SIHMON

Smart Infant Health Monitor

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Agenda

Introduction

Hardware Components

Software Development

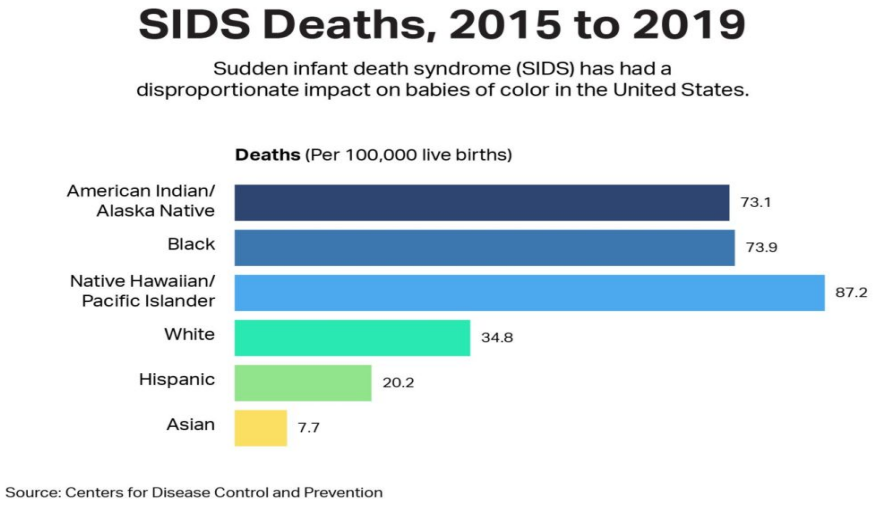
Integration

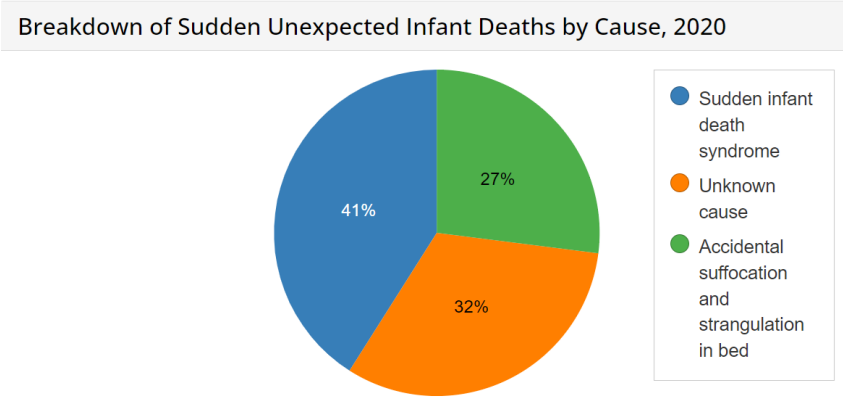
Testing

Conclusion

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.

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

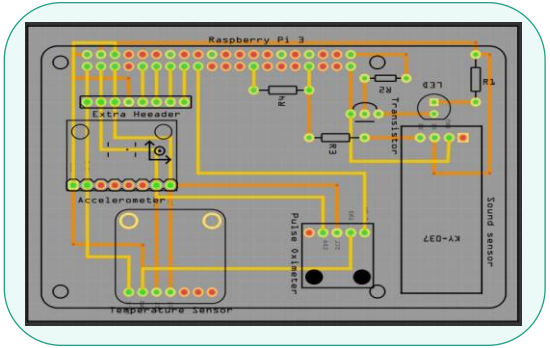
MAX30102

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

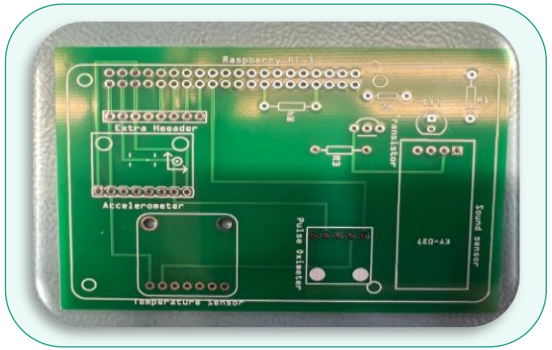
TMP006

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

Assembly



Designed PCB layout and circuit schematic using Fritzing

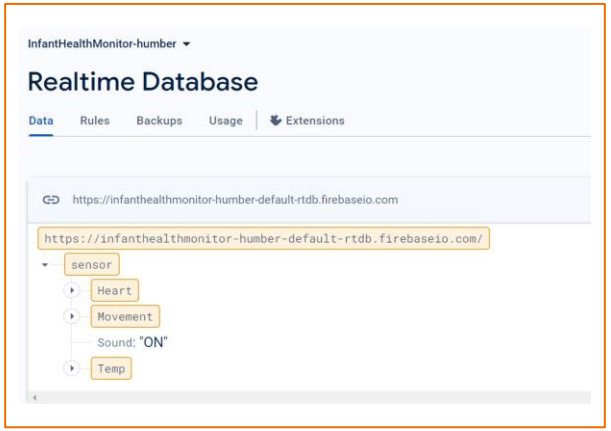


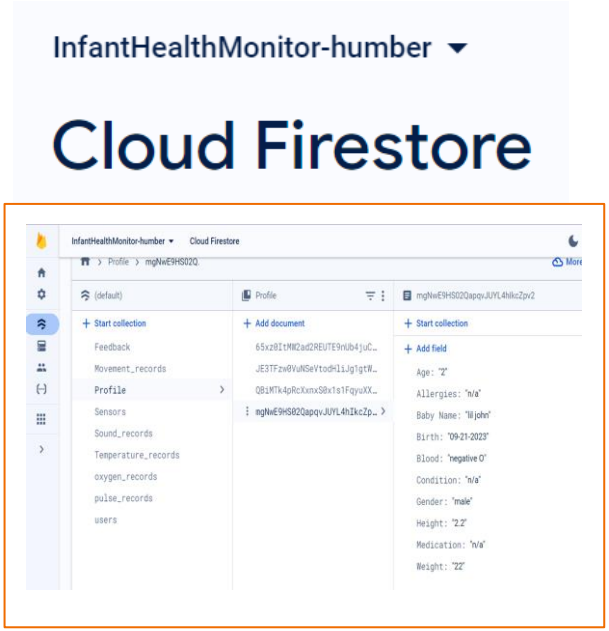
Converted digital design to physical board through manufacturing

Connected soldered components on the PCB, including transistor, resistors, sensors and LEDs to the Raspberry Pi

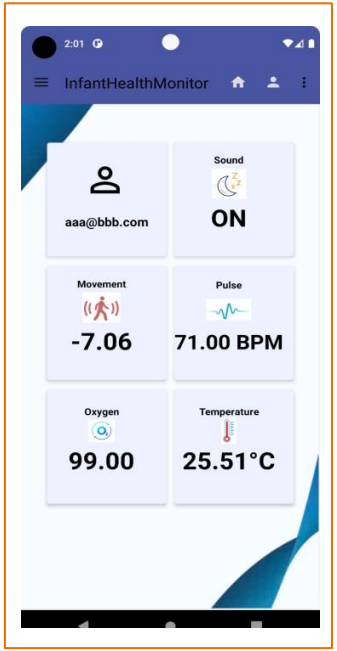
Firebase

Readings from the sensors to the Realtime database





Mobile Application with real time readings from the Firebase database

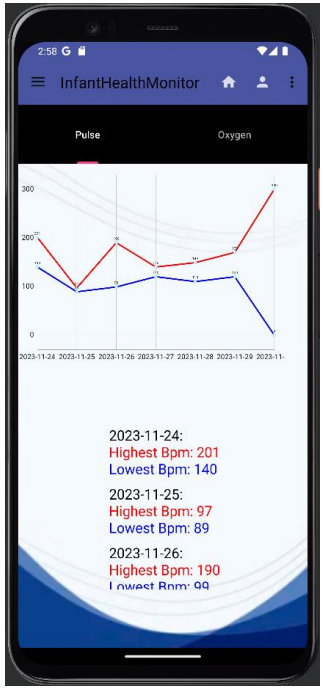


Screens

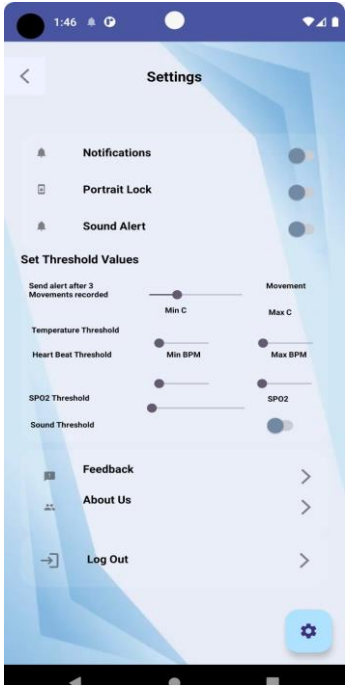
Login Screen

HomePage Screen

Sensor Screen



Settings Screen

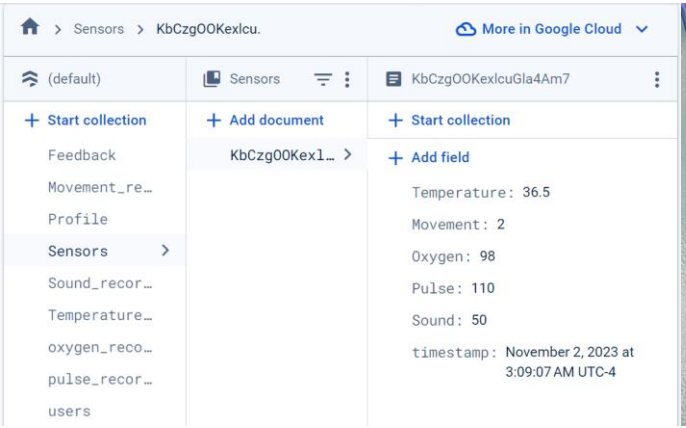


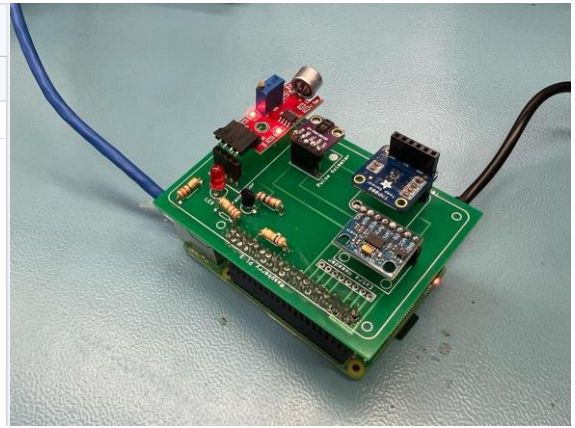
Testing and results

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:** Safeguarding infant health through advanced, non-invasive monitoring.
- **Empowering Caregivers:** Ability to respond swiftly to the infants' needs.
- **Commitment to Innovation:** Continuous improvement and innovation in healthcare technology.

Parents Peace of Mind

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.