AUTHENTICATED ACCESS FOR VEHICLE AND SPEED MONITORING THROUGH IOT

A. Madhukar, K. Sirisha, Ch. Sriya Varma, Ch. Kanaka Mahalaxmi, K. Ravi Kumar,

1,2,3,4 U.G Scholars, 5 Professor
Department of ECE, N S Raju Institute of Technology, Sontyam, Visakhapatnam, A.P. India.

Abstract: This paper implements a system which authenticates the License of the user and their Fingerprint and to monitor the speed of the vehicle remotely. This project is promoting a concept called as Smart License. When any person enters Smart License in RFID reader, then it will be compared to data existing in program and if License is authorized, then only it asks to place the finger in FP scanner to verify. If and only if Fingerprint matches to data already existing, then the vehicle will start. And if not, a message will be displayed on LCD indicating that an unauthorized access been done. And the owner can also turn off the ignition system through GSM by giving commands. And the vehicle location can be obtained with the help of GPS module. This vehicle security and speed monitoring System is powered by an Arduino UNO microcontroller and Arduino Nano microcontroller. These microcontrollers control various modules such as RFID, GSM, GPS, FP scanner, Relay, LCD and motor. These all components are connected to Arduino UNO and Arduino Nano and Arduino UNO is connected to the internet with the help of NodeMCU, a WiFi module. Through Arduino IOT cloud, one can monitor the speed of the vehicle with the help of internet.

Keywords: Smart License, RFID, Fingerprint, GSM, GPS, NodeMCU, LCD, IOT.

I. INTRODUCTION
An Embedded system is defined as a computing device that does a specific job. Appliances such as the air-conditioner, DVD player, printer, faxmachine, mobile phone etc. are examples of embedded systems. By using Embedded Systems in daily life, the people’s daily life is being simplified and made much more advancements in the field of Electronics. One of the main concerns now in the society are the vehicle accidents and the vehicle theft. The more number of accidents are being made by unlicensed drivers and also the speed in which they are riding, and the vehicle theft is also a problem for anyone who owns a vehicle. The family members or the dear ones are the most suffered persons when one has been attacked by an accident. So, to facilitate the parents or dear ones to monitor the speed of the vehicle when their children are driving a vehicle, a system is required through which they can rest happily without worrying about their children. So, overcoming all these problems, this system has been developed.

II. OBJECTIVE
The main objective of this system is to prevent vehicles from theft, to prevent accidents happening by unlicensed drivers and to monitor the speed of the vehicle remotely from anywhere around the world. In the case of any suspicious activity, the owner can turn off the vehicle engine from start remotely and can get the location of the vehicle. In this paper, section III gives the Literature survey and section IV gives the Implementation details of our project and section V shows the obtained results.

III. LITERATURE SURVEY
Pradeep Sawant, Suraj Godse, et.al., proposed Microcontroller Based Smart Card Car Security System. In this system, a PIC167877A microcontroller, RFID reader, RFID card and a GSM modem were used for the successful implementation of the system. The PIC16F877A microcontroller was used to serve as the entire brain of the system which holds the unique RFID card number and controls the electromagnetic relay and the GSM MODEM. The Electromagnetic relay served as the mechanical tool that secures the car ignition system, and the GSM modem was used to call the car owner whenever there is an intrusion attempt. Consequently, with this kind of system presented in this paper, the security of our automobiles can be more sensitive in order to secure and protect our automobiles more from any intrusion and theft in an electronic based approach [1]. Rajaatabh Agarwal and Boominathan P implemented Vehicle Security System Using IoT Application. The main extent of this project is to stop the motor of an automobile naturally. This should be possible at whatever point a man attempting to take the vehicle, around then sends a hinder to a programmable microcontroller of Arduino family that stores proprietor's number upon an Intimation message out of the blue. When some individual tries to take the auto then microcontroller gets a prevent and the proprietor gets a SMS that his auto is being stolen then the proprietor login to the IOT based web server and control the vehicle like start buzzing, or can execute engine [2].
Mrs. Maalini Dharmaraj, M.E., Mr. Venkatesh Annamuthu et.al., Developed Fingerprint based Anti-theft for Two Wheelers Authentication of Vehicle users. This project used to propose a system which describes the concept of controlling vehicle thefting by using the method of fingerprint based authentication and which alerts the user by providing the notification to the user. This proposes a system which identify the authenticated person for the vehicle and starts up the vehicle when the person is approved by the Finger Print Module. If any unauthorized access of vehicle is to be applied then the system fully locked and there is no way to move the vehicle from the place of parking. The capability to start-ups the vehicle is initiated by the Positive Charge from the Finger Print Module [3].

Ahsan Ullah, Arfatul Sumiraj, et.al., designed IoT based Vehicle Speed Monitoring and Controlling System for Reducing Accident occurs on the Road in Bangladesh. The proposed system has developed for reducing accidents occurs on the road in Bangladesh. This system can measure vehicle speed based on distance and time by IR Sensor. RFID card has been used for identity of a vehicle number. And RFID 522 has used for detect over speed vehicle. In this project, GPS has been used for tracking the current location of vehicle [4].

Deepak. S, Dinesh Kumar. G, et.al., proposed License and Fingerprint Detection for Security Purpose in Automobiles. A minutiae approach in designing the Authentication System were implemented using Fingerprint and RFID tag gives security to the users’ vehicle system and provides safety for the ignition system using a finger print scanner and RFID tag for the authentication of the ignition system. The result obtained in providing the security gives quite reliable in all the different modes of the paper. The system has successfully gain mastery over some of the aspects existing with the present technologies, by the use of finger print Scanner and RFID tag identification as the authentication Technology [5].

Elakiya. G and Dr. V. R. Angela Deepa designed Speed Monitoring System—an IOT based application to ensure Safety for the Students. The idea of this project is to develop a smart speed monitoring system by detecting the speed of the vehicle and to alert the management or the authorized person whenever the vehicle exceeds a certain speed limit. This proposed system consists of speed measuring sensor groove coupler module of Arduino to detect over speeding of vehicle and a GSM module to send Notification. The Notification is sent to the school management/authorized person. This helps in monitoring the speed of the vehicle and which in turn sends notification to the authorized person in case of speed driving [6].

Arwa M. Ali, Dr. Heisum M. Awad and Ibrahim K. Abdalgader proposed Security system for Vehicle based on driver’s license and fingerprint technology. This system prevents vehicle theft and driving without proper driving license. It achieved through select authorized driver’s license allows running the car, also to provide extra security the system contains biometrics in form of fingerprint recognition to grant access to vehicle. To prevent all possible ways to vehicle theft, GSM module is used to send SMS alter to the owner of car tell him unauthorized driver’s license entered. Also used GSM module to send SMS to holder of driver’s license for remember him to renewal his license before expiry [7].

IV. IMPLEMENTATION

This system is built up of Arduino UNO and Arduino Nano in which Arduino UNO takes care of the license and fingerprint validation and starting of the ignition when validated. And it is connected to the NodeMCU, which is a WiFi module connects to Arduino IOT cloud which can be used to get the speed of the vehicle at that instant of time in Arduino IOT cloud application or through web. And the LCD is used to present the state of the vehicle. The Arduino Nano takes care of the GSM and GPS modules. If any suspicious activity occurs, we can turn off the vehicle ignition by just sending a message to the GSM and also can get the location of the vehicle also through a command to the GSM with the help of GPS.

Fig. 1: Block Diagram
And another advantage of this system is that we can monitor the speed of the vehicle through Arduino IOT cloud and at the same time we can get the location of the vehicle, so that it can be very helpful to people.

V. RESULT

![Final Circuit prototype](image1.jpg)

Fig 2: Final Circuit prototype

This figure Fig.2, illustrates the final hardware unit for our system. And when wrong License entered, the LCD will indicate as shown in the Fig.3.

![When Wrong License Given](image2.jpg)

Fig. 3: When Wrong License Given

After validating the license, the system asks for fingerprint of the rider as in Fig.4.

![After validating the License](image3.jpg)

Fig. 4: After validating the License

After validating the fingerprint, ignition of the vehicle starts which is represented by a motor in this system as in Fig.5.

![Engine started after validating the fingerprint](image4.jpg)

Fig. 5: Engine started after validating the fingerprint
The owner can stop the ignition of the system if found something that is suspicious by just sending a message as bike off to the gsm, and the motor will be stopped and again we will get a return message. Also we can locate our Vehicle by just sending a message as locate vehicle from our mobile phone to the gsm, which is been shown in Fig.6.

We can get the speed of the vehicle through wifi module and the potentiometer. In this system, the potentiometer is rotated to see the changes in Arduino IOT cloud Application as shown in Fig.7.

In this project, we designed “Authenticated Access for Vehicle and Speed Monitoring Through IOT” with the help of two Arduino microcontrollers i.e., Arduino UNO and Arduino Nano and connecting it to various components. This system prevents vehicle theft and driving without proper driving license. It achieved through RFID and to provide extra security to the system, it contains biometrics in form of fingerprint recognition to grant access to vehicle. To prevent all possible ways to vehicle theft, GSM module is used to switch off the ignition and send location coordinates with the help of GPS module by sending a command to it. And through this System, one can monitor the speed of their dear ones remotely from anywhere in the world just with the help of internet.

This project is very useful in the perspective of every vehicle and it is also reduces insecurity on the roads created by illegal drivers. And it can be improved by adding Artificial Intelligence to it, as the life is becoming simpler day by day, one may want to fastly authenticate themselves by using Facial Recognition. Additionally, one can also add camera module in order to observe the vehicle remotely.
REFERENCES

Dr. K. Ravi Kumar, working as a Professor in the Department of Electronics and communication Engineering, N. S. Raju Institute of Technology, Visakhapatnam, has about 14 years of teaching experience. His area of research includes Radar Signal processing, Image signal processing, Antennas and Embedded system.

A. Madhukar, Studying B. Tech in Electronics and Communication Engineering at N. S. Raju Institute of Technology, Visakhapatnam.
