

A Survey on IoT based approach for Vehicle Theft Detection

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Abstract— Property crimes is said to hover around 10 million annually. Of this vehicle theft tops the list and often occurs in all parts of the world. There are so many recent technologies evolving and new methods are being upgraded in overcoming this issue. Internet of Things has paved way to provide interaction between things. Internet of things with intelligence is a new era for the technology developments. The existing methods have various shortcomings like the logics used cannot be implied in all the situations. The methods involved in vehicle theft detection have become aware to everyone including the burglars and they try to break the system and steal the vehicle. Therefore there must be a system which invisibly and uniquely authenticates and authorizes the vehicle. The system should not know its existence to the outsiders. A mobile app can act as an interaction between the user and the vehicle. Location updates are sent periodically to the registered user through mobile app. Privacy plays an important role which is maintained through the mobile app where vehicle is being monitored when friends, relations and drivers uses the vehicle.

Keywords— Arduino, fingerprint sensor, mobile app, Internet of things, vehicle-theft.

border then the probability of capturing the vehicle is quiet low. Some vehicles are even stolen from attended garages and parking lots and thieves ingenuity has overcome the most complex and safest mechanical locking devices.

There was steady increase in the number of stolen vehicle and the searches carried out as reported by INTERPOL [2].

The above fig (1) represents the automobile burglary rate increase in India. About 165,690 vehicles are stolen in India where the graph depicts a huge deviation is seen at 2004-2013. The automobile theft could have increased proportionally with the increased population in the recent years [9]. In 2013, FBI estimated about 699,594 motor vehicle thefts nationwide. However there was small decline in the previous year which again kept on increasing in the upcoming years after 2013. For every 13 minutes a vehicle theft occurs in India has been reported by the Times of India [1].

The industry observers and the technicians create awareness about the technologies used during the theft and the tactics that are widely being followed by the burglars among the people. The automobile industry uses different technologies like the smart keys, which eliminated hot-wiring to steal cars, switching to vehicle identification number, different lock systems for the vehicle. With the help of these technologies there was reduction in the vehicle theft for few years.

I.INTRODUCTION

Vehicular theft constitutes a high percentage of reported criminal acts [7]. The number of automobiles involved in travelling each grows drastically high and it becomes impossible to identify the stolen vehicle. If the stolen crosses the national

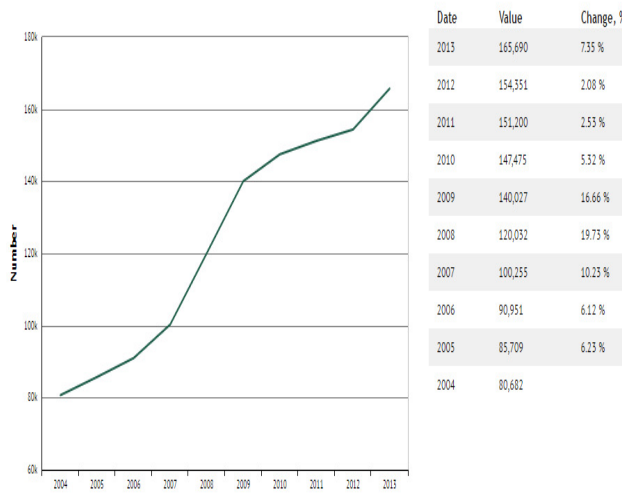


Figure (1): Automobile burglary rate in India

II. LITERATURE SURVEY

With the evolution of technology in the recent years, different mechanisms and innovations are used in various fields. Vehicle theft detection concentrates mainly on the various lock system or monitoring and controlling of vehicle from a remote location. These types of devices cannot be practically implied as there are various shortcomings and the logics needs to be revised.

A sensor based vehicle theft detection system along with some features like fire detection is implemented in the vehicle [4]. Two android devices communicate with each other one from the vehicle and the other is with the owner of the vehicle. A password lock is used to control the vehicle. When a user tries to access the vehicle the intended uses needs to be authorized only then the vehicle ignition can be turned on.

Constant surveillance of any object is maintained on car. Remote monitoring of vehicle is streamed through the surveillance pad [5]. An event detection module consists of event detection sensor and event detection logic. Whenever the ignition is started the location is updated in the pad.

Password locks with remote ignition cut-off mechanisms are used with the controller of the vehicle [8]. If any incorrect password is encountered more than three times then the engine is cut off and the vehicle cannot be accessed anymore. When any

event of theft has occurred is alerts the nearby user with a buzzer sound.

Face recognition mechanisms are used when the engine is started a picture is captured and sent to the owner of the vehicle [3]. This person can verify the user and identify whether the vehicle is stolen or not. The image is stored in the compressed format and only when the image is verified is vehicle's ignition can be enabled.

III. COMPARATIVE STUDY

Paper Name	Features	Limitations
VTDS: Vehicle theft detection system	<ol style="list-style-type: none"> 1. This system is based on real time tracking system and fire detection methods. 2. It uses two android devices for the interaction between the car and the vehicle. 3. This android device in turn connects with the Arduino module. 4. The user interface is in the form registration and password lock where every user can access the vehicle with the help of a 	<ul style="list-style-type: none"> • The system uses two android devices which are actually not needed for theft detection. • Secondly the password lock type is not an efficient lock system for the vehicle in all cases. • After the theft has occurred ignition of the vehicle is controlled which is totally blunder because the owner may not be aware of the road traffic at that situation. • The password lock may be dismantled at certain case which leads

	password. 5. If more than three attempts are made then it notifies the owner with an alert message.	to unreliable system.		notify the owner of the vehicle with the alert messages. 3. This system again makes use of password lock and when a more than 3 attempt is made to unlock then it automatically locks the vehicle. 4. It also uses a buzzer sound to alert the nearby user that the theft has occurred.	periodic location updates is quiet complex and live streaming of location updates of the vehicle is not possible.
Instant Theft Alert and Tracking System in Car	1. The theft alert and tracking system comprises of surveillance pad, Event tracking and Event detection modules. 2. This system is purely based on tracking and monitoring the vehicle. 3. When the door of the vehicle is locked then it starts sending the notification to the owner of the vehicle.	<ul style="list-style-type: none"> The theft alert reports only about the location of the vehicle but does not take any measures to detect the theft efficiently. Monitoring of the vehicle does not identify the theft and every time it notifies the user. Privacy is not maintained when any known people tries to access the vehicle. 			
Vehicle theft Detection and Prevention using GSM and GPS	1. This system comprises of Remote ignition cut-off and Vehicle tracking modules. 2. It uses GSM module to interact and	<ul style="list-style-type: none"> It uses PIC microcontroller which cannot be used for multi-purpose or extend its purpose. The password lock is not an efficient lock method and if the car is locked totally then it may not help in emergency situations. It uses only GSM module so 	A new embedded car theft detection system.	1. This system uses face recognition techniques to identify the owner of the vehicle. 2. It sends image of the driver using the vehicle to the owner. 3. Image processing is performed for the face recognition mechanism. 4. If any authorized	<ul style="list-style-type: none"> Too many images need to be saved to find the authorized person. If in case of emergency when a person tries to access the vehicle then it reports as theft and sends those details to the police station. Image processing techniques are complex to develop. The camera can be easily dismantled by the burglar.

	used tries to access the vehicle the algorithm quits, if not it recognizes for a particular time and send the image to the owner and the police station.	
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IV. CONCLUSION

Every existing system is based on a lock mechanism in the vehicle. The recent technologies paved way to break the lock and becomes easy to steal the vehicle. Therefore a system should be designed in such a way that it invisibly authenticates and authorizes the driver. It must help the owners monitor the vehicle at any time and live stream the vehicle's location and update it periodically. If the owner suspects that any theft is likely to occur it should report to the nearby police station. The thief cannot dismantle the entire system or break the lock as everything is invisible. This can easily help the owner to identify the

vehicle and the thief can be caught red handed by the police.

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