**Innovative Helmet**

**Aim:** To make a smart helmet that can detect and send an alert via SMS.

**Components required:**

|  |  |  |
| --- | --- | --- |
| **Name** | **Quantity** | **Component** |
| U1 | 1 | Arduino Uno R3 |
| U2 | 1 | Wi-Fi Module (ESP8266) |
| R1, R3, R5 | 3 | 1 Ohm Resistor |
| R2 | 1 | 2.2 Ohm Resistor |
| D1, D2 | 2 | Red LED |
| R4 | 1 | 220 Ohm Resistor |
| DIST1 | 1 | Ultrasonic Distance Sensor |
| TILT1 | 1 | Tilt Sensor |

**A close up of a device

Description automatically generatedCircuit diagram:**

**Code:**

|  |
| --- |
| #include <ESP8266WiFi.h>  char \* MakerIFTTT\_Event = "Accident";  char \* MakerIFTTT\_Key = "ZRp8Dg3RtdlV3NcBM5ncVYTUX7M7vtJIJCO2ZgH\_Nx";  char \* hostDomain = "maker.ifttt.com";  const int hostPort = 80;  const int sleepTimeS = 30;  int distanceThreshold = 0;  int cm = 0;  int inches = 0;  int tiltRead;  char \* ssid = "My-Wifi";  char \* password = "WiFi@123$";  WiFiClient client;    void setup()  {  Serial.begin(115200);  delay(50);  Serial.println();  Serial.println("ESP8266 in normal mode");  Serial.println();  pinMode(A5, INPUT);  pinMode(9, OUTPUT);  pinMode(13, OUTPUT);  connectToWiFi(ssid, password);  }  void loop()  {  distanceThreshold = 150;  cm = 0.01723 \* readUltrasonicDistance(7, 6);  inches = (cm / 2.54);  Serial.print("\nTilt sensor read: ");  Serial.println(tiltRead);  Serial.print(cm);  Serial.print("cm, ");  Serial.print(inches);  Serial.println("in\n");  tiltRead = digitalRead(A5);    if(cm <= distanceThreshold)  {  digitalWrite(13, HIGH);  delay(1000);  Serial.print("Vehicle very near detected.");  }    if(tiltRead < 1)  {  digitalWrite(9, HIGH);  delay(1000);  Serial.print("Helmet tilted.");  }  if(tiltRead < 1 && cm <= distanceThreshold )  {  ifttt\_trigger(MakerIFTTT\_Key, MakerIFTTT\_Event);  }  }  void connectToWiFi( char \* ssid, char \* pwd)  {  int ledState = 0;  Serial.println("Connecting to WiFi network: " + String(ssid));  WiFi.begin(ssid, pwd);  while (WiFi.status() != WL\_CONNECTED)  {  delay(500);  Serial.print(".");  }  Serial.println();  Serial.println("WiFi connected!");  Serial.print("IP address: ");  Serial.println(WiFi.localIP());  }  String ifttt\_trigger(String KEY, String EVENT)  {  String name = "";  client.stop();  if (client.connect(hostDomain, hostPort))  {  Serial.println("Connected");  String toSend = "GET /trigger/";  toSend += MakerIFTTT\_Event;  toSend += "/with/key/";  toSend += MakerIFTTT\_Key;  toSend += "Estimated distance: ";  toSend += distance;  toSend += "tilt";  toSend += tilt;  toSend += hostDomain;  toSend += "\r\n";  toSend += "connection: close\r\n\r\n";  client.print(toSend);  }  else  {  Serial.println("Connection failed");  return "FAIL";  }  } |

![A screenshot of a cell phone

Description automatically generated]()**Serial Monitor output:**

**Procedure:**

1. All the connections are made as shown in the circuit diagram.

2. In IFTTT an applet is created with webhook and SMS service to a predefined mobile number.

3. All the credential like IFTTT key has to be given in the code for appropriate usage.

4. When ever an event with predefined condition is triggered it sends an SMS to the predefined number from IFTTT.

**Explanation:**

In this project of Innovative Helmet, the circuit is connected as shown in the circuit diagram with Ultrasonic sensor, Tilt sensor, Arduino, Wi-Fi Module (ESP8266), LED, Resistors and Connecting wires. After setting up the connections and code the program is uploaded to board and simulated. When ever the Ultrasonic sensor detects the distance of the vehicle less than or equal predefined threshold distance and the tilted becomes 0, it indicates that the accident has happened. So, when this condition is triggered it sends an SMS to a particular mobile number using IFTTT.

**Conclusion:**

A smart Helmet that can detect the accident and send a SMS has been developed successfully.

**Submitted by,**

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