IOT BASED SMART CRADLE SYSTEM FOR BABY MONITORING

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Keywords:

UART: Universal Asynchronous Receiver/Transmitter

Introduction:

At present, both parents are required to work due to high cost of living. However, they still need to look after their babies, thereby increasing workload and stress.

Working parents cannot always care for their babies. They either send their babies to their parents or hire a caretaker while they are working.

Some parents do not want to hire a caretaker because of safety issues and expenses. So, IOT based baby monitoring and automatic swing system that can monitor the baby's condition in real time is proposed to solve these problems.

Objectives:

1. To design a prototype of a smart cradle where it aims at monitoring the vital signs (cry detection, foul smell detection etc...) of the baby by the data which is obtained from the sensors.
2. To keep track of the baby's activities and health conditions using appropriate sensors.
3. To develop a mobile application that sends a notification to the parents with condition Message of the baby which helps in detecting the baby activity and monitoring accordingly.

Methodology:

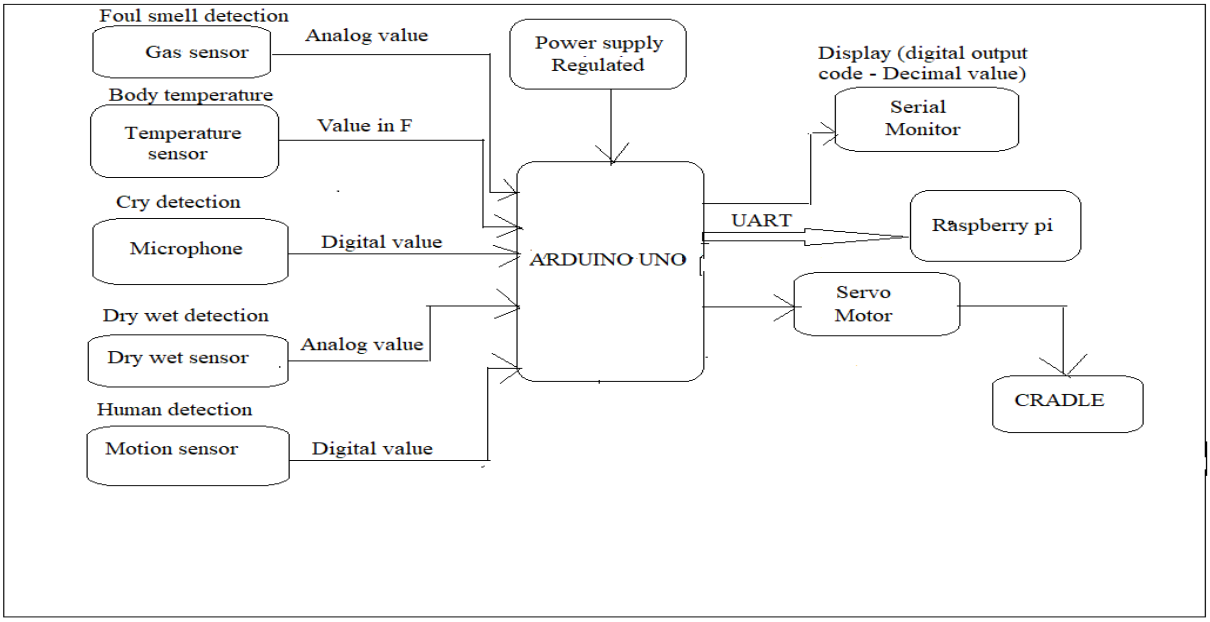

Fig 1: Block Diagram

- The above figure represents the architecture design of the system where it aims at monitoring the vital signs of the baby in order to make it more comfort. The entire system is divided into three parts namely – Input section, Logic implementation and Output section.

- If the baby is making noise or baby is crying then sound sensor will hear that frequency and will make cradle swing. If the baby had wetted the mattress of the cradle, then alert SMS will send to the parent which is detected by the dry wet sensor.

- If the body temperature of the baby changes rapidly then it is detected by the temperature sensor. If baby is moving in cradle or any kind of movement detected by the PIR sensor and Foul smell is identified by methane sensor and later alert SMS will send to the parent.

Result:

1. The proposed system detects each and every activity of baby via different sensors that are attached to the cradle.
2. All data taken from the sensors will be stored in cloud and analyzed at regular intervals and notification about the events and the view images captured are uploaded to cloud server.
3. Cradle will trigger automatically via motor driver by microcontroller when the baby cries continuously upon the set point values.
4. The temperature value, wetness, motion and cry status of the baby displayed on 16x2 LCD display.

Conclusion:

1. In the model we have implemented various types of sensors which brings the automation to the cradle swing. The study of various types of sensors helps to achieve the smartness of cradle with additional features to the cradle. In the present study, smart baby cradle system is developed.
2. This cradle is capable of detecting the baby cry, mattress wet, temperature, person detection and methane content of the baby and initiate cradle swings automatically when threshold value crossed. The device can be used to minimize the workload of the parents and nurses in home and hospitals respectively. This automatic baby cradle would let the working mother to do household works besides taking care of baby at the same time.

Scope for future work:

1. In future we can add more features to make more efficient and user-friendly. The feature we can add to this device such like rotating toy with music
2. Another implementation can be continuous video streaming of the baby activities using an IP camera. This will help the parents to look after the baby even if they are not around.
3. More sensors can be added like to detect heartbeat, sleeping pattern can be observed using data science technology. Additional facilities can be triggering emergency from app tracking the baby using GPS can also be added.