

IOT BASED ADVANCED SMART CRADLE BABY MONITORING SYSTEM

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Keywords:

IoT-enabled baby cradles integrate multiple sensors, actuators, and communication technologies to ensure the well-being of infants. The core components include:

Sensors: Temperature, humidity, motion (accelerometer), sound, heart rate, and respiration sensors.

Microcontrollers & Microprocessors: Arduino, Raspberry Pi, ESP8266, or ESP32 are commonly used for data processing.

Connectivity Modules: Wi-Fi, Bluetooth, Zigbee, and GSM for real-time alerts and remote access.

Actuators: Automated rocking mechanisms and soothing sound systems for comfort.

Mobile Applications: Parent-friendly interfaces for real-time monitoring and alerts.

Introduction

The Internet of Things (IoT) has revolutionized baby monitoring by enabling real-time tracking of vital parameters such as temperature, humidity, movement, and sound. Traditional baby cradles lack intelligent monitoring, leading to challenges in ensuring infant safety and comfort. This literature review explores various studies on IoT-based smart cradle systems, focusing on their features, technologies, and benefits.

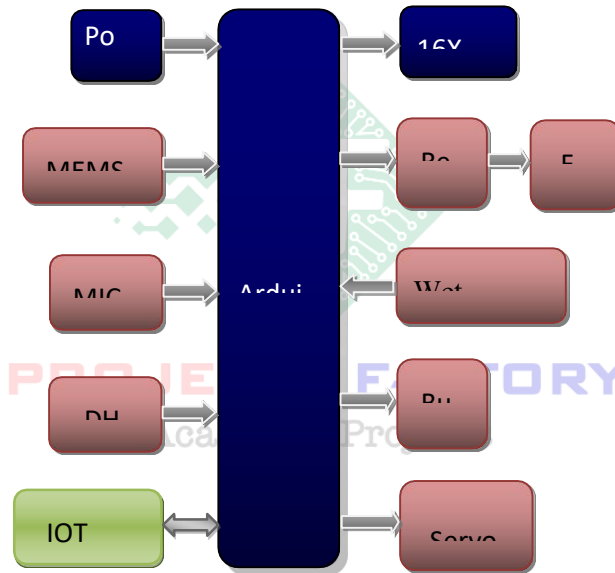
Methodology/Working:

Arduino is main heart of this project and it will read all sensors and control cradle swinging. When Baby cries then MIC sensor identify and gives signal to Arduino. Arduino send PWM pulses to servo motor to swing cradle. MEMS sensors attached to baby to monitor moments of baby. When baby moves fan will be ON. If baby urinates then buzzer will be ON. Arduino reads all sensors data and displaying on LCD. Also, it sends sensors data to IOT cloud server through ESP8266. We can monitor baby conditions when baby is in cradle from remote server.

Applications

- IOT based cradle
- Electronic cradle
- Smart cradle
- Baby monitoring system

Block Diagram



Conclusion

IoT-based smart baby cradle monitoring systems provide real-time tracking, automated soothing, and health monitoring, significantly improving infant care. Various studies highlight advancements in integrating sensors, AI, and wireless connectivity for enhanced safety and comfort. However, challenges like power consumption, data security, and affordability remain. Future research should focus on energy-efficient designs, AI-driven predictive analytics, and robust security measures. Despite limitations, these systems offer parents peace of mind and contribute to safer sleep environments for infants. Continued innovation in IoT and AI will further enhance the effectiveness and accessibility of smart cradle technologies in the coming years.

References

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