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Real time Car Antitheft System with Accident Detection using AVR Microcontroller; A Review

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Abstract: The present condition of insecure environment causes increase in the ratio of vehicle theft, which creates a major responsibility towards manufacturers as well as owners of luxury automobile to inbuilt the anti theft system which prevent the car from theft. The proposed security system for cars used to prevent them from theft using AVR microcontroller. It can add various images to database and with the help of face recognition technology when any person enters into car then it compares image of that person with the existing images into database if the person is authorized user then access of will be granted and if not then block the car access and the car owner will be informed about the unauthorized access with the help of Multimedia Message Services (MMS) by using GSM modem. Also it can provide password authentication in such case if car owner want to give emergency access to some user whose image is not recognizable, but still it gets the access of car. In addition it can also perform accident detection in order to provide the security to the users. In that case message will be sent to nearest police station or hospital.

Keywords: AVR microcontroller, antitheft system, MM S, GSM modem, face recognition.

I. INTRODUCTION

Many people make the assumption that car theft only occurs in seedy areas of town, but car theft can occur anywhere in any area of town. People need to be careful not to entice thieves by making common mistakes. Theft is one of the most common behaviors. Where the ownership of a physical possession can be altered without the rightful owner's consent, theft prevention has been introduced to assert the ownership whenever the rightful owner is physically absent. An anti-theft system is any device or method used to prevent or deter the unauthorized appropriation of items considered valuable. In addition it can also perform accident detection in order to provide the security to the users. In that case message will be sent to nearest police station or hospital.

The existing system are Car alarm, flashing light techniques which makes use of different type of sensors, for example pressure, tilt and shock & door sensors, but the drawbacks are cost and it only prevents the vehicles from theft but can't be used to trace the thief. In case of wheel and steering lock system, they are visible from outside the car and prevent the wheel from being turned more than a few degrees. The proposed antitheft system for smart cars used to prevent them from theft using AVR microcontroller. It can add various images to database and with the help of face recognition technology when any person enters into car then it compares image of that person with the existing images into database if the person is authorized user then access of will be granted and if not then block the car access (i.e. Produce the interrupt signal to car engine to stop its action) and the car owner will informed about the unauthorized access with the help Multimedia Message Services (MMS) by using of GSM modem. Also it can provide password authentication in such case if car owner want to give emergency access to some user whose image is not recognizable, but still it gets the access of car. In addition it can also perform accident detection in order to provide the security to the users. In that case it uses strain gauge sensors at four side of car which can measure a jerk up to 40 kg

when any kind of jerk is experienced by the car within a specified range then message will be sent to owner of car and nearest police station or hospital.

II. LITERATURE REVIEW

The existing car antitheft system are Car alarm, , flashing light techniques which makes use of different type of sensors which can be pressure, tilt and shock & door sensors, but the drawbacks are cost and it only prevents the vehicles from theft but can't be used to trace the thief. In 1997 B Webb introduce wheel and steering lock system, to prevent car from theft, but they are visible from outside the car and prevent the wheel from being turned more than a few degrees.[1] . The next system was proposed on Security Module for Car Appliances by Pang-Chieh Wang,et.al. This system prevents car appliances from stealing and illegal use on other cars. If illegal moving and use a car appliance with the security module without permission occur that will lead the appliance to useless. But it does not prevent vehicle from theft [4]. In 2008 Lili Wan, et.al. implemented new system based on GSM in which owner can receive the alarm message quickly and if necessary, also it can monitor the car by phone [6].The next system was a sensor network based vehicle anti theft System (SVATS). In this system, first step is to form a sensor network by using the sensors in the vehicles that are parked within the same parking area, then monitor and identify possible vehicle thefts by detecting unauthorized vehicle movement. An alert will be reported to a base station in the parking area if an unauthorized movement is detected. As the sensor cannot communicate with the base station directly in the extreme case, vehicle cannot receive any protection when no neighbors can be found even if a sensor has tried its maximum power level [5]. In [7] authors define an automotive security system to disable an automobile and its key auto systems through remote control when it is stolen. But it does not help to recognize the theft.

An efficient automotive security system is implemented for anti-theft using an embedded system occupied with a Global Positioning System (GPS) and a Global System of mobile (GSM) by Montaser N. Ramadan et.al. to track and monitor vehicles that are used by certain party for particular purposes, also to stop the vehicle if stolen and to track it online for retrieval[8]. The next system was proposed in 2013 on real time vehicle theft identity and control system based on ARM 9. It performs the real time user authentication using face recognition, using the Principle Component Analysis (PCA) algorithm if the result is not authentic then ARM produces the signal to block the car access and the car owner will informed about the unauthorized access with the help Multimedia Message Services (MMS) by using of GSM modem . But in this method the camera captures owner's image only. If the owner's relatives or friends want to start the vehicle it will not start [11]. Recently new system proposed on vehicle anti-theft system based on an embedded platform consists of multiple layers of protection .The first layer of protection in the system is a fingerprint recognition, based on which the doors are opened. Also to prevent thieves from breaking the glass and getting inside the vehicle, vibration sensors are used in all the windows with a threshold level to prevent false alarms. the vehicle is turned on only with the mechanical keys along with correct key number entry on the combination keypad present, failing to do so for three successive times will result in vehicle getting immobilized by cutting the fuel supply and an alert message is sent to the mobile number of the owner. Further to prevent the seizure of the vehicle, tyre pressure sensor is also being used which also alerts the owner through a mobile message.[12]

In case of vehicle accident detection new system proposed by Varsha Goud et.al. on vehicle accident automatic detection and remote alarm device. This system can detect accidents in significantly less time and sends the basic information to first aid center within a few seconds covering geographical coordinates, the time and angle in which a vehicle accident had occurred. This alert message is sent to the rescue team in a short time, which will help in saving the valuable lives [9]. Detecting an accident before occurring it can save human life. To implement this new system was proposed in which a car will try to avoid obstacle after avoiding human or animal if there is any. Driver will also be notified with red lights indicating that obstacles are in front. However, if the system would not be able to avoid accident then this system will automatically generate a tweet in tweeter. For further safety, this system also contains relay and buzzer where relay helps to protect the car from battery ignition and buzzer will make noise to inform people surrounded [13].

In 2000 paper proposed on An Introduction to Face Recognition Technology which covers issues such as the generic framework for face recognition, factors that may affect the performance of the recognizer, and several state of the art face recognition algorithms [2]. New technique has been proposed in 2004 by Jian Yang, et.al. is two-dimensional principal component analysis (2DPCA) for image representation. As opposed to PCA, 2DPCA is based on 2D image matrices rather than 1D vector so there is no need to transform image matrix into a vector prior to feature extraction. Due to this an image covariance matrix is constructed directly using the original image matrices and its eigenvectors are derived for image feature extraction [3]. The next paper proposed on image-based face detection and recognition to evaluate various face detection and recognition methods, which provide complete solution for image based face detection and recognition with higher accuracy, better response rate as an initial step for video surveillance [10].

III. CONCLUSION

When compared with the existing system the advantage of this proposed system is that we can prevent the vehicle theft by using face recognition. The proposed security system for smart cars used to prevent them from theft using AVR microcontroller. When any authorized person enters into car then access of will be granted and if not then block the car access and the car owner will informed about the unauthorized access with the help Multimedia Message Services (MMS) by using of GSM modem. Also it can provide password authentication in such case if car owner want to give emergency access to some user whose image is not recognizable, but still it gets the access of car. In addition it can also perform accident detection in order to provide the security to the users. In that case message will be sent to owner of car and nearest police station or hospital.

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