



RF Controlled Bike Security System with Helmet Sensor

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Article Information

Received : January 18 2022
Revised : January 26 2022
Accepted : February 02 2022
Published : February 15 2022

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Abstract— Security is primary concern everywhere and for every one. Every person wants his home, industry, valuable belongings such as bikes, cars etc to be safe. Most bikes/cars do not come with an effective protection system, and a determined thief is generally able to steal a car in a matter of seconds. Bike security alarms come in a variety of forms, and offer different levels of protection. The most basic systems can be fitted very quickly by almost anyone, but if you have chosen to get a fully comprehensive bike security alarm system that includes a wide range of feature. In a large number of two wheeler accidents, deaths occur because no preventive actions have been taken beforehand by the driver or those sitting in the two-wheeler. It becomes essential to use protective guard while riding the vehicle. In our paper we propose one such security systems that makes it mandatory for the user to wear a helmet before riding a two wheeler.

Keywords: *Arduino IDE, Embedded System, Bike security, Helmet detection.*

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Citation: Dr. Sudha Arvind, K.Abhinaya, V.Navaya Sree, Md.Mohith, Ch.Sumanth “RF Controlled Bike Security System with Helmet Sensor”, Journal of Science, Computing and Engineering Research, 3(1), 226- 229, 2022.

I. INTRODUCTION

The theft of bike is increased day by day. There is no any security is provided for two wheelers in theft till now. So, in this application the security lock is use through which the control of the bike accessing remains in the user hand. Means if user starts security locks in his/her application then only the bike will be start. There is hardware in bike to control android application. The major advantage of the system is, you can also make the security lock off and stop the bike from starting when your bike is too far from the area when you are currently present means owner have control of his/her bike from very long distance. And it gives voice alerts when the rider is not using helmet [2].

II. EMBEDDED SYSTEMS

The Embedded systems are computer systems that are part of larger systems and they perform some of the requirements of these systems. It is a both combination of software and hardware which together form a component of a larger machine. Embedded systems cover a large range of computer systems from ultra-small computer-based devices to large systems monitoring. Due to small size and requirements for mobility, but also extremely low production costs these systems require small and controlled resource consumption and have limited hardware capacity.

III. LITERATURE SURVEY

1. Microcontroller and Sensor Based Smart Biking System for Drivers Safety ,IEEE 2019 : [1]This paper describes the proposed methodology to build a safety system which is integrated with the smart helmet and intelligent bike to

reduce the probability of two-wheeler accidents, bike theft and drunk drive cases. This device aims for the safety and security of two wheeler riders as well as of two wheeler.

2. Bike Security with Theft Prevention ,IEEE 2018:[2] In “bike security with theft prevention system” There is an android application which is useful to prevent the theft of bike because theft of bike is increased day by day. There is no any security is provided for two wheelers in theft till now. In this system, three layers of protection is use, in first layer of security, second layer and third layer. So that these layers gives indication about the theft.
3. Vehicle Theft Detection and Tracking Based on GSM and GPS,IRJET 2017: [3]These systems constantly watch a moving vehicle and report the status on demand. When the theft is identified, the responsible person sends SMS to the microcontroller, then microcontroller issue the control signals to stop the engine motor. Authorized person needs to send the password to controller to restart the vehicle and open the door. This is more secured, reliable and low cost.
4. Motorcycle theft prevention and recovery security system, IEEE 2017:[4] Motorcycle Theft Prevention and Recovery Security System is a very helpful and effective measure to prevent motorcycle theft. The engine immobilizer or kill switch feature and alarm system are very much useful to prevent thief from stealing motorcycles. In cases of motorcycles that are completely taken, this study helps in the recovery through the use of Global Positioning System (GPS) technology that locates the location of the vehicle.

IV. IMPLEMENTATION OF PROPOSED SYSTEM

The implementation of the paper design can be divided into sections:

a. Hardware and Software implementation.

- Arduino UNO
- Vibration sensor
- Push button
- RF Encoder
- RF decoder
- HT12E
- HT12D
- Buzzer

b. Software Requirements

- Arduino IDE Software

V. PRODESCRIPTION

- Arduino UNO: Is board based open-source Microcontroller and Arduino developed.
- Vibration Sensor : Vibration sensors are piezoelectric accelerometers that sense vibration. They are used for measuring fluctuating accelerations or speeds or for normal vibration measurement
- Push button: Push-button (also spelled pushbutton) or simply button is a simple switch mechanism to control some aspect of a machine or a process. Buttons are typically made out of hard material, usually plastic or metal.
- RF Encoder :The RF module is often used along with a pair of encoder/decoder .The encoder is used for encoding parallel data for transmission feed .
- RF decoder: The decoder is used for decoding the bits that are received from the HT12D
- HT12E: It is commonly used for radio frequency (RF) applications. HT12E simply converts 12 bit parallel data in to serial output which can be transmitted through a RF transmitter
- HT12D :It simply converts serial data to its parallel (may be received through RF receiver) to 12 bit parallel. These 12 bit parallel data is divided in to 8 address bits and 4 data bits.
- Buzzer : An electrical device that makes a buzzing noise and is used for signaling.
- Arduino IDE: With Arduino board this software can be used. Code can be easily written with this open- source software.

VI. PROCEDURAL FLOW

- Start.
- Download Arduino IDE software and power up your board.
- Launch Arduino IDE, then open your first project and select your Arduino board.
- Take power supply ,side lock switch ,Vibration sensor and pull button at the transmitter section.
- Connect ARDUINO UNO ,HT12E,RF encoder in the transmitter section.
- Now connect RF decoder, buzzer, HT12D, LCD in the receiver section.
- Connect the Arduino UNO cable with one port of PC.
- Compile the program in Arduino IDE.
- End.

VII. PROPOSED SOLUTION

- The prototype consisted of two applications ,bike security and helmet detection sensor whether the helmet is worn or not .When the bike is locked when the side lock switch

will be on then whenever it gets any sounds around the bike or anyone is trying to stole then it gives the buzzer sound with LCD display.

- When the rider ready to bike, whenever he on the side lock switch then it gives the continuous beep sound with LCD display ,if he worn the helmet then it will not give any buzzer sound.
- This project consists of RF module .
- Whenever the owner locks his/her vehicle automatically the vibration sensor gets activated and when the rider starts the bike it checks the rider whether he worn the helmet or not.
- When some person want to steal the vehicle automatically the 125dBgets activated with a loud speaker with some alert messages to the near by people. This is a simple and useful security system and easy to install. This vibration detector is realized using readily available, low cost components. And it gives voice alerts when the rider is not using helmet .

“Figure 1” Shows the flow chart of the project.

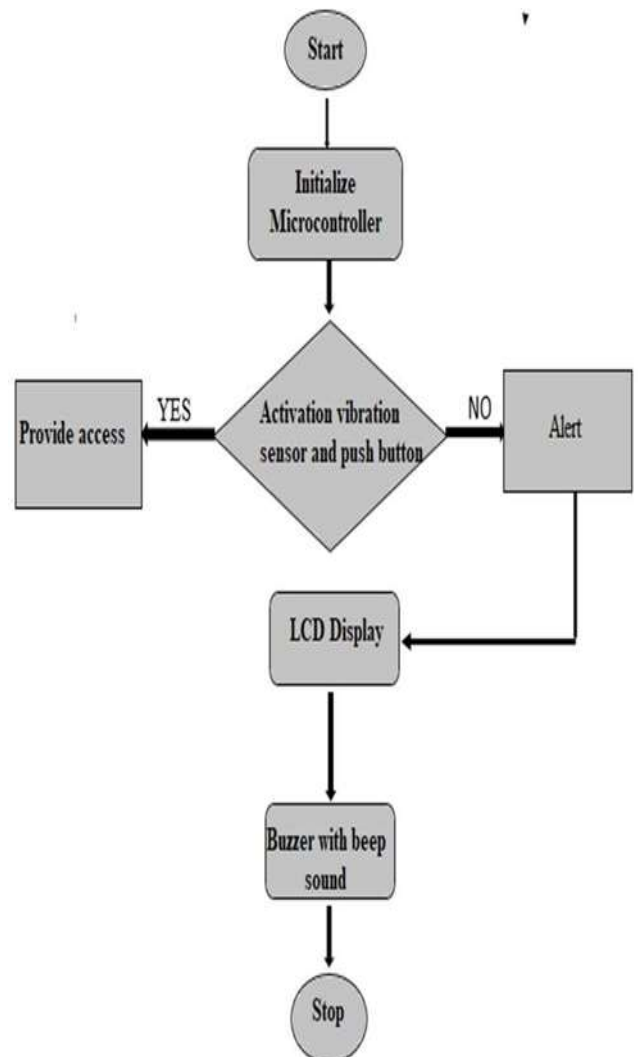


Figure 1: Flow Chart

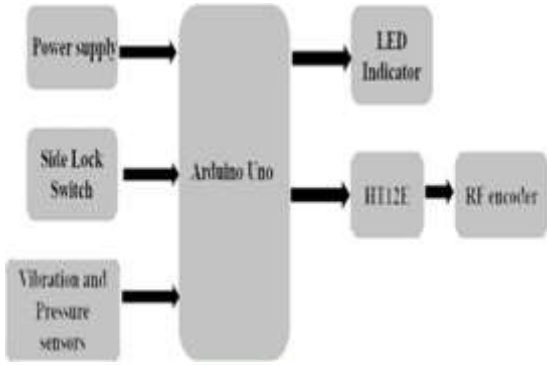


Figure 2 : Block Diagram of RF Transmitter



FIGURE 3: Block Diagram Of RF Receiver

VIII. RESULTS AND DISCUSSION

The output for Bike security system and helmet sensor using vibration sensor and push button is shown in below

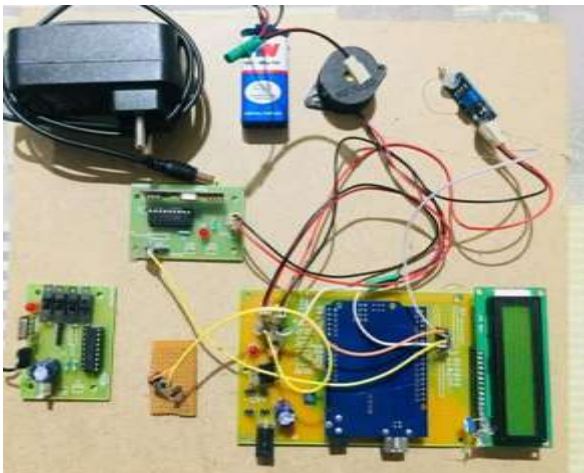


Figure 4 : Overall prototype set up of system

Figure 4 shows the overall set up of the system



Figure 5: System when it is ON

Figure 5 shows the set up when the power supply is Given.

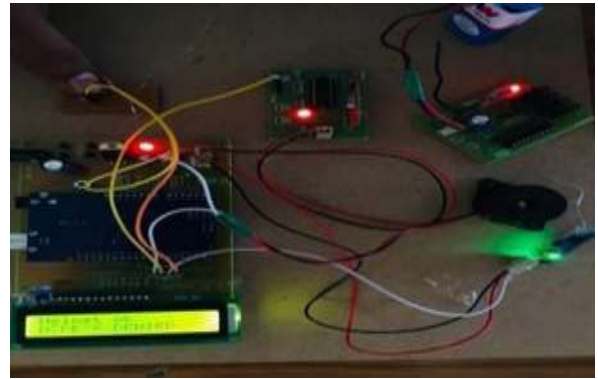


Figure 6: When the unauthorised person tries to unlock the bike

Figure 6 When any unauthorised person makes any sounds in bike surroundings or tries to unlock the bike then it gives the continuous beep sound ,LCD display is shown as “ACCESS DENIED”.

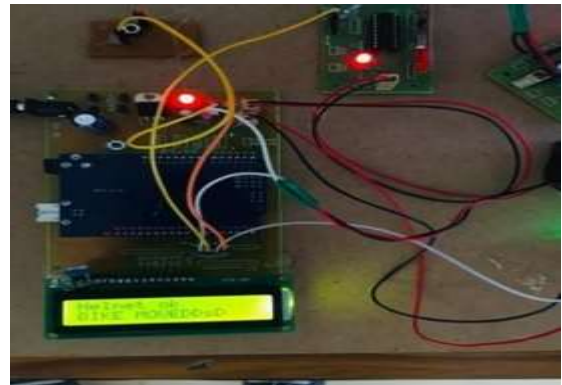


FIGURE 7: When the owner unlocks the bike in which all the equipment are connected.

Figure 7, when the owner keeps the right key then the access will be given to the rider and it displays as “BIKE MOVED”

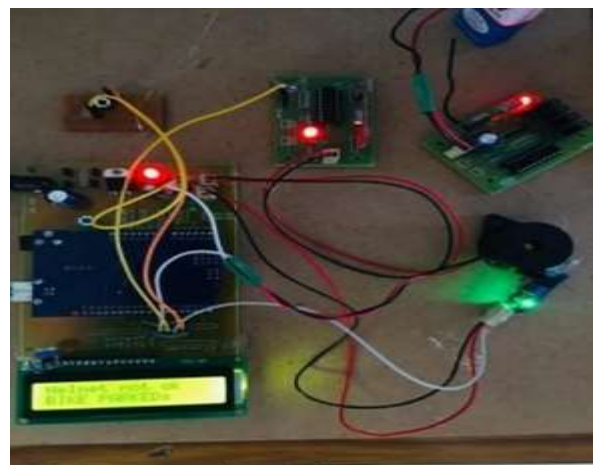


Figure 8: When the rider did not worn the helmet.

“Figure 8”, When the rider unlocks the bike, but he did not worn the helmet then it gives the continuous beep sound and LCD display will show as“HELMET NOT OK”

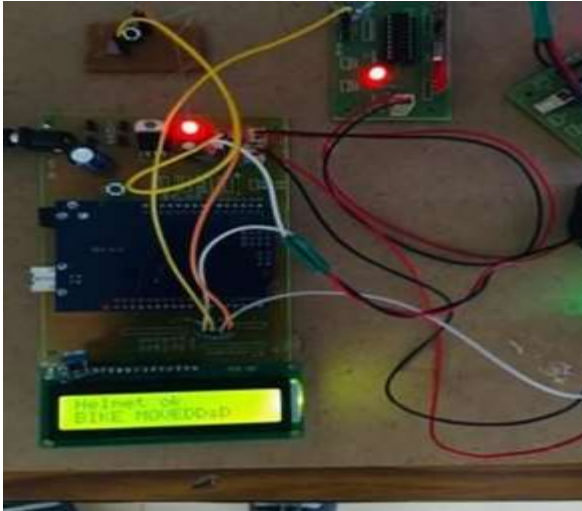


Figure 9 :When the rider worn the helmet.

“Figure 9”,When the rider unlock the bike and the rider worn the helmet then LCD display will show as “HELMET OK”.

IX. CONCLUSION

Bike security features plays the much more in day to day life. The main motto of bike security system is to prevent the bike from the unauthenticated handling and prevents stolen of the bike. The smart helmet ensures safety of the rider by making it necessary to wear it. If the prime safety rules are violated. The proposed system will prevent the biker from starting the bike when he not worn the helmet.It aims to reduce the number of accidents and deaths caused by not wearing helmet and drunken drive in the future. This paper wants riders to be safe and adhere to the law. The device is designed in such a way that only the authenticated user of the vehicle can use it. And if and only if the riders wear the helmet, the ignition system gets on.

X. SCOPE FOR FUTURE WORK

In future, extra sensor in the hardware can be used to detect if the person is alcoholic or not. If the person is alcoholic the bike will not start. By this feature in the bike we can stop the accident of the particular person who is going to ride the bike, this feature facility can be enabling or disable via android application

XI. ACKNOWLEDGMENT

Authors thank ECE Department HoD Prof.G.Srikanth , Director Dr.A.Raji Reddy , CMR Technical Campus, Hyderabad, Telangana for providing necessary infrastructure and Lab Facilities to carry out the required work .

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