

# DRISHTI MOBILITY KIT

(An AI-Powered Assistive Ecosystem for Visually Impaired Persons)

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## Problem Description

- **285 million** people globally are visually impaired; **39 million** are completely blind (WHO).
  - India alone has **4.95 million blind individuals**, with limited access to modern assistive tools.
  - Pain points validated through interviews and research:
    - Difficulty moving independently in unfamiliar areas
    - Inability to read menus, documents, or labels
    - Inability to identify currency notes
    - Zero situational awareness (faces, emotions, hazards)
    - Over-reliance on others → loss of independence and confidence
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## Problem Validation

- WHO reports indicate lack of affordable assistive technology as a primary barrier.
  - User interviews reveal pain points: inability to recognize faces, read labels/menus, or navigate unfamiliar spaces.
  - Existing AI glasses are **too expensive, single-feature**, and **non-integrated**, limiting real adoption.
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## Existing Solutions & Limitations

1. **Basic Blind Sticks** – Only detect obstacles; no AI, no identification, no assistance.
  2. **Smart Glasses (e.g., OrCam, Envision)** – Extremely costly; limited to text/object recognition; no obstacle detection or SOS.
  3. **Mobile Apps** – Not hands-free; unreliable in outdoor conditions; poor real-time guidance.  
**Bottom line:** Current solutions are fragmented, expensive, and lack an all-in-one ecosystem.
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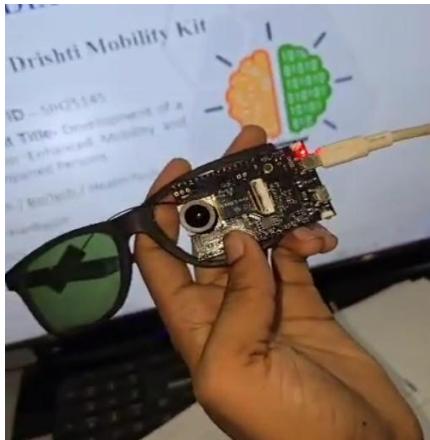
## Proposed Solution

**Drishti Mobility Kit** – A low-cost, AI-powered hybrid system combining:

- **Smart Blind Stick:** Ultrasonic + IR sensors, vibration/audio feedback, GPS-based SOS.
- **AI Smart Glasses:** OCR text reading, product recognition, currency identification, face/emotion recognition, and scene description.
- **Human Assistance Mode:** Live video call to volunteer/guardian when AI confidence is low.
- **Unified Mobile App:** Consolidates alerts, navigation, SOS, and volunteer connectivity.

### Uniqueness:

- Stick + Glasses + Human Assistance = *Complete ecosystem*, not a single device.
- Smartphone-powered → massively reduces cost.
- AI + human hybrid → near-100% reliability in real usage.



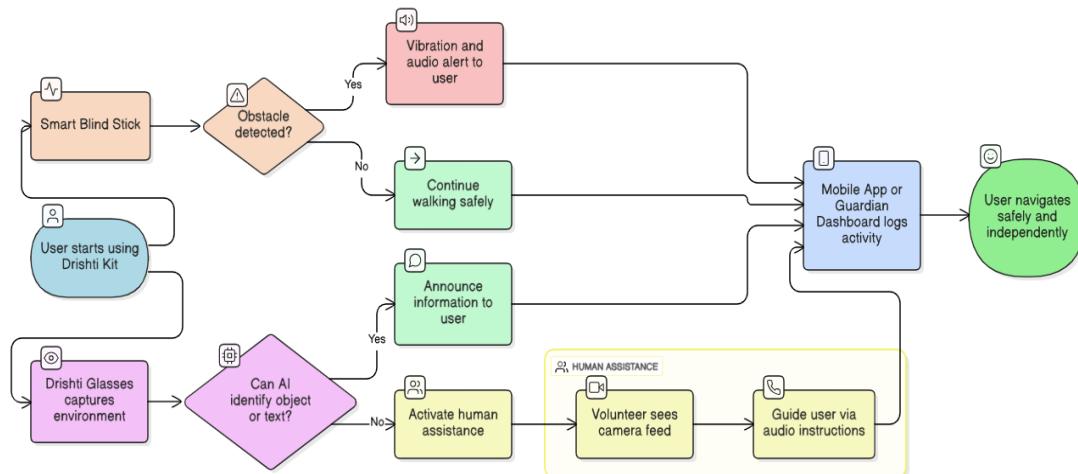
## Brief Technical Description & Feasibility

### Hardware:

- Realtech camera, ultrasonic/IR sensors, vibration motors, GPS module, smartphone as AI processor.

### Software Stack:

- TensorFlow Lite, PyTorch Mobile, MobileNet, YOLOv5-Nano, OpenCV, Dlib, Tesseract OCR.
- WebRTC/RTSP for live volunteer assistance.



### Feasibility:

- All components are commercially available (COTS).
- Models optimized for low power, real-time inference.
- Modular architecture allows independent or combined use of glasses and stick.

### Viability:

- Affordable manufacturing, scalable, high adoption potential in India and developing regions.
- Supports upgrades through mobile app updates without new hardware.