SMART TWO WHEELER INTELLIGENT RETROFIT KIT SYSTEM

ARAVIND SIDDHARTH.G.S
electrical and electronics engineering panimalar engineering college
chennai,India

JORDEN.B
electrical and electronics engineering panimalar engineering college
chennai,India

JOSEPH ROSHAN.H
electrical and electronics engineering panimalar engineering college
chennai,India

JOTHISHWARAN.R.R
electrical and electronics engineering panimalar engineering college
chennai,India

MADHAVAKANNAN.N
electrical and electronics engineering panimalar engineering college
chennai,India

Abstract -This project describes the need for ease and enhancement of the quality of security systems owned by motorcycles has encouraged manufacturers to produce sophisticated security systems. It aims to reduce the action of criminality that often occurs on motorcycles. One of them is keyless lock ignition locking system.

The keyless ignition system is a key module that has an RF transmitter to transmit data to an RF receiver module on a motorcycle. The device allows the exchange of data can occur within a certain radius. This aims to facilitate the owner of a motorcycle in the opening or lock and turn on or turn off his motorcycle without a key. Because automatically within a certain radius, the motorcycle can be opened by turning the ignition switch only. The keyless ignition locking system also has a unique encryption pattern between the modules. So that if there are two different motorcycles though the same type, there will not happen the error of data transferring.

From 30 times testing lock and unlock the keyless motorcycle. And turn on and turn off the motorcycle. This keyless ignition system can work properly. The percentage obtained in testing turned on a motorcycle at 83%.

I. INTRODUCTION :

The Intelligent two wheelers are advanced vehicles that are equipped with cutting-edge techn0ologies to enhance their performance and safety. These vehicles are designed to provide a comfortable and convenient riding experience, while also minimizing the environmental impact of transportation. They incorporate features such as GPSThe Intelligent two wheelers are advanced vehicles that are equipped with cutting-edge techn0ologies to enhance their performance and safety. These vehicles are designed to provide a comfortable and convenient riding experience, while also minimizing the environmental impact of transportation. They incorporate features such as GPS navigation, collision avoidance systems, automated parking, and smart connectivity, allowing riders to interact with their surroundings in a more intuitive and efficient way. With the increasing demand for sustainable transportation options, intelligent two wheelers are becoming an increasingly popular choice for commuters and enthusiasts alike

II.COMPONENTS USED :

- **a.** Voltage regulator
- **b.** RF Transceiver
- **c.** ESP32 DEV Board
- **d.** Vibration Sensor
- **e.** Relay
- **f.** DC-DCStep Down Converter Module LM2596

III.PROPOSED SYSTEM :

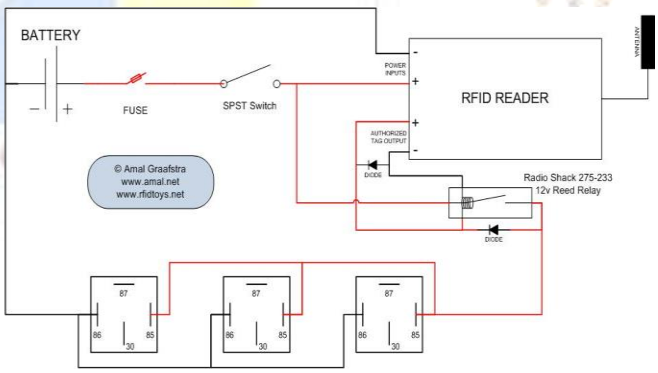

fig1.proposed system

To the proposed system of smart two-wheeler intelligent bike is an innovative solution that aims to improve the safety, performance, and efficiency of two-wheelers. The system integrates advanced technologies like artificial intelligence, IOT, and sensors to provide real-time insights and control over the bike's functions. Here are some of the key features of the proposed system:

- INTELLIGENT SAFETY SYSTEM
- SMART NAVIGATION
- INTEGRATERD COMMUNITY
- PERFORMANCE OPTIMIZATION
- ANTI-THEFT PROTECTION
- OVERVIEW

IV.EXISTING SYSTEM:

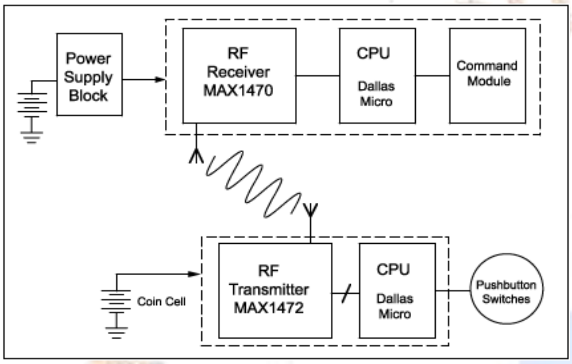

fig.2 Existing system

The existing systems for intelligent two-wheelers vary depending on the anufacturer and model. However, some common features include:

1. Smart sensors: These sensors are used to collect data about the vehicle's performance, including speed, temperature, and battery life. This data is then used to optimize the vehicle's performance and improve its efficiency.

2. Connectivity: Many smart two-wheelers are connected to mobile devices and other IoT devices, allowing riders to access real-time information about their vehicle's performance and location.

3. Anti-lock braking system (ABS): ABS is a safety feature that prevents the wheels from locking up during hard braking, reducing the risk of skidding and loss of control.

4. Traction control: Traction control is a safety feature that helps prevent the wheels from slipping on wet or slippery surfaces, improving stability and control.

5. Collision warning system: This system uses sensors and AI algorithms to detect potential collisions and alert the rider to take evasive action.

6. Electric powertrain: Most smart two-wheelers use electric powertrains, which are more energy-efficient and emit fewer pollutants than traditional gasoline engines.

Overall, these features make smart two-wheelers safer, more efficient, and more connected than traditional vehicles. As technology continues to evolve, we can expect to see even more advanced features in future models.

A security system based on RFID, GPS and GSM [3] consolidate the establishment of an RFID is similar to barcoding. In that, data from a tag or label are captured by a device that stores the data in a database. At the point when the car picks the worker, he/she needs to swap the RFID card. RFID belongs to a group of technologies referred to as Automatic Identification and Data Capture (AIDC). AIDC methods automatically identify objects, collect data about them, and enter those data directly into computer systems with little or no human intervention. RFID methods utilize radio waves to accomplish this. At a simple level, RFID systems consist of three components: an RFID tag or smart label, an RFID reader, and an antenna. RFID tags contain an integrated circuit and an antenna, which are used to transmit data to the RFID reader (also called as interrogator). The reader then converts the radio waves into a more usable form of data. Information collected from the tags is then transferred through a communication interface to a host computer system, where the data can be stored in a database and analysed at a later time. The microcontroller matches the RFID card number with its database records and sends the representative's ID, taxi ID & the taxicab position co-ordinates to the organization unit by means of GSM module. The GSM module will get the message through GSM in the organization unit. On the off chance that worker ends up by himself/herself in an issue, he/she will press the catch button. Microcontroller will distinguish the activity and send a signal to the GSM will intimate the organization unit and the police.

V.FLOWCHART EXPLANATION

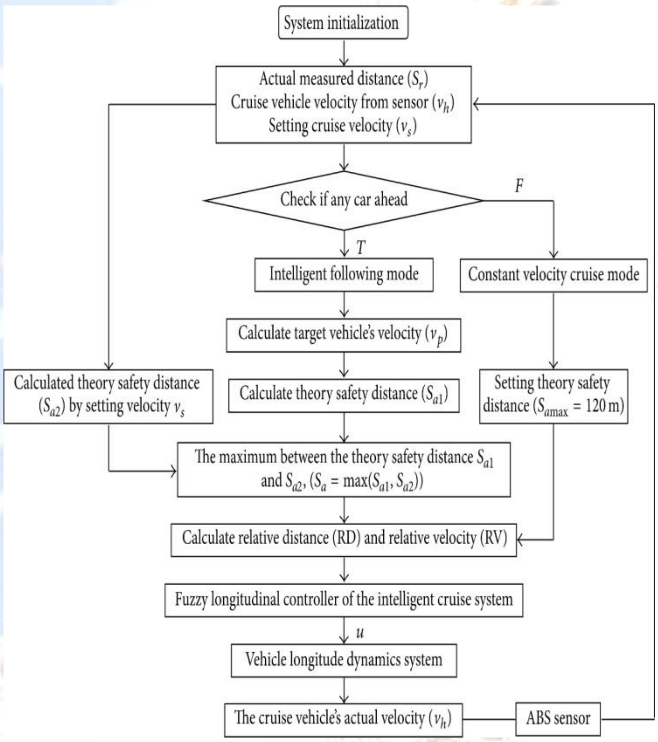

fig.3 flowchart explanation

VI.HARDWARE DESIGN

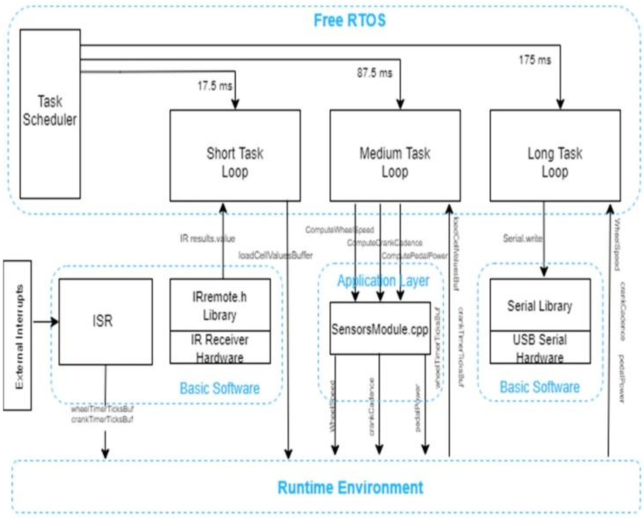

fig.4 hardware design

VOLTAGE REGULATOR :

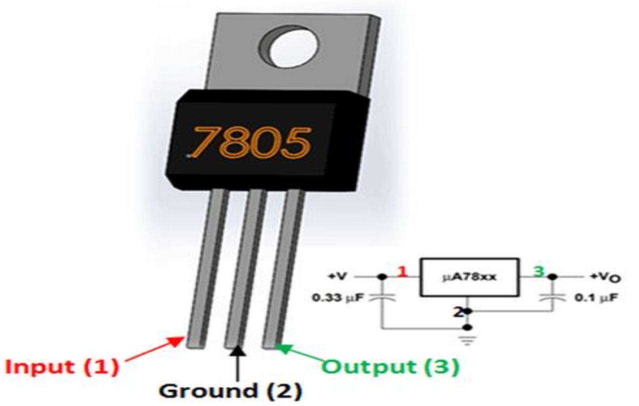

fig.5 voltage regulator

VII. COMPONENTS USED

a.Voltage regulator

b.RF Transceiver

c.ESP32 DEV Board

d.Vibration Sensor

e.Relay

f.DC-DCStep Down Converter Module LM2596

VOUT differentials. It is important to consider the estimated power dissipation of a linear regulator in application, since using larger input voltages results in high power dissipation that can overheat and damage components. Another limitation of linear voltage regulators is that they are only capable of buck (step-down) conversion, in contrast to switching regulators, which also offer boost (step-up) and buck-boost conversion. Switching regulators are highly efficient, but some disadvantages include that they are generally less cost-effective than linear regulators, larger in size, more complex, and can create more noise if their external components are not carefully selected. Noise can be very important for a given application, as noise can affect circuit operation and performance, as well as EMI performance.

REMOTE KEYLESS SYSTEM:

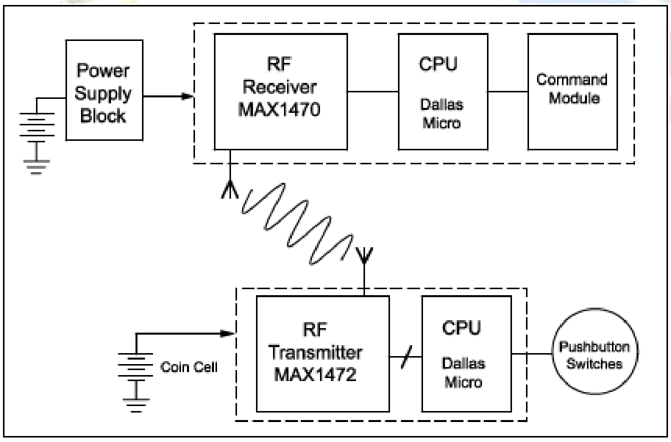

fig.6 remote keyless system

A remote keyless system (RKS), also known as remote keyless entry (RKE) or remote central locking, is an electronic lock that controls access to a building or vehicle by using an electronic remote control (activated by a handheld device or automatically by proximity).RKS largely and quickly superseded keyless entry, a budding technology that restrictively bound locking and locking functions to vehicle-mounted keypads.

Widely used in automobiles, an RKS performs the functions of a standard car key without physical contact. When within a few yards of the car, pressing a button on the remote can lock or unlock the doors, and may perform other functions.

A remote keyless system can include both remote keyless entry (RKE), which unlocks the doors, and remote keyless ignition (RKI), which starts the engine.

KEYLESS IGNITION SYSTEM:

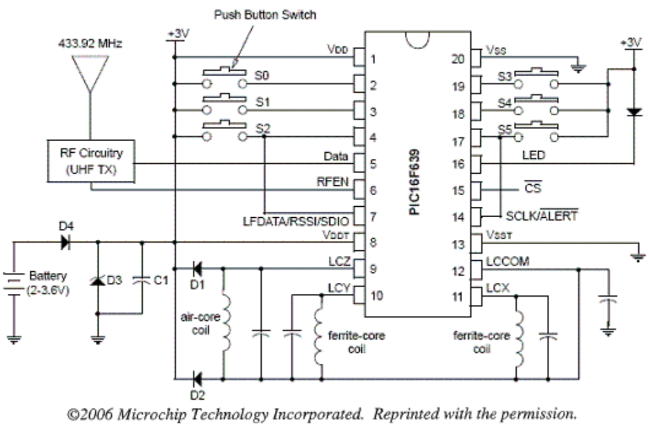

fig.7 keyless ignition system

Some cars have a proximity system that is triggered if a transponder car key is within a certain distance of the car and is sometimes called hands-free or advanced key.One of the earliest systems was found on the 1993 Chevrolet Corvette (called the Passive Keyless Entry System) and in Mercedes-Benz vehicles from 1998.Today, this system is commonly found on a variety of vehicles, and although the exact method of operation differs between makes and models, their operation is generally similar: a vehicle can be unlocked without the driver needing to physically push a button on the key fob to lock or unlock the car and is also able to start or stop the ignition without physically having to insert the key and turning the ignition. Instead, the vehicle senses that the key (which may be located in the user's pocket, purse, etc.) is approaching the vehicle.A simpler version of the smart key system is the engine immobiliser, involving a security key system embedded into most modern vehicle's keys. A small chip rests on the vehicle's key or under the plastic key cover.

RF TRANSCEIVER:

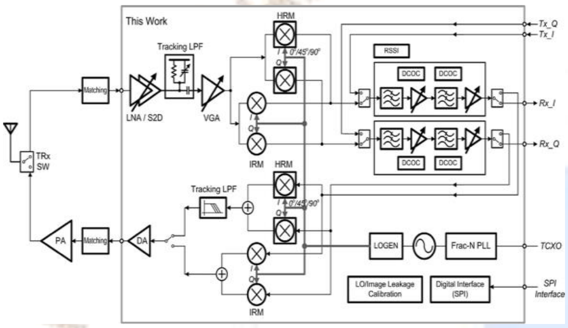

fig 8.rf transceiver

The Working Principle of RF Transceivers:

RF transceivers consist of an antenna and a tuner. The antenna receives transmitted signals while the tuner separates them.

To send signals, an RF amplifier is used to boost the signal strength out of the antenna for better range. The antenna then takes this signal and converts it into electromagnetic waves. These EM waves travel through the receiver's antenna.The receiver's antenna will then modify the incoming signals back into the current. This process is reversed when sending information back to its originator.

Detectors or demodulators extract information that was encoded before transmission. Radio techniques are also used to limit localised interference and noise. Moreover, oscillators come in handy when transmitting a new signal. They create sine waves, encoded and broadcast as radio signals.

Overall, RF transceivers form the link between two devices within communication networks. Without them, wireless communications would be virtually impossible.

VIII.CONCLUSION:

In this project, we made detailed go thorough learning on a mixture of different components of kit circuits is obtainable in an effective manner. The technologies projected under every group has been finished and presented here in a successful manner. In order to figure out, an immense lesson was complete the growth of kit circuits in all dimensions as well as right through the time, smart kit system circuits has been evolved. Experiments and new technology components has been proposed and tested. Smart kit circuit significant information was noted and a smart device that creates talented outcome of the results in prevents accidents by monitoring various conditions. We observed that same information applied on a quantity of cases, various algorithms creates entirely different results. The foremost complexity faced by kit system is choosing a suitable conceptual algorithm that would superior suit the accident free and lighter version.

A uncomplicated readily obtainable well known Arduino uno nothing but microcontroller always choosed by scientist, educators and researches for use of smart design. The final outcome of the literature is safe and secure travel between source to destination. Developed smart kit system is a valuable answer to numerous troubles. Compulsory condition to start a two-wheeler bike was wearing the component kit and also human being clear head which in turn reducing the probability of road accidents.

The proposed smart kit device maintenance the two-wheeler driver and create safer roads because it acts as a virtual policeman. The device Smart kit using radio frequency is price valuable and beneficial methodologies. The smart kit device method ensures the security of the two-wheeler rider by wearing the component of kit. Adjacent located hospital, road transfort officiers, and members available in their family are being conveyed regarding two wheeler accidents. Automatic documentation, identification, and statement the accident immediately with very high accuracy has been done with the help of accident detection algorithm.

IX.REFERENCES

[1] StamosKatsigiannis , Rhys Willis, and NaeemRamzan, (2019), "A QoE and Simulator Sickness Evaluation of a Smart-Exercise-Bike Virtual Reality System via User Feedback and Physiological Signals",IEEE Transactions On Consumer Electronics, 65(1),119-127.

[2] Sayanee Nanda, Harshada Joshi and SmitaKhairnar,(2018), "An IOT Based Smart Systemfor Accident Prevention and Detection", Fourth International Conference on Computing Communication Control and Automation (ICCUBEA), 1(1), 1-6.

[3] Divyasudha N, Arulmozhivarman P and Rajkumar E, (2019), "Analysis of Smart kits and Designing an IoT based smart kit: A cost effective solution for Riders", 1st International Conference on Innovation in Information and Communication Technology (ICIICT), 1(1), 1-4. [4] Jesudoss A, Vybhavi R and Anusha B, (2019), "Design of Smart Kit for Accident Avoidance", International Conference on Communication and Signal Processing, 1(1), 0774-0778.

[5] Durga K Prasad Gudavalli, Bh.Sudha Rani and C.Vidyasagar, (2017), "Kit Operated Smart E-Bike", IEEE International Conference On Intelligent Techniques In Control, Optimization And Signal Processing, 1(1), 1-5.

[6] RashmiVashisth, Sanchit Gupta, Aditya Jain, Sarthak Gupta, Sahil, PrashantRana, (2017), "Implementation And Analysis Of Smart Kit", 4th IEEE International Conference on Signal Processing, Computing and Control (ISPCC 2k17), 1(1), 111-117.]

I. Code for the Prototype

II. #include <BleKeyboard.h>
III. #define volup 12
IV. #define voldown 13
V. #define play 14
VI. #define next 27
VII. #define prev 26
VIII.
IX. BleKeyboard bleKeyboard;

```

void setup() {
  pinMode(volup, INPUT_PULLUP);
  pinMode(voldown, INPUT_PULLUP);
  pinMode(play, INPUT_PULLUP);
  pinMode(next, INPUT_PULLUP);
  pinMode(prev, INPUT_PULLUP);
  Serial.begin(115200);
  Serial.println("Starting BLE work!");
  bleKeyboard.begin();
}

void loop() {
  if(bleKeyboard.isConnected()) {

    if(digitalRead(volup)== LOW){
      Serial.println("VOLUME UP");
      bleKeyboard.write(KEY_MEDIA_VOLUME_UP);
      delay(500);
    }

    else if(digitalRead(voldown)== LOW){
      Serial.println("VOLUME DOWN");
      bleKeyboard.write(KEY_MEDIA_VOLUME_DOWN);
      delay(500);
    }

    else if(digitalRead(play)== LOW){
      Serial.println("PLAY or PAUSE the music");
      bleKeyboard.write(KEY_MEDIA_PLAY_PAUSE);
      delay(500);
    }

    else if(digitalRead(next)== LOW){
      Serial.println("Next track");
      bleKeyboard.write(KEY_MEDIA_NEXT_TRACK);
      delay(500);
    }

    else if(digitalRead(prev)== LOW){
      Serial.println("previous track ");

bleKeyboard.write(KEY_MEDIA_PREVIOUS_TRACK);
      delay(500);
    }
  }
}
#include <BLEDevice.h>
#include <Arduino.h>
#include <BLEUtils.h>
#include <BLEScan.h>
#include <BLEAdvertisedDevice.h>
#include <BLEEddystoneURL.h>
#include <BLEEddystoneTLM.h>
#include <BLEBeacon.h>

#define ADDRESS "ff:ff:10:79:5a:0a"
#define UUID "6b27b72c-9fdd-beb9-9f41-579ef9e81b82"
#define UUID2 "85eae855-eba2-478a-2b46-20112810c08a"


#define ENDIAN_CHANGE_U16(x) ((((x)&0xFF00) >> 8)
+ (((x)&0xFF) << 8))

#define RELAY_PIN 13
#define SCAN_INTERVAL 1000
#define TARGET_RSSI -85
#define MAX_MISSING_TIME 7000

BLEScan* pBLEScan;
unsigned long lastScanTime = 0;
boolean found = false;
unsigned long lastFoundTime = 0;

int rssi = 0;


class MyAdvertisedDeviceCallbacks: public
BLEAdvertisedDeviceCallbacks
{
  void onResult(BLEAdvertisedDevice advertisedDevice)
          {
    std::string strManufacturerData =
advertisedDevice.getManufacturerData();

      uint8_t cManufacturerData[100];
      strManufacturerData.copy((char
*)cManufacturerData, strManufacturerData.length(), 0);

    Serial.print("Device found: ");
    Serial.println(advertisedDevice.toString().c_str());
    rssi = advertisedDevice.getRSSI();
      Serial.println("RSSI: ");
      Serial.println(rssi);

      BLEBeacon oBeacon = BLEBeacon();
      oBeacon.setData(strManufacturerData);
Serial.printf("iBeacon Frame\n");
      Serial.printf("ID: %04X Major: %d Minor: %d
UUID: %s Power: %d\n", oBeacon.getManufacturerId(),
ENDIAN_CHANGE_U16(oBeacon.getMajor()),
ENDIAN_CHANGE_U16(oBeacon.getMinor()),
oBeacon.getProximityUUID().toString().c_str(),
oBeacon.getSignalPower());


    if(advertisedDevice.getAddress().toString() ==
ADDRESS||oBeacon.getProximityUUID().toString() ==
UUID||oBeacon.getProximityUUID().toString() == UUID2)
    {

      found = true;
      advertisedDevice.getScan()->stop();


    }

  }
  } ;

void setup()
{
  Serial.begin(115200);

  pinMode(RELAY_PIN, OUTPUT);
  digitalWrite(RELAY_PIN, LOW);


  BLEDevice::init("");
  pBLEScan = BLEDevice::getScan();
  pBLEScan->setAdvertisedDeviceCallbacks(new
MyAdvertisedDeviceCallbacks());
  pBLEScan->setActiveScan(true);
  BLEScanResults foundDevices;
 //  Serial.print("Found gadgets: ");
  Serial.println(foundDevices.getCount());
}

void loop()
{
  unsigned long now = millis();

  if(found){

    found = false;

    if(rssi > TARGET_RSSI){
      lastFoundTime = millis();
      digitalWrite(RELAY_PIN, HIGH);
      lastFoundTime = now;
    }
  }

  else if(now - lastFoundTime > MAX_MISSING_TIME){
    digitalWrite(RELAY_PIN, LOW);
  }

  if(now - lastScanTime > SCAN_INTERVAL){

    lastScanTime = now;
    pBLEScan->start(1);
  }
}
```