

PR1101 – AUTOMATION PROJECT

BABIES BUDDY (CHILD SECURITY AND TRACKING DEVICE)



NAAC 'A' Grade Accredited

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CERTIFICATE

This is to certify that the project work entitled “**Babies Buddy (Child Security and Tracking Device)**” submitted by **Aakash Mittal, Chirag Kumar, Deeksha Dixit and Vikas Janu** towards the partial fulfilment of the requirements for the degree of **Bachelor of Technology in Computer Science Engineering** of JK Lakshmipat University, Jaipur is the record of work conducted by them under our supervision and guidance. The submitted work has reached a level required for being accepted for the final submission of project.

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Date of Submission: December 04, 2022

ACKNOWLEDGEMENTS

We have completed this project under the guidance and supervision of **Dr. Devika Kataria** Associate Professor, IET, JK Lakshmipat University, **Dr. Hanuman Prasad Agrawal**, Assistant Professor, IET, JK Lakshmipat University and **Mr. Divanshu Jain**, Assistant Professor, IET, JK Lakshmipat University. I will be failed in my duty if I do not acknowledge the esteemed scholarly guidance, assistance, feedback, and knowledge I have received from them towards the fruitful and timely completion of this work.

We express our deepest thanks to **Dr Dheeraj Sanghi**, Vice Chancellor, JK Lakshmipat University, and **Dr Sanjay Goel**, Director, Institute of Engineering and Technology, JK Lakshmipat University for their constant support, encouragement, and guidance.

We also acknowledge with a deep sense of reverence, our gratitude towards our parents for their direct or indirect support during the entire course of this project.

Thanking You

Sincerely Yours,

Aakash Mittal

Chirag Kumar

Deeksha Dixit

Vikas Janu

ABSTRACT

Babies Buddy (Child Security and Tracking Device) is a device by which the parents can track the location of their child and can get the alert whenever the child gets out from the defined range or location. This sort of device can be used efficiently by the parents who are staying in the societies and who are working professionals because they might face this issue that they get less amount for their child to take them out and play with them outside every day. As we know that when we are stuck in any tensed situation or when we are worried then our heartbeats increase so we have attached the pulse sensor also in this device, so that parents can get the data of the heartbeats of their child.

Even though there are similar sort of devices in the use, but they have their own drawbacks, some might have low efficiency as compared to their price whereas some might not be proper functional as required and similarly there are problems associated with these devices. This project is initially focusing on the device which can be carried by the child on their waist so that the child also carries that without any problem or any burden.

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BABIES BUDDY (CHILD TRACKING AND SAFETY DEVICE)

CHAPTER 1: PROBLEM STATEMENT

In today's world the problem that is faced by the children and the parents is that when some unfortunate thing happens with their children. Because of the unconsciousness of the children some negative elements can harm a family majorly the child himself and his parents. Nowadays we all are moving ahead with the help of technology. And in this busy schedule of the parents, they are also requiring the need of technology to take care of their baby. This sort of device can be used efficiently by the parents who are staying in the societies and who are working professionals because they might face this issue that they get less amount for their child to take them out and play with them outside every day. Our device will help the parents to monitor the movements of their baby. If parents want to know the location of their child, then they can track the location and the heartbeats as well. In this device the pulse sensor is also attached so that the readings of the heartbeats also, can be tracked by the parents. So that they can be doubly sure about the safety of their child.

CHAPTER 2 : LITERATURE SURVEY

Park, S., 2022 [1], To lessen parental anxiety and enable schools to monitor students in real time, this article suggests an SMS-based approach. One gadget transfer connection between several devices through. SMS is used to link the concerned gadget to a mobile device. Shareholders may use the gadget to follow kids and collect real-time data. The primary benefit of the suggested approach is the ability to communicate location over mobile network (GSM). In this case, a hardware-based prototype model (device) is built.

DHANALAKSHMI, M., HEMAMALINI, S., DIVYA, M. AND SIVALINGAM, T. [2] This paper deals with the tracking device which can be worn by the children. This device does not need any expensive technology and it is user friendly. Both educated and uneducated people can use this device effectively. The main purpose of this device is to trace the location of the child in an easy manner. The child can also send alert message along with their location to their parents. The existing devices use Bluetooth and Wi-Fi for communication. As these two technologies cover only a short range, the communication over the far area is highly impossible. This device uses SMS based technology to overcome this problem. Know the latitude and longitude of the child's location the parents are not in the need of sending any specific code to the device. If they press the key, they can receive the SMS. There are two ways to alert the parents and neighbours if the child feels insecure. The alert message is sent to the parents or guardian mobile via SMS and the buzzer is activated. It indicates that the child is in danger to the by passer.

SAN HLAING, N. N., NAING, M. AND NAIN, S. S. [3] Global System for Mobile Communication (GSM) and Global Positioning System (GPS) based vehicle location and tracking system provided effective, real time vehicle location, mapping and reporting this information value and add by improving this level of service provided. The GPS based vehicle tracking system is designed to find out the exact location of any vehicle and intimate the position to the concerned authority about through an SMS. The system includes a GPS modem that it retrieves the location of a vehicle in terms of its longitude and latitude. The system uses geographic position and time information from the GPS. The system has an onboard module that it resides in the vehicle to be tracked and a based station that monitors data from the various vehicles. The onboard module consists of GPS receiver, a GSM modem. This hardware is fitted on to the vehicle in such a manner that it was not visible to anyone. That system sends the location data to the monitoring unit continuously therefore it is used as a covert unit. The location data from tracking system uses to find the location and to give the information to police when the vehicle is stolen. This gives an edge over other pieces of technology for the same purpose. The system automatically sends a return reply to that mobile indicating the position of the vehicle in terms of latitude and longitude when a request by user is sent to the number at the modem. A program has been developed that it is used to locate the exact position of the vehicle and to navigated track of the moving

vehicle on Google map. The system allows to track the target anytime and anywhere in any weather conditions. This system is user friendly, easily installable, easily accessible and can be used for various other purpose

BANDARU, A. [4] Cloud computing has become a valuable tool not only in the business world but also in our day-today activities. Most businesses have opted to cloud computing as it is considered safer and more dependable especially in inventory tracking. Cloud computing is the on-demand provision of services that includes data and projects can be put away and gotten to easily. Amazon is at the forefront in providing cloud-computing services globally using a service called Amazon Web Services (AWS). It allows customers to store data on the platform. However, AWS has a major shortcoming, which is denial of service, which may be risky especially for businesses that heavily rely on the platform to conduct their businesses. Cloud computing, is important in helping SMEs (Small and Medium size Enterprises) utilize emerging opportunities, thus giving an advantage to compete evenly in business. Most SMEs are seen to prefer AWS over other service providers as AWS is efficient and more affordable. As a result, new and up-coming companies are more likely to use AWS as their service provider for cloud computing. Despite the advantage cloud computing offers, there are worries as to the safety of stored data and ease of use. In this paper, the advantages and disadvantages of the cloud computing, cloud storage systems, and infrastructure using web services such as Amazon Web Services are elaborated.

CHAPTER 3: PROJECT OBJECTIVES

We have made this device keeping in mind the safety of the child and the concerns of the parents for their child. This device has been completed to help the parents to track the location of their child within the given range with the additional feature that if the child walks out of a particular range or location then the parents will receive an alert message. This will be incredibly useful for parents who are working professionals because they get less time to spend with their child. So, they can just attach the device to their child and can let him go and play outside and can track the child just on the cloud. As we know that when we are stuck in any tensed situation or when we are worried then our heartbeats increase so we have attached the pulse sensor also in this device, so that parents can get the data of the heartbeats of their child. This sort of device can also help in those cases where the police find it difficult to find that where was the child last seen when any unfortunate incidence happens. So, it can help them in knowing the last location of the child and if device stays in contact with the cloud, then we can track their exact location.

CHAPTER 4: SCHEMATIC DIAGRAM

CHAPTER 5: COMPONENTS USED

1. NODE MCU

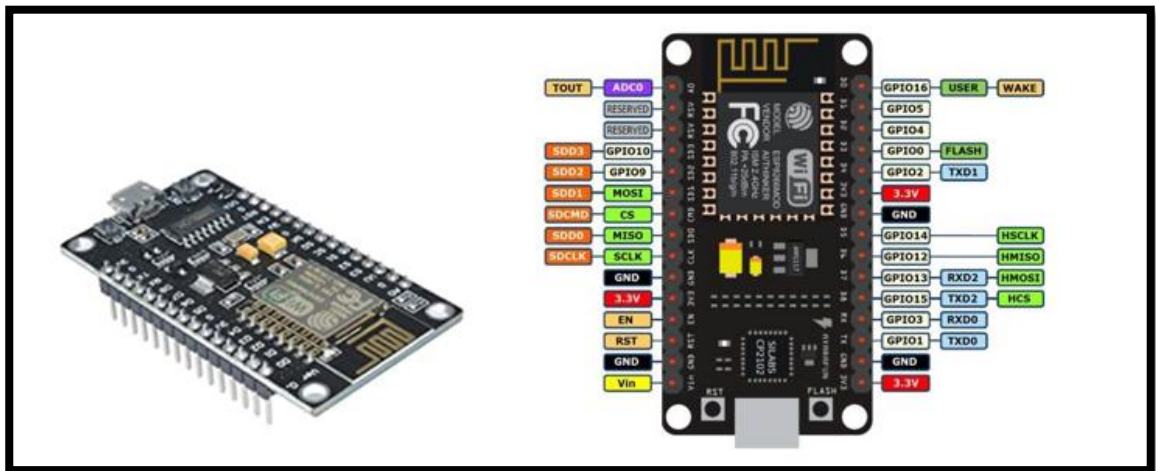


Figure 1 - Node MCU Pin Diagram

A LUA-based open-source firmware called NodeMCU was created for the ESP8266 Wi-Fi chip. NodeMCU firmware is included with the ESP8266 Development board/kit, also known as the NodeMCU Development board, to explore ESP8266 chip capability. Since NodeMCU is an open-source platform, anyone can edit, tweak, or manufacture its hardware. The ESP8266 Wi-Fi-enabled chip is part of the NodeMCU Dev Kit/Board. Espressif Systems' ESP8266 is a low-cost Wi-Fi chip that uses the TCP/IP protocol. The ESP8266 Wi-Fi Module can be used to learn more about the ESP8266.

2. PULSE SENSOR

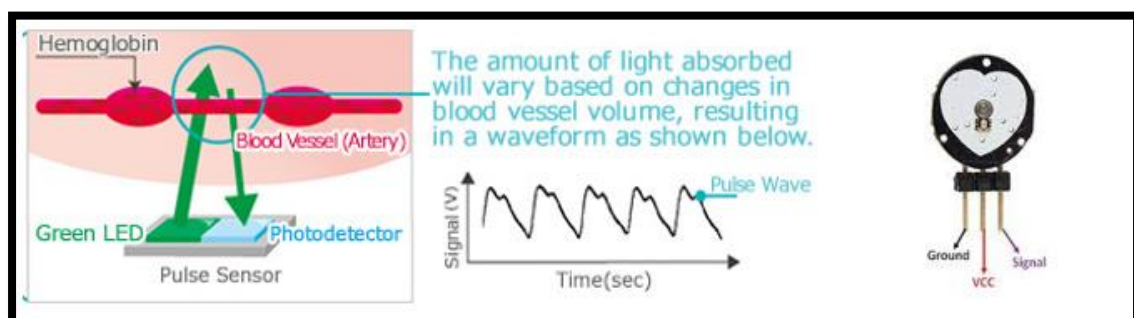


Figure 2 - Pulse Sensor

When the heart pumps blood, a blood vessel's volume changes, creating a pulse wave. A pulse sensor is a detector that keeps track of this volume change. Depending on the

measuring technique, transmission and reflection, pulse sensors that employ the photoelectric pulse wave technology are divided into two categories.

By emitted red or infrared light from the body surface and measuring the change in blood flow during heartbeats as a change in the amount of light transmitted through the body, transmission types of measure pulse waves.

3. GPS MODULE



Figure 3 - GPS Module

This GPS Module is required if you are using a drone to wander and navigate a distance. GPS drones have a GPS module that enables them to determine their position in relation to a system of orbiting satellites. The drone can conduct tasks including position hold, autonomous flight, return to base, and waypoint navigation by connecting to signals from these satellites. Based on the NEO 6M GPS, this is an entire GPS module. Provide the greatest positioning information possible, this device uses the most recent technology and has a larger built-in 25 x 25mm active GPS antenna with a UART TTL connector. Additionally, a battery is supplied to help you get a GPS lock more quickly. Improve performance with your Ardupilot or other Multicopter control platform, this GPS module provides the best position data possible. The serial TTL output of the GPS module contains four pins: TX, RX, VCC, and GND. Configure the GPS, alter the settings, and do much more, you can download the u-center software.

4. JUMPER WIRES

5. EXTERNAL POWER SUPPLY (For NodeMCU)

CHAPTER 7: SOFTWARES USED

1. Arduino IDE

The Arduino Integrated Development Environment - or Arduino Software (IDE) - contains a text editor for writing code, a message area, a text console, a toolbar with buttons for common functions and a series of menus. It connects to the Arduino hardware to upload programs and communicate with them.

2. Firebase

We don't use standard HTTP when we connect our app to Firebase. We are communicating using a WebSocket. HTTP is considerably, much slower than WebSockets. There is no need for several WebSocket calls since a single socket connection suffices. Through that one WebSocket, all of our data automatically syncs as quickly as our client's network will allow.

As soon as the data is updated, Firebase notifies us. All connected clients receive the updated data practically immediately once our client saves a

CHAPTER 8: METHODOLOGY

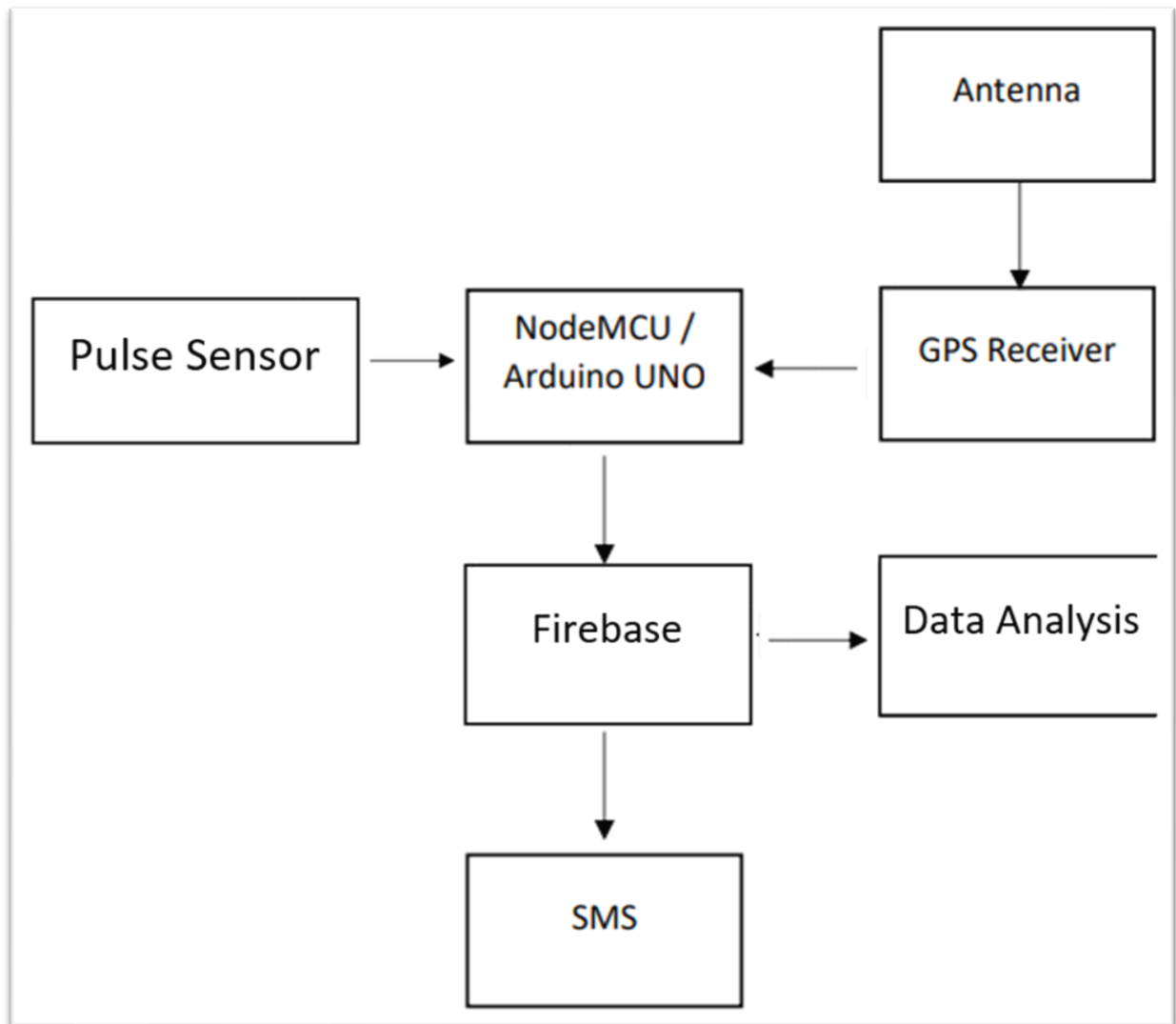


Figure 4 - Methodology

So, basically the GPS is operated by the Node MCU and GPS antenna will connect with the satellite and starts sending the location data i.e. coordinates to the GPS, and that data will be uploaded to the cloud via Firebase.

And the limits of the co-ordinates have been set in the code, so whenever that GPS coordinates goes beyond the limit, the an alert message is sent to the associated mobiel device.

Similarly in this way, the pulse sensor is also working. Pulse sensor is being connected to the Node MCU and then its data i.e. heartbeats of the person are being uploaded to the cloud via Firebase.

CHAPTER 9: RESULTS

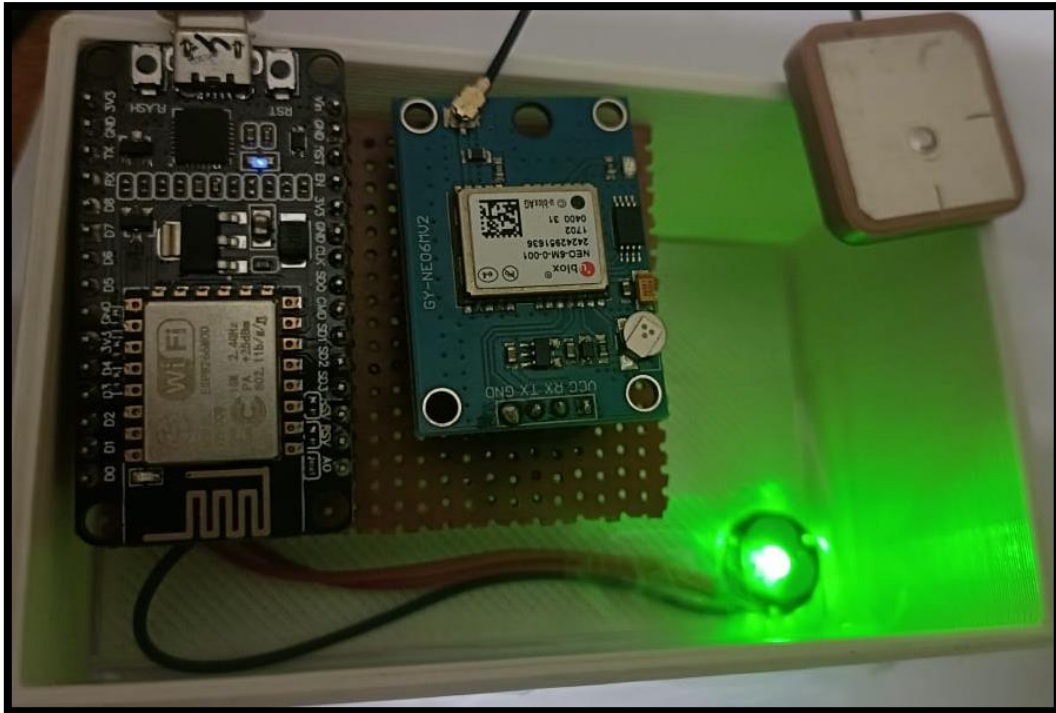


Figure 5 - Setup of NodeMCU with GPS and Pulse Sensor



Figure 6 - Prototype Body


```
longitute 26.8358679
latitude 75.6501100
BPM 80
Data sended to Firebase

longitute 26.8358679
latitude 75.6501100
BPM 71
Data sended to Firebase
```

Figure 7 - Outputs of the Code

```
https://child-safety-1749b-default-rtdb.firebaseio.com/
├── BPM
│   └── f_BPM: 71
└── GPS
    ├── f_latitude: 26.8358679
    └── f_longitude: 75.65011
```

Figure 8 - Reading on the cloud

Sent from your Twilio trial
account - Alert!Your Child
is outside the allowed
premises.The Location
cocordinates are: 26.8361880,
75.6504641

Figure 9 - Alert Message on the Device

CHAPTER 10: LEARNING OUTCOMES

Through this project, we have learnt about the followings

- Setting up the Arduino IDE and using it for Node MCU.
- Using the GPS Module with the Node MCU.
- Using the Pulse Sensor with the Node MCU.
- Formulate and solve real life problems using Internet of Things and Automation.
- Sending the data of sensors to a cloud service for easy accessibility.

REFERENCES

1. Park, S., 2022. *IoT Technology Gives Parents a Kid-Friendly Tracking and Communication Solution*. [online] Sierra Wireless. Available at: <<https://www.sierrawireless.com/iot-blog/iot-technology-gives-parents-a-kid-friendly-tracking-and-communication-solution/>>
2. Dhanalakshmi, M., Hemamalini, S., Divya, M. and Sivalingam, T., 2022. *Child Tracking Device*. [online] Available at: <<https://www.ijert.org/research/child-tracking-device-IJERTCONV6IS08021.pdf>> [Accessed 5 October 2022].
3. San Hlaing, N., Naing, M. and Nain, S., 2022. *GPS and GSM Based Vehicle Tracking System*. [online] ResearchGate. Available at: <https://www.researchgate.net/publication/334123684_GPS_and_GSM_Base_d_Vehicle_Tracking_System> [Accessed 5 October 2022].
4. Bandaru, A., 2022. *AMAZON WEB SERVICES*. [online] ResearchGate. Available at: <https://www.researchgate.net/publication/347442916_AMAZON_WEB_SERVICES> [Accessed 5 October 2022].
5. Nevon Projects. 2022. *Child Monitoring System App*. [online] Available at: <<https://nevonprojects.com/child-monitoring-system-app/>>.
6. Ibm.com. 2022. *IBM Cloud versus AWS*. [online] Available at: <<https://www.ibm.com/cloud/ibm-cloud-vs-aws>> [Accessed 5 October 2022].
7. Sarwar, S., 2022. *Basics of GSM Module*. [online] Engineerexperiences.com. Available at: <<https://engineerexperiences.com/gsm.html#:~:text=A%20GSM%20module%20is%20a,SIM300%2C%20SIM900%2C%20SIM900D%20etc.>> [Accessed 5 October 2022].
8. The Raspberry Pi Platform and Python Programming for the Raspberry Pi Coursera. 2022. [online] Available at: <<https://www.coursera.org/learn/raspberry-pi-platform?specialization=iot>> [Accessed 5 October 2022].
9. Programming with Cloud IoT Platforms Coursera. 2022. [online] Available at: <<https://www.coursera.org/learn/raspberry-pi-platform?specialization=iot>> [Accessed 5 October 2022].
10. Arduino Project Hub. 2022. *How to Interface GPS Module (NEO-6m) with Arduino*. [online] Available at:

<<https://create.arduino.cc/projecthub/ruchir1674/how-to-interface-gps-module-neo-6m-with-arduino-8f90ad>> [Accessed 5 October 2022].