Automobile Enhanced Security System using LabVIEW based on IoT

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Abstract— The automotive industry has experienced rapid changes over the last two decades. It has been a radical icon of society today for a few days now. Today, car safety is one of our society's most daunting problems and also a very critical aspect. Many sensors and equipment are used for all these protection systems, but the cost to implement is growing very high. The design process of an embedded system will be addressed in this project, which would be used to prevent/control the theft of a vehicle in public places. The model for production will be based on an embedded GSM technology framework. The key theme of this project is the virtual control of the protection system by means of software that will be operated by the microcontroller through the driver circuit. The solenoid valve will drive the driver's circuit. The activation and deactivation of the solenoid valve will therefore be regulated by the microcontroller. By entering the keyword, the password is given to the approved person of the vehicle (owner and driver) to start it. The usually closed solenoid opens if he enters the keyword, and the vehicles are ready to start. If an unauthorized individual enters the password, the device will send a warning message to the approved person to secure their car. A warning sound will be provided by an alarm connected to the device. It is possible to simulate this project using the platform LABVIEW.

The main objective of the project is to successfully deploy wireless technology in car environments through IoT Technology in the event of a robbery proposal. In the online age of things.

Key words— GSM, LabVIEW

1. INTRODUCTION

In all areas of society, the protection infrastructure has been improved. There have also been several rapid improvements to car safety, but the expenses of these security enhancements are too large and not affordable for all ownership of vehicles. The purpose of the project is to provide the best safety solution for cars at an affordable price. The LabVIEW platform has been integrated through this to create a more safe and user-friendly vehicle security framework. Generally, the notion of igniting the engine with the air is used, the spark in the engine used to ignite an engine may be avoided by blocking the air flow to the engine. A cost efficient and highly secure system is the cost of integrating this smart security system with LabVIEW software. The machine user interface is all that basic and can be easily understood by all individuals. In the fuel injector of the car, the main process of this method takes place and so there will be effective.

The Internet of Things (IoT) is indeed a virtualization technology of objects or objects that are embedded in electronics, software, sensors, and network links, such as computers, houses, vehicles, and perhaps other structures, allowing these structures or objects to collect and share information. A high level of human-to-machine communications including machine-to-machine communications is expected to build the Internet of Things. Reducing human labor is the ultimate purpose of this initiative. In protection systems, automation always has been a primary consideration. In the project, our goal is to develop and implement a safety system. The Network of Things is the network of inanimate components or "things" embedded with software, measurements and networking for electronics to allow the manufacturer, operator and/or other connected services to produce significant encouragement and guidance by exchanging data. Via its semiconductor manufacturing device, each thing is uniquely recognizable but may communicate within it. The existing internet infrastructure. IOT is usually required to provide advanced computer, system and service connectivity that goes beyond communication from machine to machine and covers a range of protocols, jurisdictions and implementations. In nearly all fields, the interconnection of these embedded devices is considered successful in development, while still allowing advanced applications such as a smart grid. With the assistance of various current technologies, these devices collect useful data and then autonomous robots flow the data between other advanced technologies.

2. Related work & problems to be addressed

2.1) Available surveys

A lot of testing has been conducted to explore the different aspects of autonomous vehicle technology to date, but most of these studies concentrate on a specific feature of autonomous vehicles to the best of our understanding, and no survey shows a complete approach to autonomous vehicle technology. Our study dates back more than eight years (2010-date). In urban areas, Campbell al. studied real-world autonomous car experiments and identified in depth the difficulties they

encountered during the test. A comprehensive analysis of the use of high performance driving (ADAS) vehicles in private vehicles has been performed by Okuda et al. Policy guidelines and private vehicle implementation were evaluated by Dear et al. Similarly, some of the problems related to the different independent vehicle policies are discussed by Baylee et al. Other work-related research involves the preparation and monitoring of private vehicle movement, the construction of long-term maps of private vehicles private vehicles and visual perceptions of private vehicles from the point of Implementation insight and user experience. In addition, Abraham et al. conducted research on customer confidence and expectations in private car technology, and Joy et al. modified privacy problems in private cars for location communications. Parkinson et al. keep cyber-attacks on private vehicles fully updated. We see that the most recent study on private cars has been cantered on particular private car issues since the previous debate. [2].

2.2) Different situations:

The dynamic articles typically block each other in significant circumstances because of which the basic item can only be incompletely visible. For these rather visible documents, identifiable facts and isolation are difficult. [3].

2.3) Direction of vehicle movement:

Since vehicles are 3-dimensional objects, they typically have different appearances from the modified or survivable point of vision. In particular, the accuracy of classifiers depends on the highlights we have used, which therefore depends rather entirely on the stage. The best model is to consider the front view and side view of a bicycle rider's appearance.

3. LITERATURE SURVEY

3.1 Paper-1

A special type of network that comes from a mobile advertising network (MANET) is a vehicular ad hoc network (VANET) and is organized in a fully methodical manner. It is attractively built and includes moving cars. Communication on VANETs enables the development of road and road links across a wide variety of short and long wireless technologies. Effective traffic control, traffic congestion, and protection and convenience for drivers are other excellent applications of VANETs. These networks have been a viable area of study for both industry and academia since their inception. For limited services or temporary projects, such as avoiding traffic congestion and accident prevention, VANETs are suitable. However, VANETs have limited time applications because of their lack of functionality and communication skills in handling worldwide data obtained from other vehicles and systems. Vehicles on VANETs need to link to a broad range of modern applications for Facilities, the Internet and people. The Internet of Vehicles (IoV) or Internet of Connected Vehicles (IoCV) is the name of these transformed VANETs, which closely fits the Internet of Things (IoT) paradigm. Each network company can act as a "smart" system in IoV and can enjoy ubiquitous Internet connectivity that enables individuals, artifacts, cars, networks and infrastructure to be integrated to build a smart network that supports a variety of services in major cities or infrastructure. The Nations (eg smart system). City, conditions on the road, safety). According to a recent report, by 2021, billions of objects, many of which are vehicles, will be linked to the World wide web. The IOV links vehicles and living organisms to allow them to send and receive data. IoV networking is available in three categories: car-to-car (V2V), car-to-infrastructure (V2I), and car-to-cloud (V2C). In the implementation of mobile cities, IOV has played an important role by business performance management functionality, benefits of real-time vehicle management information, and by controlling Drivers' and passengers' protection. The rapid pace of IoV growth, however, generates many safety concerns that are considered a serious threat to both industrial and consumer lives. As a consequence, more comprehensive research on possible safety risks and different strategies that can ensure the safety of passengers and industry is urgently needed. In this paper, we will address the different types of attacks that motor vehicles can face, as well as alternatives to some or all of these solutions can affect overall performance.

3.2 PAPER-2

The LabVIEW platform has been integrated through this to create a more safe and user-friendly vehicle security framework. Generally, the notion of igniting the engine with the air is used, the spark in the engine used to ignite an engine may be avoided by blocking the air flow to the engine. A cost efficient and highly secure system is the cost of integrating this smart security system with LabVIEW software. The machine user interface is all that basic and can be easily understood by all individuals. In the fuel injector of the car, the main process of this method takes place and so there will be effective. The Internet of Things (IoT) is indeed a virtualization technology of objects or objects that are embedded in electronics, software, sensors, and network links, such as computers, houses, vehicles, and perhaps other structures, allowing these structures or objects to collect and share information. A high level of human-to-machine communications including machine-to-machine communications is expected to build the Internet of Things. Reducing human labor is the ultimate purpose of this initiative. In protection systems, automation always has been a primary consideration. In the project, our goal is to develop and implement a safety system. The Network of Things is the network of inanimate components or "things" embedded with software,

measurements and networking for electronics to allow the manufacturer, operator and/or other connected services to produce significant encouragement and guidance by exchanging data. Via its semiconductor manufacturing device, each thing is uniquely recognizable but may communicate within it. The existing internet infrastructure. IOT is usually required to provide advanced computer, system and service connectivity that goes beyond communication from machine to machine and covers a range of protocols, jurisdictions and implementations. In nearly all fields, the interconnection of these embedded devices is considered successful in development, while still allowing advanced applications such as a smart grid. With the assistance of various current technologies, these devices collect useful data and then autonomous robots flow the data between other advanced technologies.

3.3 PAPER-3

This paper focus on today's world of comfort and luxury, various high priced costly vehicles are available. Many of these vehicles have been launched with inbuilt security systems. However, even though a huge amount of capital is being invested in areas of vehicle security, the cases of vehicle theft is still rising.

In the global or local climate, a brilliant automotive safety system means giving people the power to intelligently and naturally monitor vehicles. Several existing approaches focused on automotive safety frameworks are based on numerous developments, but involve safety and do not improve individuals at all. The manufacture of different car safety devices has no concern for whether they are basic or new production, in response to the concept of car burglary. Standard automobile safety features, for example, two-wheeled car keys and four-wheeled vehicle-friendly modules, were successfully provided by the designers. In any event, the safety features offered by the engineers at this time are not guaranteed; if they are to be genuinely protected, there should be more protection.

3.4 PAPER-4

According to Interpol, organized vehicle crimes contribute to theft and trafficking of vehicles involving personal property, insurance firms and public safety in all countries and are, in most cases, connected to larger networks of organized crime. In order to deter theft of vehicles, we need to introduce new systems based on new technology to help police and vehicle owners monitor, regulate, recover vehicles in the event of robbery and detention, such as the proposed system, Vehicle monitoring and IoT-based communication module can be easily analyzed to monitor, control the automobile in real time and suggest clear details about the nearby government buildings, then identify the best damn thing and accessible modes of communication to reach the spot.

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A convolutional neural network (CNN) is a variety of feed-forward neural network that implements the back propagation algorithm. It trains it high-level features from the primary data like images. The current accomplishment of convolutional neural networks is in their ability to extract inter-dependent information from the input images i.e centralization of the pixels which are highly sensitive compared to other pixels. The convolutional neural network training consists of different convolution layers, relu layers max-pooling layers, fully connected layers, and a loss function (e.g. SVM/Softmax) on the last (fully-connected) layer these layers are liable for the detection, classification, and evaluating of objects in images. In the preliminary layers we obtain the edge information of the input images familiar to some of the algorithms but, In the penultimate layers, we start obtaining texture and ridge information which helps us in evaluating sensitive information useful for the classification of objects in images into different classes based on their sizes and category(moving or not).

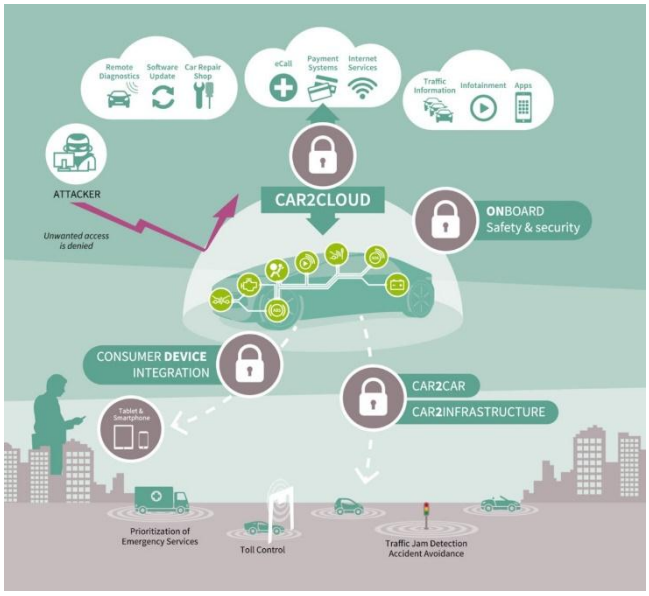

Fig 1 Architecture of Automobile security

4. Analysis of security systems

Increasingly marked by corporate mergers and mergers, the global car industry The relocation of manufacturing centres to developed economies is in the grip of a The worldwide price-war. The industry is subject to imperfect competition that has resulted in imperfect competition. Too much of it all, too much skill, too many rivals and too much Overlapping and redundancy. The industry is concerned with the demands of the market for styling, Security together comfort; and with the productivity of labour relations and production with this one, this project provides car safety using new technology to open the car door and fasten the seat belt. These two situations satisfy the user to start igniting the car. Similarly to protect our valuables from window intruders and the problem of drag. This study provides an overview of the various studies previously conducted to perform this function. The Internet-based anti-theft tracking system is designed to provide all owners with an effective service.

The analysis explores growth patterns, changes in ownership structures, trade structures, meaning, Patterns and position of selected Asian countries' governments (i.e. China, India, Indonesia and Thailand) in the world of cars.

Thailand is a big country exporting vehicles from Asia. The sector is mainly linked to Japanese FDI oriented. The Chinese automotive industry is rising very quickly and is poised to quite early on, with an especially strong dent in the foreign trade arena, in the part field, location. On the other hand, India is consolidating its stance with high demand both domestically and internationally. Indonesia's automobile industry is In essence, a production sector regulated by a major Japanese automotive industry.

Which developed nations examined are making efforts to develop their cars Sector via different routes with overt and indirect state control through various routes Initiatives for recent technologies and economic reform. Policies of the government against Liberalization of investment has given the selected countries considerable benefits as private countries With modern technology, players stepped in and FDI began to flood in, mainly through the Japanese automotive majors' paws.

Multiple states have adopted various strategies to fix the issue of excess capacity. In that business. The Japanese encouraged market restructuring through mergers and mergers Procurement while Indians were looking for a global market. Governments in all these countries Policies have been aimed at developing the indigenous automotive industry by reinforcing national players when Thailand was completely concentrated on the export market By Japanese firms. Expertise in the automotive industry is becoming increasingly component, as they are finding their niche in each of these countries. China specializes in components and India in components. Two seaters and tiny bikes, pick-up trucks and commercial vehicles in Thailand and in work trucks in Indonesia. Thailand exports to developing nations and Reinforcement of its role in ASEAN. Thailand is also growing its economic ties with Indonesia. From ASEAN. Besides traditional India, India concentrates on the Middle East and South Asia. Destinations for developing countries. With the radical opening up of the part industry, the task now is for individual governments to promote the growth of domestic production. Providers of essential components and sub-systems by, interiliac, enhancement in the Climate for investment, better patent regimes and R&D rewards.

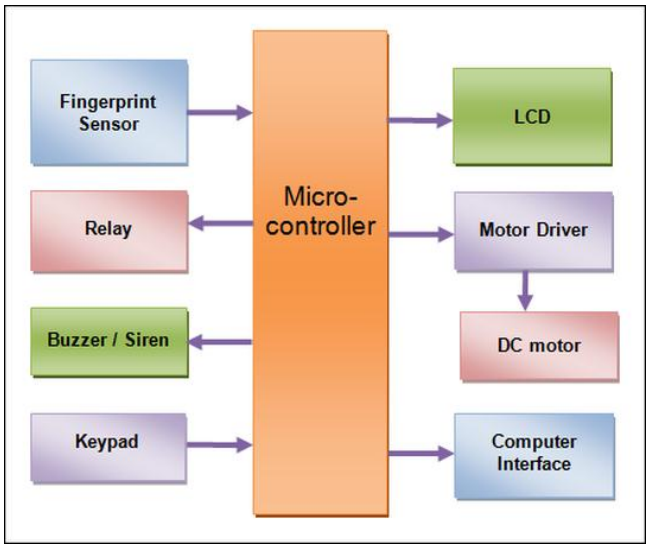

Fig 2 Block diagram of security system

5. LabVIEW

We have used LabVIEW because it offers a graphical programming approach that will help Click-through button to help you visualize all aspects of your application, including hardware configuration, rating data, and debugging. This seems to make it easier to integrate measurement hardware from any vendor, to represent a complex concept in a diagram, to develop data analysis algorithms, and to customize user interface design.

The name LabVIEW is an abbreviation of its meaning: Laboratory Virtual Instrument Engineering Workbench. LABVIEW is the language of the visual system: it is a platform for the system development and development environment that was intended to allow all types of system development.

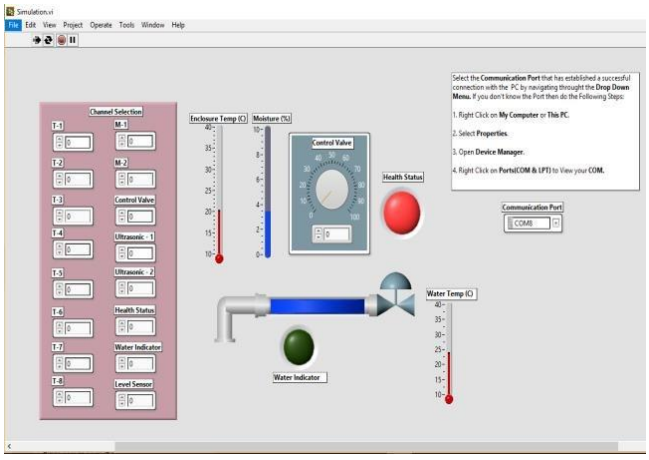

Fig 3 Example of panel in LabVIEW

The LabVIEW environment also programming also includes examples and the documents required for the back ground running applications. This will benefit on one side, but there is also a certain danger of neglecting professionalism in the context. It is very important that a developer possess a very good and extensive knowledge of the special LabVIEW syntaxes and the memory management of the topology. The advanced type of the LabVIEW development systems offer the capability to build standalone applications.

Moreover it is real and possible to applications of distributed which communicate by a client server of the devices and hence it is very easy develop and implement due to inherit the nature of parallel G.

6. Result and Discussion

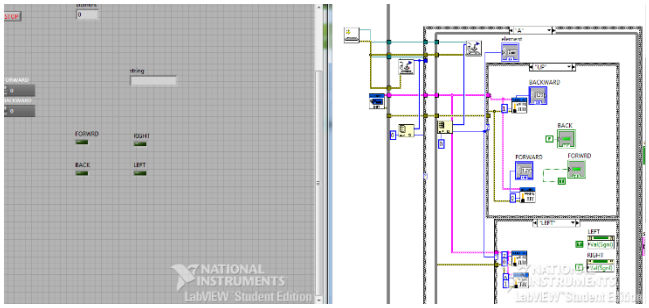

Fig 4 simulated circuit of security system

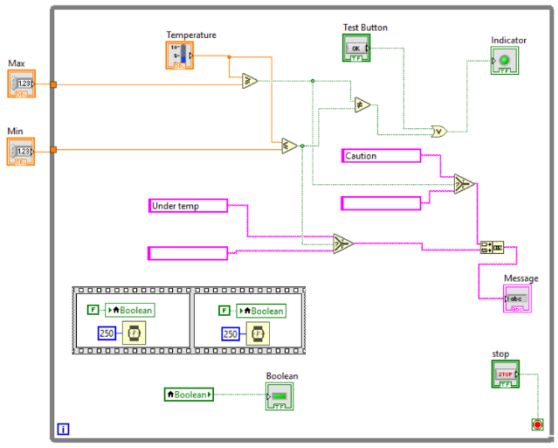

Fig 5 Temperature control circuit

7. Conclusion and Future work

We can monitor the theft of vehicles and provide a more reliable system for the car industry at a very reasonable cost by deploying our process in real time. This protection method is very convenient that can be used by every viable tool. Continuing IoT and its studies in the field Implementation in full or in part will strengthen the Standard of living. "Thus the proposed "IoT Based" project Vehicle System' will be at the level of protection A step forward and seek to close all of the gaps Which are already in current technology. The validation reveals the advanced vehicle system based on IOT is practical. And they can automatically regulate fraud. The Time of Answer The delay is therefore lower. This advanced vehicle system, based on IOT, User protection by seat belt compulsion is allowed, key less Method of locking / unlocking to drive the vehicle. Furthermore, it provides protection from car towing and robbery to the above, via a windshield in the driver. For automobiles, the device is perfect, It can also be used for other automobiles by the use of those the parts and components used in this company. Based on IOT the autonomous driving system provides maximum performance, Convenience, protection & continuity. It is an ideal strategy for car users.

Reference papers

[1] Jr., William M. Assistant Examiner: Ganjoo, Peter on Anti-theft system for use with unattended and attended vehicles comprising: a base microprocessor, IEEE.

[2] Zhen-hua Wang, Xue-ping Zhang, Ge-fei Yu, Yuan-fu Lin, Lei Chen, "A New Automobile Anti-interference Alarm System Based on Signal Detecting Technique to Design and Implement," iccsee, vol. 1, pp.310-312, 2012 International Conference on Computer Science and Electronics Engineering, 2012

[3] Goel and V. Gruhn, "Fleet Monitoring System for Advanced Tracking of Commercial Vehicles", Proceedings of the2006 IEEE International Conference on Systems, Man, and Cybernetics (SMC 2006), pp. 2517-2522, Taipei, Taiwan,08.10.2006-11.10.2006.

[4] Chia-Hung Lien, Chi-Hsiung Lin, Ying-WenBai, Ming-Fong Liu and Ming-Bo Lin, 2006 IEEE Tenth International Symposium on Consumer Electronics (ISCE 2006), St. Petersburg, Russia, pp. 7-12, June 28-July 1, 2006.

[5] E. D. Kalpan, Understanding GPS: Principles and Applications, Artech house Publishers, ISBN 0890067937, February 1996. "Implementation of GSM based Commercial Automobile Tracker Using PIC 18F452"Proceedings of 2009 IEEE student conference on Research and development (SCOReD 2009), 16-18 Nov, 2009, UPM Serdang, Malaysia.

[6] M. McDonald, H. Keller, J. Klijnhout and V. Mauro, "Intelligent Transport Systems in Europe: Opportunity for Future Research"World Scientific Publishing Company, ISBN 981270082X, 2006.Muhammad Ali Mazidi, Janice Gillespie, Mckinlay, Rolin D., " The Microcontroller in Embedded System.

[7] Raj Kamal, "Embedded System- Architecture, Programming and Design", Tata McGraw Hill Publisher, 2nd edition, 2008.

[8] Junaid Ali, ShaibNasim, Taha Ali, Naveed Ahmed and syed Riaz un Nabi, "Implementation of GSM based Commercial Automobile Tracker Using PIC 18F452 and Development of Google Earth Embedded Monitoring Software" Proceedings2009 IEEE student.

[9] Jayanta Kumar Pany1 & R. N. Das ChoudhuryEmbedded Automobile Engine Locking System, Using GSM TechnologyB.G. Nagaraja, Ravi Rayappa, M. Mahesh, Chandrasekhar M. Patil, Dr. T.C. Manjunath:- "Design & Development of a GSM Based Vehicle Theft Control System" 978-0-7695-35166/ 08©2008 IEEE, DOI10.1109 /ICACC.2009.

[10] M. Abuzalata, M. Momani, S. Fayyad and S. Abu-Ein," A Practical Design of Anti-Theft Car Protection System Based on Microcontroller,". American Journal of Applied Sciences, 9(5), 709, 2012.

[11] O. Kaiwartya, A. Abdullah, Y. Cao, A. Altameem, M. Prasad, C. Lin AND X.

[12] Liu, "Internet of Vehicles: Motivation, Layered Architecture, Network Model, Challenges, and Future Aspects," IEEE Access, 2016.

[13] A. M. Salman, " Cloud Based Vehicle Tracking System Using GPRS," College of Information Engineering, Al-Nahrain University, Iraq, Baghdad, 2020.

[14] D. A. Bahr and O. A. Awad, "LTE Based Vehicle Tracking and Anti-Theft System Using Raspberry Pi Microcontroller," College of Information Engineering, Al-Nahrain University, Iraq, Baghdad, 2019.

[15] P. Chandra Shreyas, R. Roopalakshmi, Kaveri B. Kari, R. Pavan, P. Kirthy and P. N. Spoorthi, " IoT Based Framework for Automobile Theft Detection and Driver Identification," Springer Nature Singapore Pte Ltd., 2019.

[16] T. Attar, P. Chavan, V. Patel, M. Gupta, and D. Mukhopadhyay, & quot; An Attempt to Develop an IoT based Vehicle Security System," International Symposium on Smart Electronic Systems, IEEE, 2018.

[17] K. Shruthi, P. Ramaprasad, R. Ray, A. N. Manjunath and S. Pansari. " Design of an anti-theft vehicle tracking system with a smartphone application," International Conference on Information Processing (ICIP), pp. 755-760. IEEE, 2015.

[18] M. S. Uddin, Md. M. Ahmed, J. B. Alam, and M. Islam, "Smart anti-theft vehicle tracking system for Bangladesh based on Internet of Things," 4th Int. Conf. Adv. Electr. Eng. ICAEE, vol. 5, pp. 624–628, 2017.

[19] S. N. Paing, M. Z. Oo, M. Othman, and N. Funabiki, "A Personal Use Vehicle Anti-Theft