SMART HELMET ACCIDENT DETECTION AND EMERGENCY ALERT SYSTEM USING IOT

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PROJECT GUIDE : Mrs SWATHY AJITH

AIM

A smart, IoT enabled that fits within a helmet detects accidents, monitors the rider's location, and notifies emergency contacts instantly.

OBJECTIVES

To improve the safety of the rider by:

• Alert emergency contacts in case of an accident

• Sending the current location and therefore increasing the possibility of survival by giving medical support on time.

METHODOLOGY

• Integrates sensors (accelerometer, gyroscope) to detect accidents by monitoring motion and impact force

• Uses a microcontroller to analyze sensor data and trigger alerts if an accident is detected

• Sends SMS, WhatsApp, and call alerts with real-time location information to emergency contacts

• Manages user settings, emergency contacts, and device configuration through an easy-to-use interface

• GPS tracks the helmet's real-time location and updates emergency contacts during an accident

SYSTEM ARCHITECTURE

Hardware Components

1. Microcontroller (ESP32)
2. Accelerometer+Gyroscope (MPU6050)
3. GPS Module

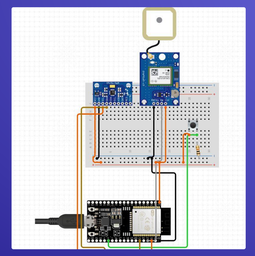
Software Components

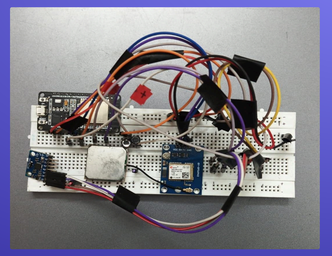
1. Embedded Code (C/C++)
2. Frontend (React.js)
3. Backend (Express.js)
4. Database (MongoDB)

KEY FEATURES

- Automatic Accident Detection
- Real Time GPS
- Emergency Alert
- User-Friendly Driver (Web based)

CIRCUIT DIAGRAM | PRODUCT | BLOCK DIAGRAM





CONCLUSION

This Smart Helmet system brings a new level of safety and peace of mind for riders, enabling quicker emergency response for saving lives. By bridging technology and safety, this product empowers families and emergency responders to be more proactive in accident scenarios. It assures quicker response to such unfortunate incidents thereby decreasing the chance of losing lives due to the lack of quick and efficient medical support.

RESULT

The device successfully detects accidents using integrated sensors, triggering alerts to emergency contacts with real time location details.

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