



Goals

- ❑ Design a wearable for tracking the location of young children and their health status
- ❑ Create a phone application that shows the wearer's location and alerts users about unusual activity
- ❑ Integrate Google Calendar and Geofencing for a more autonomous user experience
- ❑ Deliver multiple options for tracking based on accuracy and battery efficiency

Motivations

- ❑ Small children (ages of 3 - 5) are often too young to have their own phones yet guardians should be able to have a medium of contact
- ❑ Provide a cost efficient solution for parents/guardians to keep track of the child's location
- ❑ Utilize sensors which pushes the project beyond basic applications (simply tracking)
- ❑ Add features that improve on existing devices
 - different methods of location tracking
 - convenient geofencing

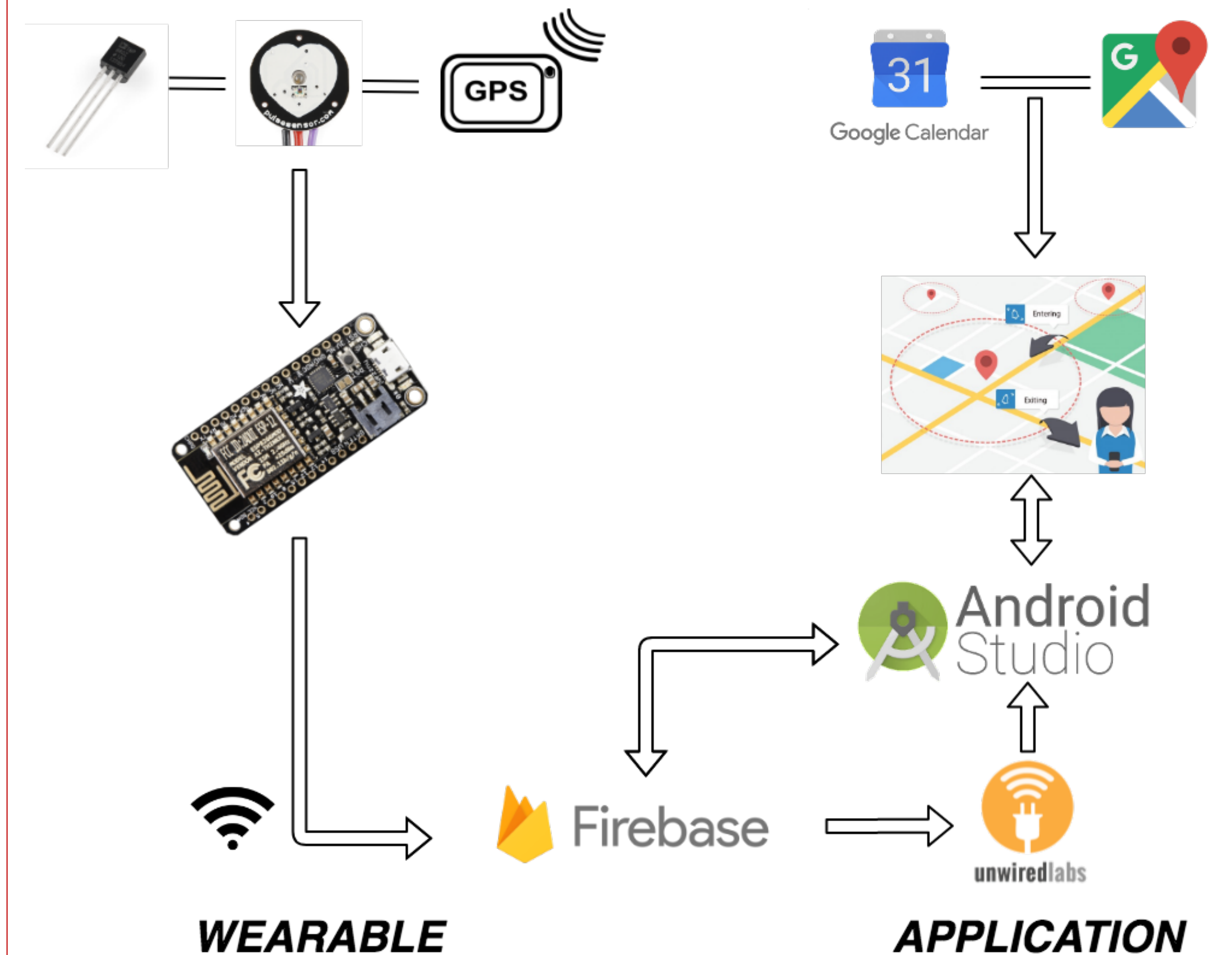
Acknowledgements

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References

- [1] <https://developers.google.com/maps/>
- [2] <https://unwiredlabs.com/docs#geolocation>
- [3] <https://firebase.google.com/docs/>
- [4] <https://pixabay.com/en/pedestrian-crossing-traffic-sign-160672/>

Methodology

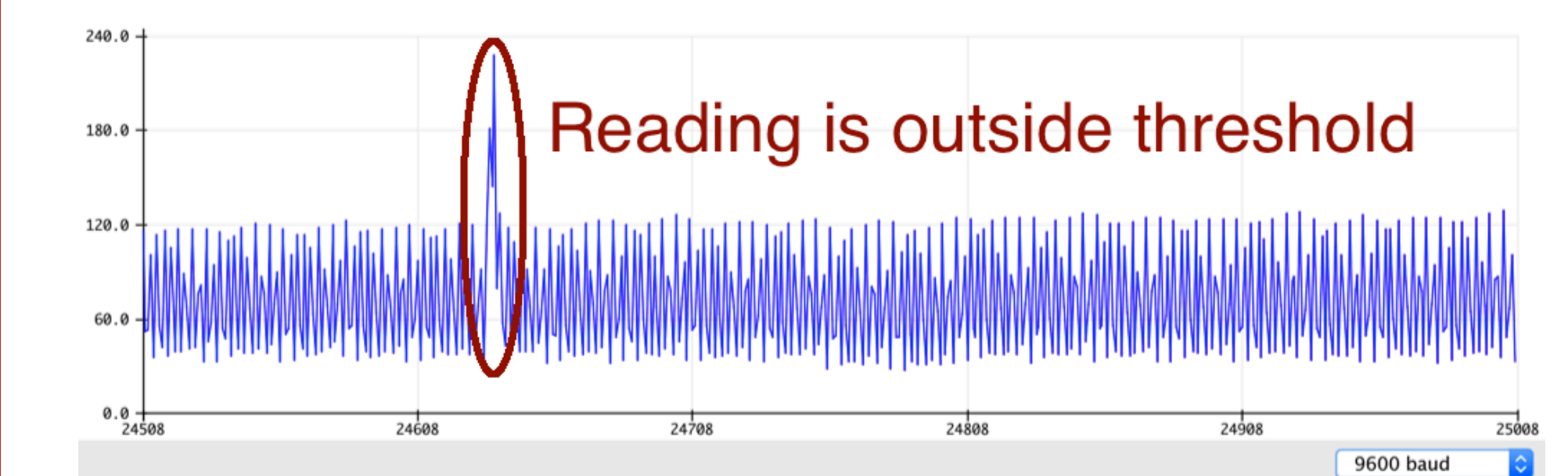


- ❑ Adafruit Feather Huzzah microcontroller is the central component of our device
- ❑ Temperature and heart rate sensors track vitals
 - Readings combined to sense tampering
- ❑ Adafruit Ultimate GPS FeatherWing has position accuracy of 1.8 meters
- ❑ Arduino IDE used to program microcontroller
- ❑ Transmits information to Firebase database via Internet connection
 - GPS location
 - BSSIDs of nearby WiFi routers
 - Sensor readings
- ❑ Retrieves information from Firebase and displays in user interface
 - Notifies user of unusual readings
- ❑ Runs BSSIDs through Unwired Labs API which returns wearable coordinates
- ❑ Java used in Android Studio to program application
- ❑ Utilizes Google APIs for geofencing
- ❑ Integrates Google Calendar for automatic geofencing
 - Addresses are geocoded for marker location
 - Event start and end times are used to calculate marker duration

Results

WEARABLE

- ❑ Achieved accurate sensor readings given unusual logic states
- ❑ Set thresholds for when application should send alerts
- ❑ Established connection between wearable and Firebase
- ❑ Successfully sent readings to Firebase periodically



temperature-test-2cef

logs

message: "Our readings are as follows:"

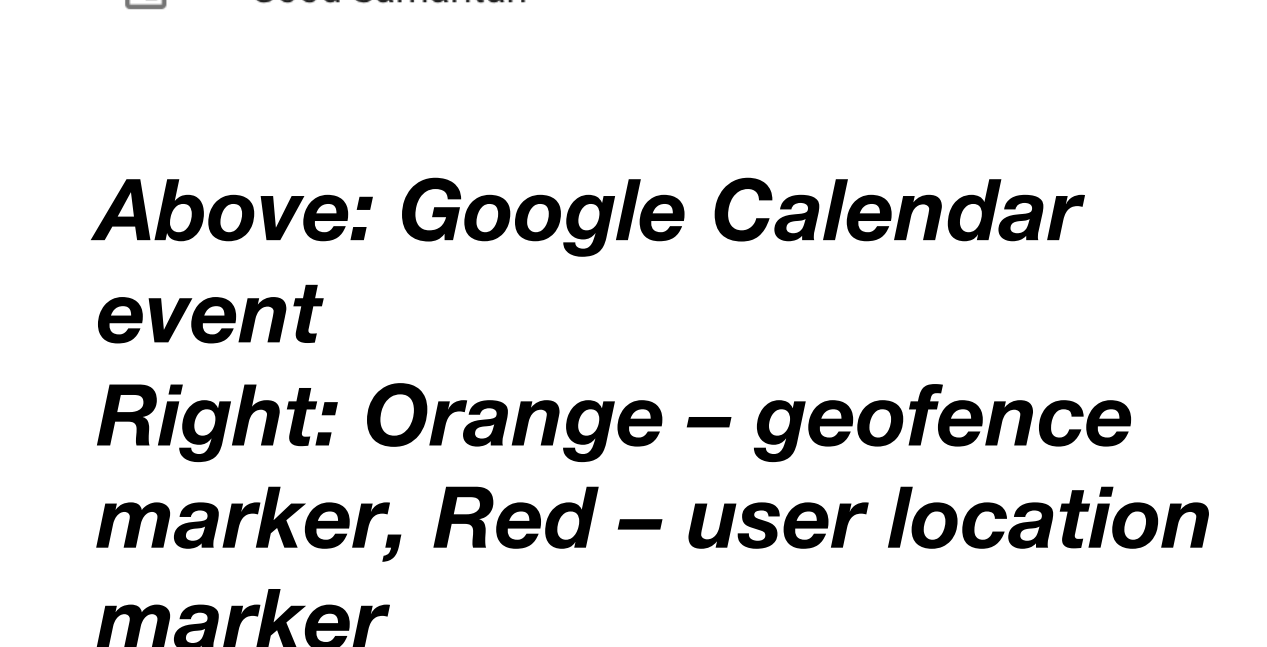
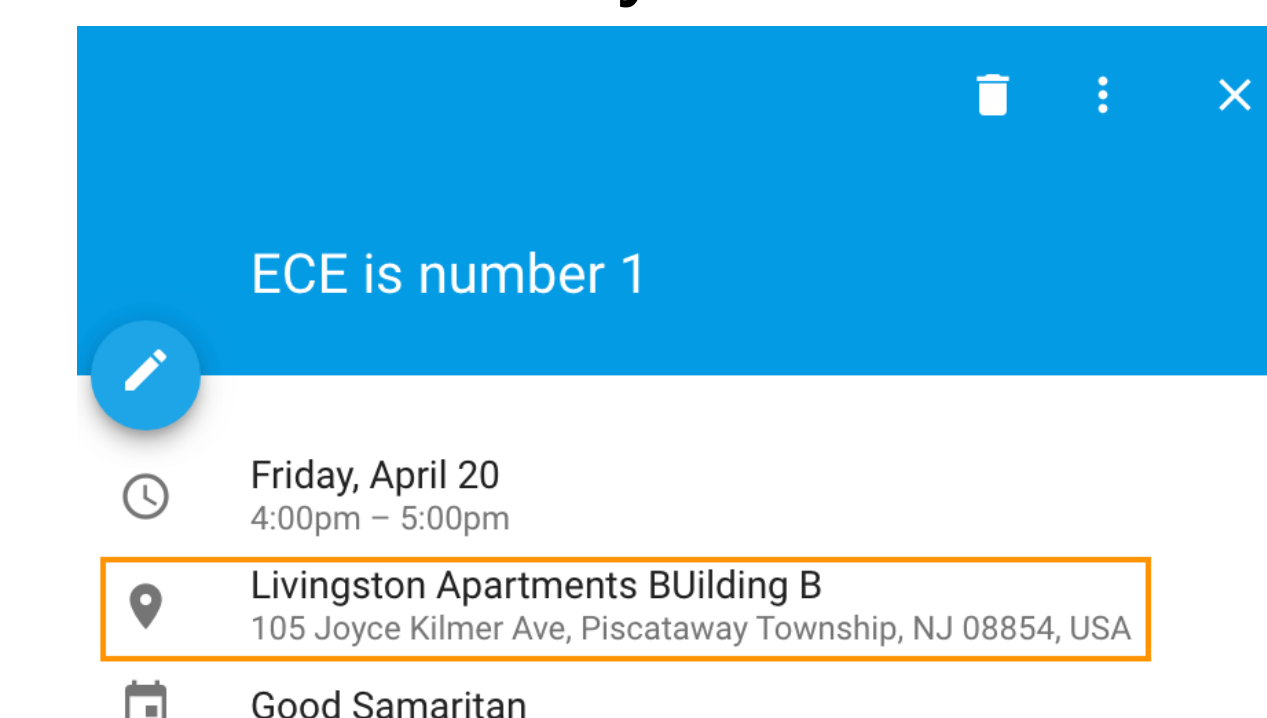
temperature: 75.49758

Above: Heart rate sensor reading

Left: Temperature reading in Firebase

APPLICATION

- ❑ Created Android Based Application that utilizes Google and Unwired Labs APIs for determining wearable location
- ❑ Retrieved data successfully from Firebase and displayed in application
- ❑ Implemented geofencing manually and automatically



Above: Google Calendar event

Right: Orange – geofence marker, Red – user location marker