IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 1, January 2026
Impact Factor: 7.67

Third Eye: A Smart Companion for Blind Safety

Kruthika KS[1], Nisha SJ[2], Sinchana HP[3], Husna Banu[4]
[1,2,3] B.E. Scholars, Department of CSE
[4]Assistant Professor, Department of CSE
Kalpataru Institute of Technology, Tiptur, India

Abstract: *Visual impairment poses significant challenges to the mobility, independence, and overall safety of affected individuals, particularly in unfamiliar or dynamic environments. Navigating safely becomes a major concern, as visually impaired users must rely heavily on tactile and auditory cues to avoid obstacles and hazards. Traditional mobility aids, such as white canes and guide dogs, have been instrumental in assisting visually impaired individuals. However, these solutions present several limitations: white canes only detect obstacles upon direct contact and are restricted to ground-level hazards, while guide dogs require extensive training, maintenance, and incur substantial costs, limiting accessibility for many users. These limitations underscore the need for innovative, low-cost, and practical assistive technologies that enhance real-time environmental awareness without imposing significant burdens on the user.*

The design of the Third Eye system emphasizes compactness, portability, and ease of use. The device is lightweight and intended for hands-free operation, allowing it to be mounted unobtrusively on common accessories such as caps, eyeglasses, or belts. The wearable form factor ensures comfort during extended use and minimizes interference with daily activities. Moreover, the system is energy-efficient, powered by a small battery, and constructed from low-cost components, making it suitable for widespread deployment, including in resource-constrained or low-income regions.

Experimental testing of the Third Eye system demonstrates reliable obstacle detection and timely feedback across various indoor and outdoor environments. The system is capable of identifying objects at varying distances and provides proportional alerts that scale with proximity, enhancing user situational awareness. Users can detect furniture, doorways, pedestrians, and other obstacles, both at head level and at ground level, thereby reducing the risk of accidents and enhancing confidence during mobility. The system also maintains performance under challenging conditions, such as low light, crowded areas, or noisy surroundings, thanks to its multi-sensory feedback mechanism.

Beyond immediate functionality, the Third Eye project represents a practical application of embedded systems and sensor technology in assistive devices. By combining real-time sensing, processing, and feedback in a wearable format, the system bridges the gap between conventional aids and advanced electronic navigation solutions. It demonstrates that affordable, compact, and intuitive devices can significantly improve the independence, safety, and quality of life for visually impaired individuals. Furthermore, the modular design allows for future enhancements, including integration with additional sensors such as infrared or LiDAR, incorporation of voice guidance for more detailed navigational instructions, and application of machine learning algorithms for object recognition and adaptive alerts.

In conclusion, the Third Eye system is a step forward in assistive technology, providing an effective, low-cost, and practical solution to the challenges faced by visually impaired individuals. Its combination of wearable design, real-time obstacle detection, dual-sensory feedback, and energy efficiency positions it as a viable tool for daily navigation, contributing significantly to improved autonomy, mobility, and safety. This project exemplifies how embedded systems and sensor-based technologies can be harnessed to empower visually impaired individuals, paving the way for more inclusive and accessible assistive solutions in the future.

Keywords: Assistive Technology, Arduino, Ultrasonic Sensor, Obstacle Detection, IoT, Blind Safety

DOI: 10.48175/IJARSCT-30713

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 1, January 2026
Impact Factor: 7.67

DOI: 10.48175/IJARSCT-30713