

**Project Title:**

Blind Aid – AI-Powered Smart Glasses for the Visually Impaired

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**Project Description:**

Blind Aid is a wearable assistive technology system designed to support blind and visually impaired individuals in navigating their environment with greater independence, awareness, and safety. At its core, it is a pair of AI-powered smart glasses integrated with a real-time object detection system, voice feedback, vibration alerts, and GPS-based navigation — all coordinated by a Raspberry Pi 5, which acts as the brain of the system. The camera, which is discreetly mounted on the eyeglasses, constantly captures the user's surroundings. This visual data is processed by the Raspberry Pi 5, which is housed in a compact side bag worn by the user. The Pi runs a pre-trained deep learning model capable of recognizing various common objects like people, vehicles, stairs, poles, and more— even without an internet connection. Upon detecting any obstacle or object of interest, it gives the user clear audio feedback through a connected speaker or earphone, describing what's ahead (e.g., "person ahead", "stairs on the right"). To enhance usability in outdoor environments, Blind Aid includes GPS navigation powered by the Google Maps API. This allows the system to provide turn-by-turn voice directions to guide users to their destination, much like how smartphones assist sighted individuals. The directions are updated in real time and spoken aloud, ensuring users can walk confidently even in unknown locations. In situations where audio feedback may not be effective — such as in loud streets, markets, or quiet libraries — the device uses vibration motors placed on the sides of the glasses or attached to the side bag. These motors provide directional vibration patterns to alert the user of nearby obstacles or guide them with silent cues. A unique feature of Blind Aid is its built-in voice assistant. Activated by a simple wake word, the assistant can understand basic commands like:

- "What's in front of me?"
- "Battery status?"
- "Guide me to the nearest bus stop."

This natural voice interaction adds convenience and accessibility, reducing the need for buttons or touch interfaces. The entire system is powered by a rechargeable battery, ensuring mobility and long-term daily use. It is energy-efficient and lightweight, making it suitable for school, public places, or travel.

In summary, Blind Aid is more than just a tool — it's a lifeline that brings vision to those who cannot see, offering safety, freedom, and independence through a powerful combination of artificial intelligence, real-time computer vision, navigation systems, and intuitive feedback technologies.

FOR MORE DETAILS VIST THIS WEBSITE : <https://dhyandevrtx.github.io/BLIND-AID/>