SIHMON

Smart Infant Health Monitor

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Agenda

Introduction

Hardware Components

Software Development

Integration

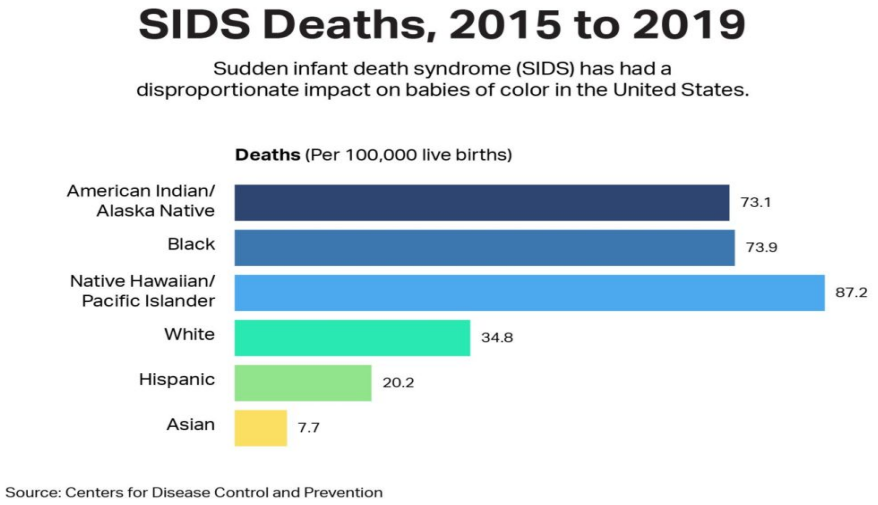
Testing

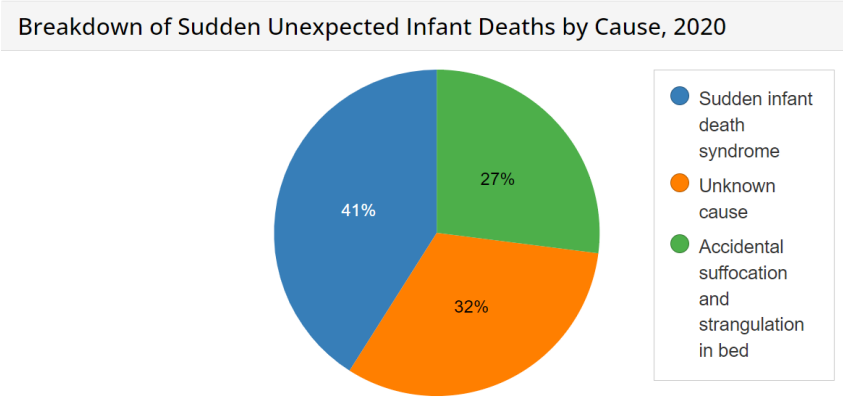
Conclusion

INTRODUCTION

Problem Domain

- SIDS causes 2500 infant deaths per year (US).
- Gastrointestinal issues: leading cause of deaths of kids 5 and under (US).
- Respiratory infections: cause 5/1000 live births (US).
- 1 million deaths due to parents being unaware of prematurely born babies health (WHO).





Solution

SMART INFANT HEALTH MONITOR

- Advanced Health Monitoring
- Real-Time Alerts
- Data-Driven Insights: based on data.
- Empowering Caregivers.

Firebase

Hardware Components: Sensors

ADXL345

- High - Resolution 3-Axis Accelerometer
- Compact and Low Power
- Sensitive Motion Detection
- Versatile Application

LM393

- Sound Detection Capability
- Microphone and Comparator Integration
- Digital Output for Sound Levels

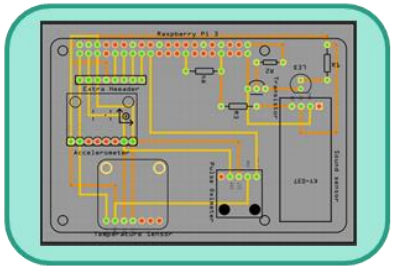
MAX30102

- Pulse Oximetry and Heart-Rate Monitoring
- Integrated LED and Photodetector System
- Non-Invasive SpO2 and Heart Rate Tracking
- Suitable for Infant Health Applications

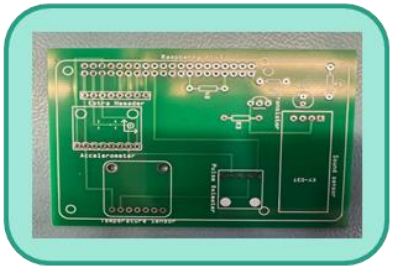
TMP006

- Non-Contact Infrared
- Thermopile Sensor
- Infrared Energy Detection from Skin
- Continuous Monitoring Capability

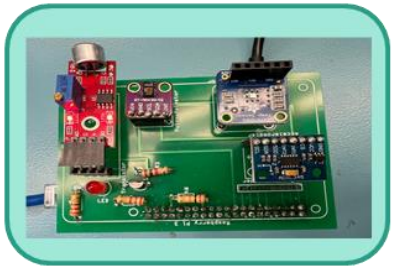
Assembly



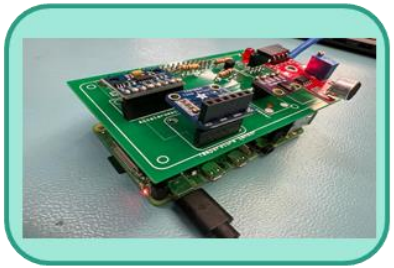
- Created PCB layout and circuit schematic using Fritzing.
- Addressed design challenges and utilized Fritzing tools for layout and connections.



- Translated digital design to a physical board through manufacturing or fabrication.
- Noted any differences or unexpected observations from the original Fritzing design.



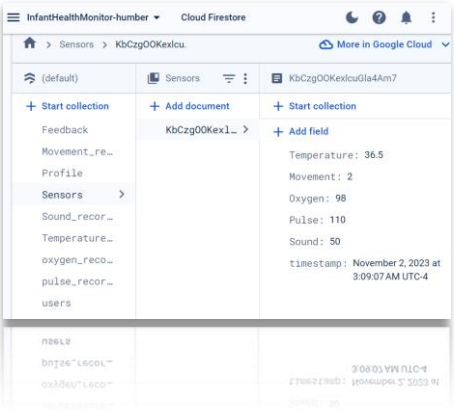
- Used soldering techniques to connect components like LEDs, PNP transistors, resistors, and all four sensors onto the PCB board.
- Ensure precision and accuracy in soldering each component onto the designated spots on the board.



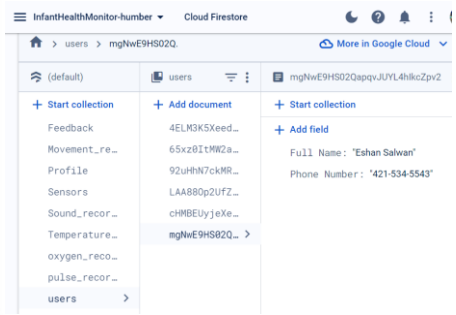
- Established connections between the completed PCB board, which includes soldered components such as sensors, LEDs, transistors, etc., and the Raspberry Pi.
- Ensured proper alignment and secure connections between the PCB board and the Raspberry Pi's GPIO pins or other interfacing methods.

Firebase

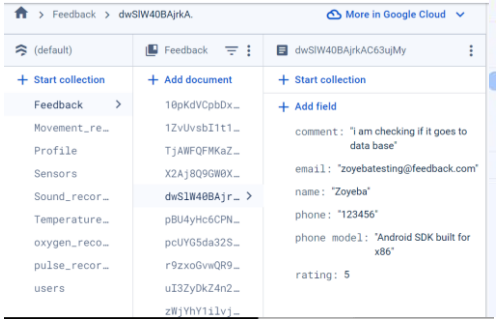
Real time readings from all the sensors



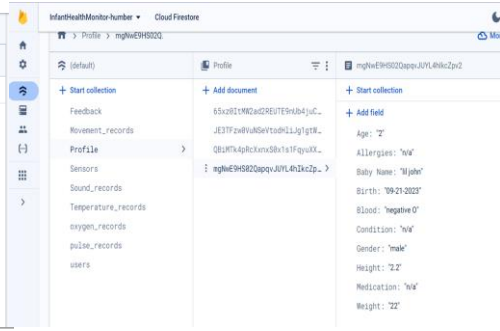
User information and authentication



Feedback from the app



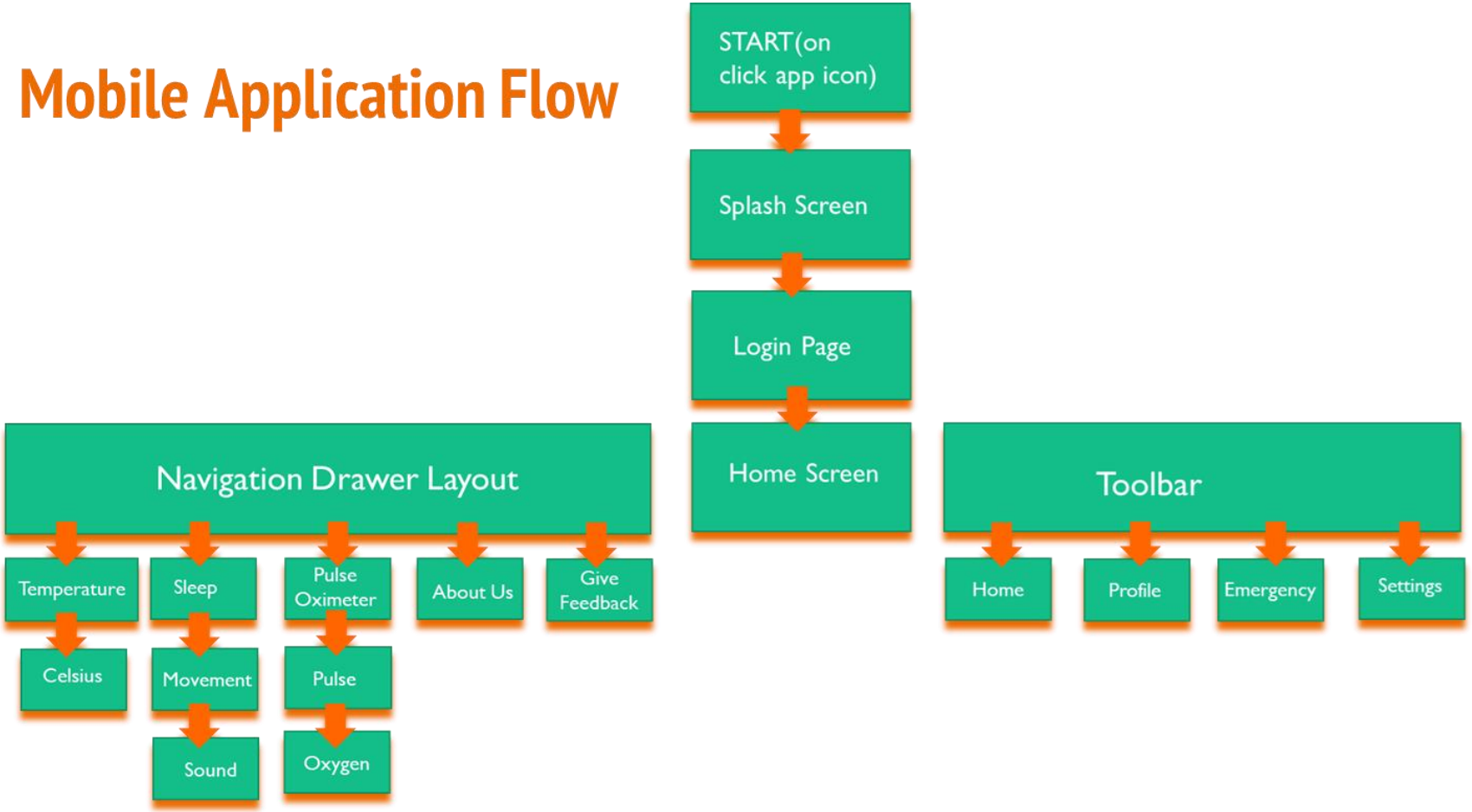
Profile data for the user



Mobile Application : Features

- Login authentication
- Profile screen for emergency information
- Home Screen with all the real time readings
- Notification alert
- Emergency call to 911
- Individual sensor screens for daily statistics
- Feedback
- Offline feature
- About us and settings page

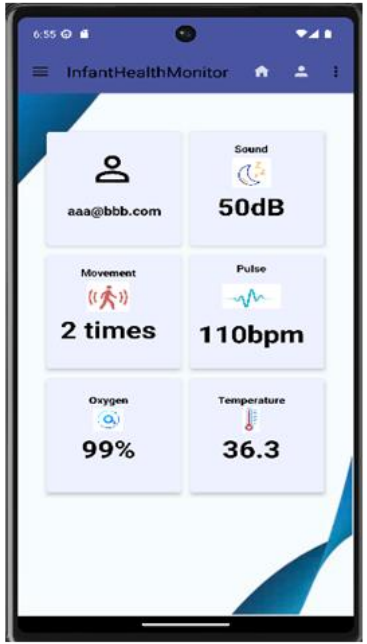
Mobile Application Flow



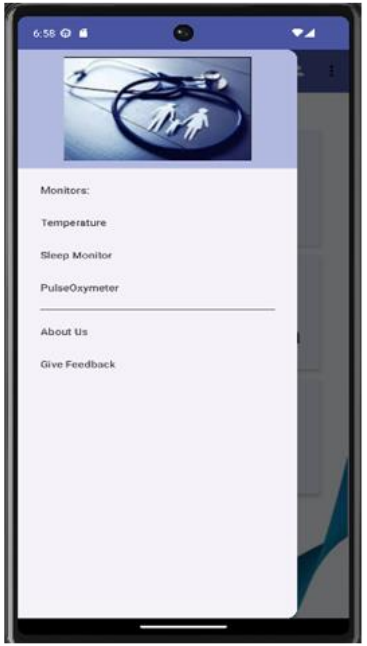
Screen Flow

Login Screen

HomePage Screen



Navigation Drawer



Settings Screen

Screen Flow

Temperature Screen

Movement Screen

Pulse Oximeter Screen

About Us Screen

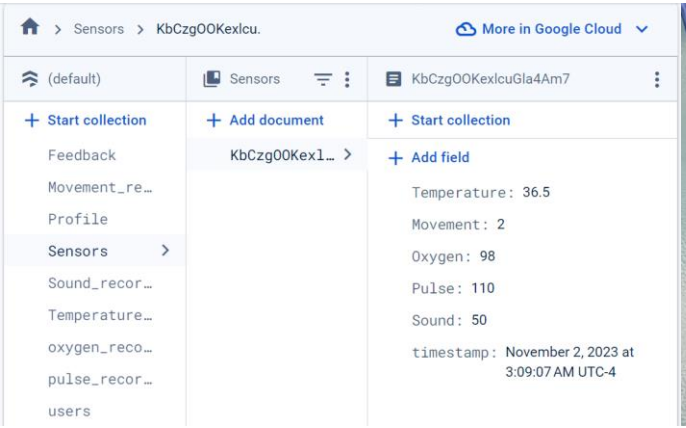
Feedback Screen

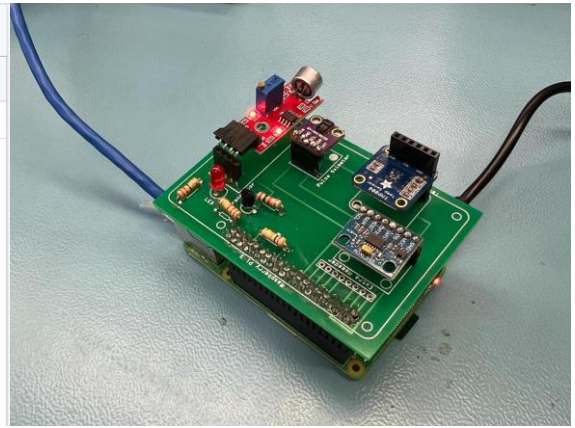
Testing and results

Assembly with Raspberry Pi, PCB, and sensors, data is visible on Firebase.

Data and graphs updated on the app.

App analyzes data and shows insights.





File Edit View Run Tools Help

Test.py

```
1  import time
2  import board
3  import busio
4  import adafruit_adxl34x
5  import adafruit_tmp006
6  import RPi.GPIO as GPIO
7  import threading
8
9  # setup adxl i2c functions
```

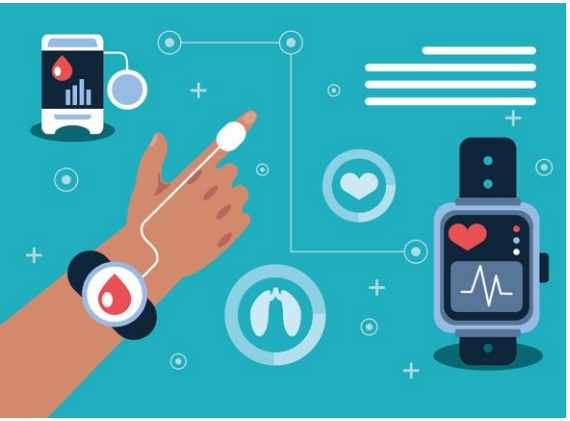
Shell

```
Python 3.7.3 (/usr/bin/python3)
>>> %Run Test.py

  LED ON
  -2.941995 0.392266 20.044793
  Sound Detected
  Object temperature: 37.10*C / 98.78*F
  BPM: 77, O2: 98
  -2.941995 0.392266 20.044793
  No Sound Detected
  Object temperature: 37.12*C / 98.82*F
  BPM: 77, O2: 98
  LED OFF
  -3.726527 1.255251 20.044793
  Sound Detected
  Object temperature: 37.10*C / 98.78*F
  BPM: 77, O2: 98
```

Conclusion

- Advancing Infant Care: Our system is a leap forward in safeguarding infant health through advanced, non-invasive monitoring.
- Empowering Caregivers: We provide caregivers with the tools for peace of mind and the ability to respond swiftly to the infants' needs.
- Commitment to Innovation: We are dedicated to continuous improvement and innovation in the field of infant health technology.
- Join us to be part of this vital change, whether through support, adoption, or spreading the word.



Thank you !!!

For exploring our vision for a future where every infant is monitored ensuring proper care and a healthier society. Together, we can make this vision a reality.