

An Anti-Theft System for Two Wheelers

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Abstract: A lot of research are going on in the field of biometrics. The proposed idea in the paper concentrates on the application of biometric for two wheelers especially, motor bikes and scooters. Bicycle theft has increased in the developing countries in the recent years. Being light and easy to hide, a stolen bicycle is often difficult to search. In our day to day life, a lot of motor bikes are missed and it is very difficult to find the location. This paper provides an effective solution in order to ensure more security and avoid unauthorized use of motorbikes. It has, therefore, become a pressing need to develop a low cost, easy to use solution to track the bicycles. In this project, a finger print based simple and efficient electric engine starter is proposed. Simple and effective hardware has been designed, implemented and tested with motorbikes. Test results show that the developed system identify the correct person and allows the right person to start the bike.

Keywords: Biometrics, Fingerprint scanner, Bicycle theft

I. INTRODUCTION

Most of our daily activities take place outside our home. Because of this, transportation affects every aspect of our lives especially in doing our daily routines such as going to work, school, mall, bank, gym, etc., and even back to our home. Without transportation, there are many activities we could not take part in. Transportation has contributed much to the development of economic, social, political and cultural fields by uplifting their condition. In the Philippines, one of the easy transportation today is the motorcycle and it has increasingly becoming the most common means of transportation. In recent days, security plays a major role, especially vehicles. Bicycle is one of the most economic and eco-friendly personal vehicles. It saves time from outrageous traffic in the road and riding on it is also a good exercise for the health conscious people. It is therefore very popular and widely used all over the world. Bike-sharing system has recently been encouraged in some cities to improve urban transportation system.

In earlier days, there had been only two systems to secure bicycle - the key based mechanical lock that is easy to break and the digital lock which is less common due to its high cost. However, none of these conventional systems are as effective as it could be to secure a bicycle from being stolen. Advancement of embedded systems and IoT technology and their availability at low cost mean we can now monitor anything around us all the time. This paper gives you simple and cheapest idea for security of vehicles. In this, The user can monitor their bicycle, get notified if it is touched or moved by someone, and even can track it on their mobile if it is stolen. This is done by establishing a constant communication between the app and the device attached to the bicycle through the cloud. All the information is stored in the cloud and can be accessed via user app anytime. The proposed system is the cheapest digital security system for the bicycle as of our knowledge.

II. BACKGROUND

Bicycle theft is a major problem as the owners of the bicycles are three times as likely to have their bicycle stolen than the car owners. There are few expensive products into the market for the security of bicycles, apart from the traditional bike locks. Troja Bike proposes a concept of a bicycle security system where a device attached to the bicycle notifies the user about the location to their mobile app. They claimed that Troja Bike cannot be removed, destroyed or disabled by the thief, the battery can last up to a season and can then easily be recharged by induction. The position data is transmitted via cellular networks. They also proposed to use Global Positioning System (GPS), Glonass, Galileo and Baidu for communication and a motion detector to protect the bicycle. Sherlock Bike is another commercial product

that costs

122.13 Euro, certainly not affordable for general people [9]. This uses GPS/Glonass module, has a motion sensor, long-lasting battery with no SIM required and Bluetooth feature for short-range communications. 560G, costs 189 USD and has a compact design and light weight [10]. It has been built with Titanium (Grade 5) and it does not have the facility to communicate through smartphones.

2.1 Objective

Proper compatibility of the fingerprint unit with the microcontroller unit is carefully designed. Due to this, starter unit associated with the engine can be able to provide proper security for the vehicles. The proposed finger print based vehicle security system differs from existing electric engine starting system in the way of increased security.

III. EXISTING SYSTEM

When key is turned on, the key switch will be short circuited. By pressing the self starter, the electro motive force will be induced in the relay. Due to the induced emf, the metal rod gets in contact with the terminal. Thus, the motor starts rotating. There is a solenoid assembly to open the contacts and to stop the motor if necessary. This is because; the usage of the starter consumes more electrical power and dries the battery as quickly as possible. The starter system produces rotation of flywheel, and hence rotation of crankshaft, and thus the reciprocating motion of piston start. After suction of charge, the first compression and first power stroke will occur due to starter and thereafter the flywheel will do its job to continue the rotation of the crankshaft.

3.1 Limitations of Existing Model

- Duplicate Keys may be used to start the vehicle.
- No security to the owner.

IV. PROPOSED SYSTEM

Proposed system consists following stages:

1. Fingerprint Sensor
2. Relay
3. Node MCU
4. Battery
5. Shake sensor
6. GPS Module

The system is a combination of a device and an android app. The device is small and can be attached under the bicycle seat so that the thieves do not notice it. The battery provides the continuous power supply to the ignition system. The fingerprint module is to verify the fingerprint of the authorized person and the OLED is used to display whether the fingerprint is matched or not. If the fingerprint is matched, the control of Node MCU will move to relay. The relay in turn ignites the ignition system. But if the fingerprint doesn't match then the buzzer of the bike will start ringing. If key is turned on and fingerprint is matched then the ignition system will be turned on and bike gets mobilized.

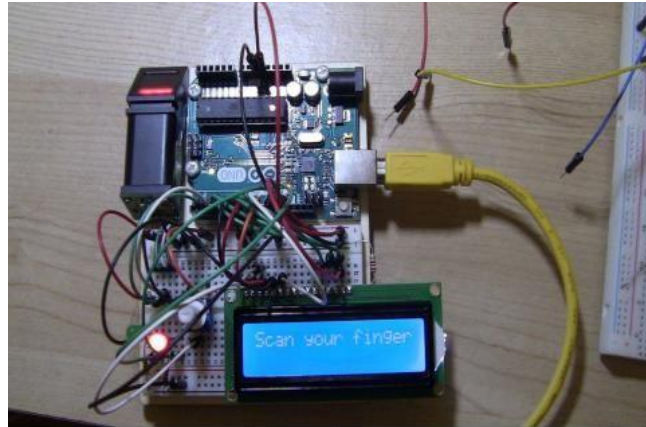
The finger print scanner actually light sensitive micro-chip which consists of either a Charge Coupled Device or a Complementary Metal Oxide Semiconductor image sensor which produces a digital image. The micro controller can be easily analyses the input digital image with the help of stored program.

Relay switches are used to open and close the ignition system according to the voltage applied through it. Normally open or normally closed relays are used. A relay is basically a switch which is operated electrically by electromagnet [6,7]. A relay can be used to control high voltage electronic devices such as motors and as well as low voltage electronic devices such as a light bulb or a fan. The part which powers the relay module is completely isolated from the part which turns ON or OFF.

Node-MCU is an open-source firmware for which open source prototyping board designs are available. The name "Node-MCU" combines "node" and "MCU" (micro controller unit). Node-MCU Dev Kit/board consist of ESP8266

wi-fi enabled chip. The ESP8266 is a low- cost WiFi chip developed by Espressif Systems with TCP/IP protocol. GPS is a system. It's made up of three parts: satellites, ground stations, and receivers. Satellites act like the stars in constellations—we know where they are supposed to be at any given time. The ground stations use radar to make sure they are actually where we think they are.

A receiver, like you might find in your phone or in your parents car, is constantly listening for a signal from these satellites. The receiver figures out how far away they are from some of them. The IR sensor to detect the vibration or pressure applied to the two wheeler. The Vibration can be detected without any error. It does not give the alert when the minimum vibration is applied.



V. CONCLUSION

In this project, we have presented fingerprint based bike theft protection. This idea can be implemented in all motor vehicle companies to increase the security system of two wheelers and also the safety of the riders, and this system will effectively applied in the future and also the result will be better. The completed hardware has been implemented in only two wheeler and tested with right person's finger print in different positions and also wrong person's finger prints. In all the tests, the designed system produced good results. There is 98% success from right person's attempts and 100% success from wrong person's attempts. So, the designed system can be used to secure the two wheelers from theft. The designed system is a better replacement for GPS technology also. In future, the same system with enhanced version can be used for other types of vehicles also. This project is to detect the theft of two wheelers, and detect the user met with an accident and gives the first aid at a quick instant.

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