

Specification Document

SmartSight, See Beyond

Projet Professionnel Personnel

By : Adem Jerbi, Kacem Mahdi, Brini Issra, Sghaier Salma, Abid Youssef

1. Introduction

- **Project Name:** SmartSight
- **Objective:** AI-powered glasses to assist visually impaired individuals in navigating their environment.
- **Target Users:** Blind and visually impaired individuals.
- **Scope:** The device should provide real-time object recognition, obstacle detection, navigation guidance, and voice feedback.

2. Functional Specifications

2.1 Core Features

- **Object Recognition:** Identifies and describes objects in the user's environment.
- **Obstacle Detection:** Alerts users to obstacles using voice/audio cues.
- **Navigation Assistance:** Instructions to avoid obstacles.
- **Voice Commands:** Allows users to interact using voice input.
- **Facial Recognition (Optional):** Identifies familiar faces if enabled.

2.2 User Interface & Experience

- **Audio Feedback:** Clear, real-time voice assistance.
- **Haptic Feedback:** Vibrations for obstacle warnings.
- **Mobile App:** A companion app for configuration and updates.

3. Technical Specifications

3.1 Hardware

- **Processor:** Raspberry Pi 4 - 4GB RAM ([Kit Raspberry Pi4 - 4GB](#))
- **Camera:** Camera Module V3 ([Module Camera Arducam V3 16MP Pour Raspberry Pi avec autofocus](#) / [Module Camera 8MP V2 Pour Raspberry Pi \(Original\)](#))
- **Connectivity:** Wi-Fi, Bluetooth.
- **Battery:** Rechargeable with a minimum of 6-8 hours of usage.
- **Storage :** SD Card 16 GB.

3.2 Software & AI Models

- **Operating System:** Linux-based embedded OS (or Android if needed).
- **AI Models:**
 - **Object Detection:** YOLO, OpenCV, or TensorFlow-based models.
 - **Text Recognition:** Tesseract OCR or Google Vision API.
 - **Speech Processing:** Google Text-to-Speech, OpenAI Whisper, or Vosk.
- **Mobile App:** Flutter/React Native for Android.

4. Security & Privacy

- **Data Encryption:** Secure storage and communication.
- **No Continuous Cloud Dependence:** Edge AI processing for privacy.
- **User Control:** Option to enable/disable features like facial recognition.

5. Constraints & Limitations

- **Form Factor:** Must be lightweight and comfortable.
- **Battery Life:** Needs optimization for extended use.
- **Processing Speed:** Must provide real-time feedback.

6. Project Timeline & Budget

- **Prototype Development:** 6 months
- **Estimated Budget:** 1000dt