

**BICYCLE HELMET WITH A
PULSE SENSOR, TEMPERATURE
AND LED SIGNAL.**

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ABSTRACT

Since cycling is a common form of entertainment and transportation, safety precautions need to be given more attention. While conventional bicycle helmets provide impact protection, the addition of an LED signalling system, temperature monitoring system, and pulse sensor is intended to improve safety. The project aims to deliver a complete system that improves road visibility, offers real-time health analytics, and protects riders.

The idea was inspired by the growing convergence of technology and safety, which highlights the need to go beyond the features found in traditional helmets. By including a pulse sensor, the cyclist's heart rate can be continuously monitored, protecting their cardiovascular system and avoiding overexertion. Temperature monitoring enhances rider safety and comfort in a variety of weather scenarios. By improving visibility, LED signalling systems lower the chance of accidents. Iterative improvements, testing, assembly, and careful component procurement are all part of the technique.

Why this idea was inspired because the inclusion of temperature monitoring in the smart helmet was conceived with the aim of enhancing rider safety and comfort across diverse weather conditions. This feature equips cyclists with real-time insights into their surroundings, enabling them to adapt their rides based on ambient temperatures. It addresses a critical aspect of the cycling experience, ensuring that riders are better prepared and more comfortable, regardless of environmental variations.

Furthermore, the integration of LED signalling systems was inspired by a commitment to improving visibility and communication on the road. Recognizing the vulnerability of cyclists, especially in busy or low-light conditions, the LED signals serve as an innovative safety feature. This not only reduces the likelihood of accidents but also establishes a proactive means for cyclists to communicate their intentions to other road users.

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CHAPTER 1

INTRODUCTION

1.1 Background of Study

This project proposes bicycle helmet with a pulse sensor, temperature and led signal as the approach. Cycling has evolved from a simple means of transportation to a lifestyle choice that promotes fitness and sustainability. However, as more individuals embrace cycling, the need to enhance safety measures and overall comfort becomes increasingly apparent. The conventional bicycle helmet, while fundamental for protection, is ripe for innovation. This realization has led to the conceptualization of the Smart Bicycle Helmet, integrating features such as a Pulse Sensor, Temperature Monitoring, and LED Signal System to revolutionize the cycling experience.

Traditionally, helmets have focused primarily on protecting the head during impacts. However, the integration of a Pulse Sensor into the Smart Bicycle Helmet introduces a new dimension by offering real-time health monitoring. Cyclists can now keep track of their heart rate during rides, promoting health awareness. Additionally, the Pulse Sensor acts as a safety net, detecting irregularities and sending alerts to emergency contacts in the event of potential health issues, ensuring a prompt response. Environmental factors significantly impact the cycling experience. The Smart Bicycle Helmet addresses this by incorporating Temperature Monitoring. Cyclists receive immediate feedback on weather conditions, allowing them to adapt their rides accordingly. This feature not only enhances comfort but also prevents health risks associated with extreme temperatures, making cycling a more enjoyable and safer activity.