

Progress Update:

1. Hardware Integration:

- Successfully integrated two PPG (Photoplethysmography) sensors and an ECG (Electrocardiogram) sensor with the ESP32 microcontroller.
- Defined pin assignments and established communication protocols between the sensors and the ESP32.

2. Sensor Data Acquisition:

- Modified the existing code to accommodate data acquisition from multiple sensors.
- Implemented logic for collecting 2 PPG and ECG data simultaneously.

3. Display Integration:

- Extended OLED display functionality to visualize PPG waveforms, ECG signals, heart rate, and SpO2 readings.
- Updated OLED display layout to accommodate multiple sensor data visualizations.

4. Blynk Integration:

- Expanded Blynk integration to include real-time visualization of PPG waveforms, ECG signals, heart rate, and SpO2 readings on the Blynk app.
- Configured Blynk widgets to display sensor data and enable remote monitoring and control.

5. Data Logging to SD Card:

- Currently in progress. Developing functionality to log sensor data (PPG, ECG, heart rate, SpO2) to an SD card for offline analysis.
- Planning to implement file management and data retrieval features for efficient data logging.

6. GUI Development:

- Implemented a GUI using libraries such as Tkinter in Python or similar frameworks compatible with ESP32 microcontroller.
- Designed an intuitive interface with buttons for starting, stopping, and quitting monitoring sessions.

7. Data Plotting:

- Developed functionality to plot real-time ECG data on the GUI interface.
- Integrated graph plotting libraries like Matplotlib to visualize ECG waveforms.

8. Data Processing with Butterworth Low-Pass Filter:

- Implemented Butterworth low-pass filter for ECG data processing to remove noise and artifacts.
- Incorporated digital signal processing techniques to enhance the quality of ECG signals.

9. Data Logging and File Management:

- Developed data logging functionality to record ECG data to a file system.
- Implemented file management features for organizing and storing ECG data files.

10. Start/Stop/Quit Buttons:

- Integrated start, stop, and quit buttons on the GUI interface for user interaction.
- Programmed button functionalities to initiate, pause, and terminate ECG monitoring sessions.