

WEARABLE ASSISTIVE SYSTEM FOR VISUALLY IMPAIRED USERS, PROVIDING SPATIAL ANALYSIS IN REAL TIME

Software



3D Perception Binocular Camera Artificial Intelligent Blind Navigation
Wearable Device Spatial Analysis Depth Information
Voice Interface Assistive Technology Navigation Processor
Guidance System Mobile Communication Module Environment Data

Innovations/advantages

Real time proactive obstacle detection, including mid height and overhead hazards that traditional aids cannot detect.

Decoupled architecture with heavy computation handled externally, keeping the wearable light, comfortable, and thermally safe.

Accurate distance estimation enabled by a trimmed mean depth algorithm that minimizes noise and occlusions.

Stable alerts ensured by temporal filtering (EMA) that smooths depth fluctuations and avoids jitter.

Robust hybrid detection tracking pipeline (object detection, depth, IoU tracking, re ID) for continuous obstacle monitoring.

Non redundant bone conduction alert system, providing prioritized audio warnings while preserving full environmental awareness.

Application field

OEMs;
Assistive tech,
Wearables, Accessibility



Product insight

This solution provides a groundbreaking form of realtime spatial awareness for visually impaired users through a lightweight wearable device paired with a highperformance external processing unit. A continuous video stream is locally analysed to detect obstacles, compute depth via a robust trimmedmean method, and stabilize distance estimates using exponential filtering for reliable proximity alerts. A hybrid detection, tracking, and reidentification pipeline ensures consistent monitoring of moving or partially occluded objects. Alerts are delivered through boneconduction audio, preserving environmental hearing. The decoupled architecture maximizes comfort and longduration usability, while future integration of advanced VSLAM mapping enables persistent 3D understanding and nextgeneration navigation capabilities.



PATENT INFORMATION

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NATIONAL PATENT APPLICATIONS



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