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### IMPLEMENTATION OF CHILD MONITORING AND TRACKING SYSTEM USING INTERNET OF THINGS

V. Senthilkumar, R. Elavarasi, Associate Professor, Er. Perumal Manimekalai College of Engineering, Hosur, Tamil Nadu, India
C.R. Balamurugan, Professor, Er. Perumal Manimekalai College of Engineering, Hosur, Tamil Nadu, India
S. Aarthi, P. Mithula, K. Sandhiya, UG SCHOLAR, Er. Perumal Manimekalai College of Engineering, Hosur, Tamil Nadu, India

#### Abstract—

In today's fast-paced world, ensuring the safety and well-being of children is of paramount importance. 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 the Child Monitoring and Tracking System (CMTS) proposed in this project leverages the Internet of Things (IoT) technology to provide real-time monitoring and tracking of children in various environments, such as homes, schools, and public spaces. 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. It consists of wearable devices equipped with sensors and communication modules, which continuously collect data about the child's vital signs, location, and activity levels. This data is transmitted to a centralized IoT platform via wireless communication protocols such as Wi-Fi or Bluetooth. The implementation of Geofencing technique improves to find an effective solution in this case. The system uses a Node MCU controller for the process of finding the boundary of the child. Parents and caregivers can monitor the child's location in real-time, receive alerts in case of emergencies or deviations from predefined safety parameters, and track historical data to identify patterns and trends in the child's behavior. The IoT platform processes the incoming data and provides caregivers with valuable insights through a user-friendly interface, accessible via web or mobile applications. The accuracy of the device can further be enhanced by giving alert if the baby tries to remove the device and checks the presence of device, using ESP8266 camera live monitoring the child is continuously observed and if the wearable device is removed the online notification is sent to the parents. The Child Monitoring and Tracking System using IoT offers a comprehensive solution to address the concerns of parents and caregivers regarding the safety and security of children in various environments. By leveraging the power of IoT technology, it provides real-time monitoring, accurate tracking, and actionable insights, thereby ensuring peace of mind for caregivers while empowering children to explore the world safely

#### **INTRODUCTION**

Internet of Things (IoT) plays a major role in every dayto day life. The major difference between IoT and embedded system is that a dedicated protocol/software is embedded in the chip in case of embedded system, whereas, IoT devices are smart devices, which are able to take decisions by sensing the environment around the device. The development of sensors technology, availability of internet connected devices; data analysis algorithms make IoT devices to act smart in emergency situations without human interventions. So, IoT devices are applied in different fields such as agriculture, medical, industrial, security and communication applications. IoT systems are useful within a system to do deeper automation, analysis, and integration. IoT contributes to technology in the fields of sensing, networking and robotics. IoT brings global changes by its advanced elements in the social, economic, and political impact of the users. Among the enormous applications enabled by the IOT (Internet of Things), smart and secure monitoring system is a particularly important one. IOT is getting upgrading day by day simultaneously its security is also important. As IOT is the vast

UGC CARE Group-1



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concept it includes many types of subtopics in which we are working on the small project named as "Child Monitoring and tracking System using IOT technology". Main motive of this project is to solve the problems of baby guardian and also secure the baby from entering the danger zone. As soon as the baby enters the danger zone the guardian will be notified through the various methods either by SMS system. This project includes conductivity sensors, Wi-Fi module, RSSI, power supply and display device. For operating purpose, we are connecting our device to the baby and alerts as well as notifications will be given to the guardians display device.

## LITERATURE SURVEY

### 1. S. Granville, A. Laird, M. Barber, and

# F. Rait. Why Do Parents Drive Their Children to School? Transport Research Series, Scottish Executive Central Research Unit, 2021.

Millions of children need to be moved from home to school and vice versa every day. For parents, obtaining a safe transport for their children is a crucial issue. The students ride their bicycles, take buses, and arrive invehicles with one purpose getting to and from school safely. A research undertaken by the Scottish Executive Central Research Unit with the purpose of increasing the proportion of non-car travel to school reveals that travelling by bus or coach appears to be by far the safest mode. Statistics suggest that a child travelling by car is seven times more likely to take part or be involved in a road traffic casualty than a child travelling by bus

# 2. E. Erge and B. Akinci, "Utilization of radio-frequency identification tags (RFID) for transportation infrastructure management: tracking engineered- to- order elements and materials throughout their life-cycles," presented at the 86th Annual Meeting of the Transportation Research Board

### Washington, 2020.

Statistics from USA, Canada and Australia also confirm that public transport (and school transport in particular) has a high level of safety, just as in Europe. For instance, the Australian College of Road Safety notes that bus travel is the safest form of road transport, at least 14 times safer than the private car, and that the record for school bus travel in particular is very good.

# 3. C. Schwartz and J. Khan, "Tracking HMA placement using RFID technology," presented at the 88thAnnual Meeting of the Transportation Research Board Washington, 2019.

Also, the research undertaken by National Highway Traffic Safety Administration in USA notes that when comparing the number of fatalities of children aged 5 to 18 years during normal school transportation hours, from 1989 to 1999 (school years), school buses are 87 times safer than private cars

# 4. W. Ross, S. Burns, P. Wu, and D. Jared, "RFID tracking technology applied to testing of transportation construction materials," 2021.

However, headlines like "Girl dies in bus tragedy" from the May 18, 2010 issue of the Peninsula newspaper in Qatar seems to be repeated several times every year in different places of the world.

# 5. K.Finkenzeller "RFID Handbook: Radio frequency fundamentals and applications," John Wiley& Sons, 2021

Many children find themselves locked in a school bus in the bus parking lot after falling asleep on their way to school. To help avoid frightening and potentially costly mistakes like these, this paper investigates an RFID-enabled solution to help monitor children when they are traveling to and from school on schoolbusses.

### **EXISTING METHOD**

The <u>Node MCU</u> (Node Microcontroller Unit) is open source software and hardware development environment that is built around a very inexpensive System-on-a-Chip (SoC) called the <u>ESP 8266</u>. The ESP 8266 , designed and manufactured by <u>Espressif Systems</u>, contains all crucial elements of the modern computer: CPU, RAM, networking (wifi), and even a modern <u>operating system and SDK</u>.



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### **PIN DIAGRAM**



### **PROPOSED SYSTEM**

The Safety Monitoring system offers parents worldwide peace of mind by enabling comprehensive tracking and monitoring of their children's activities. Integrating Geofencing and ESP8266 camera technology ensures real-time alerts and visual confirmation of the child's safety. Powered by a Node MCU controller, the system establishes precise boundaries and detects any breaches, while skin conductivity sensors provide continuous device presence monitoring. Leveraging IoT platforms, the system ensures uninterrupted geolocation monitoring and accurate alerts, addressing parents' concerns about their children's safety effectively.Every programming language occupies some memory where embedded processor like microcontroller includes an extremely less amount of random access memory



The difference between embedded C and C programming is not much actually apart from the operating environment and some extensions. These programming languages are ISO Standards and also have approximately similar syntax, functions, data types, etc.



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### SYSTEM FUNCTION



The above represents that RSSI graphical analysis

### CONCLUSION

This project control method based on the primary voltage estimation using only vehicle side information to simplify ground facilities on a dynamic WPT system. Experiments verified that the primary voltage estimation was achieved and the power control using the equilibrium point calculation based on the primary voltage estimation is effective for the dynamic WPT system, which can be simplified and not be required to regulate the road-side voltage. We also implemented the charging system with solar input source. Due to their suitability for EVs charging

application in both power and range level. The basic principle of each technology is explained. The latest development and research are summarized.

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Volume : 53, Issue 8, No.3, August : 2024

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