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Safety and Monitoring of Children Stuck Inside the Car using GSM and IOT Technology

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ABSTRACT:

The objectives of this research are to surveillance and develop a system of warning system for the safety of living organisms in the general automobile passenger compartment. It is surveillance and develops a warning system for the safety of living beings in general automobile passenger compartment. GSM is chosen due to ability to lower the energy consumption per bit while providing higher data rates. Earlier they were drastically increased the number of heart stroke deaths of children in vehicles. With the cases of clear neglect, the justified intervention and local solution must be addressed. The technology has been in the market for a while. Chosen for project development for suitable detection mechanism i.e., to detect a rear seat child, and sending a prompt and accurate message or alert to their parents effectively to overcome these preventable tragedies. If any child were placed inside the car in rear seat the PIR motion sensor is used to detect infrared radiation waves and connects a buzzer placed outside the car for care of children. Meanwhile, the GSM for mobile communication allows the system to send an alert to the driver within a short period. The alert system is triggered to IoT sensor to detect the presence of child at the back or front of car seat which will notify through message. To sense the room temperature of car were using the temperature sensors. The application of the GSM moduleSIM800L, IoT and buzzer is an alternative for the security purposes to generate an alert like alarm. Monitoring the temperature and the child motion through the APP open the car door when it's needed.

Keywords: IOT, Sensor, Arduino, GSM, LCD.

INTRODUCTION:

There are some readily available products for the safety of children's like Smart car seats which works based on the increase in the temperature in the seat where the child will be buckled up and Wireless proximity sensors which makes an alarm if the distance between child and ward increases a certain limit. But both are not a satisfactory one because for smart car seat the infant should be seated in the seat and for wireless proximity sensors the device should be tied to infant but the similar situations may happen for teenagers and elderly persons also who will not stay at one place inside the car. So a device is required to sense the

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motion. The situation reaches to extreme point because of lack of oxygen supply; there is need of sensor to measure the level of oxygen availability. In each year, there are some children who have been forgotten in the locked car and lost their life due to

heatstroke. The amounts of heatstroke deaths of youngsters in automobiles continue to grow. We need to figure out how to remind these negligent parents immediately. Effectively detecting children in the backseat and sending their parents a prompt and precise alert is a better way to prevent these tragedies.

People's day to day life style is pervaded by a galaxy of artificial systems that autonomously acquire information from the environment surrounded, process them, and real actions were performed based on the outcome of their analysis. All these systems interact with us, using graphical interfaces, communication platforms, sound or light feedbacks and physical actions [1].

Every few days, there are reports of infants left in cars on set dying of high fever [2-5]. Interventions and native reactions should also be addressed consistently in cases of apparent neglect. A pair of diagrams shows the possibility of a child being left in the car. Fifty-five is due to forgetting parts of the vehicle. The emphasis is on education and awareness for people, drivers, and the general public, but this may not prevent babies from finding themselves in tragedy. This makes it important to develop tools or systems to notify or warn drivers of problems. Putting this verse together, death can be prevented by notifying parents in case they leave their baby behind.

To prevent this tragedy, an Arduino-based system is designed to send warning messages when the system detects the presence of boy-assisted pressure and motion sensors placed in the back seat of the vehicle when drive power is lost. This project aims to provide a working diagram of a cheap and easy implementation of the Baby Safety Automotive Alert System (SCCAS). Victims of Arduino kits and his Arduino IDE one.8.2 are purported systems to send alerts to drivers, and the technology has been on the market for a minute or so. A survey and evaluation of his three existing products like the development of this project will be conducted to determine the optimal detection mechanism for SCCAS assembly [4, 7, 8, 10, and 11]. For ease of comparison, a passive infrared (PIR) device that detects child movement by emitting infrared light is chosen. Add a present and it can be a pressure device. Each movement and pressure device is used to check whether the detected heuristics are human.

LITERATURE SURVEY:

Visconti, P., Sbarro, B., Primiceri, P[1], Telemetry is a technology that enables remote monitoring and transmission of moving vehicle data, enabling the collection of a significant amount of information that can be used to verify that the vehicle is operating at its best. In this study, a reliable and accurate measurement system was created to track the mechanical and physical characteristics of an athletic vehicle while it was in motion. This was

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accomplished by utilising electronic modules and sensors that could be purchased for incredibly low prices. The temperature of the engine compartment and cooling liquid, the extension of the suspensions, the vehicle's speed, as well as its orientation and acceleration, can all be collected on board the vehicle using an enforced knowledge acquisition and wireless communication unit and wirelessly transmitted to a base station, wherever are being watched over by technical staff, ensuring quick intervention in the event of an issue. The STM32 Nucleo development board, which is the brain of the finished measurement system, is correctly programmed with the developed microcode and collects information from used sensors before transmitting it to the bottom station via a WiFi radio module. To prevent data loss, the knowledge is also stored on an SD memory card. This purpose and the interface between the engine management system and ST Nucleo board are served by the Spark fun will module. To make sure the system is functioning properly after completion, an experimental test was sent. By analyzing trends over time in monitored vehicle parameters, such as vehicle movement behavior, driving conditions, and race tracks, technicians ensure the safety and improved vehicle performance of associates in the lives of Nursingd pilots. .

D. Zhang, Y. Hu, Y. Chen, and B. Zeng [2], Breath Track the damage score of your Ready-to-Wear LAN devices. Breath Track uses partial changes in channel state data (CSI) to track human breathing. Breath Track uses both hardware and packet correction paths to correct for partial distortion caused by the hardware state of Artifact LAN chips. Time-invariant PLL partial offsets are characterized by hardware-compensated victim cables and splitters, while time-varying carrier frequency offsets, frequency offsets, and packet detection delays are removed by packet-compensated impairments. Receiver antenna connected to the transmitter reference antenna. Additionally, Breath Track uses thin recovery techniques to find dominant paths in multipath indoor environments and derive corresponding extended attenuation constants. We then use the fractional variation of the advanced damping constant to extract the careful breath-hold and breathing rate. Extensive experiments conducted have shown that Breath Track can estimate respiratory rate with an accuracy of >99 on average in most situations, and can directly track deliberate breath-holding that influences inventory fluctuations.

Pawar, P., Trivedi, A [3] Autonomous computing, communication, and collaboration between devices will play a key role in transforming the digital world. Emerging technologies for device-to-device (D2D) communications provide a great impetus to facilitate peer-to-peer networking. Therefore, D2D communication technology is expected to become an important part of the network of things (IoT). The rapidly increasing demand for quality of service is driving fundamental changes in the design of IoT systems. This white paper explores the benefits and challenges of intelligent D2D communications needed to meet the needs of the IoT.

Many industries and standards bodies are showing great interest in implementing the D2D approach in wireless networks. The D2D approach facilitates mapping but lacks the inherent

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management of high-spectrum wireless networks and centralized monitoring to conserve energy when traffic is offloaded. Networking devices provide numerous applications for the Internet of Things. Physical device limitations and network resource limitations create many problems that must be solved. Here, we tend to consider this place among the advances in D2D technology in terms of resource utilization, routing techniques, and interference management. It also explores potential future challenges presented by the scientific community.

Malneedi Vamsi; K.P. Soman [4], Occupancy detection can be a nasty drawback. There are many mechanisms for vehicle, especially vehicle occupancy detection. Today, safety has become an important and necessary aspect of the automotive business. Airbags have become a basic and important defense for automobiles. Even if airbags could be used to protect a vehicle, children under the age of 12 could die because the force applied to them would act rapidly. In this project, detective work describes the number of passengers in a car and processes the images captured by the camera to classify each person as a child or an adult. This prevents the airbag from deploying near children. Every time the car accelerates from 0 km/h to 20 km/h, the car occupancy is determined and everyone is re-evaluated. We tend to measure the widely used Haar Cascades technique for victimization detection. First, it tends to detect faces and classify each resident as either an adult or a child.

PROPOSED SYSTEM:

Arduino is an Associate of Nursing, an ASCII text file physical computing platform that implements a process language on a simple input/output (I/O) board.

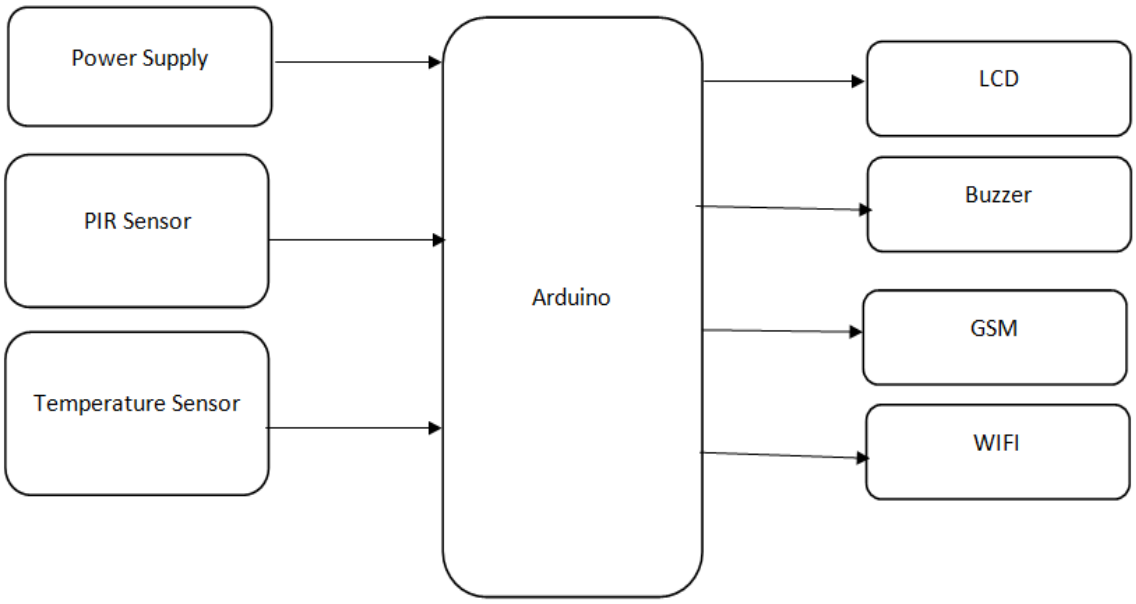

Fig. 1 Block diagram

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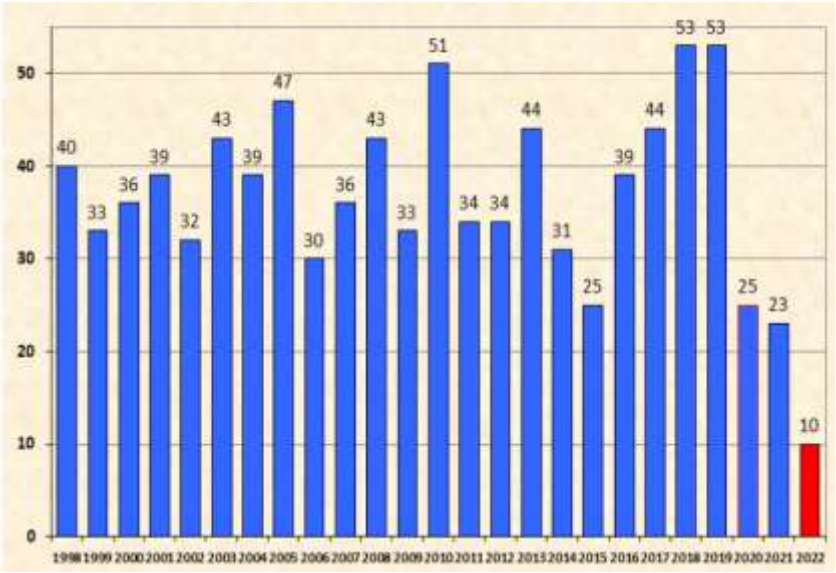

Fig. 2 shows child mortality from heat stroke in vehicles in the USA from 1998 to 2022.

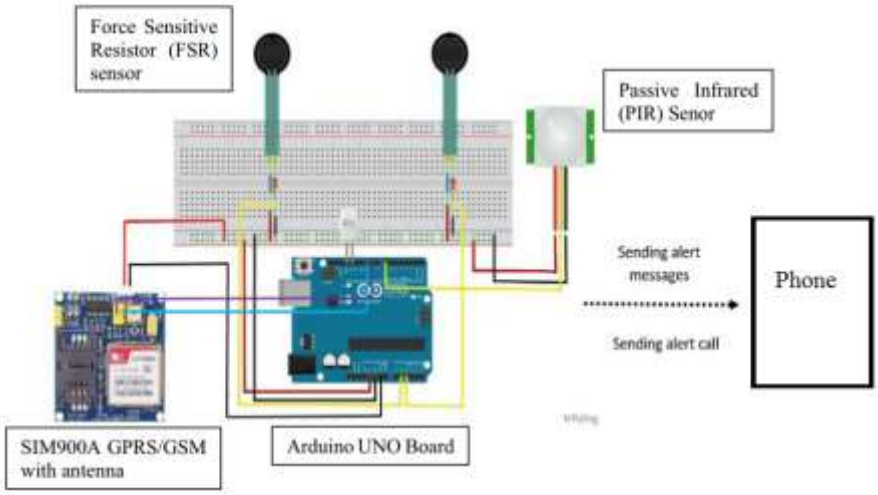

Fig. 3 SCCAS Final Module Integration

For force-sensitive resistance (FSR), it is common to observe the force applied to an infant carrier that supports the child's normal weight. A gate is used for this detection mechanism as each sensor measures a square to observe and confirm the presence of the baby. A Force Sensing Resistor (FSR) monitors the presence of driving force while typically using a switch to simulate turning the vehicle's ignition on and off. When the detection mechanism detects and confirms the baby's presence while the impeller is gone, it sends an instruction to the management unit to trigger the GSM module [9]. Text responses are sent to people when the GSM module is triggered. The final module for this development is shown in Figure 4. A force-sensitive resistance sensor element (FSR) is placed in the driver's seat and child seat to detect the presence or absence of driving force and the weight of the baby. The FSR sensing element can then be integrated into the GSM module. At the same time, a passive infrared

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(PIR) sensor element is placed on the highest chassis of the car between the driver and the baby seat. Positioned at a 45° angle to the baby carrier. This sensor element is required for a verification procedure to identify whether the load detected by the pressure sensor element is human or not by indicating the number of infrared rays emitted from the child's movements [6, 10].

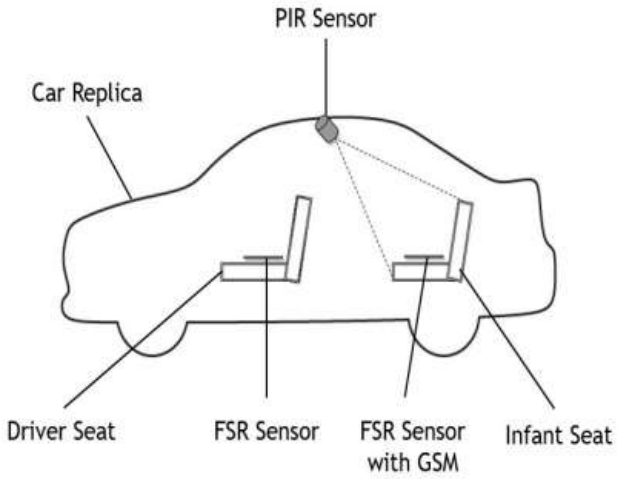

Fig. 4 Implementation of CSCAS

A. Arduino Uno Controller

The Arduino UNO is the perfect board to get started with physics and secret writing. If this is often your first experience playing around with a platform, the UNO is the strongest board to start you wobbly. UNO is the most used and documented board in the entire Arduino family.

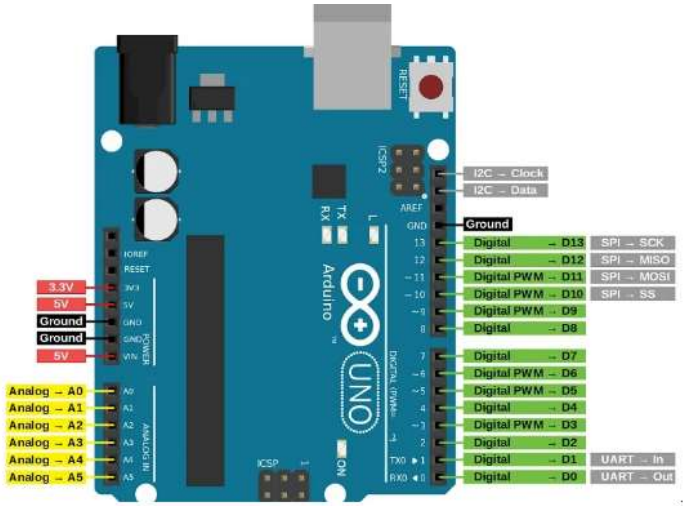

Fig. 5 Arduino UNO Controller

Arduino UNO can be a microcontroller board supported by ATmega328P. It features 14 digital input/output pins (6 of which are used as his PWM outputs), 6 analog inputs, a 16

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megacycle ceramic resonator, a USB connection, an influence socket, an ICSP header, and a push increase. Contains everything needed to support the microcontroller. Simply plug it into your laptop with a USB cable, or power it up with an AC-DC adapter or battery to start it up. You can tinker with the UNO without worrying about anything going wrong. Worst case scenario is that you'll spend a few bucks replacing the chip and starting over. It consists of half a dozen analog inputs, influence sockets, a USB connection and an ICSP header. The pin out flexibility offers many alternative possibilities for drive motors, LEDs, read sensors, etc.

In this post, we'll go over the capabilities of the Arduino Uno pin out.

B. PIR Sensor

An electronic sensor called a passive infrared sensor (PIR sensor) monitors the infrared (IR) light that objects in its range of view emit. Their primary application is in PIR-based motion detectors. Security alarms and automatic lighting systems frequently employ PIR sensors.

Its aims are to assess if the project's goals were accomplished, to assess how well the project was managed, to draw lessons for the future, and to make sure the organisation reaps the largest possible rewards from the project.

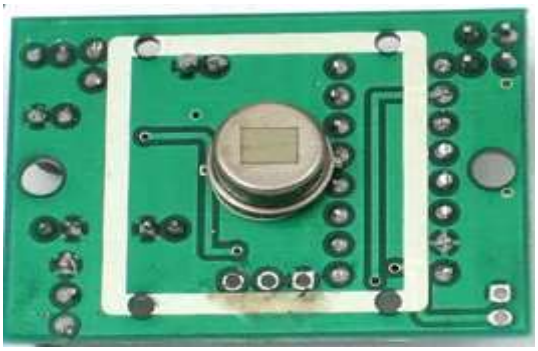

Fig. 6 PIR sensor

C. Temperature sensors

Voltage applied across the terminals of a diode is the fundamental operating principle of temperature sensors. When the voltage raises, the temperature rises as well, which is followed by a voltage drop between the diode's base and emitter transistor terminals?

Fig. 7 Temperature sensor

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Due to its many benefits, the DHT11 temperature and humidity module is the most popular one for Arduino and Raspberry Pi. For instance, low power usage and exceptional long-term stability. At a very low cost, it is possible to achieve relatively high measurement accuracy.

RESULT AND DISCUSSION:

After a minute has passed in the case where parents abandoned a child in a parked car, the process would begin, and the Safety Child Car Alert System would be activated. If the pressure sensor detects a weight a few seconds later, the detecting mechanism would be activated, as shown in Figure 3. A confirmation method for the presence of children is required, one that can recognize the motion that a youngster makes in a hot automobile owing to prolonged exposure to the heat. The system then notifies parents via alert messages, as shown in the figures below. Once the child has been removed from the seat, the system is idle.

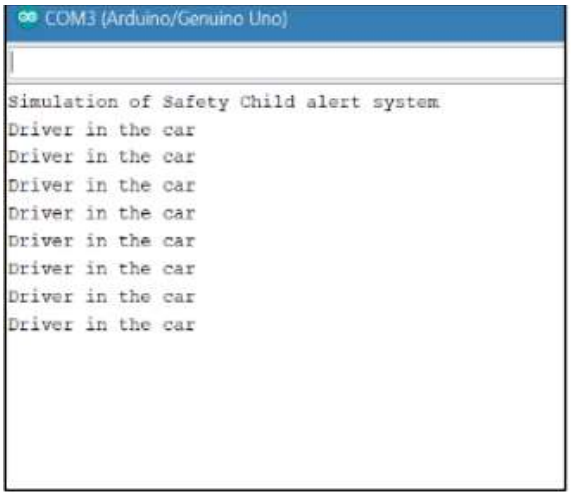

Fig. 5 shows how an FSR sensor can identify a driver inside a vehicle.

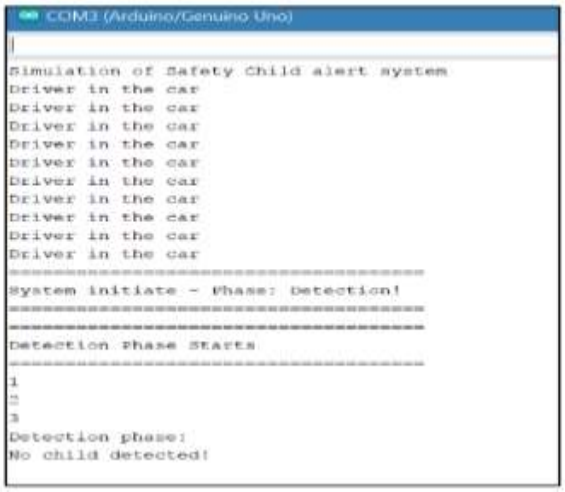

Fig. 6: No child was found in the vehicle after the driver had departed.

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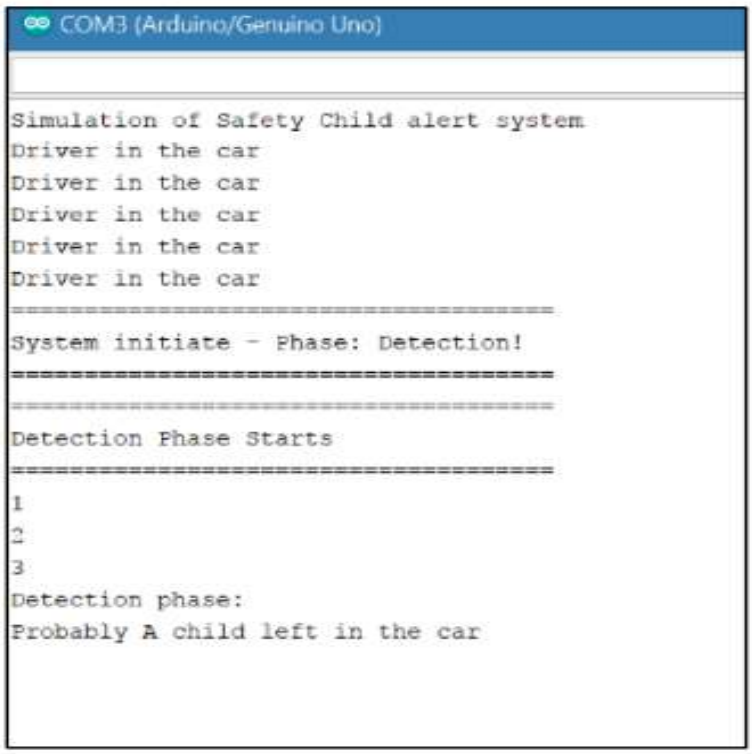

Fig. 7 after the driver left, a youngster was left in the vehicle.

Fig. 8: Alerts are sent, and the child is taken out of the seat

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Table 1 provides a summary of the findings based on various criteria. These evaluations are used to determine how the system's fundamental functions, such as how it activates, how its detection and confirmation mechanisms function, and how the alert text is sent out, are performed.

Table 1 The functional assessment of SCCAS

Operational Features	Response or Units	Result	Notes
CRS Model		Safety Child Car Alert System	Lab working prototype using Arduino Development Kits.
Orientation	FF = Front Facing		Use motion sensor so, not applicable for Rear Facing (RF) child seat.
Audible Presence Detection Confirmation	Yes or No	No	The green LED flashes when the parents left the driver seat.
User Action Required for Activation	Yes or No	Yes	The parents left the driver seat when no pressure detected by the FSR sensor
User Action Confirmation	Yes, No or n/a	Yes	The green LED flashes when no pressure on driver seat and turn off when no child on the seat.
End-of-Trip Reminder Notification	Yes or No	No	The system is deactivated when the child is removed from the CRS
Left-Behind Notification	Yes or No	Yes	Text alert is triggered "15 seconds after parent left the car"
Left-Behind Notification Recipients	User, Vehicle Surroundings, Telecommunication	User	Text alert sent out if detect motion.
Left-Behind In-Vehicle Cancellation	Yes, No or n/a	No	When the child is removed from the seat, the green LED will be turn off
Snooze Function	Yes, No or n/a	No	

CONCLUSION:

A new sensor-based system with IoT and GSM alert has been developed by our team. We used a force sensing resistor, infrared sensors, carbon dioxide sensors, temperature/humidity sensors, and infrared sensors in this system. These data collection devices are attached to a microcontroller board that is prepared to aggregate all collected data in order to identify an alarm scenario, act on warning processes, and send alert messages to users using a GSM module. To open the window, the Dc motor of the car's glass window begins to operate. The proposed detecting system is therefore put into practice to provide warning and safety measures for kids left in cars.

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