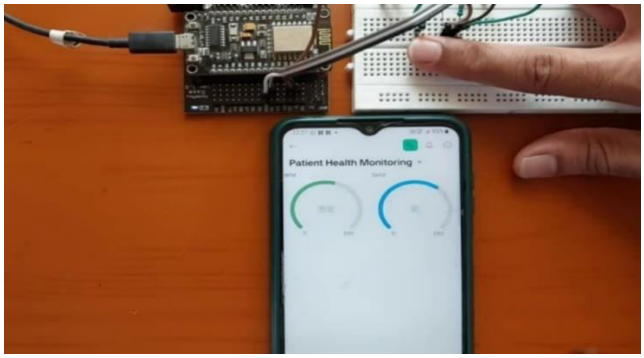

Figure 2: Final System Prototype Hardware Setup

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Live Updates:
The system delivers real-time updates of both heart rate (in beats per minute, BPM) and SpO2 (as a percentage of oxygen saturation) via the Blynk app.
Users can track their health metrics in real time, receiving continuous feedback on their heart rate and oxygen levels.

Instant Feedback:
Provides users with immediate insights into their heart and oxygen levels, ensuring they are informed about their health status at all times.
Helps users stay aware of any changes, offering valuable information for managing their health.

Effective Daily Health Tracking:
The system serves as an effective tool for daily health tracking.
Users can easily understand and respond to fluctuations in their heart rate and oxygen saturation.
Clear and Intuitive Interface: The Blynk app presents the health data in a clear and accessible format.
Contributes to a seamless and intuitive user experience, ensuring that the monitoring process is easy to follow.

VIII. CONCLUSION

The Real-Time Heart Monitoring System Using Blynk successfully provides a convenient and efficient way for users to monitor their heart health in real time. By utilizing the MAX30100 Pulse Oximeter sensor and ESP8266 microcontroller, the system offers accurate and continuous heart rate and oxygen saturation (SpO2) measurements, which are displayed live on the Blynk app. This system enables users to stay informed about their heart and oxygen levels throughout the day, promoting proactive health management and enhancing users' awareness of their cardiovascular health.

The system effectively meets its primary objective of providing real-time feedback on critical health metrics. By displaying live readings of heart rate (in BPM) and SpO2 (as a percentage), the system serves as a reliable tool for daily health tracking. The app's clear and user-friendly interface ensures an intuitive experience for users, making it easy to monitor vital signs. The real-time monitoring offered by this system is a significant step towards empowering users to take control of their heart health and make informed decisions based on current health data

REFERENCES

1. Texas Instruments. (2022). Wireless ECG, SpO2, PTT and Heart Rate Monitor Reference Design for Medical and Consumer Wearables. Retrieved from Texas Instruments
2. Electronics for You. (2022). Reference Design For ECG, SpO2, PTT and Heart Rate Monitor. Retrieved from Electronics for You
3. Manjuhallegowda, M. (2021). Health Care Monitoring System. Retrieved from GitHub
4. Texas Instruments. (2022). TIDA-01580 Reference Design. Retrieved from TI.com
5. Texas Instruments. (2022). Healthcare Wearable Reference Design. Retrieved from Texas Instruments
6. Texas Instruments. (2022). ECG, SpO2, PTT and Heart Rate Monitor Design Guide. Retrieved from Texas Instruments
7. IEEE Xplore. (2019). Wearable Health Monitoring Systems. Retrieved from IEEE Xplore
8. Instructables. (2020). Heart Rate Monitoring Using Arduino and Sensors. Retrieved from Instructables
9. Hackster.io. (2020).

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