

Smart Cradles for Babies

Innovative Solutions for Infant Care

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Cry detection

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**Swing automation
and Interface**

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Health Monitoring

INTRODUCTION



Smart cradles utilize advanced technology to monitor babies' health and comfort. They support features such as contactless temperature measurement and remote functionalities, making infant care more convenient and effective for parents.

Introduction to Smart Cradles

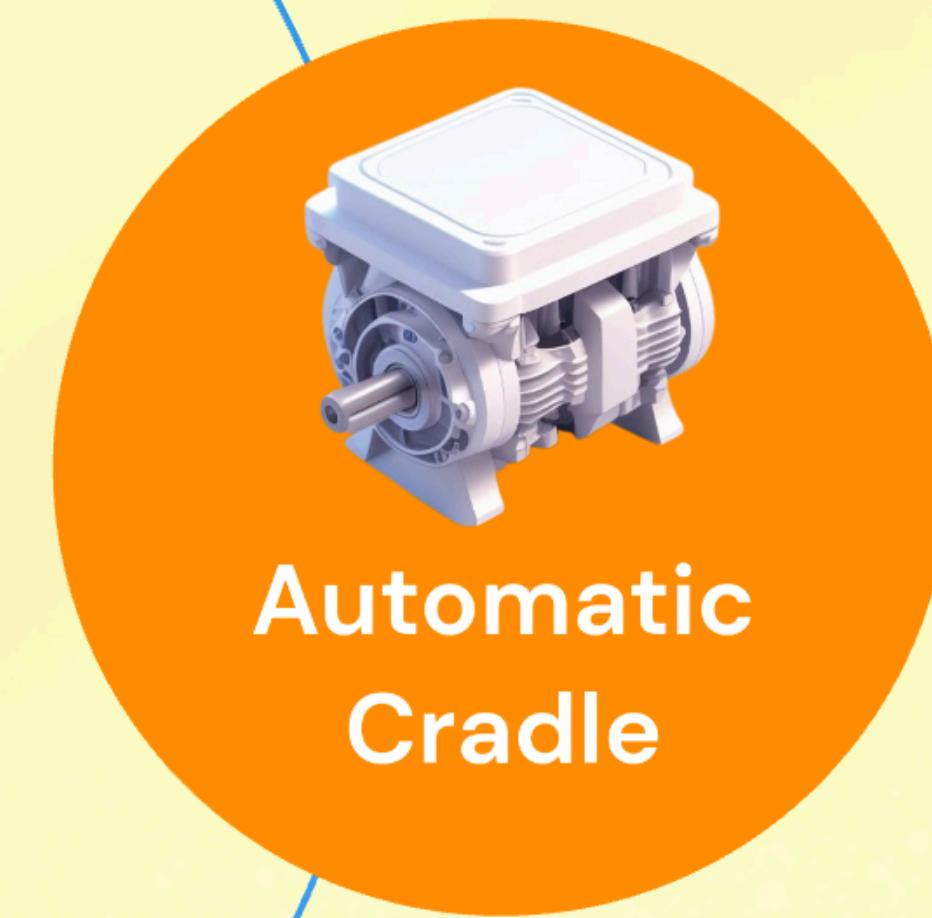


Swing Automation, Cry Detecting Mechanism, Cloud Computing (Data Storage) & User Friendly Web Application (for User Controls).

In order to detect each & every activity of Baby, different Sensors/Modules are attached to the Cradle: Humidity & Temperature Sensing Module for detection of Wetness of the bed, Cry Detection Circuit to analyse Cry Patterns which eventually triggers the swinging mechanism

An instant mobile notification will be generated if any abnormal activity is detected (something unusual like crying of baby or wetness due to Baby Urine) .

TASKS



Let us look at the approaches we took to realise these functionalities, and the subsequent result obtained.

Approach and Result

CRY DETECTION

We created the dataset for our ML model. Each audio file was preprocessed. The model was trained in our machine and then uploaded to the laptop.



Automatic Swing Mechanism

Stepper Motor is used to swing the cradle.

- *Upon Cry detection*
- *Through GUI*



PEE AND POOP DETECTION

Soil Moisture Sensor is used to detect moisture.

- Turn on LED and Buzzer
- Can be detected using GUI also.



THE GUI

- **HTTP (Hypertext Transfer Protocol)** is used for communication between RPi and Interface.
- **Flask** server running on the Raspberry Pi.
- This GUI can be used to:
 - Swing the cradle.
 - Check for moisture, Temperature, Pulse.

Smart Cradle Control

Swing :

Start Swing

Stop Swing

Poop and Pee Detection :

Check Moisture

No moisture detected

Health :

Check Temperature

Check Heart Rate

Check Oxygen

Temperature: 97.8 C

Heart rate: 101

Oxygen: 96.2 C

Steps in the Communication Flow

- **Initiate Action from the Client :** JavaScript in the HTML page sends an POST request to the Flask server.
- **Process Request on the Server**
- **Return Response to the Client:** the server sends back a JSON response



Basic Health Monitoring

Using infrared sensor MLX90614, smart cradle can measure a baby's temperature without direct contact, eliminating discomfort and safety concerns. And an alert notification can be sent when the temperature rises above normal.



THANK YOU