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IOT BASED SMART HELMET TO START MOTOR BIKE AND RIDER ACTIVITY MONITORING

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ABSTRACT

The "IoT-Based Smart Helmet for Motorbike Activation and Rider Activity Monitoring" project introduces an innovative solution that revolutionizes motorbike safety and rider behavior monitoring. Leveraging NodeMCU, alcohol sensors, touch sensors, limit switches, and gyroscopes, this smart helmet system offers a comprehensive approach to motorbike activation, rider safety, and real-time activity tracking. Motorbike accidents and rider behaviour are significant concerns, and this project addresses these issues head-on. The smart helmet is equipped with an array of sensors and communication modules to enhance safety and accountability.

To start the motorbike, the rider must wear the smart helmet. The helmet features an alcohol sensor that prevents vehicle activation if alcohol is detected. Additionally, a touch sensor ensures that the helmet is worn correctly. During the ride, If a mobile phone is detected while driving, the motorbike is automatically immobilized. In the event of a fall, the gyroscope detects the impact and sends an alert. All this critical information, including motorbike activation status, alcohol detection, and fall alerts, is transmitted in real-time over IoT. This allows riders to review their activity and promotes responsible behaviour.

INTRODUCTION

In today's rapidly evolving technological landscape, the Internet of Things (IoT) has emerged as a transformative force, revolutionizing the way we interact with and manage various aspects of our daily lives. The integration of IoT in power metering systems represents a pivotal advancement, offering unprecedented capabilities in monitoring, analyzing, and optimizing energy consumption. A Power Meter using IoT (Internet of Things) is a sophisticated device that combines traditional energy measurement with advanced connectivity and

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data analytics. Unlike conventional power meters, IoT-enabled power meters integrate sensors and wireless communication capabilities to provide real-time and accurate insights into energy consumption. These smart meters capture data on voltage, current, and other relevant parameters, transmitting this information to centralized cloud platforms via wireless protocols like Wi-Fi or Bluetooth. The centralized data allows users to remotely monitor and analyze their energy usage, enabling informed decisions for efficiency, cost savings, and sustainability. The integration of IoT in power meters not only enhances monitoring capabilities but also opens avenues for predictive analytics, automation, and optimized grid management, contributing to a more intelligent and responsive
energy ecosystem.

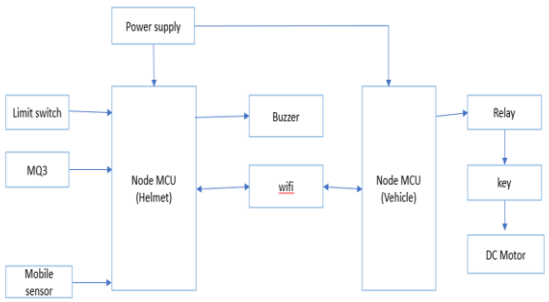

Figure.1 Block Diagram

OBJECTIVE OF THE PROJECT

Motor bike accidents and rider behavior are significant concerns , and this project addresses these issues head-on. The smart helmet is equipped with an array of sensors and communication modules to enhance safety and accountability.

Here are references for a theft vehicle detection system using IoT:

LITERATURE SURVEY

Technological Components:

Explore the key technological components required for an IoT-based smart helmet, such as sensors, connectivity modules (like Bluetooth or Wi-Fi), microcontrollers, and power sources. Review existing studies or projects that have implemented similar technological setups.

Motorcycle Safety and Accident Prevention:

Examine literature on motorcycle safety, focusing on the role of helmets in preventing head injuries and fatalities.

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Investigate how IoT technology can contribute to improving motorcycle safety, including collision detection, emergency alerts, and automated assistance systems.

Rider Activity Monitoring:

Discuss the importance of monitoring rider activity for enhancing safety and performance.

Review studies on wearable sensors for monitoring physiological parameters like heart rate, body temperature, and fatigue levels during motorcycle riding.

Explore how IoT-based smart helmets can integrate sensors for real-time monitoring of rider behavior and health status.

IoT Communication Protocols and Platforms:

Evaluate different communication protocols and platforms suitable for IoT-based smart helmet systems, considering factors such as range, power consumption, and data transmission reliability.

Discuss the integration of cloud platforms for data storage, analysis, and remote monitoring of rider activity.

User Experience and Human Factors:

Consider user experience design principles for smart helmet interfaces, including ease of use, comfort, and accessibility.

Review studies on user acceptance and adoption of wearable technologies in motorcycle riding contexts.

PROPOSED SYSTEM

The power supply is given to both ESP8266 NodeMCU sender and receiver. After proper wearing of helmet the aluminium foil inside the helmet gets pressed and a connection is generated. Now the relay will gets activated with green light and the bike will be started. The MQ3 sensor, touch sensor, helmet switch and buzzer and connected to D6, D4, D5,D3 respectively for the sender side ESP8266 NodeMCU. MQ3- “0” will be represented if there is any presence of alcohol. Touch sensor- “0” will be represented for presence of touch. Helmet switch- “1” will be its on state. Whenever the MQ3, touch sensor shows “0” and helmet switch goes to “0” the will get activated and the bike will be turned off.

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RESULT

Figure.2 Kit demonstration

CONCLUSION

- Provides rider safety
- Turns off the bike when rider consumes alcohol
- Turns of the bike when rider uses mobile

FUTURE SCOPE

The future scope of an IoT-based smart helmet using the ESP8266 and MQ3 alcohol sensor project is quite promising. It can have applications in various industries, such as transportation, construction, and emergency services.

In the transportation sector, these smart helmets can be used by motorcycle riders, cyclists, and scooter riders to ensure their safety on the road. The alcohol sensor can help prevent accidents by detecting alcohol levels and alerting the rider if they are unfit to ride. Additionally, these helmets can incorporate other sensors like GPS, accelerometer, and gyroscope to provide real-time data on speed, location, and impact detection, further enhancing safety.

In the construction industry, smart helmets can be used to monitor workers' safety by detecting environmental hazards like toxic gases, excessive heat, or low oxygen levels. The helmets can send alerts to both the worker and the supervisor, ensuring timely action is taken to prevent accidents or health risks.

Emergency services can also benefit from smart helmets. Firefighters can use them to monitor their vital signs, detect hazardous gases, and communicate with their team members in real-time. This can greatly improve their safety and effectiveness during rescue operations.

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ADVANTAGES

Promotes responsible behaviour.

Reduced accident rates.

Driver Safety.

APPLICATION

Can be used for different variant of two wheeler vehicles

REFERENCES

1.Ramalatha, M., Ramkumar, A. K., Selvaraj, S. and Suriyakanth, S. (2014) RFID Based Personal Medical Data card for Toll Automation. Elysium Journal Engineering Research and Management. Volume1, ISSN:2347-4408, pp 51-52.

2.Santhosh, S. and Sanihosh K. K. (2013) Campus Access Control System RFID Based. International Journal of Electronics and Computer Science Engineering. Volume 1, Number 3, ISSN: 2277-1956, pp 1439

3. Karithik, K. (2014) advanced College Surveillance. International Journal of Scientific and Research publications.

4. Xiaolong, L. (2009) Design and Implementation of a Digital parking lot Management System.

5. Technology interface Journal Harri, N. (2011) The Study of Business Opportunities and Value add of NFC application in Security Access Control Solution.

6. Master thesis, Department of Business administration, Kemi-Tornio, pp 17-19. Fang, Z., Dagu, H., Zheng, D. and Viping, H. (2008) Design and Implementation of an automatic Clearance Control System based on RFID. IEEE 7th world congress intelligent control and automation (WCICA). Pp 6621 -6626.