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ರಾವ್ ಬಹದ್ದೂರ್ ವೈ.ಮಹಾಬಲೇಶ್ವರಪ್ಪ ತಾಂತ್ರಿಕ ಮಹಾವಿದ್ಯಾಲಯ, ಬಳ್ಳಾರಿ
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Project Title: **SMART BABY CRADLE USING IOT**

Project Guide

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- ARDUINO UNO
- SENSORS
- CAMERA
- GSM MODEM
- VOICE MODULE

INTRODUCTION/BACKGROUND WITH REFERENCE WORK

Child care is of most extreme significance for a parent. The present quick paced world makes it hard for parents to continuously look after their kid. After long working hours, it is hard for parents to constantly

watch out for their kid. To help such parents, there is a idea of a SMART CRADLE SYSTEM. The smart baby cradle helps working women balance their work and domestic chores. Besides, there are extra features or functions provided by the newly automatic cradle that are beneficial for parents. In this busy life it will be very difficult to control the babies and if someone is hiring a professional to take care of their infants, the security of the infant is questionable. Moreover, in today's life, it is very hard even for the homemakers to sit near their babies and sooth them whenever they feel uncomfortable. Hence, the use of the Internet of Things helps in dealing with this problem.

Marie R. Harper and Maxine R. Blea developed the first automatic rocking cradle which swings side by side on a horizontal axis which replicate the motion same as achieved by human oscillation of cradle. Servo motors are used to provide oscillatory motion to crib. Servo motor is attached to the crib of cradle that produce motion same as human efforts. The servo motor is of any known type in which the gear –operating means is easily stopped when the slightest resistance or opposition to its movement is encountered, thereby providing on extremely safe device for use with small children or babies. The advantages of this system are safe for small babies as it has mechanism to stop swinging of crib whenever a resistance is occurred, require fewer human efforts and presence. This introduced a framework which observe all necessary indication of the child. sound sensors which are used for observing the cry pattern of the child. Additionally, the live images of the infant are obtained through camera module through a Wide Area Network (WAN). The camera module is also induced which is responsible for observing the activities of the child and keeping an eye on the infant's development in a limited area.

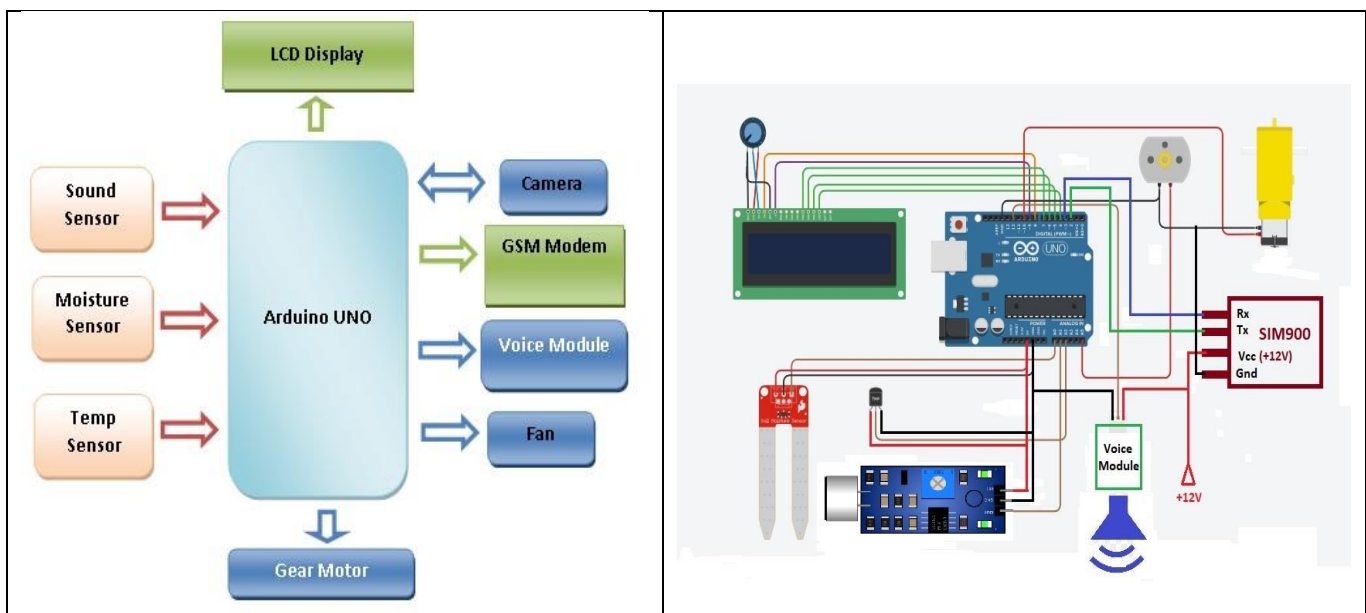
Existing cradles need all time care and attention when the baby is in the cradle. It does not allow parents to remotely monitor the cradle when they are not near the baby. Even if smart cradles exist, they are very expensive.

OBJECTIVE OF THE PROJECT:

- To design the development of a smart baby cradle, which has the ability to monitor bed-wet, smelly diaper condition and body temperature.
- To make a baby cradle safe and comfortable for the baby with the use of various sensors to monitor the baby 's life through the camera as well as to detect bed-wet conditions to keep the baby away from an unhygienic environment.
- To design a prototype of a smart cradle where it aims at monitoring the vital signs (cry, temperature detection etc...) Of the baby by the data which is obtained from the sensors.
- 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.
- To design the development of a smart baby cradle, which has ability to monitor baby movement, bed-wet condition and body temperature.

METHODOLOGY

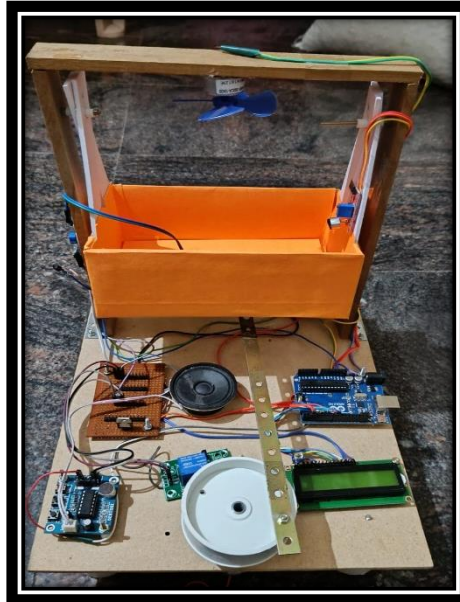
- The above figure represents the architecture design of the system where it aims at monitoring the vital signs of the baby in order to make it more comfort.
- If the baby is making noise or baby is crying then sound sensor will hear that frequency and will make cradle swing along with the soothing music.
- If the baby had wetted the mattress of the cradle, then alert SMS will send to the parent which is detected by the Moisture sensor.
- If the room temperature of the room changes rapidly then it is detected by the temperature sensor and fan will be activated to keep the temperature down.
- The proposed prototype of smart baby cradle will monitor the activities of the infant. A gear motor will rotate (swing) the cradle up to an angle that is safe when infant is inside the cradle.
- A camera will be used to track the baby inside the crib. A GSM module to communicate with a remote device that is operated by parents.



The sensors are the main source of input to the Arduino. Based on the three sensors' input, microcontroller sends three different messages respectively, the messages that have been received to the mother's official's registered mobile number.

RESULTS

The sensors are the main source of input to the Arduino. Based on the three sensors' input, microcontroller sends three different messages respectively. Fig. shows the messages that have been received to the Mothers official's registered mobile number.



The above figure represents the proposed model of the system where it aims at monitoring the baby. When the Sound sensor detects the cry of the baby in the cradle, the sensor will send the signal to the Arduino Uno, and depending on the input, the output is activated and the voice recorder is active along with the relay, the relay is used to turn on the gear motor, which is used to swing the cradle.

Whenever there is variation in room temperature the fan speed is controlled according to the temperature using the LM35 sensor as input which is connected to the analog input of the Arduino. Whenever the baby has wetted the mattress of the cradle, the moisture sensor is used to detect the wetness of the mattress, if the wetness reaches the threshold level the Arduino will activate the GSM modem and send the alert SMS to a predefined number. The proposed prototype of the smart baby cradle will be monitored using the camera connected to the cradle.

CONCLUSION:

This system allows working moms and dads to do household chores along with caring for the baby. The automatic baby cradle can be used at home. It is very useful for working parents to take care of babies. It is economical and user-friendly. Technology has been developed in a great way that it makes human work simpler. So, in that aspect to convenient the baby care smart baby cradle has been designed. It is economical and user-friendly. The Smart baby cradle can be used at home. The cradle is capable of detecting moisture of the diaper, temperature of the body and also used for live monitoring.

INNOVATION

The cornerstone of our project is Women Empowerment; by providing them a Smart Cradle System with a special focus on developing countries. This paper proposes the use of "Smart Cradle System" which involves the use of the Internet of Things. The proposed solution involves live monitoring of the child through a mobile application remotely. The smart

cradle incorporates the use of a sound sensor for the detection of the with the increasing demands and responsibilities of life, parents becoming busy most of the time which makes taking care of an infant incredibly difficult task as infants need the attention and supervision of caregivers all the time.

However, the advancement of technology has led to the emergence of smart baby cradle as an intelligent system with numerous features to reduce the burden of parents and caregivers. The paper aims to enhance the quality of the existing baby cradle systems by incorporating a new module for managing baby cry. Managing baby cry involves providing analysis for baby cry, and accordingly, triggering the suitable device attached to the cradle.

SCOPE FOR FUTURE WORK

- To enhance the security of the baby, apart from the basic requirement more modules can be added.
- Includes modules of attaching a toy which can be used to ease the baby, when he is bored or crying.
- In future we can integrate our project with machine learning that can monitor the health conditions like heart beat & pulse rate of the baby.