

Child Tracking System Using Zigbee Network

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ABSTRACT:

Violence towards children has recently risen at unprecedented rates all over the world, and it is beyond time for schools to provide a safe support system for pupils. This paper aims to discuss the introduction of a children's trailing scheme for each child who attends faculty. Present programs, however, are unable to deter child abuse since they only provide knowledge about the children, the youngster, and the kids' cluster, rather than an actual child, leaving parents with a poor sense of trust in their child's well-being. They frequently neglect to realize the value of detecting a child's cry and telling its parents daily. The suggested system would include a kid toddler, a baby module, and one receiver module for periodically gathering data on the missing boy. The international positioning system of the nodemcu controller is included in the child module. GPS was used to calculate the children's position, which was then sent to the local host server method. The microcontroller is linked to a parent handheld Wi-Fi device. In this project, we created an IP address. When the parent scans, the IP address of the child's location is shown on the webpage. If the address is not shown on the tab, it means the child was not at home. We attached another future to the kid's panic button in this experiment: if the kid pushes the panic button twice, the buzzer circuit would begin to blast until the panic button is activated.

Keywords:

zigbee, buzzer, panic button, nodemcu, Arduino

1. INTRODUCTION

In recent years, the presence of women in industrialized countries has increased significantly, affecting children's well-being and caring for many communities. Therefore, this technology applies mostly to working parents. You either return your kids to your parents or use a childcare specialist when you are at work. A parent cares about its children's well-being while caring for others. A parent cares about its children's well-being while caring for others. They then go home after lunch or tea to check on their babies. A baby tracking system that can monitor babies' health in real time has been suggested. A baby monitoring system that monitors the welfares of babys in real time was proposed to solve these concerns. A video camera and a baby tracking device with no boundaries. It would import data and notify parents on urgent situations in real time and reduce the time needed to deal with them. The condition is often referred to as crèche death, since many SIDS babies may be in their crib. Children under 12 months of age are mostly affected. In children under the age of six months, the majority of deaths from the SIDS occur[1]. SIDS symptoms are not clear, but if a baby has a rough surface on his or her nap, the risk will remain minimal. In addition, the infant does not lay on a mattress or any other supportive area when sleeping. The investigators do not know why sleeping on these floors increases the danger of SIDS, but warn that it can be dangerous[2]. For example, a 2003 research found

that putting a baby on soft bedding rather than on solid bedding created five times more SIDS[3]. Overheating during sleep can also be prevented. Warmth, as they sleep but not to the extent of discomfort, should be provided to children. The chance of SIDS rises with the hot weather or winter due to the overwhelming parents or the heavy covering of their infants, which allows them to overheat. Thus, if an adult has enough room temperature, it's also suitable for an infant. The Internet of Things (IoT) refers to the Internet network of objects. It enables sensors, without human involvement, to transfer sensor data via Internet [5, 6]. Since the Internet of Things is such a broad category, it covers a wide range of technology and is developing even more. The operating level of around 26.66 billion IoT devices is anticipated in 2019 and the availability and wLAN connectivity of 75 billion IoT devices will be about 2025 [7, 8]. Millions of wearable sensors are used extensively in healthcare applications amongst these embedded consumers[9]. The gross global investment in IoT amounted to US\$737 billion in 2016, projected to reach US\$1.29 trillion in 2020. The Internet of Things (IoT) is a thriving sector[10, 11]. The Internet of Things provides power, real-time analysis, autonomy and self-contained operations and optimization features. In this research, IoT is embedded in our baby tracking system to give parents a fast response time and greater sense of safety.

The Node Wi-Fi-based Controller Unit, the main microcontroller in this project, is an open-source

framework for IoT applications. It collects and uploads data from sensors onto the MQTT server. The MQTT registry also accepts user commands for various functions. NodeMCU is composed of a physical programmable circuit board similar to the Arduino and Raspberry Pi. The NodeMCU can be programmed with the Arduino Software. The programming environment is optimised and you can write the instructions code and upload the microcontroller.

2. LITERATURE SURVEY

Few research looked from diverse viewpoints at the concept of an artificial baby crib. [16] . Off-line paraphrase An advanced noise cancellation system for babies is offered to monitor the baby while minimising sound emissions. It also offers This machine's main goal is to play soothing music so that noise will suppress it. This gadget also controls the light intensity in the room with a light sensor. Our device has, by comparison, more sophisticated capabilities, such as real-time IoT tracking and Web camera monitoring. [17] Describes an E-baby cradle which is shaking alone as it listens to screams and when the moaning stops swinging. The swinging pace of the cradle can be modified to meet customers' demands. It has an integrated warning that advises the consumer if two conditions are met. When the mattress is damp, it must be hidden from the alarm sound. Secondly, when the baby begins to shout for some time, it sounds a warning to alarm the parents. But since it only uses a buzzer bell to surprise the baby, it is useful only when parents are near the crib. If parents do not live in the house, such as working or on vacation, they cannot keep an eye on their children. [18] [18] Off-line paraphrase A simultaneous automated baby surveillance system has been proposed. The authors have developed a low-cost gadget, which swings the crib as the child begins to weep and swings when the infant ceases weeping. The built-in warning sounds if either of those events occurs: The boy won't stop shouting a certain amount of time when the mattress is damp. There is a video monitor over the crib to keep an eye on the child. Parents can only collect SMS warnings, on the other hand, and have no system access. This leads to a more sophisticated framework that uses an IoT platform to track and control in real time the installed intelligent cradles remotely.

2.1 EXISTING SYSTEM

Fehlers in application development have been identified after a systematic baby monitoring science literature analysis. We then demonstrated a clever crib that mixes IoT with a baby tracking device. Subsequently, the clever cradle material was obtained. The equipment and materials used in this unit's construction are chosen to accommodate an infant. The most important thing is that the baby remains good. The modelling stage is followed by a setup of the interface, GUI decision for the device and implementation phase. The electronic elements used in the construction of the control unit were selected and ordered for machine use. And the coding was done in accordance with the proposed scheme. The designed baby tracking system was built and optimised following a simulation approach, via a range of tests, to produce the desired result. Then, before the intelligent cradle was completed, it was installed on the cage prototype for testing.. Should the experiment malfunction due to coding errors or other complications, the process has been repeated until the cradle achieves the intended result and achieves the testing goals.

3 METHODOLOGY

1] Connecting With Nodemcu:

The ESP8266 is a low-cost Internet gateway for connecting your designs. Since the module will function as a hotspot and station, data can be downloaded on the internet, making the Internet of Things easier. It would also use APIs to import content from the internet and enable the project to browse and make all the information on the internet more intelligent. The attraction of this module is that the Arduino IDE can be encoded to make it a lot simpler to use. The ESP8266 is just 3.3V, and something over 3.7V will disable it and watch the circuits. The 3.3V programming FTDI module is perfect for configured ESP-01. You have one fine thing if you don't have one now, but an Arduino board would be enough for now. The ESP-01's powering up dilemma is a widespread problem. Since the module uses a lot of electricity while debugging, you can power it with a 3.3V Arduino pin or a potential divider. As a result, it's important to develop a small 3.31v voltage regulator that can supply atleast 500mA.

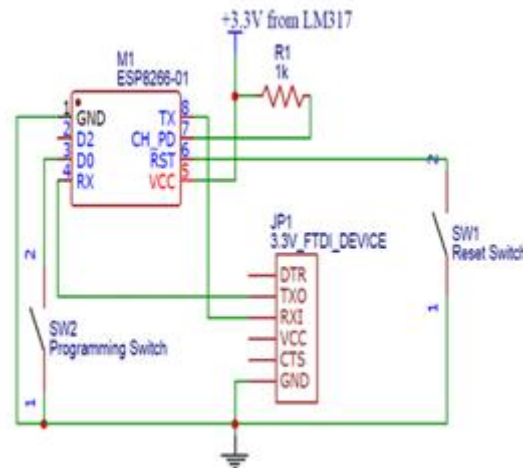


Fig 3.1

Hold the GPIO-0 pin based on maintaining the SW2 button (Program Switch). Then the programming mode and the code can be uploaded. The switch can be turned off when code is issued.

2] Connecting Gps Module With Circuit

The global system for positioning is a satellite navigation system which needs at least 24 satellites. GPS is available 24 hours a day, anywhere in the world, in any environmental situation without annual costs or startup costs. GPS satellites in an exact orbit pass the Earth twice a day. Each satellite transmits a special signal and orbital parameter, which GPS devices can decipher and use to precisely calculate the position of the satellite. This knowledge is used by GPS receivers along with trilateration to evaluate exactly where a user is located. To calculate the distance between satellites, the time needed to absorb a transmitted signal is used by the GPS receiver. The receiver will calculate and report the location of a consumer with distance measurements from a few more satellites. A GPS receptor shall be locked on the signal of a minimum of three satellites to measure 2-D (latitude and longitude) and detect movement. The receiver will assess the 3-D location when 4 or more satellites become apparent. Eight to nine satellites are normally found by a GPS receiver depending on the hour of the day and the position on the globe. After determining your location, the GPS will calculate additional figures, such as • Speed • Bear • Route • Trip distance • Destination distance.

A buzzer is a small and powerful piece of equipment that allows our projector system to be added to music. It can be used on a breadboard, a Perf board or even a PCB, since it is lightweight and portable and can be used in most electronic applications. On the industry, there are two kinds of buzzers. If powered, the basic buzzer makes a sound of continuous beep; the other kind is a prefabricated buzzer that is more bulky and produces beep than that. Beep, Beep, Beep, Beep, Beep, Beep, Beep, Beep Beep, Beep, Beep, Beep, Beep, Beep, Beep The sound is produced by an internal oscillation circuit. Only mount this buzzer to a 4-9 Volt DC power supply to use it. A controlled +5V or +6V DC supply is recommended while the standard 9V battery can be used. Typically the buzzer is connected to a circuit that turns it on and off at set times and intervals.. LCD display devices, which can be found in many different applications, are computer display modules. A 162 LCD monitor is a very simple module used in various appliances and circuits. These units are preferred over seven and other LEDs with several segments. In the Command Register the LCD instructions are stored. A command tells the LCD to conduct a task like initialising it, clearing your computer, locating your mouse, tracking your display, etc.. Data are saved in the data log to be displayed on the LCD. Data is the ASCII value of the character on the LCD. Click here to find out more about an LCD's internal structure.

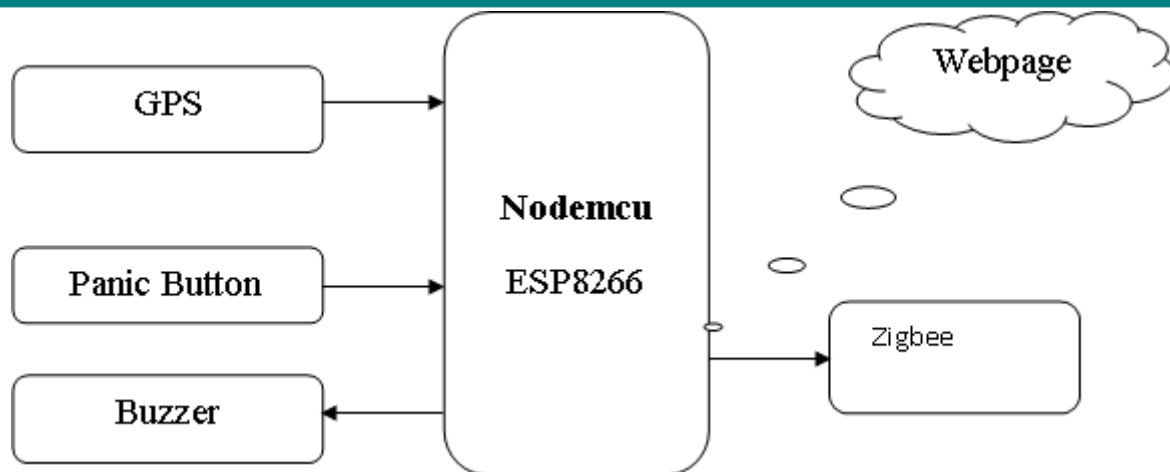


Fig 3.2

3] Connecting Zigbee Network

Zigbee has developed an IEEE 802.15.4 specification which identifies a number of high-level networking protocols for the construction of personal areas for portable low-powered digital Radio networks, such as home control, medical device data storage, as well as other limited bandwidth applications including wireless communications. As a result, Zigbee is a wireless ad hoc low-power, low data-rate network running close by. Due to low electricity demands, power production and setting, the transmission range is limited to 10-100 metres. Zigbee can transmit data over long distances by means of a mesh system to reach remote computers. In low-data applications, zigbee is commonly used, Requiring long battery life and stability in network use. A 250 kbit/s Zigbee Rate is suitable for short time transfers of sensors or data entry.

The coordinator is Zigbee network tree's most powerful CPU with bridges to other networks. Any network has only one ZIGBEE coordinator because this is the mechanism that started the network. It serves as a trust hub, a security keys registry and a network data retrieval system.

In addition to running an application, a router may serve as an intermediate router, transmission of data from other devices. The abbreviation "Null" is ZR. The router can also be used as a relay router for other computers' data transfer in addition to a programme: ZED is a Zigbene end machine shortcut. Its functions are restricted to communication with the parent node; data from other nodes cannot be accepted. As a result, the node sleeps for a long time, which means the battery life is longer. Since a ZED has less memory, the production of a ZR or ZC is cheaper.

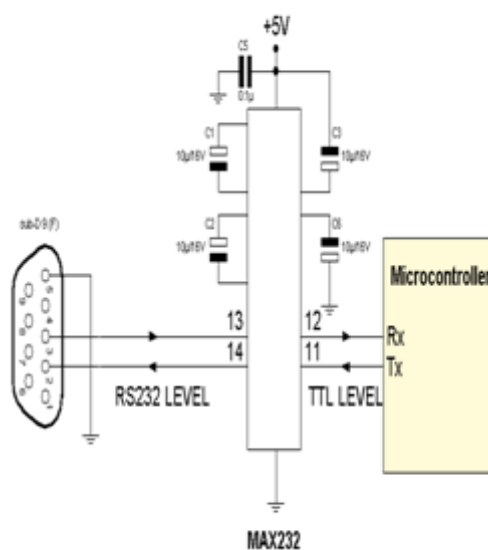


Fig 3.3

4] Connecting Arduino And Nodemcu

A code editor, a message area, a text console, a tool Bar with basic function buttons and a selection of menus are

included in the Arduino software (IDE). It links and uploads programmers to Arduino and Genuino hardware. For your first Arduino, the Uno is an

outstanding pick. It includes everything and nothing you may need to get started.

There are 14 optical pins for input and output. There are six analogue inputs on offer.

A USB port, power jack, reset button, and other features are available. Sketches include programmers created with the software Arduino (IDE). These sketches have been rendered and saved in a text editor. The editor can be used to cut / paste and search/substitute text. The message region displays errors and accepts feedback when saved and exported. The Arduino Software (IDE) sends the terminal with full error and other results. In

the lower right corner of the window the built board and serial port are visible. Using the toolbar keys, programmers can be searched, imported, developed, displayed and saved, the series monitor can be opened. Libraries can add features to sketches by enabling communications with hardware or data editing. Choose the Sketch > Import Library menu to use a library in a painting. This will compile the booklet of the sketch and add one or two #comments to the top of the sketch. Since the artwork is shown, libraries are more accessible than the drawing on the board.

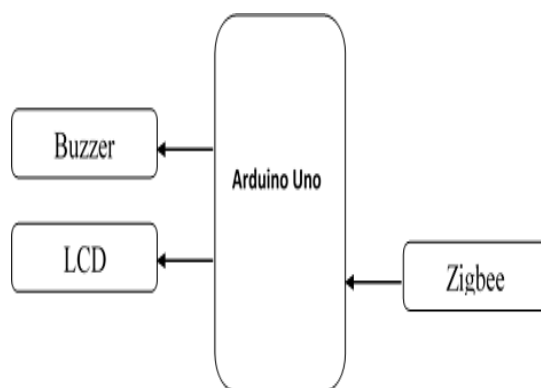


Fig 3.4

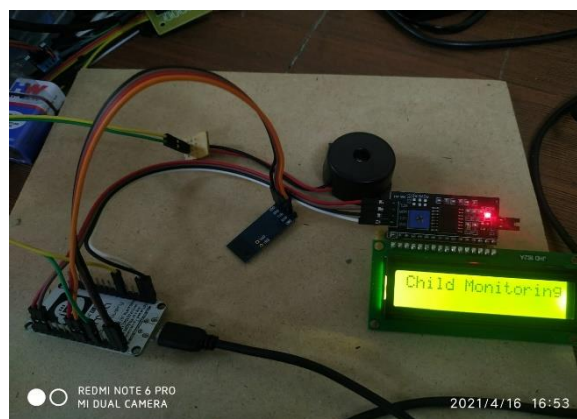


Fig 3.5

4. RESULT

Since NodeMCU had a Wi-Fi module, the project was the main controller board for application of the IoT principle within the current framework in the project's circuit architecture. Due to its simplicity and open-source architecture, NodeMCU was used to meet the IoT requirements. With the smartphone app, the User can watch the baby and talk to the baby through its built-in wireless microphone. Since the completion of the prototype the overall cost of the produced unit has been

lowered to around RM 700 per model and is thus ideal for mass production.

The users experience of the device ought to be revised in order to address the weaknesses of both the Adafruit.io MQTT webpage and MQTT Dash smartphone app. For notebooks, PCs and tablets, we will build a web-based and Android dashboard, with more tracking and controls based on our device requirements.

CURRENT LOCATION OF GPS	
Location Details	
Latitude	13.2454
Longitude	101.7298

Fig 4.1

5. CONCLUSION

In future, the wireless camera will therefore be converted into an IP camera for network visualisation with IP hosting. Parents will see the baby's status in the network window in real time by entering the IP address of the IP camera. Additional experiments will be conducted to further enhance this strategy. The motor of the swing mechanism can be calibrated to speed according to the measured dB. (s). When coding will modify the spinning direction of the stepper motor, the 12 V DC geared motor can be converted into a 12-V steppers motor.

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