Virtual Assistant for the Visually Impaired

An advanced AI-powered assistant designed to support visually impaired users through real-time **object detection**, **scene description**, **navigation assistance**, **text reading**, and **voice interaction**. Powered by modern computer vision and speech technologies, the assistant runs on a laptop and provides instant spoken feedback.

🚀Features

Voice Interaction

- Fully voice-controlled
- Offline speech recognition using **Vosk**
- Natural speech output using **pyttsx3**

🚊Object Detection

- YOLOv8-n and YOLOv8-s integrated
- Detects objects in real time
- Announces detected objects via speech

🧭Navigation Assistance

- Detects obstacles
- Estimates distance and direction
- Gives real-time navigation warnings

🗾Scene Description

- Uses AI to describe surroundings
- Helps users understand environments instantly

🗾Text Reader

- Reads documents, signs, boards, and screens
- Uses OCR + TTS for reading aloud

🏙️Depth Estimation

- Measures object distance
- Alerts user about nearby hazards

Tech Stack

- **Python**
- **OpenCV**
- **YOLOv8**
- **Vosk ASR** (offline speech recognition)

- **pyttsx3** (text-to-speech)
- **Flask** (for simple frontend)
- Optional AI API for scene understanding

Project Structure

```
Chat-bot-for-the-Blind/
├── app.py
├── main.py
├── object_detection.py
├── navigation_assistant.py
├── scene_description.py
├── text_reader.py
├── depth_estimation.py
├── templates/
│   └── index.html
├── vosk-model-small/
├── yolov8n.pt
├── yolov8s.pt
├── requirements.txt
```

How to Run

1. Install dependencies

```
pip install -r requirements.txt
```

2. Start the assistant

```
python3 main.py
```

🏡Author

Anubhav Chaudhary
CSE 4th Year – AI/ML & Computer Vision Project

If you want, I can add badges, screenshots, or GitHub setup instructions to this README as well.