

IOT BASED BABY MONITORING SYSTEM USING RASPBERRYPI

Sathiya Sivam.B¹, Aswinram A², Babu perumal R³, Kaleeswaran M⁴,

¹Assistant Professor, Department of ECE, KGiSL Institute of Technology, Coimbatore, India

^{2,3,4}UG Scholar, Department of ECE, KGiSL Institute of Technology, Coimbatore, India

ABSTRACT---This paper presents an idea to design a Smart Cradle System using IOT which will help the Parents to monitor their child even if they are away from home & detect every activity of the Baby from any distant corner of the world. It is an innovative, smart & protective Cradle System to nurture an infant in an efficient way. This system considers all the minute details required for the care & protection of the Baby in the cradle. The design of smartness & innovation comes with the use of technologies/methodologies which include Internet of Things (IOT) (Modules like Raspberry Pi, Humidity & Temperature sensing), Cry Detecting Mechanism, Live Video Surveillance, Cloud Computing (Data Storage) & User Friendly Web application (for User Controls). In order to detect each & every activity of Baby, different Sensors/Modules are attached to the Cradle: Humidity & Temperature Sensing Module for detection of Wetness of the bed, A Camera on top of the Cradle for live video footage & Cry Detection Circuit to analyze Cry Patterns. All the data which is been taken from the sensors/modules will be stored in Cloud (Thing Speak) & analyzed at regular intervals. A Health Algorithm is applied to these datasets to get information about the body conditions which is helpful as any regular symptoms of a disease can be identified easily.

Keywords: IOT, Raspberry Pi, Baby Monitoring, Humidity, Temperature.

I. INTRODUCTION

As we are very well familiar with the hurdles faced by Parents to nurture their infant and especially in case if both the Parents are working. To give 24 hours of time in such cases is next to impossible.

Thus, we need to develop something unique that can help Parents to have a continuous surveillance/watch on the Baby/Infant and can notify about the same. We have come up with an idea to design a Smart Cradle System using IOT which will help the Parents to monitor their child even if they are away from home & detect every activity of the Baby from any distant corner of the world.

These Days parents are worried about their children's so they want a complete track of them and monitor them all the time. This is physically not possible so we introduce Safety Monitoring system which is helpful for monitoring or tracking the child and their activities from anywhere in the world. The major issue of child missing can be solved with the help of child tracking system as well as parents who need to keep a track of their every steps, this system plays a vital role.

The android application uses GPS and telephony services to locate their child's location. This application secretly retrieves all the Call Logs, Message Details, Contact list and accurate Location without the children's permission or without their knowledge as this application runs in background and the major advantage of this feature is, if child reboots the Mobile phone the background process starts as the reboot is complete, so the process is never ending.

This application sends all the data from the child's phone to the server and from the server to the parent's phone in every 10 minutes interval. This application is divided into 2 Apps, one is for the parent where they can see all the activities of their children and other is the Child Part, where the child can only see a calculator while the data is been fetched in the background without child's knowledge.

II. LITERATURE SURVEY

Existing Method:

In this existing system sensor are used to know the condition of baby but that will restricted to particular area where if any problem parents have to be in that area and has to and check the condition of baby manually. The whole IoT Based care system is divided into different phases according to their features. Each feature of the project is mainly designed with an IoT based system so that system becomes smarter and efficient than the earlier version of the projects.

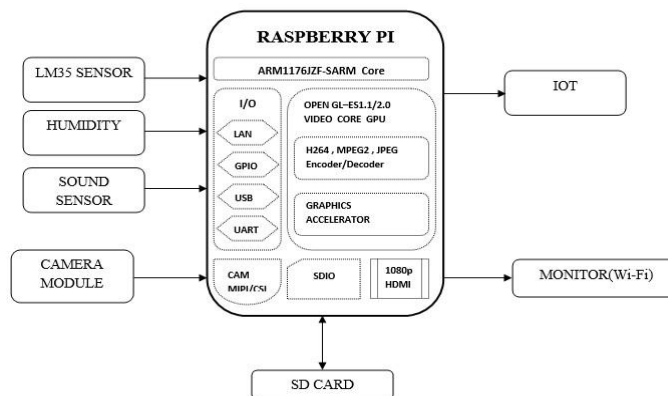
Proposed system is able to provide following features, such as:

- Tracking a baby to monitor its activities and transmit live video streaming of baby’s activities to the parents through Internet.
- Smart IOS and Android App to alert the parents when baby approaches dangerous zones & for the change of diaper.
- An vocal diverting system to the baby to divert it away from the unapproachable area.

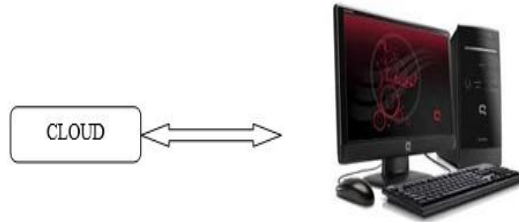
All the above mentioned features were individually tested to meet their requirement and finally merged into a single unit. As well as this system is designed as detachable units so that it can be used as per the need and the space availability

III. PROPOSED ARCHITECTURE

In this proposed system, both sensors and forecasting cloud is used, so that resulting data having high accuracy about the children condition, also we are using surveillance of the children using camera from a Wide Area Network (WAN) which can be viewed in the Web Application and also can control the situation from a remote area anywhere from the world. Parenting is not an easy task. Good parenting requires the parent to quickly respond to the needs of their child. Constant monitoring of the child also becomes a necessity, especially up to an age of 18 months. This work incorporates various features such as tracking a baby, live video streaming of baby’s activities, temperature, light and humidity control, protection from hot object hazard and design and implementation of IOS and Android based Companion App. One of the most important feature of baby care system is tracking and following a baby to ensure safety. Tracking is achieved by Pixy CMUCAM5 camera sensor which is trained to track the color of baby’s clothes. Pixy sensor is interfaced with Arduino microcontroller to drive the baby care system. Live streaming of activities of baby or people with special need is achieved with the help of video camera interfaced with Raspberry Pi Model 3B.



Block Diagram Of Proposed Model



Monitoring System

Methodology

The raspberry pi3 processor speed ranges from 700 MHz to 1.4 GHz for the PI# Model B+; on-board memory ranges from 256 MB to 1GB. Secure Digital (SD) cards are used to store the operating system and program memory in either SDHC or Micro SDHC sizes.



- Specifications:
- Operating System-Linux
- CPU-1.4GHZ/32-Bit quad core ArmCortex-A53
- Storage-Micro SDHC SLOT
- Graphics-Broadcom Video Core IV 300MHZ
- Power-1.5 W
- Website-raspberrypi.org
- Camera

The camera used here is Logitech c270 makes HD video calling with High Definition 720p video in wide screen for amazing picture quality with resolution of 1280*720.



IV. INTERNET OF THINGS

The IOT embed sensors, software, electronics and connectivity to perform better by exchanging information with other connected devices. It connects the device to the cloud, managing it and collecting data. In this project MCP3008 is used, so connect 3.3v pin from raspberry to all sensors. Similarly MCP3008 and all sensor's ground pins should be grounded. Now connect sensor's output pins to each channels of MCP3008 (ex: LM-35 to channel 0, HUMIDITY to channel 1 and SOUND sensor to channel 2 of MCP3008). Connect USB camera with raspberry pi. Connect power supply for Raspberry pi. Plug the HDMI cable in Raspberry pi from the monitor using VGA to HDMI converter cable. Connect USB Mouse and USB keyboard to the Raspberry pi

Hardware Requirements

- Raspberry Pi
- Temperature (LM 35)
- Humidity Sensor
- Sound Sensor
- MCP3008(ADC IC)
- USB Camera
- SD card
- Monitor

Software Requirements

- Raspbian Jessie
- HTML and PHP
- MQTT Protocol
- Language – Linux
- Python

V. RESULTS AND DISCUSSION

According to the system it analyses children Activities with Video Enhancement and Instant WEB App Notification for Better Monitoring of Baby. Atomization of System with Real-Time Database in the cloud, accurate sensors make the monitoring of the baby easy.

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