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

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Project Description:

Blind Aid is a cutting-edge wearable assistive technology designed to empower blind and visually impaired individuals by helping them navigate their surroundings with greater independence, awareness, and safety. At its heart, the system consists of AI-powered smart glasses integrated with a real-time object detection system, voice alerts, vibration feedback, and GPS-based navigation. All of this is coordinated by a Raspberry Pi 5, which serves as the brain of the device. The camera, discreetly mounted on the smart glasses, constantly captures visual data from the user's environment. This data is then processed by the Raspberry Pi using a pre-trained deep learning model capable of identifying common objects like obstacles, doors, vehicles, stairs, and people. Upon detecting an obstacle or object of interest, the system provides clear audio feedback through an earphone or speaker, informing the user of what lies ahead (e.g., "Person ahead", "Stairs on the right"). To further improve outdoor usability, Blind Aid includes GPS navigation powered by the Google Maps API. This allows the system to provide spoken, turn-by-turn directions — much like smartphone maps — enabling users to navigate unfamiliar locations independently and confidently. In scenarios where audio alerts are impractical — such as in noisy streets or quiet libraries — the system uses directional vibration motors attached to the glasses or side bag to silently guide the user. These motors produce intuitive vibration patterns based on the direction and type of obstacle or destination. A unique highlight of Blind Aid is its built-in wake-word-enabled voice assistant. Activated by a simple command, it can respond to helpful prompts such as: • "What's in front of me?" • "Battery status?" • "Guide me to the nearest bus stop." The system is entirely powered by a rechargeable battery, making it lightweight, portable, and ideal for daily use — whether in school, public places, or while traveling.

Why Blind Aid Matters:

Blind Aid isn't just a project — it's a lifeline. It provides a blend of AI, computer vision, and smart feedback systems to offer: • Enhanced freedom and independence • Safer and smarter navigation • An inclusive solution for real-world mobility challenges

■ For more details, visit our GitHub project:

https://dhyandevrtx.github.io/BLIND-AID/