

BABY MONITOR WITH STAR QUALITY



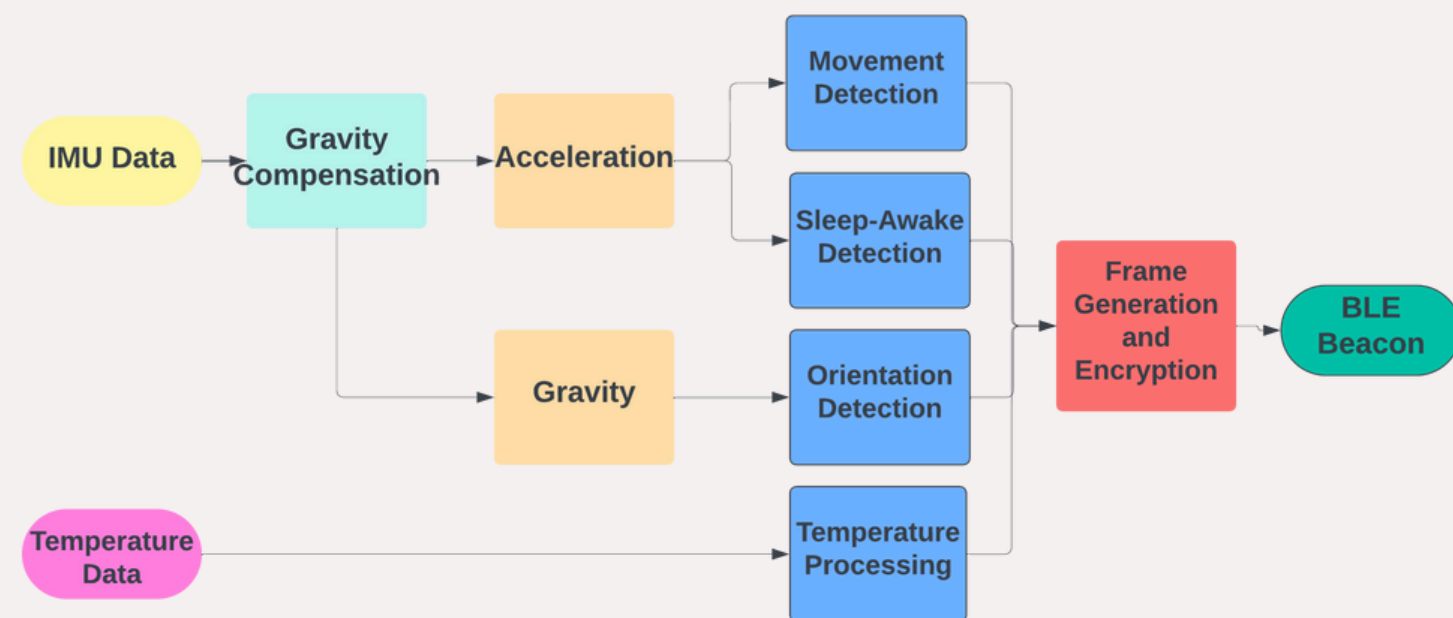
PROJECT DESCRIPTION

The Smart Baby Monitor tracks a baby's well-being by accurately monitoring body temperature, detecting cries and movements, and distinguishing sleep states. It recognizes specific words, plays lullabies or parental voices when the baby cries, and allows for verbal interaction. The system communicates wirelessly, includes soft wearable parts, and integrates with a mobile app for real-time updates and alerts, ensuring convenience and safety for both parents and babies.

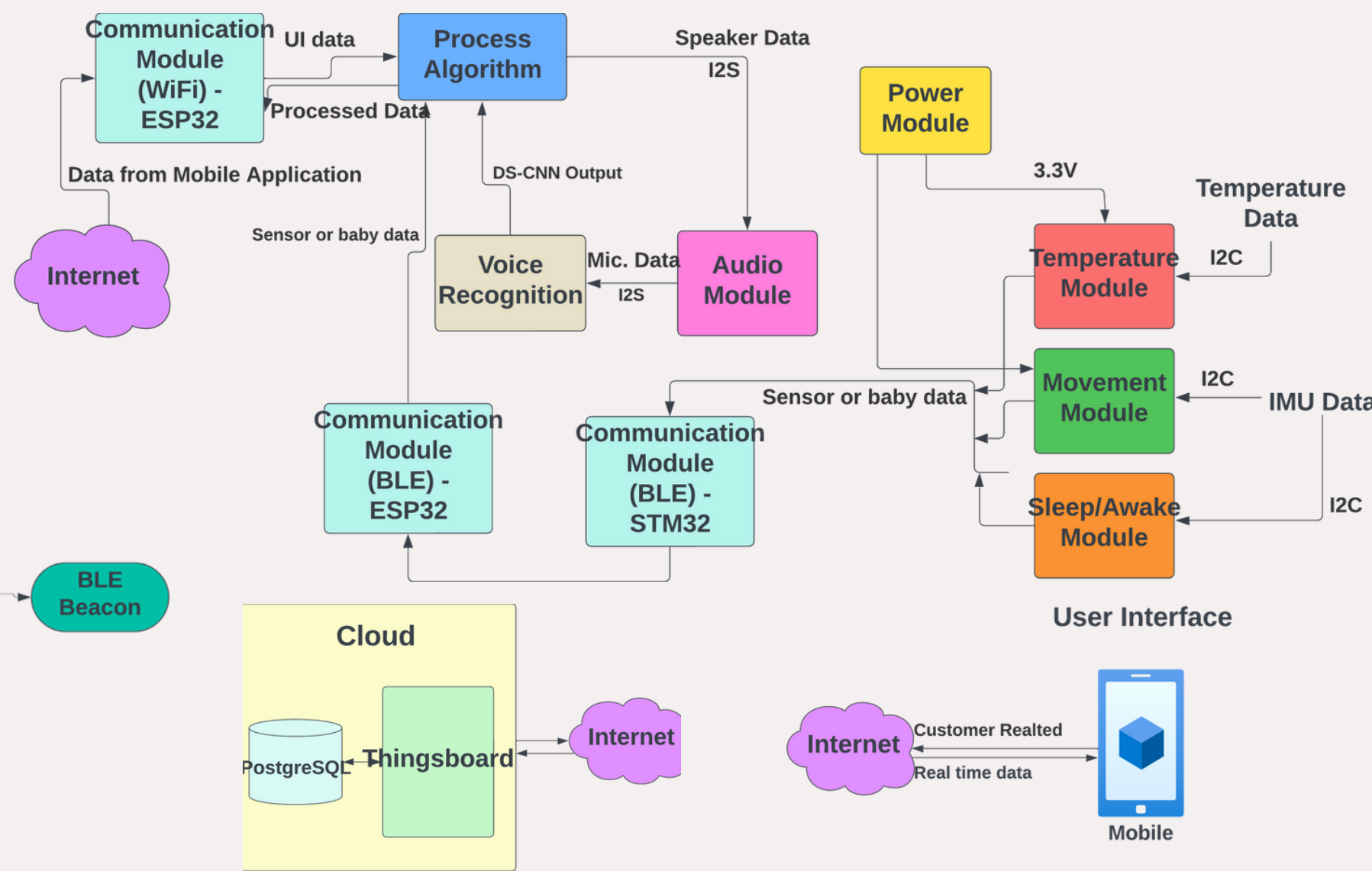
SYSTEM DESIGN

- Accurate detection of temperature, cries, and movements.
- Wireless communication for all components.
- Mobile app for real-time updates and alerts.

WEARABLE DEVICE



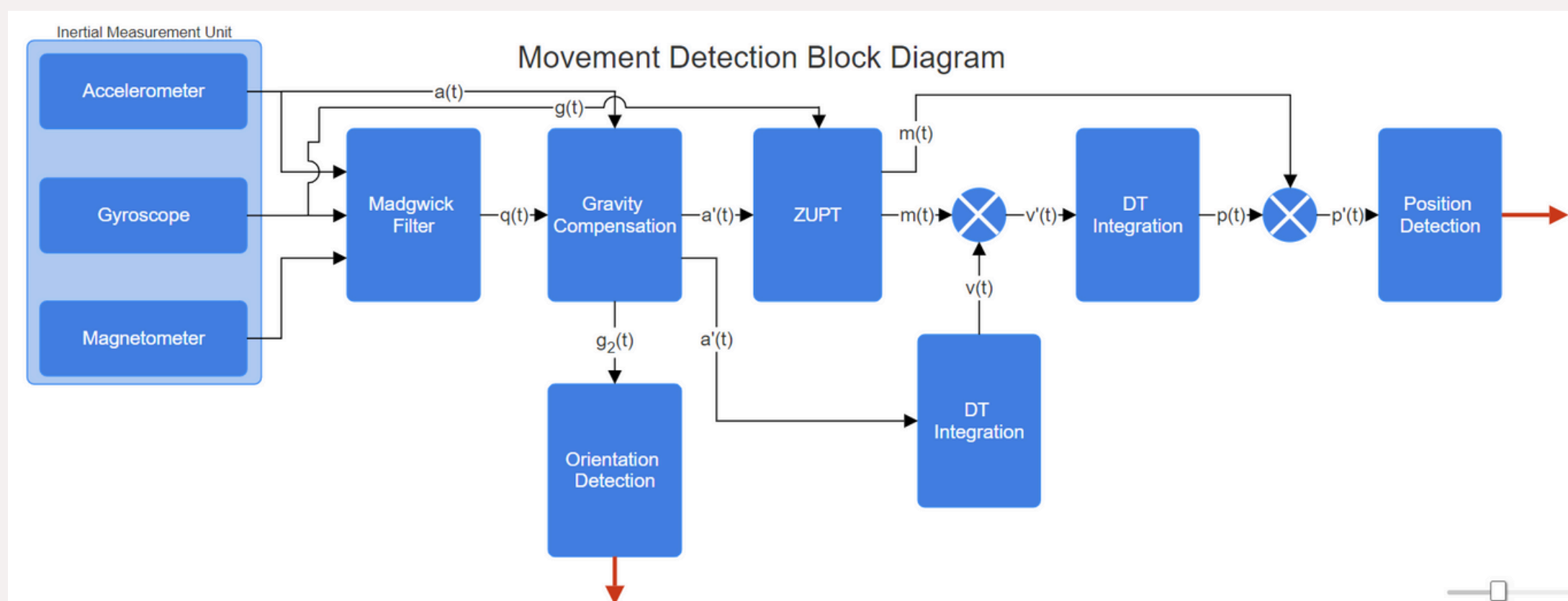
GENERAL SYSTEM



MOVEMENT DETECTION

Our movement subsystem can detect movement of 20 cm that can take place in 1 seconds. By using MPU-9250 IMU sensor, the system can detect 9 axis movement

- Sudden movement detection
- Dangerous orientation detection



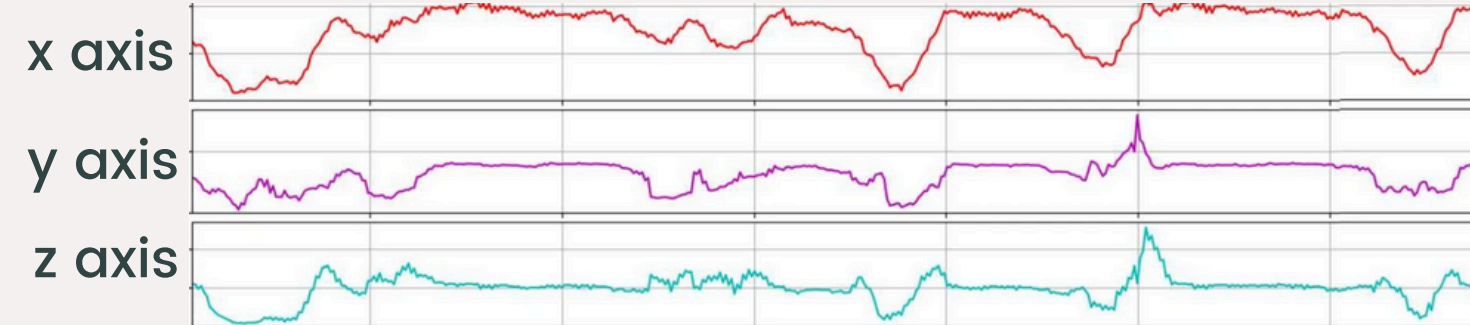
SLEEP AWAKE DETECTION

Sleep Awake state detection using only IMU data

- %85 F1 score
- State detection within 5.30 minutes



Acceleration vs time (m/s^2)



VOICE RECOGNITION AND CRY DETECTION



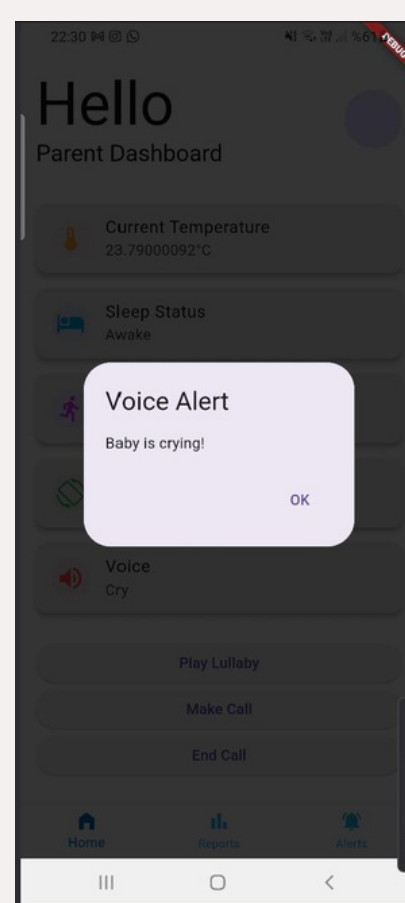
Our voice classification model can detect mama - papa sounds and crying of the baby immediately: Our figure of merits:

- On-device, real time processing
- Above 80% precision and 70% recall for each class
- Streaming tiny convolutional classification model
- Trained with 3000+ baby voice data

MOBILE APPLICATION

Our mobile application provides private and reliable data to parents.

- Baby Call
- Continuous Monitoring
- Warnings
- Notifications



TEMPERATURE DETECTION

Temperature detection using IR sensor within our end device close to the baby

- 0.2 °C accuracy
- 0.051% error rate at most
- High Temperature warning via Mobile Application



CLOUD

- User Privacy
- Secure Authentication
- Reliable Connection

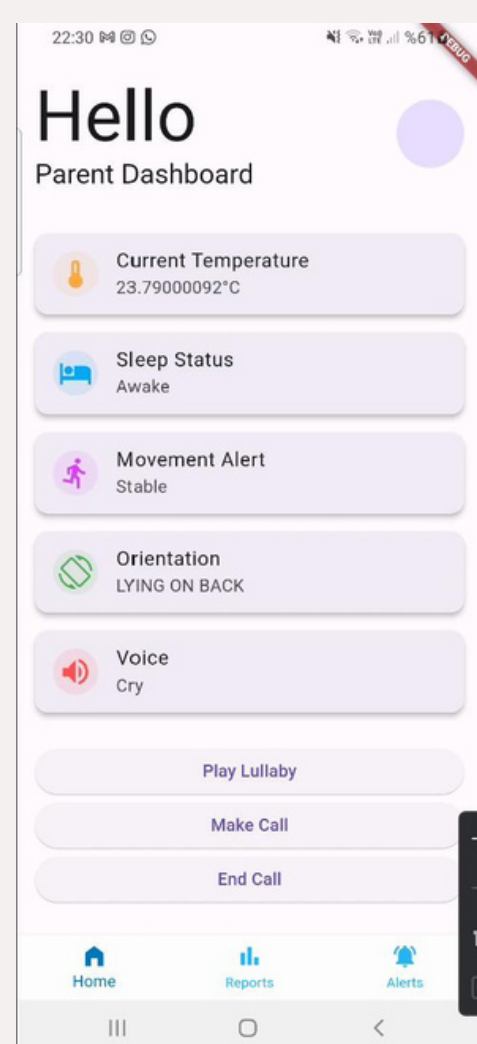


RESULTS AND DISCUSSIONS

The Smart Baby Monitor's test results showed exceptional performance across all subsystems. The device accurately tracked movements, identified specific sounds and cries, and reliably detected sleep-wake states. Temperature monitoring was precise, ensuring the baby's well-being. The inclusion of a mobile application provided real-time updates and alerts, enhancing parental convenience. Overall, the monitor proved to be a reliable and efficient tool for comprehensive infant care.

WHAT MAKES US DIFFERENT?

Our Smart Baby Monitor not only meets all the base requirements but does so at a significantly lower cost of \$88 compared to the \$300 budget. Additionally, we offer a mobile application for real-time monitoring and alerts, enhancing user convenience. Our device boasts low detection errors for all subsystems, ensuring reliable performance.



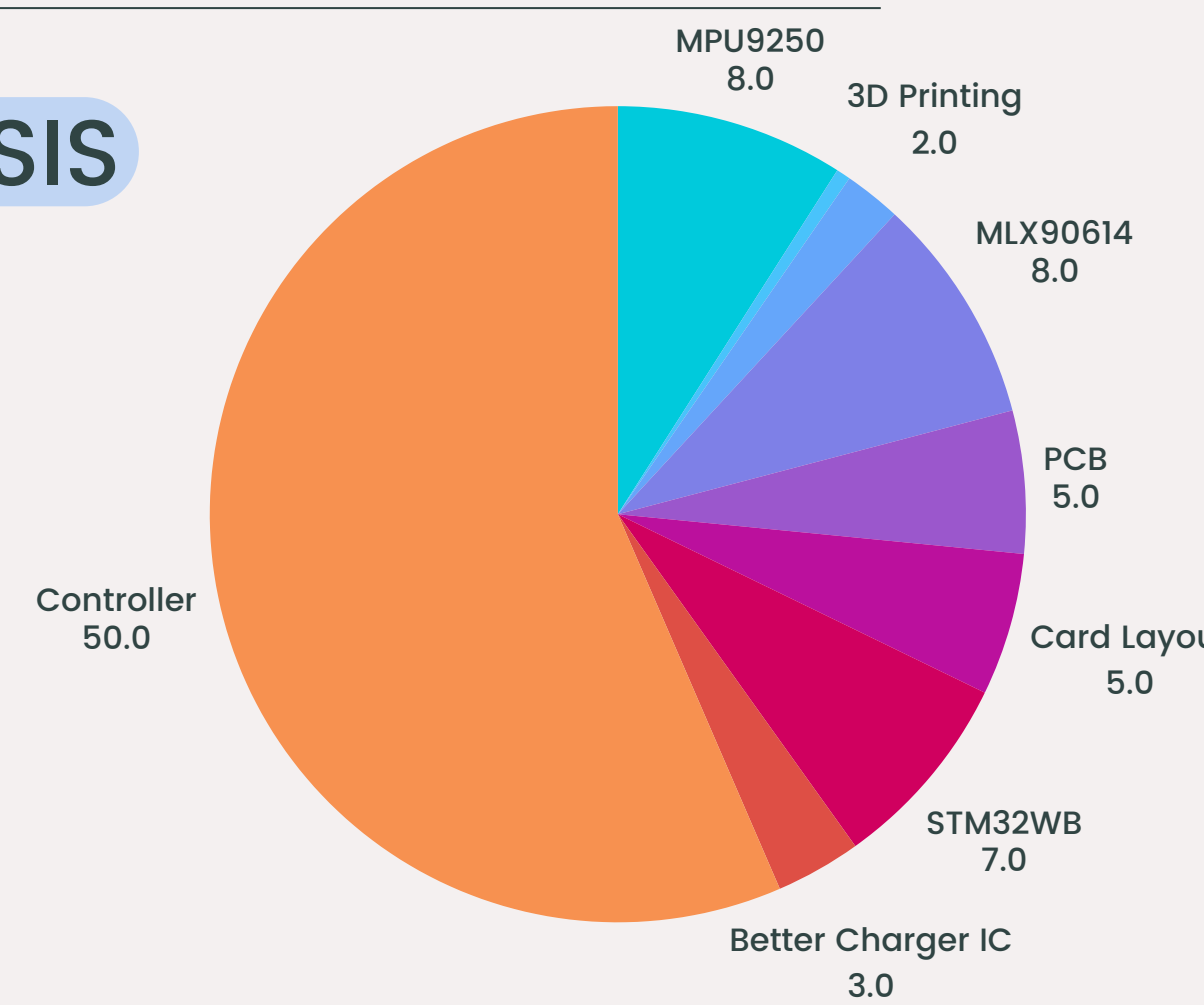
MOBILE APPLICATION



USER MANUAL

COST ANALYSIS

- Device Cost: 88 \$
- We have only used 29% of our budget.
- Highly market competitive



DELIVERABLES



USB CABLES



CONTROLLER



WEARABLE DEVICE



ODTÜ
METU

BEYZA ÖGE

HASAN EFE AKIN

AHMET ÇOBANOĞLU

HÜSEYİN KARACA

TANEL GÜLERMAN