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# INFANT CARE ASSISTANT USING MACHINE LEARNING AND IOT

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**ABSTRACT:** In today's industrialized countries, women's participation in the workforce has dramatically increased. This participation is one of the main reasons that affect baby care in many families from the birth of the baby to a certain age. The most important factors that should be followed in infants are values, body temperature and sleep patterns, which we can sometimes call vital functions. An abnormal increase in the temperature of the baby during sleep is one of the most critical factors causing sudden infant death syndrome, a febrile complication. In this article, an internet of things (IoT) based baby monitoring mechanism, namely a smart cradle structure, which tracks the real-time temperature, heart rate, wetness and sound of the baby is proposed, and the data received from the sensors will be transferred to a web platform via Wi-Fi and checked in real-time. In the case of crying, the cradle will swing autonomously. The alarm will be activated if the crying does not stop or if an abnormal increase in the measured body temperature, heart rate and humidity level is observed. Thanks to the alarm, it will be ensured that the person responsible for the care of the parent or baby will respond to the care that the baby needs in a timely manner. In addition, the LED will be placed in the cradle, and it will be monitored whether or not an alarm is given over the cradle.

**KEY WORDS:** Smart baby cradle system, internet of things (IOT).

## 1.INTODUCTION

Many parents are unable to devote sufficient time to infants on account of office work or being short-handed. Additionally, there are also many first time parents, who lack experience in raising children. Infants, on the other hand, demand constant attention and care. Simple methods to immediately calm the agitated infants need to be devised. Hence, there is a need to assist parents in taking care of their infants by providing them with a single product which would monitor their infants at all times, send notifications in case attention is required, raise alerts in case of emergency situations and provide real time interaction between parents and infants.

The first verbal communication of newborn baby with the world is baby's cry. Infant crying is a biological alarm system. An infant crying signal is the attention call for parents or caregivers and motivates them to alleviate the distress. There is a need to develop a new low cost indigenous electronic System because the existing mechanical systems are imported and costly. Emotion based technique has been implemented. Based on the emotions nothing but the child is crying then a message is sent to the parents. The algorithm which is used is CNN.

## LITERATURE SURVEY

- **Adaptive Sway Control for Baby Bassinet Based on Artificial Metabolic Algorithm**
- **Authors:**Yang Hu , WeihuaGui
- **Abstract:**
- To improve the Household management and decrease the young parents' Labor intensity, a new baby bassinet is made. The kind of bassinet can realize adaptive sway according to baby status. Some sensors can perceive the movement of baby and other information such as baby cry. Alarm signal can be produced according to baby abnormality status. A kind of artificial metabolic algorithm is proposed in the paper. The algorithm can be applied for adjusting the bassinet swaying extent. The real example can show that baby can reach quiet rapidly and other control device can work efficiently for the baby health.

- **Automatic E-Baby Cradle Swing based on Baby Cry**
- **Authors:**Dilip Kumar
- **Abstract:**
- There is a need to develop a new low cost indigenous electronic cradle because the existing cradles are imported and costly. This paper presents the design and implementation of a new indigenous low cost E-Baby Cradle that swings automatically when baby cries, for this it has a cry analyzing system which detects the baby cry voice and accordingly the cradle swings till the baby stops crying. The speed of the cradle can be controlled as per the user need.

  

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The system has inbuilt alarm that indicates two conditions – first when the mattress is wet, which is an important parameter to keep the baby in hygienic condition, second when baby does not stop crying with in a stipulated time, which intimated that baby needs attention. This system helps parents and nurses to take care of babies without physical attention.

- **IoT Based Smart Cradle for Infants**
- **Authors:**SudalaiMuthu T
- **Abstract:**
- Baby needs attention by all the time, it is highly difficult for parents due to their house hold activities. It is impossible for working women. There are many systems are available to care of baby while the parents in work, but it is a dire need for the complete solution to take care of baby. A smart cradle is designed to address the challenges in taking care of baby. A proposed Smart Cradle is designed as prototype by utilizing IoT. It assists the parentage to monitoring their kid regardless of whether they are away from home. It identify each movement of the Infant from any turning of the world. It is an imaginative, shrewd and defensive Cradle System to sustain a newborn child in a proficient manner. This framework considers all the subtleties required for baby monitoring. The proposed Cradle design uses various sensors includes Humidity, Temperature Sensor, Camera on the Cradle for live video film and Cry Discovery Circuit to break down Cry Patterns. The sensed data stored in Cloud (Thing Speak) and broke down at ordinary interim. The developed prototype experimented in the defined environment. The results are recorded and analyzed.

- **An IoT Smart Cradle for Tracking Babies**
- **Authors:** Rekha S
- **Abstract:**
- Today IoT is a common technology. Many applications are designed based on IoT. One such important application is to use mobile phones to watch the activities of babies. If both the parents are working on a farm or if they are busy in their work, then it is difficult for them to nurture their infant. Therefore, we build an IoT-based cradle that lets the parent to track their child even they are far from home. In this paper we presented a smart cradle with continuous live surveillance. When a child cries, the bassinet instantly begins moving. This often warns parents if the infant is crying and if the mattress inside the bassinet is damp. Rotating toy is attached to cradle to entertain baby which may decrease the possibilities of baby cry.

## PROPOSED SYSTEM

- The system is microcontroller based that is being designed is aimed to help parents and nurses in infants care. Features being:
- System starts playing mothers voice automatically when baby cry and stops till the baby stops crying.
- A sound detector is interfaced to the controller which senses sound when baby cries and activates the controller with its digital output.
- Sounds an alarm when mattress gets wet.
- A temperature sensor kept under the bottom cover where the baby sleeps can sense the temperature all time and sends analog signals to the inbuilt ADC of the RL78 controller.
- The digital data can be continuously monitored. A reduction in temperature indicates the wetness in the cover.The controller can be made to activate an alarm, so that his/her cover be changed.
- Sounds an alarm if baby cries for more than a stipulated time indicating that baby needs attention.
- Wi-Fi interface sends alert to android based handsets to get the attention of parents/nurses.
- An ALCD is interfaced to the controller which keeps displaying the status as messages.
- Whenever the baby cries the cradle will swing.
- CNN Algorithm is used to record the emotion of the child based on that if the child is crying an message will be sent to the parents.

## EXISTING SYSTEM

- Mechanical Systems For Pillow Management.
- No Synchronization between child and mother health parameters.
- Short Range i.e. Implementations.
- Costly Implementations.

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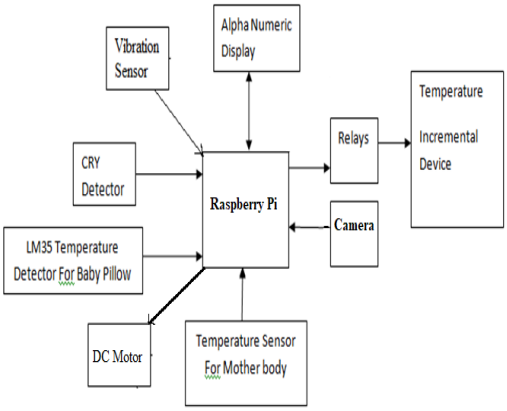
## PROBLEM STATEMENT

- Baby health Monitoring is very important in these days.
- Increase in rate of working women's makes difficult to monitor baby health all the time
- Parents in the present world are busy in their professional life, so they do not get sufficient time to take care of their babies.
- It may be expensive for the household to afford a nanny. Today's woman has to manage home along with their office work simultaneously.
- The system is microcontroller based that is being designed is aimed to help parents and nurses in infants care. Features being:
- System starts playing mothers voice automatically when baby cry and stops till the baby stops crying.
- A sound detector is interfaced to the controller which senses sound when baby cries and activates the controller with its digital output.
- Sounds an alarm when mattress gets wet.
- A temperature sensor kept under the bottom cover where the baby sleeps can sense the temperature all time and sends analog signals to the inbuilt ADC of the RL78 controller.
- The digital data can be continuously monitored. A reduction in temperature indicates the wetness in the cover

## OBJECTIVES

- Designing a system which monitors baby body temperature and increase the pillow temperature according to mothers body temperature and intimation in times of baby cry.
- Intimation to mobile phone
- Vibration sensor to detect the baby fall.
- Whenever the baby cries the cradle will swing.
- Based on the emotions(child crying) message will be sent to the parents

## BLOCK DIAGRAM




## METHODOLOGY

- The system is microcontroller based that is being designed is aimed to help parents and nurses in infants care. Features being:
- System starts playing mothers voice automatically when baby cry and stops till the baby stops crying.
- A sound detector is interfaced to the controller which senses sound when baby cries and activates the controller with its digital output.
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- A temperature sensor kept under the bottom cover where the baby sleeps can sense the temperature all time and sends analog signals to the inbuilt ADC of the RL78 controller. The digital data can be continuously monitored. A reduction in temperature indicates the wetness in the cover.
- The controller can be made to activate an alarm, so that his/her cover be changed.
- Sounds an alarm if baby cries for more than a stipulated time indicating that baby needs attention.
- Wi-Fi interface sends alert to android based handsets to get the attention of parents/nurses.
- An ALCD is interfaced to the controller which keeps displaying the status as messages.
- Whenever the baby cries the cradle will swing.

  

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- CNN Algorithm is used to record the emotion of the child based on that if the child is crying an message will be sent to the parents.

**SYSTEM REQUIREMENTS**

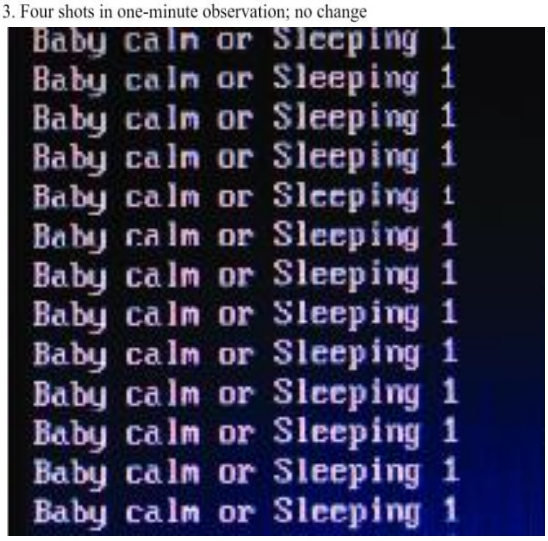
**Hardware Requirements:**

- Raspberry Pi
- Camera
- DC Motor
- Temperature Sensor
- Sound Sensor
- Vibration Sensor

**Software requirements:**

- Python
- Open Cv
- Twilio account for SMS and live video streaming of baby

3. Four shots in one-minute observation; no change




**Cradle Movement mechanism flow chart**

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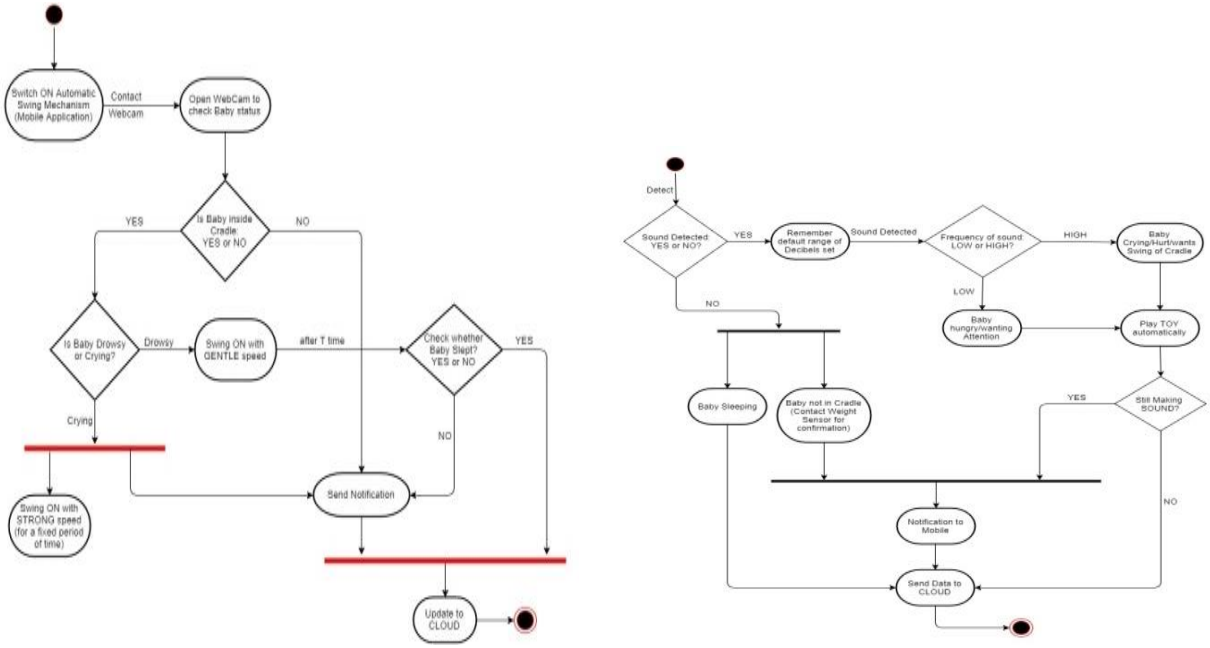


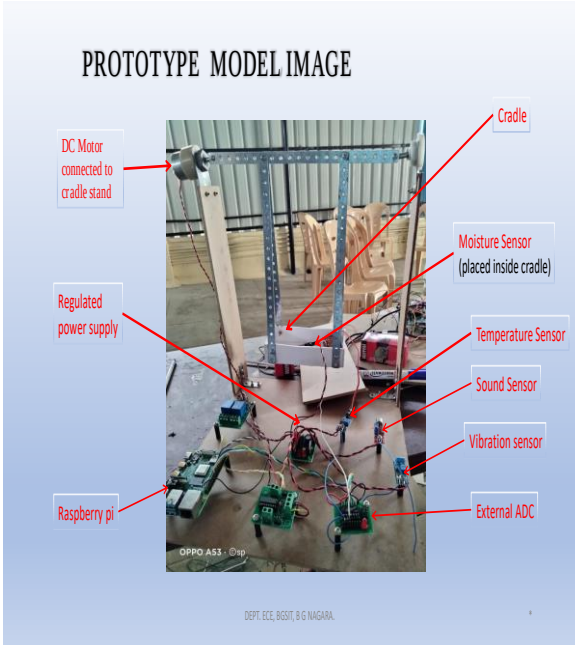

Sound detection flow chart

## ADVANTAGES

- Automated System
- No manual attention required all the time
- Easy to implement
- Baby health gets monitored all the time
- Use of Wi-Fi module makes the monitoring from any part (Long Range)
- Immediate attention

## POSSIBLE OUTCOMES

- Emotion based Cry Detection
- Wetness detection based on temperature sensor
- Message delivered to the parents.



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