

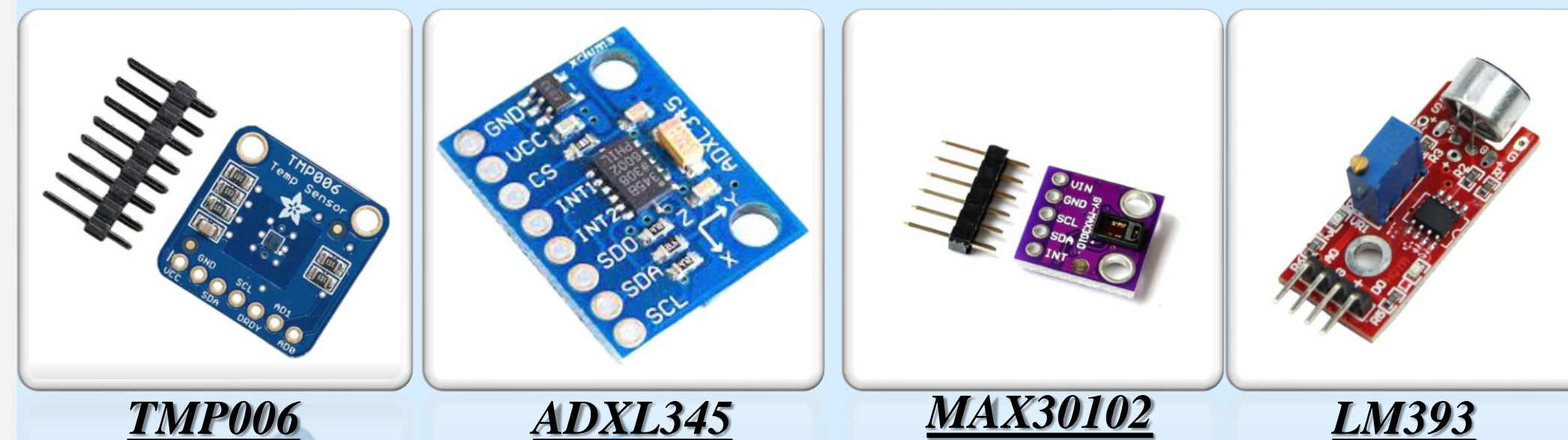
Smart Infant Health Monitor (SIHMON)

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INTRODUCTION

Welcome to a revolutionary era in caregiving with our capstone innovation – the Smart Infant Health Monitor (**SIHMON**) App, powered by a Raspberry Pi Computer and our PCB (printed circuit board).

SIHMON **monitors infant's health** in real-time through our **user-friendly mobile app** using sensors. It empowers both parents and healthcare providers to effortlessly nurture the well-being of our little ones. SIHMON uses the following sensors: -



- **TMP006:** Continuous monitoring child's temperature.
- **ADXL345:** Movement detection for monitoring infant activity levels.
- **MAX30102:** Monitoring heart rate and blood oxygen level.
- **LM393:** Cry detection to alert caregivers for prompt attention to the baby's needs.

AIM

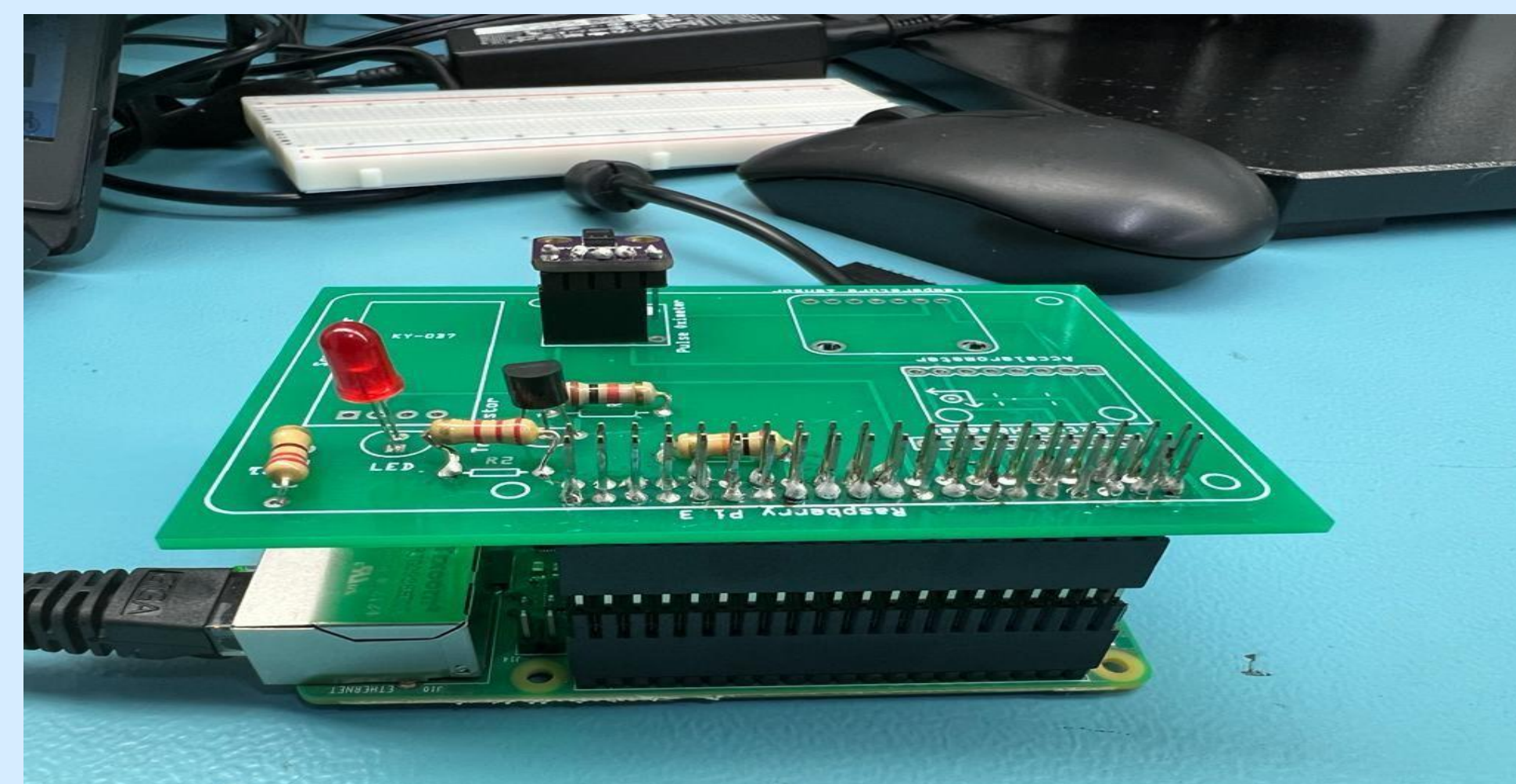
Provide parents/caregivers with a convenient way to: -

- Monitor and track their infant's health in real time.
- Receive alerts if anything seems unusual.
- Ensure and hence improve their baby's well-being.

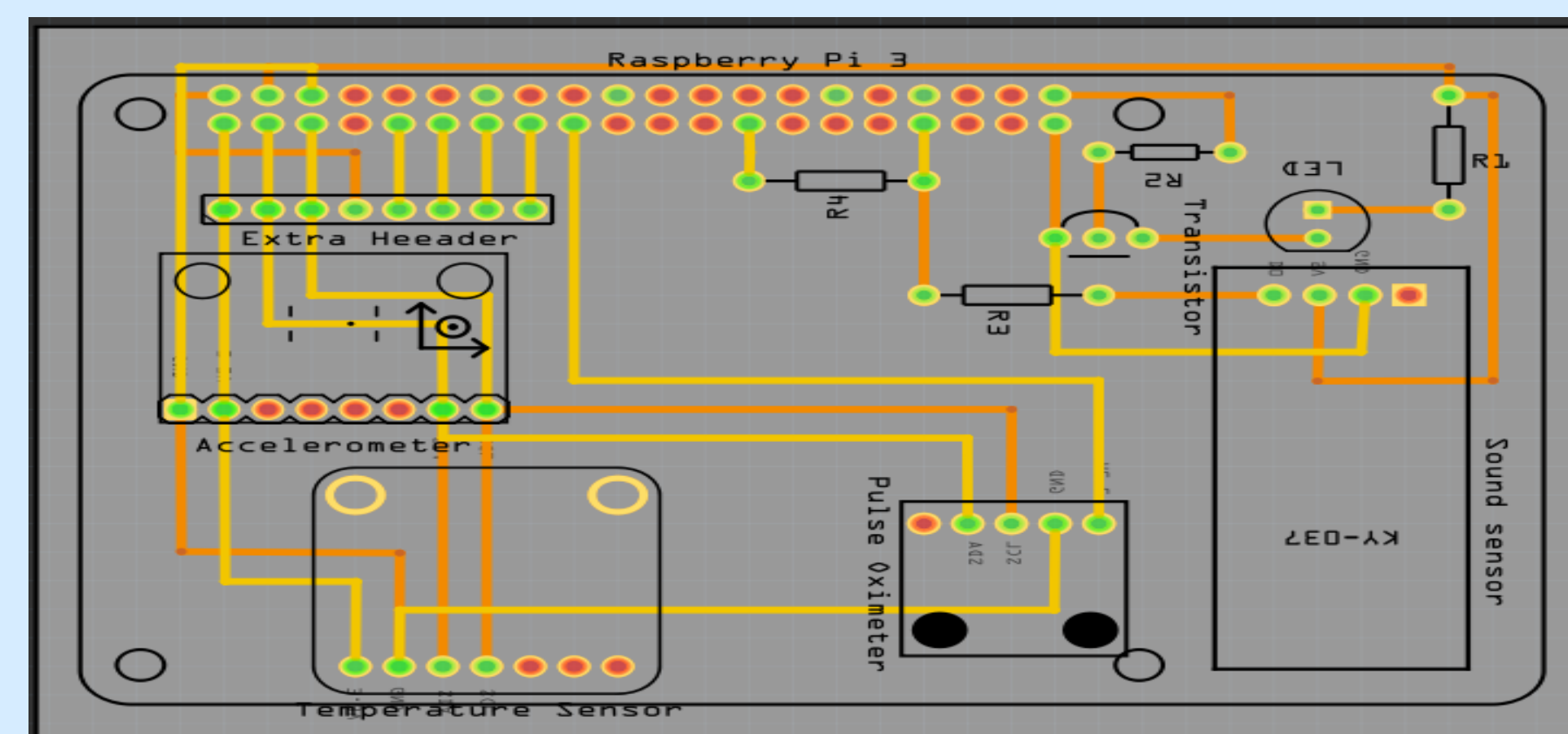
HARDWARE DEVELOPMENT

We followed a hybrid **Agile-Waterfall** approach to develop the hardware solution: -

1. Selected optimal sensors to monitor infants' health.
2. Developed and **unit-tested** our circuit on a breadboard.
3. Designed PCB (printed circuit board) **using Fritzing**.
4. Collaborated with PCB production vendor to manufacture the PCB.
5. Programmed the computer (**Raspberry Pi**) to collect the infant's health data from the sensors and record it into the **database** (Firebase) **using Python**.
6. Rigorously tested the prototype.



Testing heart rate and blood oxygen sensor with PCB and Raspberry Pi.



Layout of PCB Board comprises all the four sensors in the Fritzing

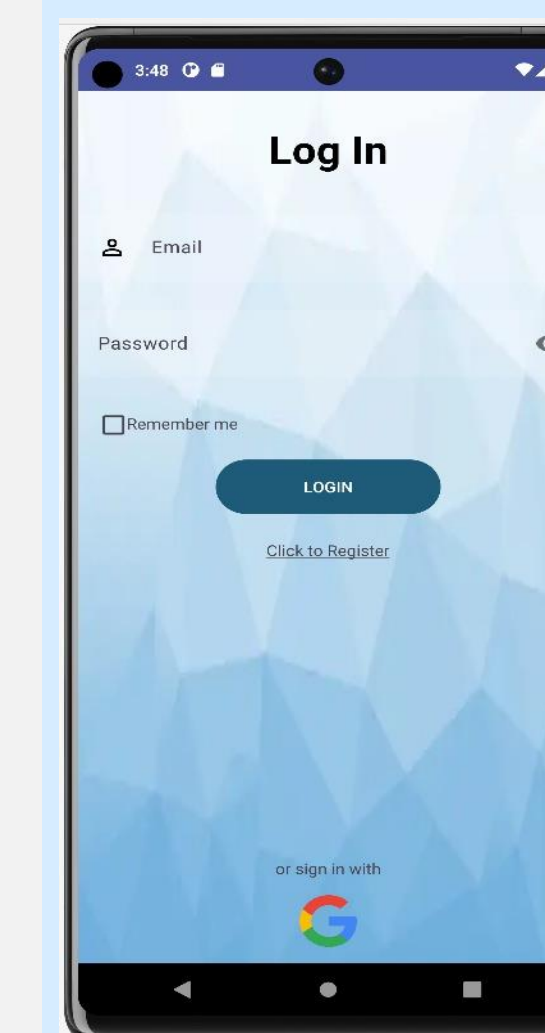
MOBILE APPLICATION

The main functions of the application include

- **Secure login** for parents and health professionals.
- Home page with **card-based layout** for sensors.
- Analytics page to **track daily health statistics**.

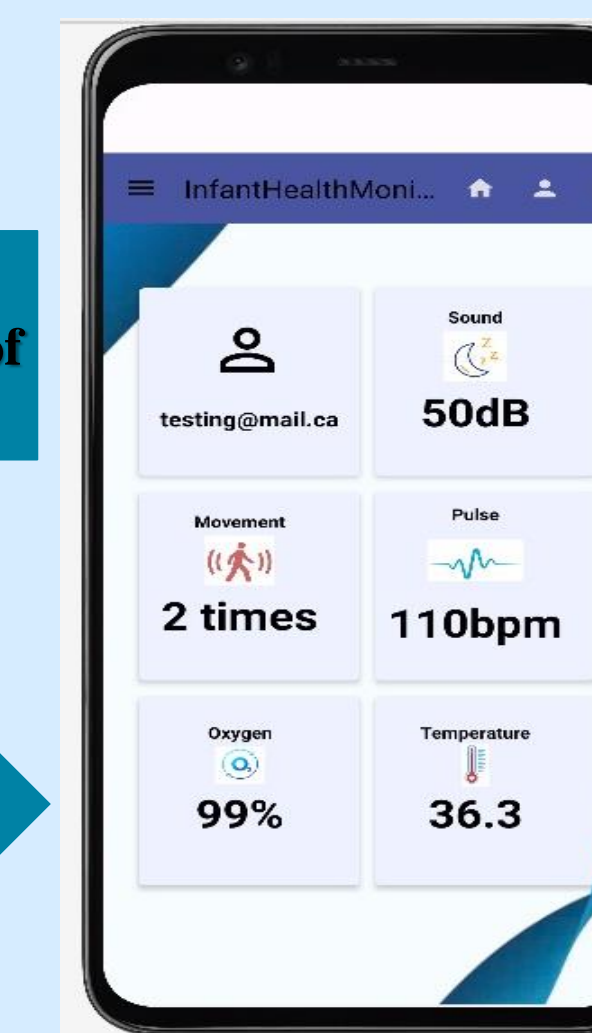
The team followed the **Agile-DevOps** approach to develop the mobile application: -

- Used **Android Studio** and **Java** to develop the app.
- Used navigation drawer to design user interface.
- Added scroll views and graphs to enhance **UI/UX**.
- Used **Junit, Selenium, and Espresso** to test the code.



Android studio. (2023)
Screenshot of Login Page of
Infant Health Monitor

Android studio. (2023)
Screenshot of Home Screen of
Infant Health Monitor



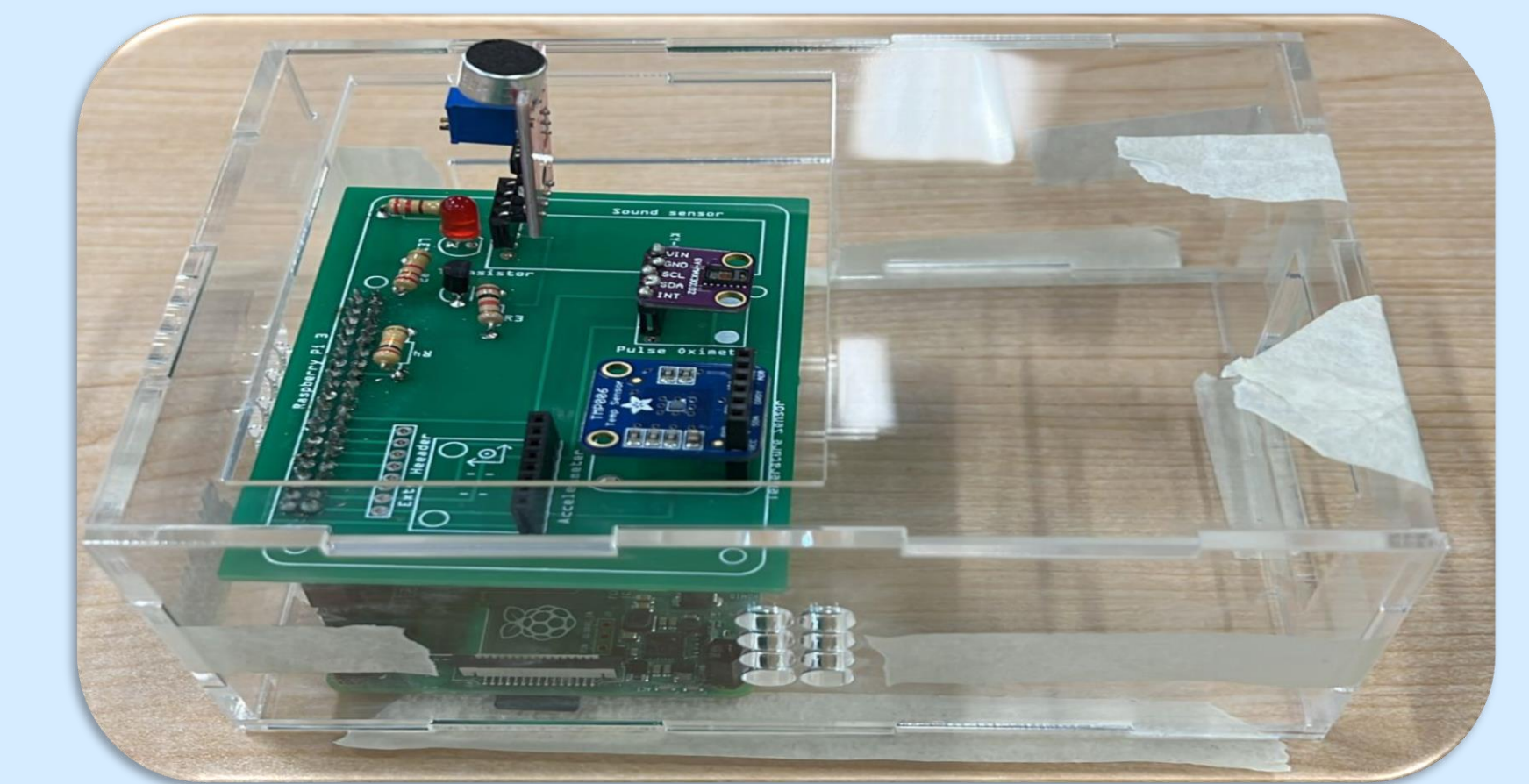
Android studio. (2023)
Screenshot of Motion Screen of
Infant Health Monitor

Android studio. (2023)
Screenshot of Profile Screen of
Infant Health Monitor



MANUFACTURING

We are excited to present a live demonstration featuring a 3D-printed acrylic box designed using CorelDRAW. Witness the seamless integration of the sensors, PCB, mobile app, and computer (Raspberry Pi). This prototype emulates the complete functionality of our final product (the actual health band).



CONCLUSION

In a nutshell, SIHMON is more than just a capstone project; it is an innovation which will make a real impact in the lives of parents worldwide.

We have successfully completed the prototype stage. Our future plans include miniaturization of the sensors so they can fit within a band worn by the infant.

ACKNOWLEDGEMENTS

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