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Vehicle To Vehicle Communication Using IoT

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ABSTRACT:

By installing advanced sensors on machines for intelligent interaction, developing technology makes it possible for machines to communicate with one another. The quantity of sophisticated gadgets per person is growing at a rapid pace, and the Internet of Things (IoT) offers a wide range of applications across several industry sectors. Another application area where IoT might be used to make cars smarter is the automobile sector. The relationship between a smartphone, a sensor shield, and an ESP32 development board is explained in this text. The recommended design allows for interaction with the car over WiFi and is intended for automotive security. The automobile is evolving into a form-id capable sensor platform, gathering data from the environment, from other cars (as well as from the driver), and transmitting it to adjacent automobiles and machinery to support safe

navigation, environmental control, and traffic management. Essentially, the Vehicle Grid becomes an Internet of Things (IOT) that we call the Internet of Vehicles (IOV), capable of determining the optimal route for user navigation to their destinations. Unlike other notable IOT examples (like smart buildings), the Internet of Vehicles won't rely solely on V2I for data flow to the Internet. It will also make use of peer-to-peer V2V communications to augment onboard sensor inputs and provide safe and efficient navigation. In this research, we first go over a number of vehicle applications that employ V2V and V2I.

Keywords: Advanced Sensors, Developing Technologies

INTRODUCTION

Bringing learning into our homes, offices, walks, cars, and other spaces is to create a smart, well-organized environment that is rapidly useable and promoted. This new concept needs to be relevant at all times, blend in with our routine, and be there if we want it. Giving our cars and roads the ability to make the road logically safe (information about traffic, obstacles, risks, possible ad lib courses, air, etc.) and to make our trips around the world utterly amazing (Internet access, beguilement sorting, helping two people look for each other on a city visit, etc.) are some applications of this idea. These are typical uses. These applications are typical examples of Intelligent Transportation Systems (ITS), which aim to enhance street transportation security, appropriateness, and customer happiness through the use of Conventional traffic board constructions rely on connected underpinnings where sensors and cameras placed along the route gather data on traffic conditions and depth. This data is then sent to a central processing unit for processing and making appropriate judgments. This type of framework is often costly in terms of affiliation and is characterized by a slow reaction time for data management and transfer in an environment where transmission of information suspension is crucial. Moreover, these road-based devices require unplanned and excessive support. Consequently, for massive scale This type of organization necessitates a massive investment in the communication and sensor infrastructure.

LITERATURE SURVEY

Zhou and collaborators (2022) [1]: Average error/correction distance, recall rate, and accuracy rate suggested an integrated vehicle information rectification approach for V2X that is based on Q-learning and rationality.

The Moubayed group (2021) [2]: Mean latency/delay and mean computational resource use created a binary integer linear programming problem to represent the ideal V2X service location in a mixed core/edge context.

Flament Maxime (2019) ("Smart Mobility Technology"). [3]: "Cellular Vehicle-to-Everything" (C V2X) enables linked cars to speak with the cloud, with one another, and with their environment directly. Smart mobility technology is already a reality.

"Automobile Anti-theft Technology Based on GSM and GPS Module," Li Jie (2012) [4]: Beyond vehicle mobility, Smart Networks and automated systems (ICINIS) offer a "true experience."

Al-**Omary (2010) "Solid, independent, and secure mobility" [5]:** Concept for a collaborative vehicle that combines cutting-edge technology with practical applications and presents focused on humans ideas for future mobility.

2010 El-M ("Implementation of GPRS Based Positioning System Using PIC Microcontroller") [6]: Communication Systems and Networks, Computational Intelligence (CICSN). These are typical examples of what we refer to as intelligent transportation. "Inter-vehicle telecommunications and their relevance to clever vehicles"

Tsugawa S. (2003) [7]: Vehicle technology include the Plug Inn app, a peer-to-peer EV charging community in France; information regarding accessible charging facilities from Mobilize

METHODOLOGY

The research focuses on the automotive industry, which is one amongst the application fields where IoT may be used to make vehicles more sophisticated. If placing intelligent sensors on a machine for intelligent interaction makes communication between machines feasible

4.1 The Internet of Things (IoT): Is an intelligent approach for dynamic infrastructure linked to a worldwide network which possesses the ability to autonomously modify its configuration in response to various network protocols.

4.2 Ease of Equipment: Es-press-if Systems, the company that created the well-known ESP8266, has released the ESP32, an inexpensive Systems on Chip (SoC) Microcontroller. With integrated Wi-Fi and Bluetooth, the 32-bit Xtensa LX6 Microprocessor from Tensilica is available in both a single-core and dual-core variants. Like the ESP8266, the ESP32 has the benefit of having integrated RF components such as an RF balun, filters, an antenna switch, a low-noise receive amplifier, and a power amp.

4.3 Liquor Sensor: This sensor works similarly to a standard analyzer in terms of identifying the amount of alcohol present in breath. It responds quickly and with great sensitivity. Based on the amount of alcohol present, the sensor outputs an analog resistive. One resistor is all that is required for the extremely basic driving circuit.

4.4 Ultrasonic sensor: Operates by emitting an electrical wave at a frequency that is higher than audible to humans. The sensor's transducer receives and transmits ultrasonic sound like a microphone. Like many others, our ultrasonic sensors deliver a pulse using a single magnet.

4.6 Motorized Controller: Known as a twin H-Bridge motor driver, the L293D motor driver is capable of controlling two motors simultaneously. This integrated circuit (IC) can interact with a DC motor that can be turned both clockwise and counterclockwise. The ASCII value of the character that will be shown on the LCD is the data.

4.7 LCD: An electronic display component with a wide range of uses is the liquid crystal display (LCD) screen. A 16x2 LCD display is a relatively simple module that can be found in many various types of circuits and devices. Compared to other multi-segment LEDs especially those with 7 segments, these modules are preferable. The reasons behind this are that LCDs is inexpensive, simple to program, and offer infinite visual capabilities**.**

4.8 Thermal Sensor: This non-contact is an infrared thermometer. High precision and resolution are achieved by the MLX90614 thanks to an inbuilt 17-bit ADC including a powerful DSP. It has a plethora of uses, such as movement detection and body temperature monitoring. The sensor's 90-degree field of vision measures the average temperature of all objects in its path.

4.9 Energy Source: A power supply is an electrical power source. A power supply unit, or PSU, is an equipment or device that provides electrical or other forms of energy to an outputting load or set of loads. A +5 V DC controlled electrical source is required for this project.

4.1A Optical Flutter Sensor: An infrared sensor is used in the eye blink sensor. There are two sections to it. a sender and a recipient. Infrared radiation are continually emitted onto the retina by the transmitter. As the receiver is always searching for changes in the waves that reflect that signify an eyeblink. When the eye is closed, a high output is expected. The output will be modest if the pupil is open.

4.1B Vibration Sensor: A piezoelectric sensor is a synonym for a vibration sensor. Many operational evaluations make use of these elastic detectors.By translating to an electrical charge, the sensor in question leverages the piezoelectric effects to measure changes in force, temperature, acceleration, pressure, and strain.

RESULT

Machines with intelligent sensors allow for intelligent interaction. The number of linked devices per person is increasing quickly over time, and the Internet of Things (IoT) offers a wide range of applications across many industrial sectors. Another application area where IoT may be utilized to increase the intelligence of cars is the automobile sector. The communication between the sensor shield, smartphone, and ESP 32 development board is explained in this document. The proposed concept for automotive security permits WI-FI access to the vehicle. In order to help with safe travel, reducing pollution, and traffic management, the automobile changes into a form-fitting sensor system that can gather information from the environment, other cars, and the driver. It then feeds this information into neighboring cars and facilities.

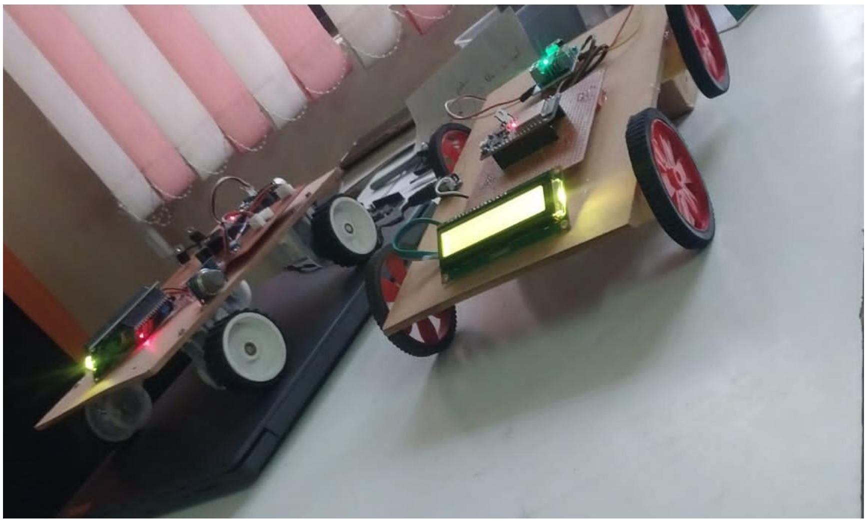

Figure No: 5.1.1A Hardware Implementation

Fig5.1.1B:Obstacle Detected

- The Fig5.1.1B shows the Obstacle Detected on the Car to Car Communication System
  Using SONAR, the HC-SRO4 ultrasonic sensor is used for calculating the object's distance.
  The frequency during which it generates ultrasound is 40 MHz, or 40000 Hz. The frequency hits the item in its path as it moves through the surrounding air. The rays return to the module after bouncing off the item.
  HC-SRO4 has four terminals: GND, TRIG, ECHO, and VCC. +5V is the voltage supply, or VCC. The Evp and TRIG terminals of one specific Arduino board can be linked to any digital I/O pin.
  Medium ranges are ideal for the use of ultrasonic sensors. There is a 0.3 cm resolution.
  The sensor's average ranges are 10 cm to 3 m. This is when it performs the best.

6 . FUTURE SCOPE

Vehicle-to-everything (V2X) technology allows for interaction between a vehicle and the many moving aspects of the road that surround it, such as other cars. Bicycles on roads, people who walk around automobiles, buildings that surround the roads, various road signs, and signals on the roads. Communication from the car to everything has been greatly simplified by making it faster, and communication, as well as other operations in the automobiles, has been automated. Advancements in technology have led auto makers to combine algorithms for machine learning and artificial intelligence (AI) to create self-driving automobile to any location without a driver

Advanced technology-based cars can communicate information regarding traffic, safety and safety via a wireless network by employing V2V communication, which is part of V2X communication. Specific protocols are used for this purpose. This technology uses a mix of alarm formats, such as audio, visual, and touch, to identify impediments or any other media.

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CONCLUSION

Security systems and the protocol for vehicle-to-vehicle communication are still in the development stage. As of right now, drivers may send and receive alerts using it. In the future, autonomous vehicles made with machine learning and artificial intelligence algorithms may be equipped with security systems and a vehicle-to-vehicle communication protocol. Drivers won't be required in the future as driverless cars grow more prevalent. Both the driving distraction and the data security issues will be resolved. Vehicle-to-vehicle communication protocols and security systems will improve driving effectiveness, save lives in collisions, and enable companies to increase their output. It is also utilized to lessen traffic in large cities, which reduces the release of carbon dioxide. The article provided brief A discussion of the security systems and communication between vehicles protocol, including benefits, limitations, and future possibilities.

REFERENCES

1. In Li Jie, Hu Jian-mingy, and Li Guang-Hui, "The car Anti-theft System Based on GSM and GPS Module," Intelligent Networks and Intelligent Systems (ICINIS), 2012 Fifth International Conference on, vol., no., pp.199,201, Nov. 1-3, 2012
2. "The Implementation of GPRS Based It System Using PIC Microcontroller," in Computation Intelligence to Communication and Networks (CICSyN), Second International Conference on, August 28–30, 2010; El-Meany, W.M.; Alomari, A.; Al-Hakim, R.; Al-Ibrahiim, S.; Nousif, M.
"A Cheap Real-Time Monitoring Network Concept Using Integrated GPS/GPRS Modules," Wireless and Mobile Communication (ICWMC), 2010 6th International Symposium on, vol., no., pp.521,525,20-25 4. September 2010 El-Medan, W., Al-Omary, A., Al-Hakim, R., Al-Irha Yim, S., and Nusaif, M.
3. The Wikipedia page on vehicle communication systems may be accessed using the sixth link.Technical information