



Blood Pressure Arm Band

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Project Goal

The goal is to design and implement a smart wearable device that can measure ECG, Respiration and other health data for the user. The results can be displayed in real time graph on the phone apps for Android.

BackGround

According to the American Heart Association, there are about 103 million adults have high blood pressure, which may result in significant heart disease. Whereas, most of the heart disease is preventable. Arm band provides an useful tool for individuals to track their blood pressure in advance of the heart disease.

Material Needed

Raspberry Pi
Texas Instruments ADS1292R
Electrode
Android/iOS devices
Jumper wires
PPG Sensor

Reference

- [1] Dias, Duarte, and João Paulo Silva Cunha. "Wearable Health Devices-Vital Sign Monitoring, Systems and Technologies." *Sensors* (Basel, Switzerland) vol. 18,8 2414. 25 Jul. 2018, doi:10.3390/s18082414
- [2] Phaneuf, Alicia. "Latest Trends in Medical Monitoring Devices and Wearable Health Technology." *Business Insider*, Business Insider, 19 July 2019, <https://www.businessinsider.com/wearable-technology-healthcare-medical-devices>.

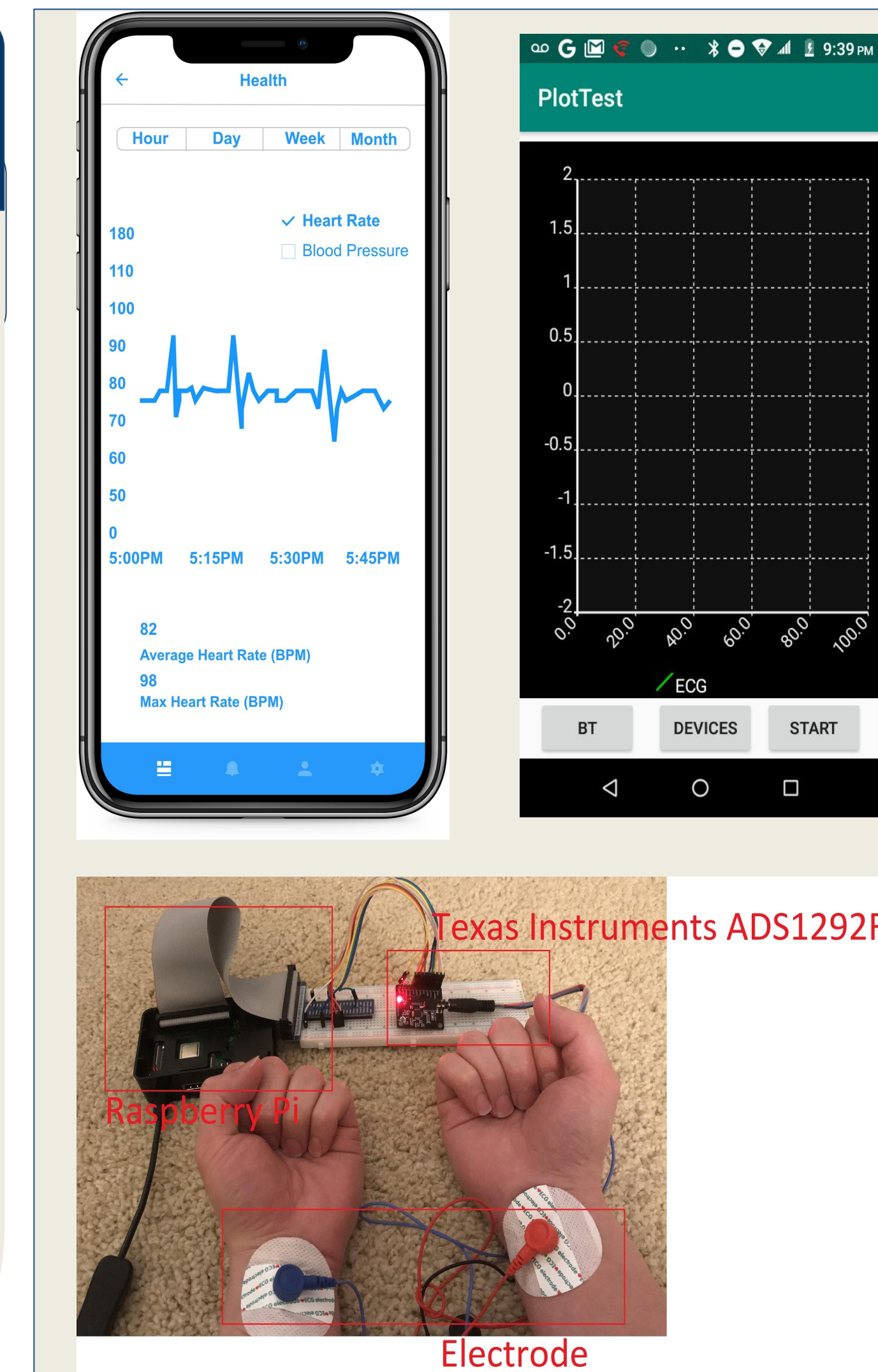
Milestone

Finished:

- Python Driver for ADS1292R is working
 - ECG signal can be measured
- Raspberry Pi bluetooth Sender is working
- PPG signal can be collected,
- Android App can receive data from Pi
 - traditional bluetooth is done
 - basic graphing API for Android App is done

Working on:

- Reduce noise in received ECG signal
- Apply Digital signal processing (MATLAB/C?) to reduce noise in the measured signals



Accomplishment

Future Work: Blood Pressure estimation and Hypertension Prediction

The model of blood pressure estimation is not suitable for everyone, so we want to apply machine learning to adjust the model to different patients. Our final goal is to design a smart armband for patients. When emergency like hypertension occurs, the device can detect it earlier and notify the patient to get help.

