

SEGURANCA – SAFETY IN YOUR HANDS

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Abstract

In today's day and age, parents, and guardians often find themselves preoccupied due to the fast pace of our everyday routines. Absent-mindedness can lead to neglect for the safety of children and those in need of constant supervision. According to the FBI, the total number of missing children has remained at nearly half a million over the last several years. Seguranca is a smart, wearable device designed to set the minds of parents and guardians at ease. The goal is to reduce uncertainty and increase the overall wellbeing of users who use this device. This project takes advantage of the capabilities that the Internet of Things (IoT) offers to collect data about location and pulse (heartbeat) while allowing communication between the user and the parent or guardian.

Introduction

During the research period of project development, we were looking at social issues concerning safety for which there were few (or no) technological solutions available on the market. We found that the number of missing persons had been gradually increasing over the years¹, which met the criteria. According to the FBI, in 2018 there were 424,066 NCIC entries for missing children. To make matters worse law enforcement says that in abduction cases or with genuine lost persons, the first 24 hours are crucial to the chances of eventual recovery. After reading the article, we wanted to create a product using currently existing technology to reduce the number of missing persons and increase the chances of immediate recovery. While brainstorming for solutions, we found that researchers have examined online survey responses from parents nationwide. Overall, 96 percent of guardians who said they were currently using an electronic tracking device said it made their quality of life better (47 percent said it made it "somewhat better," and 49 percent said, "much better.")². After careful consideration, the team settled on a wearable accessory, specifically a watch, as it was more likely a child would wear it without removal.

Design

The design section is mainly divided into hardware and software. The hardware section of the project includes; a Wi-Fi module (ESP8266), a pulse sensor (DFRobot), a GPS sensor (GT-U7) and an LCD touchscreen. The Wi-Fi module collects the latitude and longitude coordinates using the GPS sensor and heart rate using the pulse sensor. It sends this information along with timestamp every second to the database in the form of JSON objects. The software section consists of an iOS Mobile App and a database that sends and receives data through JSON objects. We are using a real-time database on firebase.com run by Google. The database sends the information from the device to the mobile app. The app is mainly for the guardian and will include all the information for the watch

user. The mobile app provides a user interface to view the heart rate data, the GPS location and can communicate with the user. The app will currently only available in the App Store when the product launches.

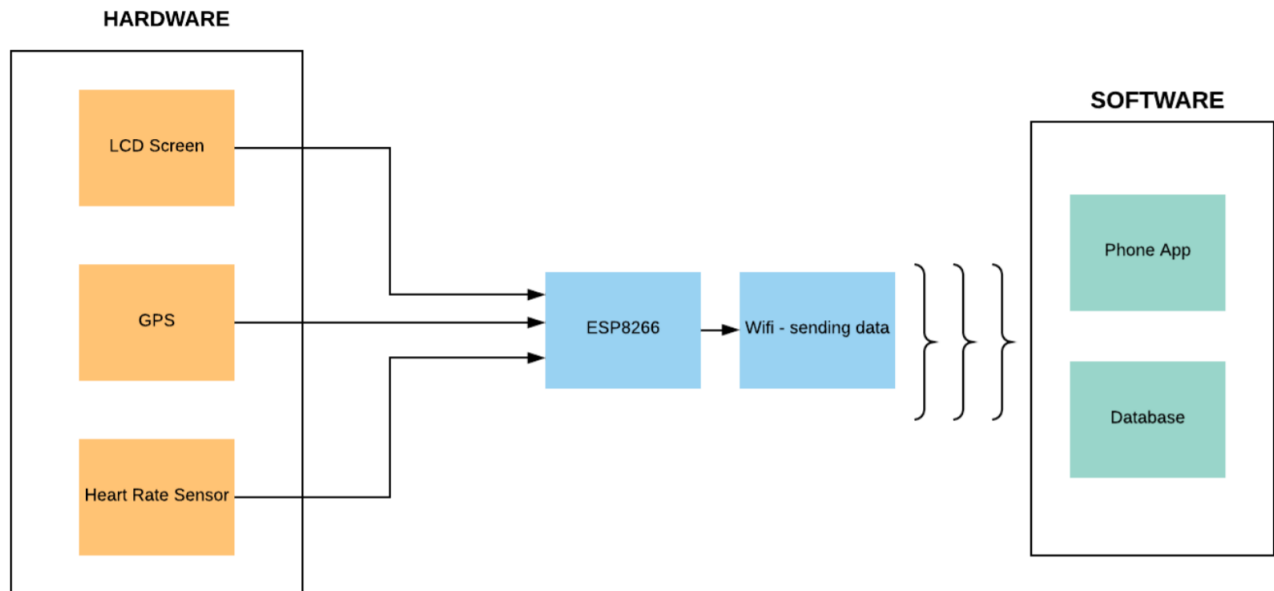


Figure 1: Block Diagram of Seguranca

Summary and Conclusions

To summarize, the team was able to create a device that would help an individual to monitor the well-being of another using precision tracking GPS, Geo-fencing feature, heart rate monitoring and chat capability. We believe that with the help of Seguranca, parents and guardians will have less anxiety about their children, older parents or grandparents from getting injured or going missing. Because last known location, the direction of travel, and speed can all be collected from GPS data, Seguranca estimates that with the help of their product the number of lost children or injured elders will go down by 80%. This is because the GPS tracking, geofencing, monitoring of the heart rate beyond normal resting or playtime heart rate and easy communication will assist parents and guardians in keeping track of their loved ones. Seguranca will help lower the number of lost children and injured elders one watch at a time.

References

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