



University of Bahrain, College of Engineering
Department of Electrical and Electronics Engineering
IoT Course – EEM602

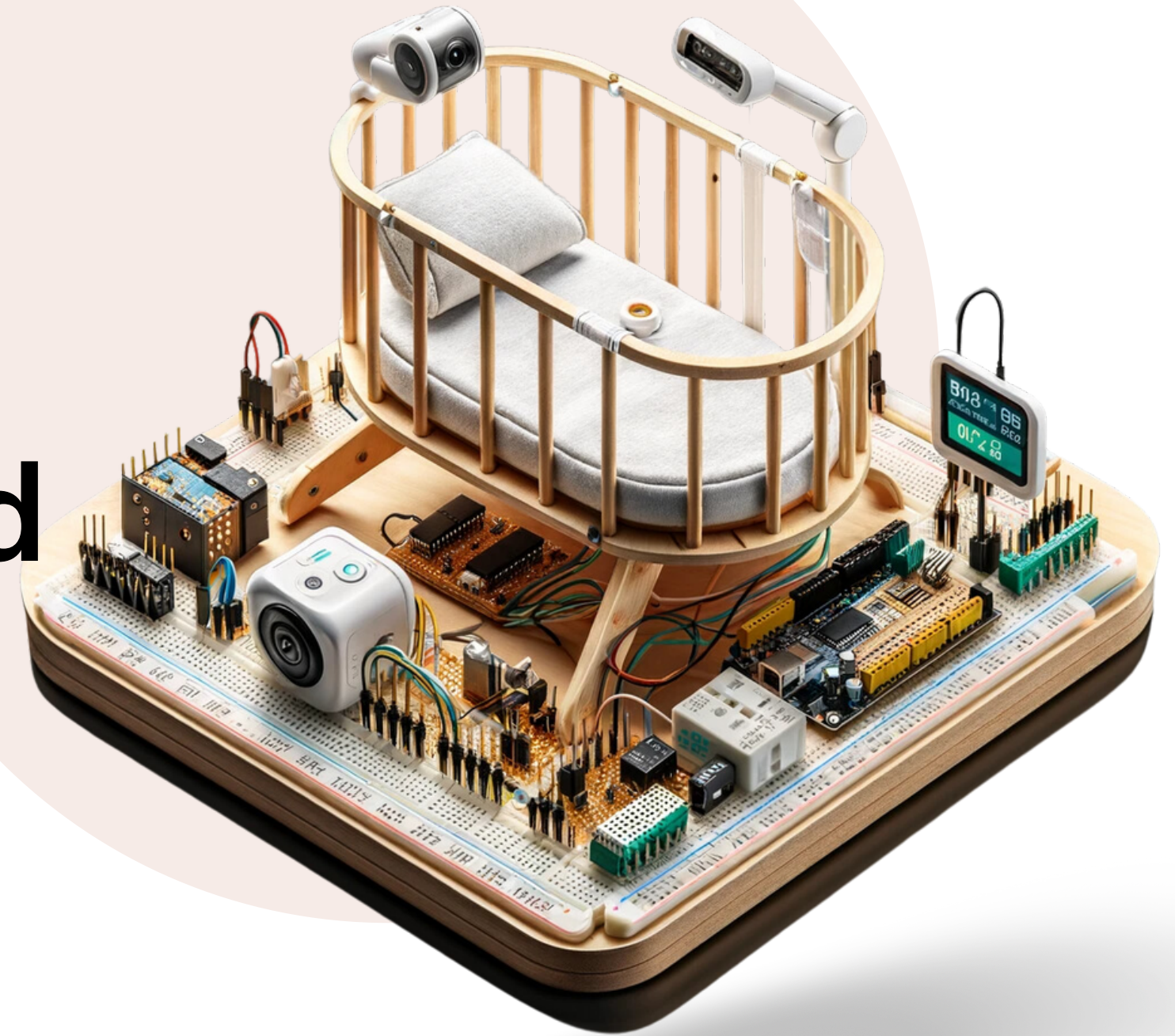
IntelliCradle: IoT-Enabled Infant Care System

EEM602 IoT Term Project

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- 20153417

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Source: AI generated.

Introduction



Source: AI generated.

**Modern world, New
Lifestyle**

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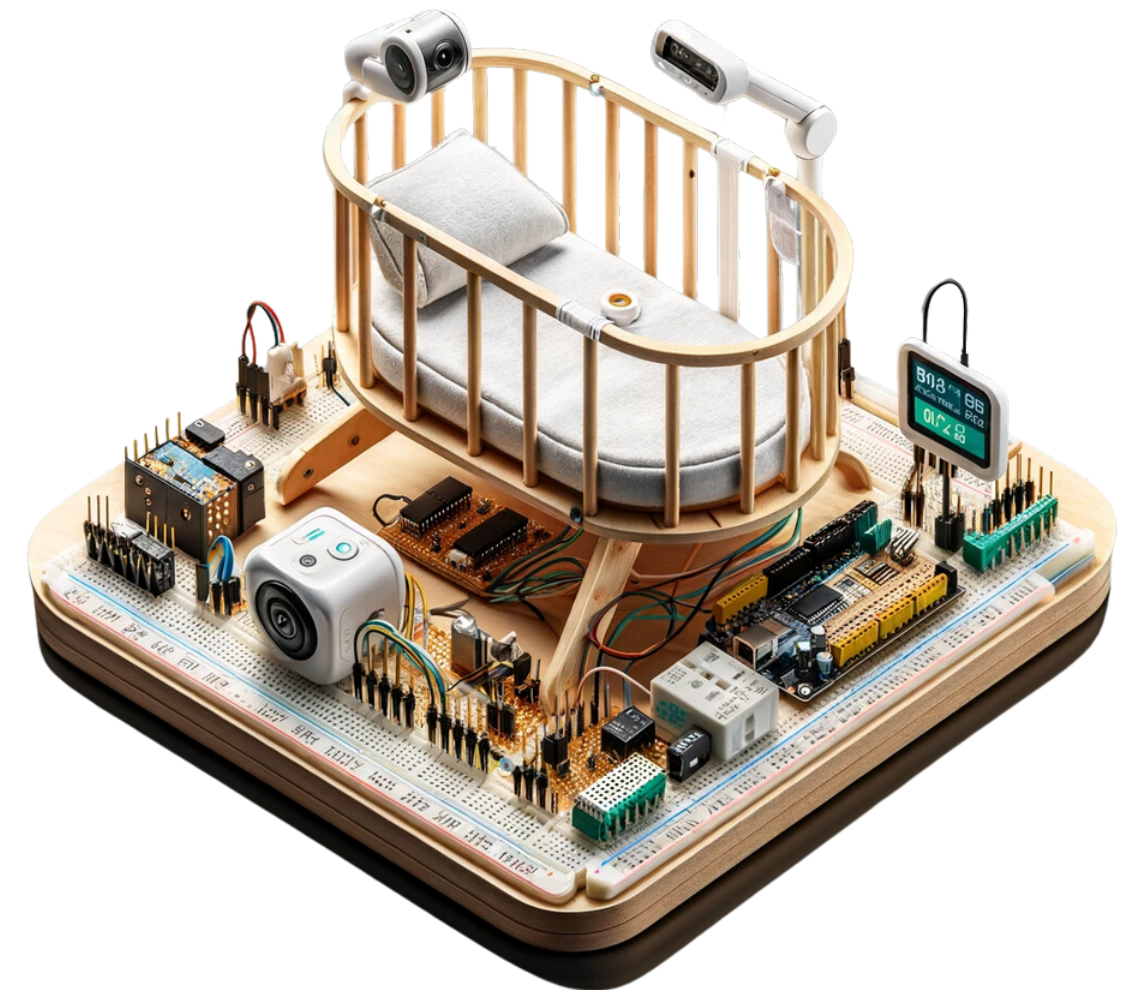
Problem Statement

Traditional baby cradles



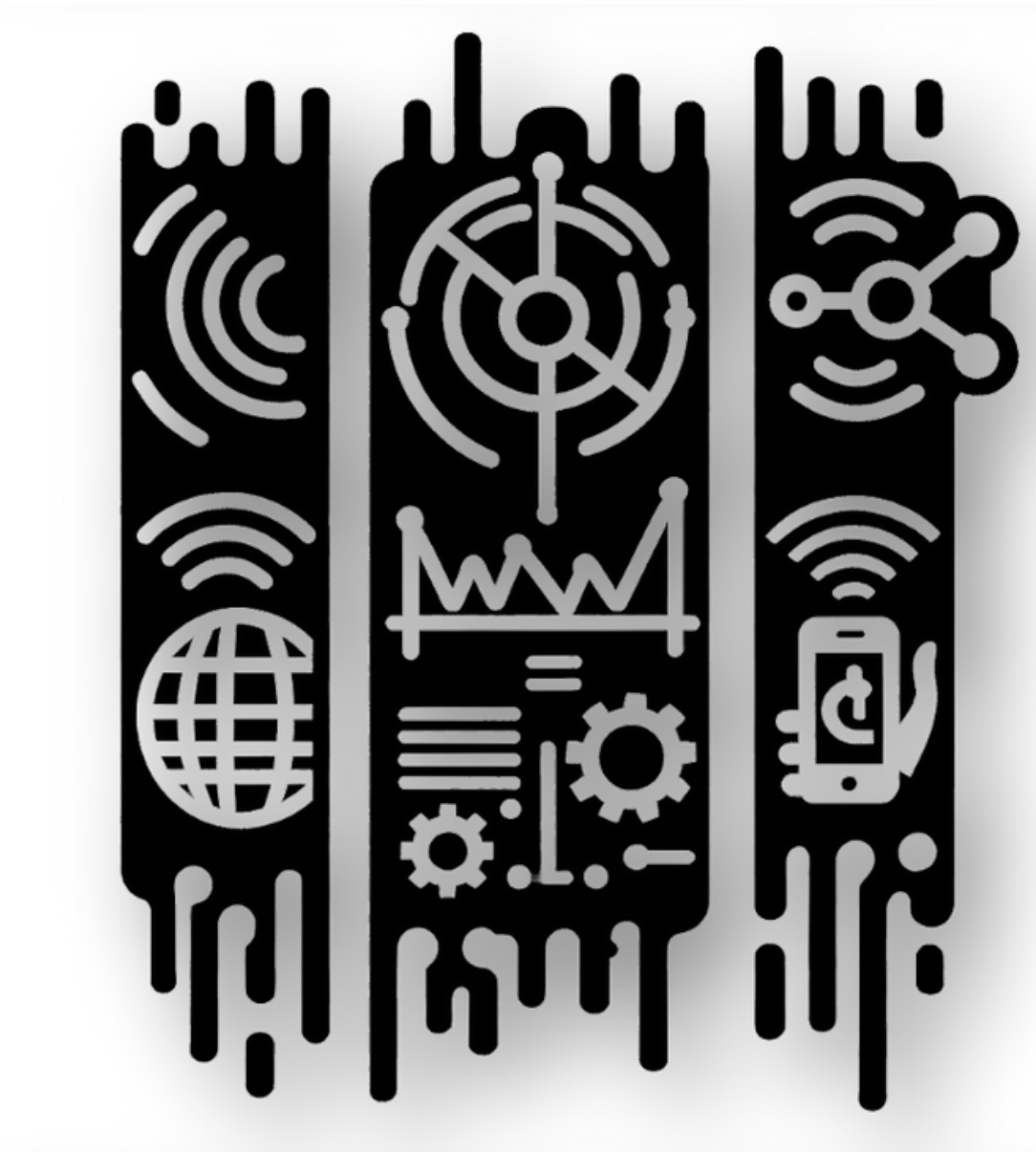
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Smart baby cradles



Source: AI generated.

Objectives, & Expected Outcomes



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Designing a smart cradle prototype

integrated with Temp and sound sensors

Control actuators in different scenarios

Collect and analyze sleeping data

Displaying all above on user interface

Literature Review

1

3 papers

3

Specialty

2

Similarity

4

Limitation

System Architecture

Hardware components

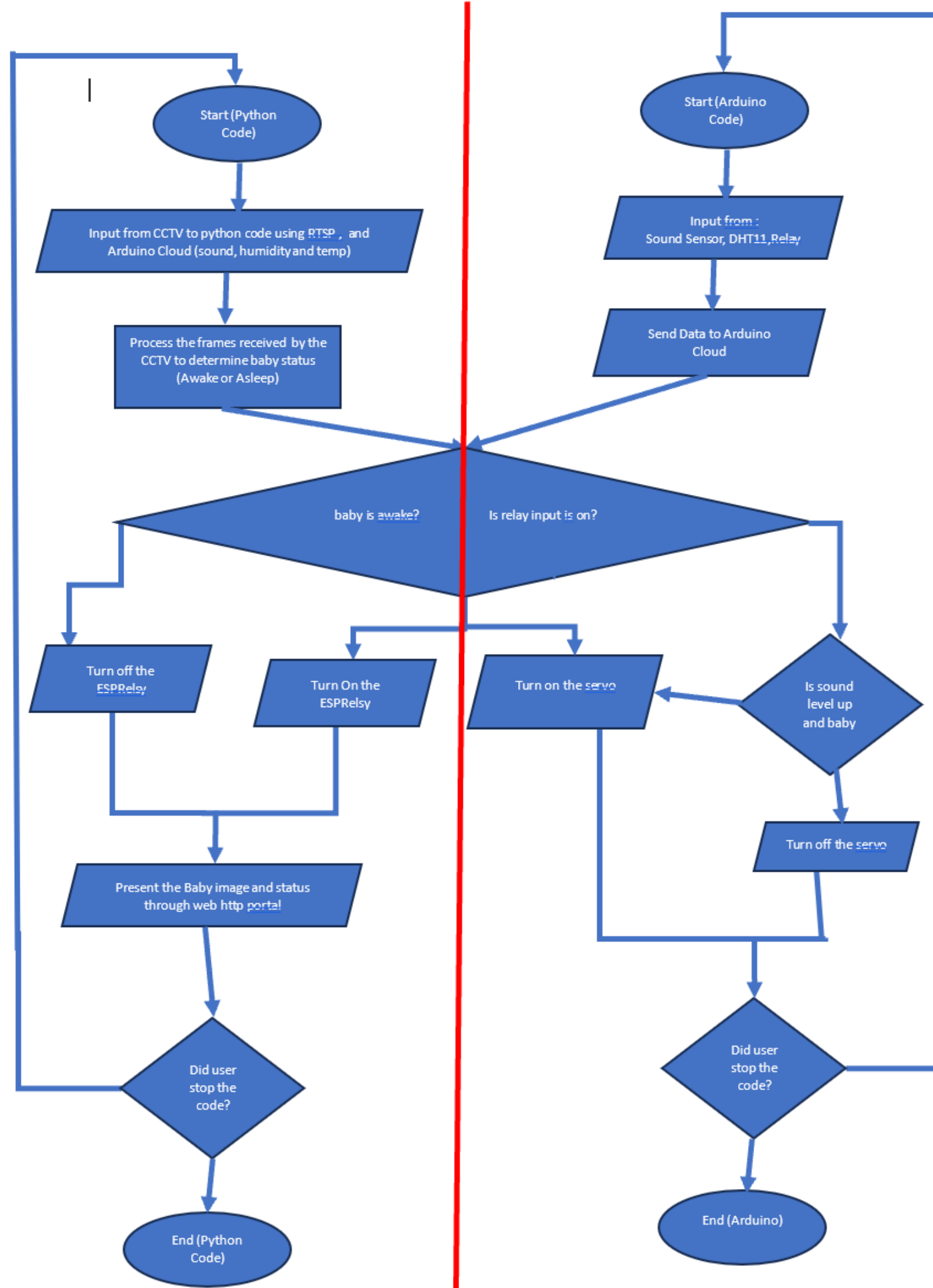
Arduino Uno
Linux Sever
ESP Relay
DHT11
CCTV camera
Buzzer

Software Architecture

Combination of
Arduino code and
python code

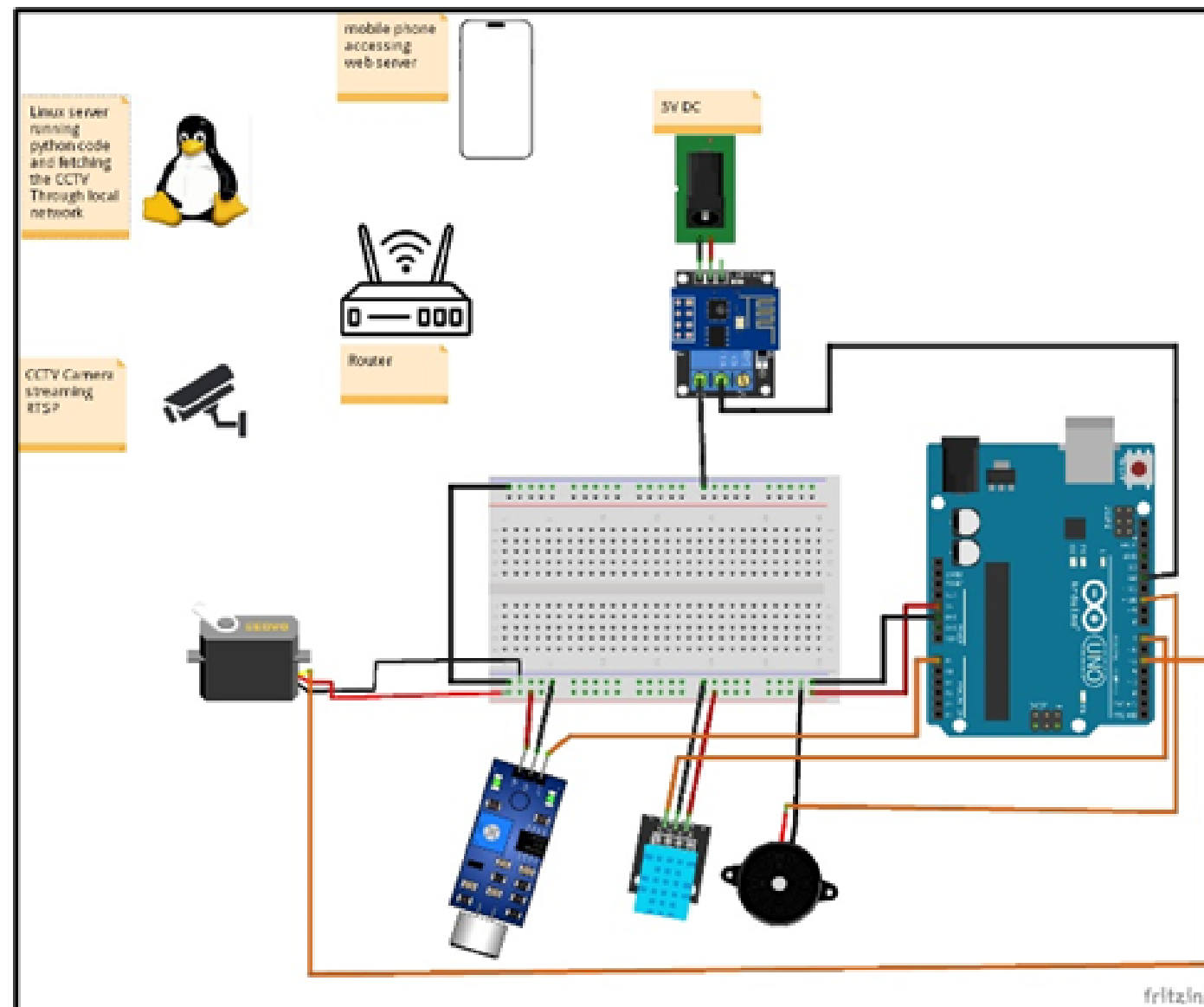
Protocols used

RTSP
HTTP
Custom TCP



Design and Implementation

A. EXPERIMENTAL SETUP

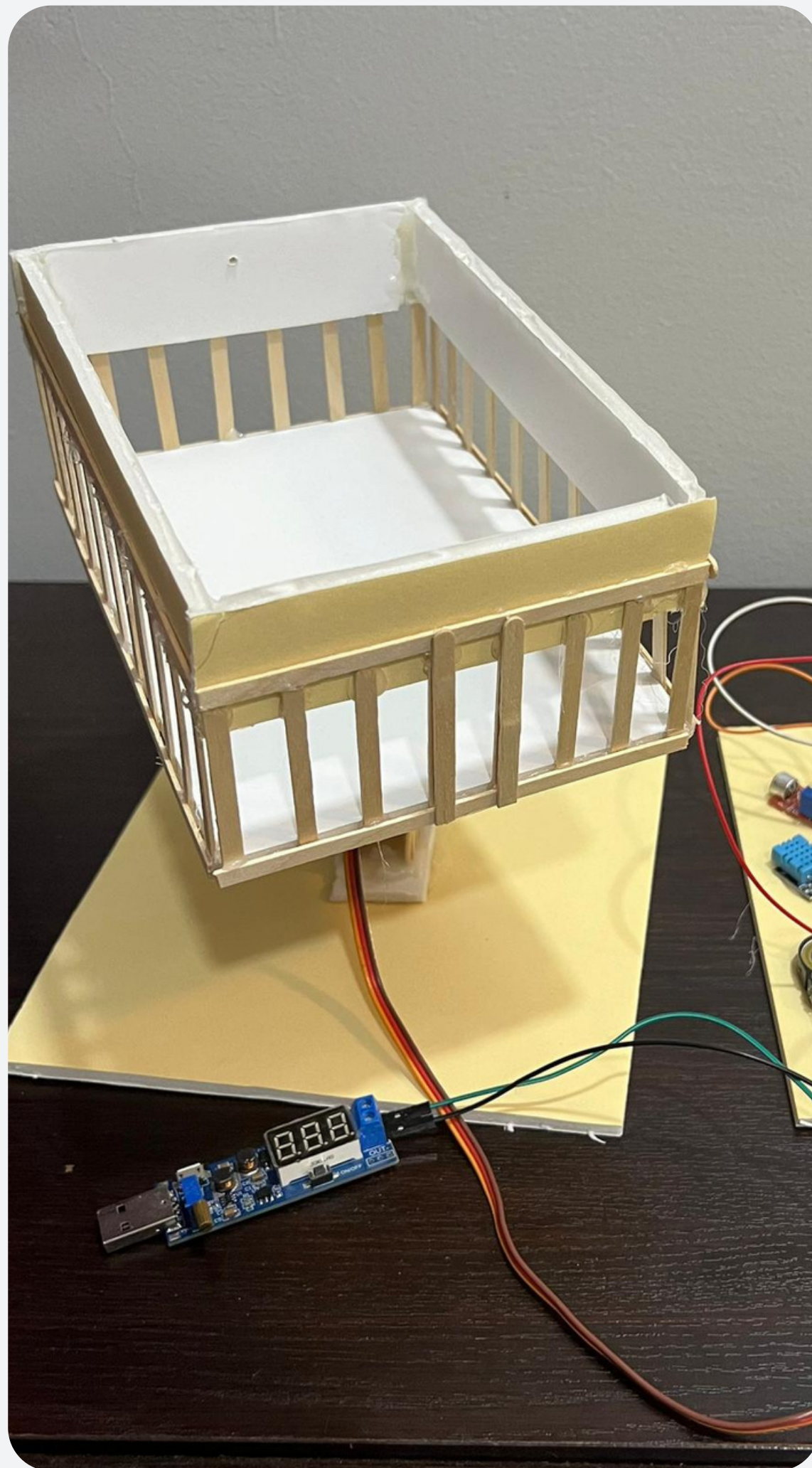


B. TESTING AND VALIDATION

1. Functionality Tests
2. User Interface Test

Source: Drawn using fritzing

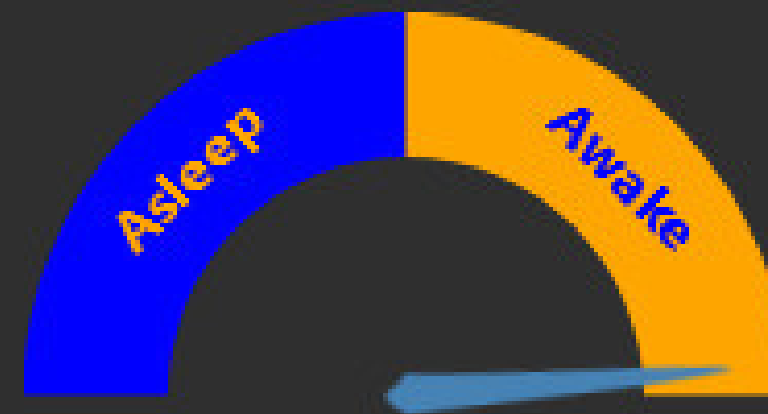
Results



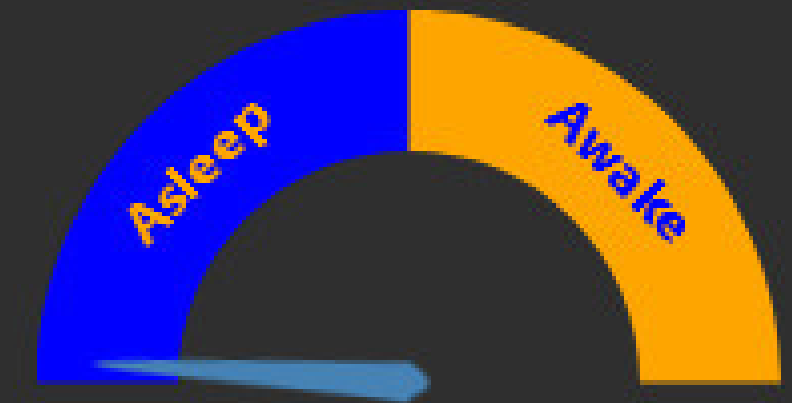
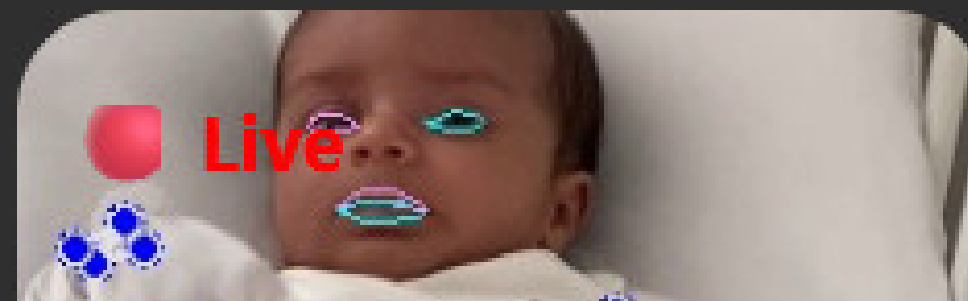
22.7 C
temperature

43%
Humidity

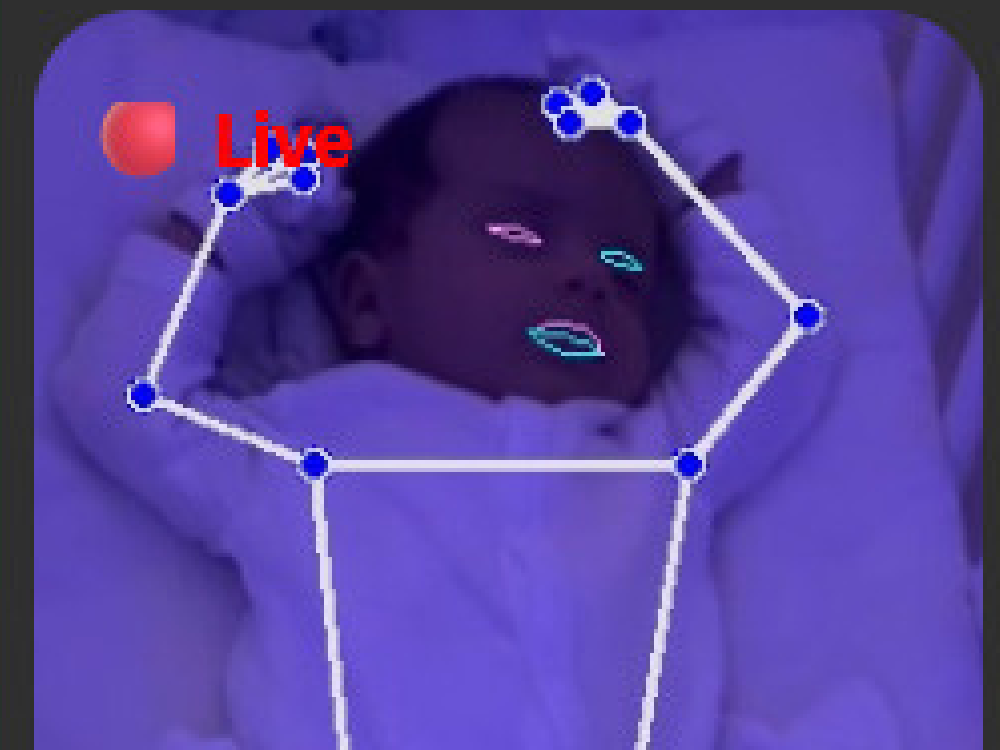
Your Baby's Sleepometer

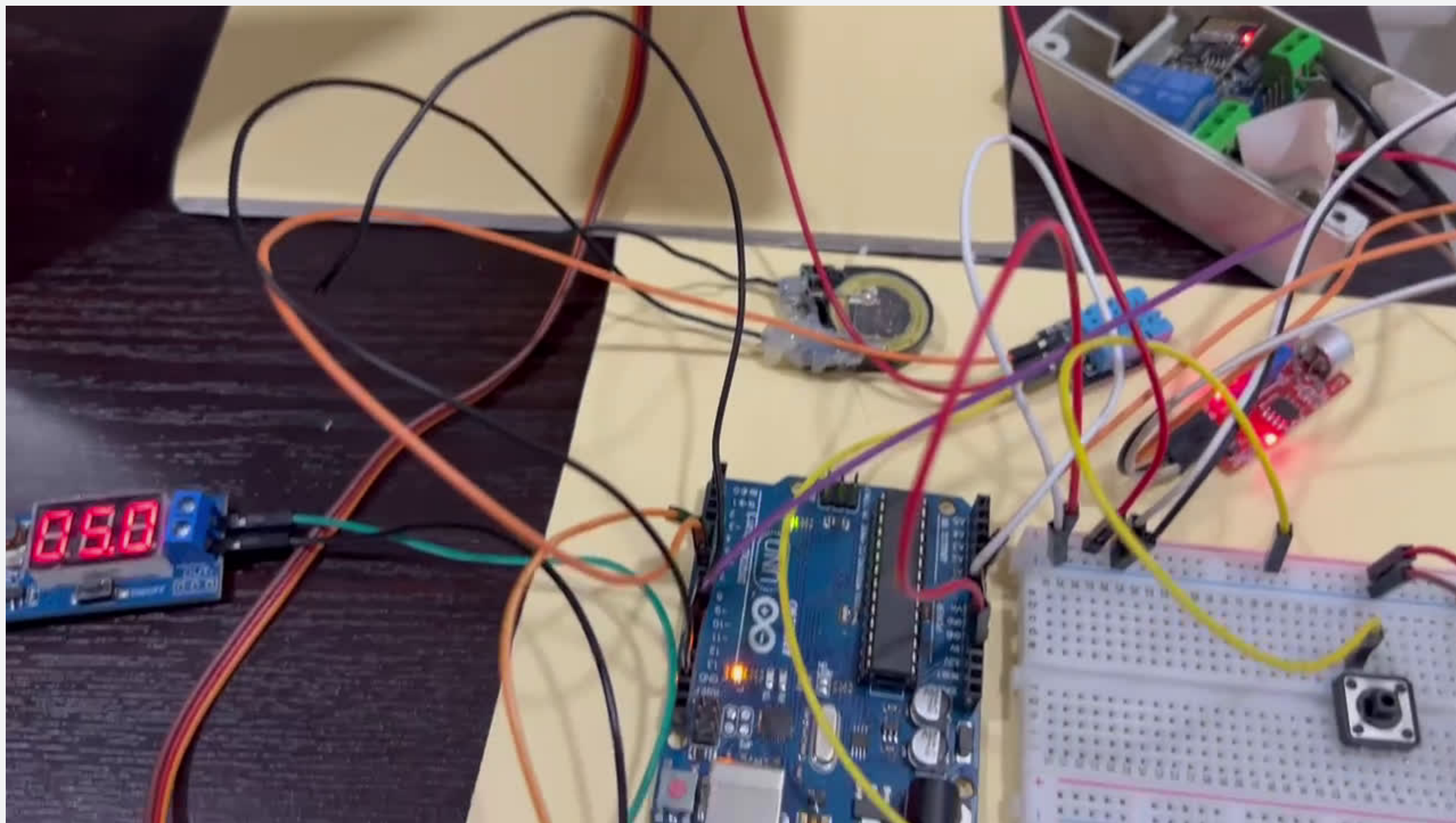


Activity: Eyes Open, Moving

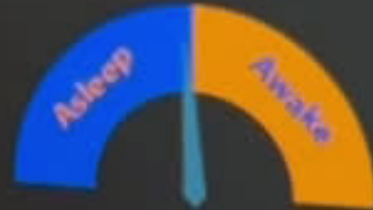


Activity: Eyes Closed, Not moving





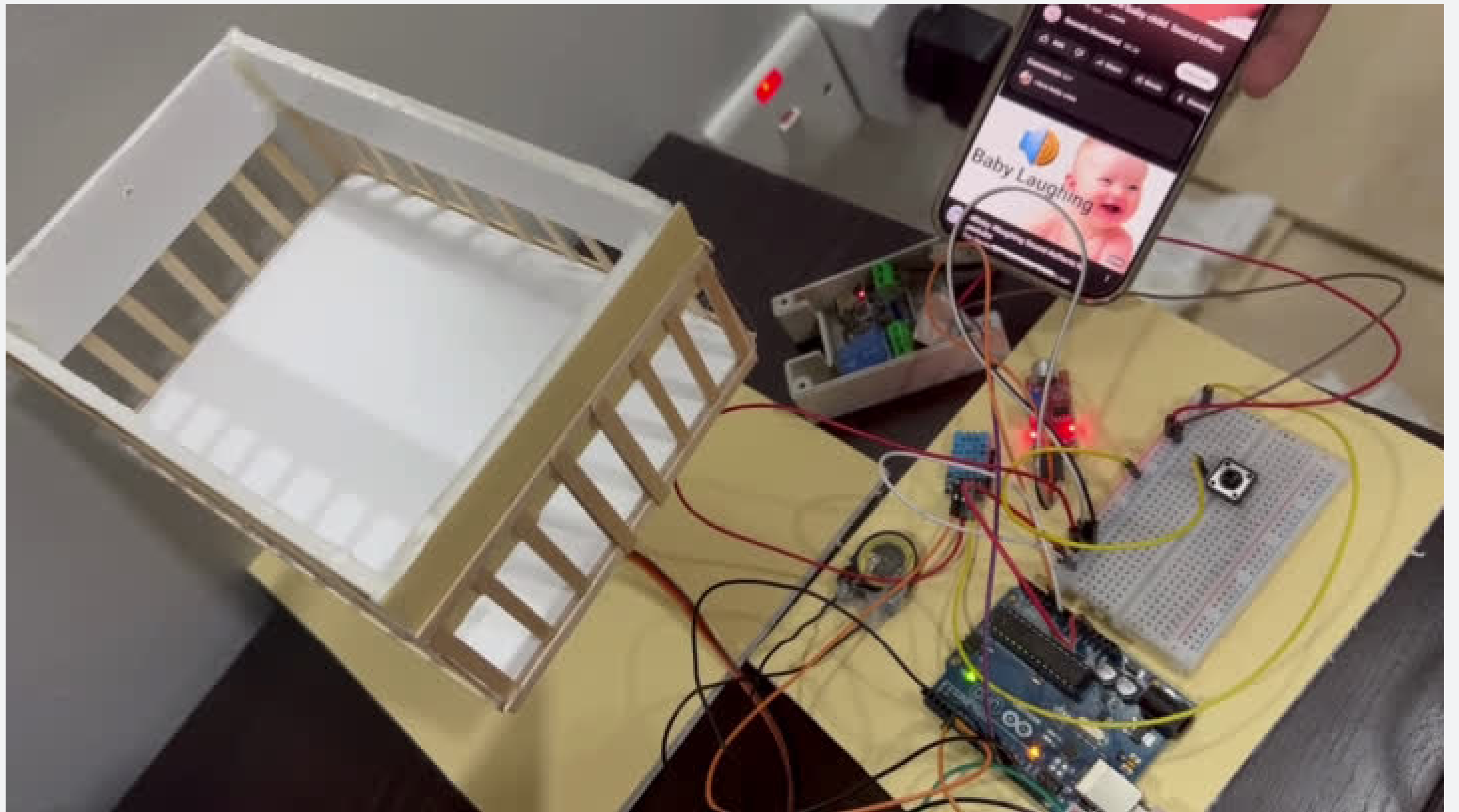
Your Baby's Sleepometer



Activity: Eyes Closed, Moving



Anatomical features detected,
ignoring custom presence
detection AI
If incorrect, use buttons to retrain



Challenges and Solutions

1

Collecting Data

3

Home lab server

2

Analyzing sleep pattern

4

Cradle motion and prototype

5

Sound detection and
recognition



Conclusion

“The great myth of our times is that technology is **communication**.”

– Libby Larsen

Source: AI generated.



References

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| [1] | N. Saude and P. A. H. Vardhini, "IoT based Smart Baby Cradle System using Raspberry Pi B+," 2020 International Conference on Smart Innovations in Design, Environment, Management, Planning and Computing (ICSIDEMPC), Aurangabad, India, 2020, pp. 273-278, doi: 10.1109/ICSIDEMPC49020.2020.9299602. |
| [2] | N. L. Pratap, K. Anuroop, P. N. Devi, A. Sandeep and S. Nalajala, "IoT based Smart Cradle for Baby Monitoring System," 2021 6th International Conference on Inventive Computation Technologies (ICICT), Coimbatore, India, 2021, pp. 1298-1303, doi: 10.1109/ICICT50816.2021.9358684. I. S. Jacobs and C. P. Bean, "Fine particles, thin films and exchange anisotropy," in Magnetism, vol. III, G. T. Rado and H. Suhl, Eds. New York: Academic, 1963, pp. 271–350. |
| [3] | S. Joseph, A. Gautham.J, A. Kumar and M. K. Harish Babu, "IOT Based Baby Monitoring System Smart Cradle," 2021 7th International Conference on Advanced Computing and Communication Systems (ICACCS), Coimbatore, India, 2021, pp. 748-751, doi: 10.1109/ICACCS51430.2021.9442022. R. Nicole, "Title of paper with only first word capitalized," J. Name Stand. Abbrev., in press. |
| [4] | Caleb Olson, "GitHub - calebolson123/ Baby Sleep Coach: DIY Baby Sleep Tracking," GitHub. https://github.com/calebolson123/BabySleepCoach |

**Do you have any
questions for my
father?**

