

IOT Based Smart Baby Monitoring System with Live Streaming and Alert Notification

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Abstract: *This paper is mainly focused on both parent and child as parents can monitor their babies in their busy life or busy schedule. Since most people these days are more people too busy to care for or spend time with their newborns, this project will enable parents to watch over their child using a mobile or web cameras and a system or sensors (Moisture sensor, Temperature and Humidity sensor, Gas sensor, Motion sensor) that is connected to it. He may take care of the infant in the cradle safely thanks to this project. In today's environment, parents must simultaneously manage their home and their professional obligations. Therefore, some parents choose to send their child to a day care facility or to the house of their elders. However, under both regular and extraordinary circumstances, parents are unable to continually check their child's health. This route will go into depth over every little thing required for the protection of the infant inside the cradle. As a result, a live streaming Internet of Things-based baby monitoring system is ready for parents to use to keep an eye on their infants in real time.*

Keywords: Baby monitoring, cradle, IOT, sensors, Moisture sensor, Temperature and Humidity sensor, Gas sensor, Motion sensor

I. INTRODUCTION

The present state of some parents' work lives makes it hard for them to handle or care for their children, and as a result, they don't have the time to give their children the attention they need. In contrast to the fact that it is possible for old fogey to maintain their infants out of the house all the time with them, keeping watch of a baby constantly is a very difficult task. When adults or couples are getting down to business or managing their work, hiring a babysitter or nurse to continuously watch the infant is a common course of action. Alternative solutions include daycare centres, preschools, nurseries, etc.

In India, 73 percent of moms who are working lose their jobs after having a child, or roughly three-quarters of all mothers. It can be essential for them to care for and raise their infant. Managing a career and being mindful of one's children at the same time is upsetting for parents. Therefore, this IOT-based infant monitoring system will aid in parenting. In order to handle their infant securely, Baby Monitoring System will be solutions.

This work involves a non-contact based baby monitoring device utilising android, which is utilised for appropriate safeguards and supervising the performance of newborns by their busy parents. Everyone is busy with their work these days, but women are more busy since they must manage both domestic duties and employment. They had to look after the house and the kid after a long day at work. In this article, we suggest a smart baby carrier that enables working mothers to keep an eye on their children. This system transmits a live video feed to the PC using an android-based solution.

II. LITERATURE SURVEY

There are several home-care systems available, however the bulk of these systems are created specifically for seniors and patients. These systems can perform a number of tasks, including automatically sending out warning alerts and monitoring their state of health. Infants require different care than adults, though. Since they are completely dependent on others to carry out their daily tasks, children and adults need different kinds of care. Infants are unable to communicate their suffering or health issues. Infants are unable to communicate like adults, therefore when they are uncomfortable,

such as when they have a fever, they can only cry. Therefore, a system of home care specifically created for newborns is necessary today and would greatly lessen the load on parents, especially mothers. Numerous research articles and patents for healthcare applications are examined in support of this requirement with the goal of finding potential solutions to care for the newborn. We have suggested an IoT-based Smart Baby Monitoring System with live streaming and alarm notification to improve the work.

The inventors of a low-cost system that swings the cradle when the baby's sobbing sound is detected and stops when the infant stops crying proposed a similar autonomous baby monitoring system. Either one of the following situations causes the built-in alarm to sound: the mattress is damp; or the baby's wailing continues after a certain amount of time. To keep an eye on the child, a video camera is positioned above the cradle. However, the parents are unable to operate the system and can only get SMS notifications. As a result, the suggested solution in the current study is more sophisticated since it makes use of an IoT application to remotely monitor and operate the created smart cradle in real time. [1]

An Arduino-based resonant cradle with newborn scream detection was suggested by. An suitable sensor is then created to determine the state or angle of swinging. According to the scientists, this technology saves electricity and enables parents to record baby cries brought on by hunger or discomfort on an SD card kept in an SD module. However, because it prevents updating of the data in the IoT server or remote control of the cradle, such local control solutions are undesirable when parents are positioned a little distance from their babies[2].

III. EXISTING SYSTEM

To take care of kids, several caretakers/housemaid were engaged. Additionally, most baby medical facilities require payment for watching and feed their child. In such kinds of facilities, there seems to be abundant of cheating discovered throughout several times, so thank you for media. There's other evolved cradle, although those frequently only have few number of traits.few characteristics, are experiencing difficulties for caring the newborn/keeping babies from sleeping. A fresh start to something like an independent monitoring system for neonatal care was provided in another work [3], a Micro Controller solution. A affordable infant tracking system designed by the researchers capture the noises when a baby cries and is attached to a swinging cradle that swings mechanically when any system hears a sound and continues to swing until baby stop wailing.

Additionally, a camera is fixed to the side to the cradle to capture video of the baby's environment. A study [4] on the development of an integrated tool for tracking infants was just delivered by professors Kranti Dive and Gitanjali Kulkarni. It consists of a voice detected object for watching infants, a Long distance relationship light sensor, as well as a door sensor. LEDs display the sensors' data, as well as an indicator is connected to the computer to send out a warning.

A collection of objects connected to internet was referred to as the "Iot technology" (IoT). It allows for the automatic transmission of sensor data by devices over the Internet [5, 6]. The IOT is a very broad category that includes a variety of devices and is currently growing quickly. In 2019, there will be approximately 26.66 billion IoT gadgets active, then by 2025, there will also be 75 billion IoT gadgets accessible and remotely connected to Internet [7],3 [8]. Among these interconnected devices, there are billions of smart technologies that are often used in healthcare systems [9].

In addition to handling data from sensors inside an incubators with a Lcd screen to show incubators moisture, nget al.[10] used an Arduino Microcontroller with an ATmega328 CPU. The sensor data was evaluated by the Arduino and sent to the PC for continual monitoring. A baby monitoring system [11] is a device or system that may help parents keep an eye on their kids from a distance as well as ensure the parents' safety and comfort.

The recommended study was able to help new parents are aware of their infants by using a smart phone application. Another GSM-based newborn monitoring device has been unveiled by Savita P. Patil and Manisha R. Mhetre [12]. This gadget can track a baby's body temperature, wetness, heart rate, and movements via the GSM network and send the data to the parents. The arduino UNO is used to run the system presented in this paper, although this system is affected by a microcontroller.

IV. PROPOSED SYSTEM

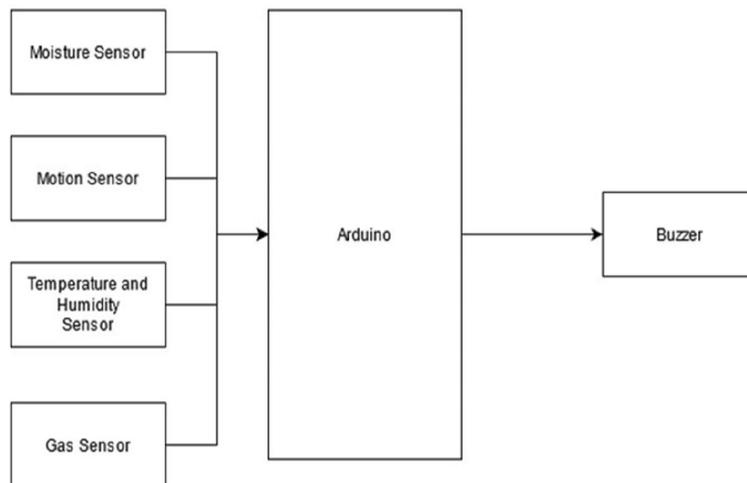


Fig 1: Block diagram of system design

The following figure displays the suggested design methodology. An Android app uses the phone's built-in camera to collect the video stream in the first block of the figure. To save the user having to adjust the resolution for various mobile phones, the app employs a preset resolution while streaming. The video stream must then be converted into frames by the Mobile application after it has been captured. Each frame in a video file is merged to create a video file.

After being retrieved from the video stream, the images are then placed in an android mobile phone's buffer. The android phone buffers the pictures so it maintains an extra frame on hand to prevent latency or stuttering when watching live feed. The information inside the queue then is transmitted towards the local area network after these frames have been saved in it. Then, the pc may be used to watch the streaming information about baby.

The software starts when viewed on an Android mobile and displays an IP address. This IP address has to be provided to the system. After these details have been entered, the computer will gather the stream and display it.

V. COMPONENT DESCRIPTION

5.1 Arduino Board (micro-controller)

It serves as the system's processing unit. In order to perform the proper action, it will gather the information from sensors and processed the data. When a baby cries or moisture is detected, the microcontroller will stop to take prompt action. Using the driver circuit, the microcontroller delivers a message by controlling the device.



Fig 2: Arduino uno

5.2 Motion Sensor

Microcontroller and Motion Sensor will be connected. This will make it easier to see the baby's movements. Microcontroller will send a message to the parents' device whenever the baby makes any movement.



Fig 3: Motion Sensor

5.3 Moisture Sensor

In terms of the comfort of the newborn, this will be crucial. When the mattress is moist from urination, it will alert the controller by sending a signal in the form of current. Conducting tracks for this sensor are created with a narrow space between two adjacent tracks. Conducting urine will short these tracks, and the sensor's resistance will drop to almost nothing.

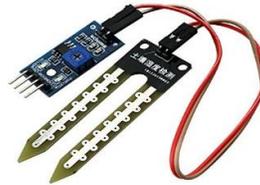


Fig 4: moisture Sensor

5.4 Gas Sensor

The micro-controller will be attached to a gas sensor. the baby's microcontroller will send the parents the mail in order to aid identify any gas that has been dispersed nearby.



Fig 5: Gas Sensor

5.5 Temperature and Humidity Sensor

Microcontroller will be coupled to temperature and humidity sensors. If the infant becomes overheated, the sensor reading is passed to the microcontroller, which subsequently sends the mail to parents.

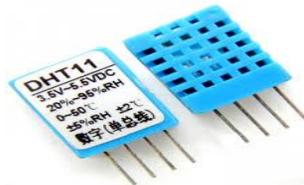


Fig 6: Temperature and Humidity Sensor

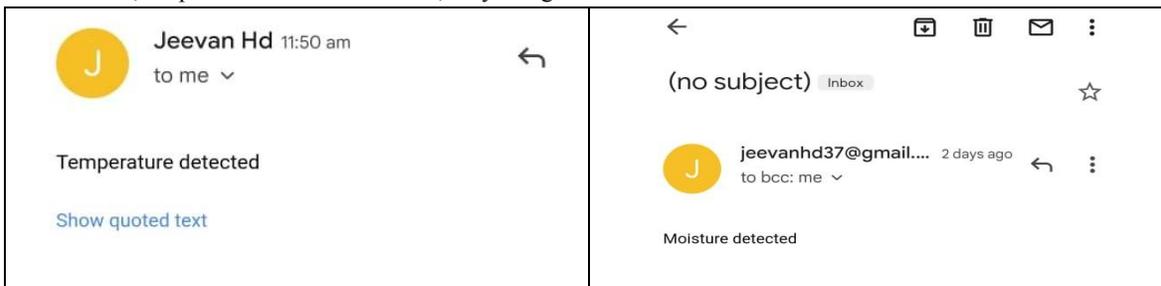
VI. RESULT

The method was thoroughly tested on a baby, and it was discovered that the findings were identical to those obtained using a conventional instrument. Parental concerns were taken into account when this technology was being tested on a baby.



Fig 7: Monitoring the baby

Using a mobile camera, parents can keep an eye on their children. If something happens to the child, they can readily be monitored and, despite their hectic schedules, they can get mail.



A) Detection of temperature

B) Detection of moisture



C) Detection of motion

D) Detection of gas

While the system was functioning, pictures of the display were captured. The hardware is completely working, and data from both a smartphone and sensor have been send to the parents through mail.

VII. CONCLUSION

This paper presents a non-contact based baby monitoring system utilising mobile, which is utilised for adequate safety and monitoring the activities of newborns in their busy schedules. Everyone seems to be extremely busy these days, but women are more busy since they must manage both domestic duties and employment. Only a PC and an Android mobile phone are used in the suggested system. The live video footage will be streamed to the PC using an android application that will be created using android studio. The modern android phone's real time video stream is displayed on the PC. People spend more time these days with their work to take care of their newborns, thus it will be quite beneficial for parents to keep an eye on their children among their hectic routines. When a baby engages in any odd behaviour, sensors will pick up on those and give notice to the parent's smartphone. This is known as smart baby monitoring utilising IOT. This method can help parents make their children more pleasant. Parents are not required to pay for housekeepers or caregivers to watch over or take better care of their infants.

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