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Keyless Bike Control System

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Abstract: *Including warning mechanisms is essential in modern car safety systems to improve driver awareness and reduce hazards. A phone call alerting system that activates when a car's ignition is turned on is shown in this abstract. The goal of the suggested solution is to solve the frequent problem of drivers unintentionally leaving their cell phones behind or in dangerous positions while driving. With the ignition state of the vehicle as a trigger, the system guarantees the rapid transmission of a phone call alert to the driver's mobile device. This warning can encourage safer driving habits and lessen distractions by reminding the driver to find and secure their phone before starting their trip. To ensure dependability and user-friendliness, the installation of such a system requires the smooth integration of mobile communication technologies with ignition status sensors. According to preliminary assessments, this alarm system greatly raises driver awareness and lowers the risk of driving while distracted by a phone.*

Keywords: Keyless bike control system, Phone call alert when ignition is on, Bike control

I. INTRODUCTION

This cutting-edge solution improves security with multi-factor authentication and encrypted communication while also streamlining the user experience by doing away with the need for physical keys. It also provides the option to incorporate other intelligent features like usage tracking, remote diagnostics, and customised settings.

When the bike key is turned on, this creative project instantly notifies the mobile user. Advanced sensors and real-time communication technologies are integrated into the system to guarantee that the user is constantly aware of any action pertaining to the bike. This notification alert call provides an additional degree of security and peace of mind, whether it is used to deter theft or merely monitor its usage. Biking has never been smarter or more secure. Say goodbye to uncertainty.

This system's implementation requires a number of crucial elements to function together. The primary processing unit is the ESP32 microprocessor, which also manages the SIM GSM module and keeps an eye on the ignition condition. When the ignition is turned on, the SIM GSM module is in charge of placing the call. A DC jack makes it easier to connect the vehicle's battery to a dependable power source, and a voltage regulator controls electricity to guarantee the electronics run steadily.

II. LITERATURE SURVEY

Shekarapalli bargava ravi kanth et al.,[1] analysed when you hit this button, the system will do several things, such as send an emergency message, find the person who is in danger, and start a phone call using the number you have pre-programmed for them. After pressing the emergency button, the system will immediately SMS the recipient's phone number with an alert message, such as "danger situation." After then, the receiver will receive an SMS with the real-time location coordinates, enabling them to find their target quickly. In an emergency, the recipient's phone number may also be called by the system, allowing for direct communication.

Aditi Golder et al.,[2] examined a home security system that can send a message as quickly as possible and apply a call to the client's GSM (Global System for Mobile) cell phone device. The newest low-cost technology has replaced our home security system. The PIR (Passive Infra-Red) movement sensor, the Arduino sensor, which served as the system's core for movement recognition, and the GSM module—which was utilised to create the system's hardware—were all utilised in this study. This framework participates in the GSM unit's programming analysis using Putty and the Arduino

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IDE. One important feature of this system is the PIR sensor, which is used to detect intrusions from nearby circles and immediately trigger calls to protect users from unauthorised access. The Integrated Home Safety framework could detect and analyse human movement in real time.

Fakhriy Hario Partiansyah et al.,[3] investigated about an OpenBTS with USRP N210-based, low-cost, portable GSM telecommunications infrastructure that may be used in distant locations. Most OpenBTS implementation issues and failures stemmed from the compilation of OpenBTS software. Thus, an experimental implementation of the GSM OpenBTS software version 5.0 on USRP N210 is described in this work. To prevent failure, revisions were made to the dev/build.sh and deb/libcoredumper/build.sh files. After that, asterisk becomes executable thanks to the new script letc/asterisk/extensions-custom.conf. The OpenBTS programme now includes the Asterik softswitch installation, making version 5.0 more user- friendly and practical.

Farhan Fauzi et al.,[4] evaluated to activate the ignition, place the key into the slot to turn the motorbike on or off and into the lock position. In order to deter theft, motorcycles are also outfitted with security equipment like handlebar locks. Motorcyclists frequently have the misfortune of misplacing or breaking their motorbike keys. The project was developed to develop an ignition system using RFID technology, which has been used to e-KTP for user identification instead of traditional ignition, based on the problem. The RC522 RFID reader module is connected to the ATMega328 microcontroller on the Arduino UNO, which serves as the control centre and input for the system's ability to read identifying tags on e-KTP. The handlebar key that is now in use is replaced with a solenoid lock.

M Balachandar et al.,[5] examined the development and application of overload detection systems based on load cells, which can help make truck operations safer and more effective. We are creating an auto-lock ignition system using this effort. The load cell, or any other mechanism, provides the system with its input. The controller never stops searching for these sensors' output. The engine will be locked by the system if there is any indication that the load has exceeded the predetermined limit. In our study, the vehicle overburden is monitored using a microcontroller-based monitoring system. The engine's ignition is stopped by the controller cutting off the spark plug's power supply when the reference voltage from the load cell exceeds the predetermined limit.

S J Swathi et al.,[6] investigated the use of sensors—gas and proximity sensors—password authentication, and RFID technology. The suggested solution involves installing a proximity sensor in the helmet, which prevents the rider from operating the two-wheeler if it is not worn. The purpose of the fixed gas sensor is to detect whether the rider has drunk alcohol. In that case, the ignition system remains off. When the ignition system turns on, a gas sensor detects whether the rider has ingested alcohol. If it has, the ignition system turns off automatically.

Dhruvi k zala et al., [7] assessed the system's main benefit is that, in addition to allowing you to turn off the security lock and prevent your bike from starting when it is too far away from where you are right now, it also gives the owner remote control over their bike. GPS technology is also used, allowing the user to define a fixed area range in the application. If the bike leaves that range, the GPS hardware in the bike will automatically notify the user through the application. The user can then save four or five contacts in the programme already.

Hampika Gorla et al.,[8] examined the goal of this initiative is to ensure passenger and vehicle safety. The model comes with a GPS tracker that allows us to locate the car, and GSM is utilised to provide pertinent vehicle position values via SMS. Thus, the guardians or the owner of the car would get the notification right away and take appropriate action. This method might be used to shorten the lifespan of our cars. The goal of this project is to create a vehicle tracking system. This tracking system consists of a GPS receiver and a mobile smartphone that provide position data to the user. The esp8266 Wi-Fi module uploaded sensor data to the things peak cloud along with the time and date.

III. METHODOLOGY

a. Existing method

Existing keyless bike control systems nevertheless have several issues despite these advancements. Since RFID and BLE signals have a very short range, there may occasionally be problems with connectivity, particularly in areas where there are many obstacles or electrical interference. Furthermore, still potential for improvement in terms of the hardware components' resilience to the severe weather and vibrations that come with riding a motorcycle. Furthermore, there is still potential for improvement in terms of the hardware components' resilience to the severe weather and vibrations that come with riding a motorcycle.

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Due to the possibility of these systems being compromised by advanced hacking techniques, security risks still exist. Relay attacks, for instance, are still a risk since they involve intercepting and extending the signal between the RFID/BLE device and the motorcycle. Some solutions use proximity sensors or extra verification levels, like needing a PIN to be entered on the bike's interface or through a smartphone app, to handle this.

b. Proposed method

The proposed keyless bike control system is intended to improve security, convenience, and functionality while employing cutting-edge technology to overcome the shortcomings of the current systems. The main component of this system is a strong Bluetooth Low Energy (BLE) and GSM integration that is enhanced by an extensive mobile application. A secure, encrypted communication protocol will be incorporated into the system to prevent hacking attempts and guarantee that only authorised devices may communicate with the bike's ignition. To prevent relay attacks and communication problems, proximity sensors and extended-range capabilities will be added to the GSM and BLE signals. Furthermore, the hardware will be made to be incredibly resilient, able to survive the severe weather and shocks that come with riding a motorcycle.

In addition to offering a better user experience by doing away with physical keys, the proposed solution intends to greatly improve the security framework by utilising multi-layered authentication methods and powerful encryption. The suggested keyless bike control system offers a next-generation solution that satisfies the needs of contemporary, tech-savvy motorbike users while solving the shortcomings of keyless ignition systems by including sophisticated smart features and guaranteeing sturdy, long-lasting hardware.

IV. RESULTS AND DISCUSSIONS

The installation of a phone call warning system that was activated by the ignition state of the car showed notable increases in driver awareness and safety. Field studies revealed that drivers were often reminded to find and secure their mobile phones before beginning their journey when they got call notifications. This preventive action successfully decreased the number of times phones were forgotten or left in potentially dangerous places within the car. Additionally, statistical research showed that users were becoming more compliant with safe driving behaviours and that there had been a discernible decrease in phone-related interruptions.

Components used:

- ESP32
- Sim GSM module
- Voltage regulator step down
- 12v power supply
- Bike key switch
- LED’s
- Jumper wires
- Smart phone
- Sim card

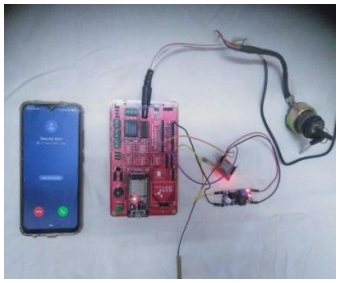

Fig: Alert call when the ignition is on

V. CONCLUSION

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Bicycle security and surveillance are greatly improved with the addition of a phone call warning system that sounds when a bike's ignition is turned on. The system makes use of an ESP32 microcontroller and a SIM GSM module to identify ignition events and instantly notify the owner by phone. By providing consumers with quick notification of any unauthorised or unexpected usage of their car, this real-time warning system lowers the possibility of theft and increases user peace of mind. Power management components, such as the DC jack and voltage regulator, are carefully integrated to guarantee dependable performance and safeguard delicate electronics. All things considered, this solution shows how to use contemporary IoT technology in a useful and effective way to improve bike security. Adding phone call alert system that is activated by the bike's ignition is a practical and preventative way to improve vehicle security. The system identifies when the ignition is turned on with reliability thanks to an ESP32 microcontroller and a SIM GSM module. It then promptly starts a phone call with the selected user. Bike owners can react quickly to any theft or unauthorised usage thanks to this timely notification system, greatly enhancing the security measures in place.

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