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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ECB1212-DESIGN THINKING

CIA 2 REVIEW

ASSISTIVE SYSTEM FOR VISUALLY IMPARED

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ABSTRACT

This project focuses on developing an assistive system to help visually impaired individuals navigate safely and independently. The system uses sensors and voice assistance to detect obstacles and provide real-time guidance. It enhances the user's awareness of their surroundings and supports confident movement. The design is affordable, portable, and easy to use for daily activities. Overall, this system aims to improve safety, independence, and the quality of life for visually impaired persons.

INTRODUCTION

Visually impaired individuals face difficulties in moving independently and safely. Traditional aids like white canes offer limited support. With modern technology, better solutions can be created to assist them. A smart assistive system can provide voice guidance and obstacle detection. This project aims to develop an easy, affordable tool to improve their daily mobility.

PROBLEM STATEMENT AND OBJECTIVE

PROBLEM STATEMENT:

- Visually impaired individuals face difficulties in independent mobility and obstacle detection, as existing tools provide limited guidance and awareness of their surroundings. There is a need for a simple, affordable, and smart assistive system that enhances safety and independence.

OBJECTIVE:

- To develop a user-friendly assistive system that helps visually impaired users navigate safely.
- To provide real-time obstacle detection and voice-based guidance.
- To offer a low-cost and portable solution for daily use.

SURVEY

paper	title of the paper	journal name, author and year	inference	pros	cons
paper1	smart assistive navigation system for visually impaired using IOT	International Journal of Engineering Research & Technology (IJERT),2022	IoT-based navigation improves mobility with sensor + voice support.	Provides low-cost IoT-based navigation with effective sensor and voice assistance.	Provides low-cost IoT-based navigation with effective sensor and voice assistance.
paper2	ai-based obstacle detection and voice assistance for visually impaired	IEEE International Conference on Smart Technologies,2021	AI enhances obstacle detection accuracy with real-time voice guidance.	AI improves obstacle detection accuracy and enables smarter real-time voice guidance.	Requires higher processing power and may depend on internet for full performance.
paper3	design of wearable assistive device for blind people using ultrasonic sensors	Journal of Innovative Research in Engineering & Technology,2023	Ultrasonic wearable device gives low-cost short-range obstacle sensing.	Ultrasonic wearable device is simple, portable, and cost-effective.	Short-range sensing only and cannot identify object types.
paper4	smart cane for blind people using Arduino and sensors	International Journal of Advanced Research in Electronics and Communication Engineering (IJARECE),2022	Arduino smart cane is affordable but offers limited features.	Arduino-based smart cane is affordable, easy to build, and user-friendly.	Limited features and lacks advanced navigation capability.
paper5	Object recognition techniques for assistive technology	IEEE Access,2020	Object recognition techniques can make assistive systems more intelligent.	Object recognition enhances system intelligence for better user assistance.	High computational requirements can reduce real-time speed and efficiency.

EXISTING

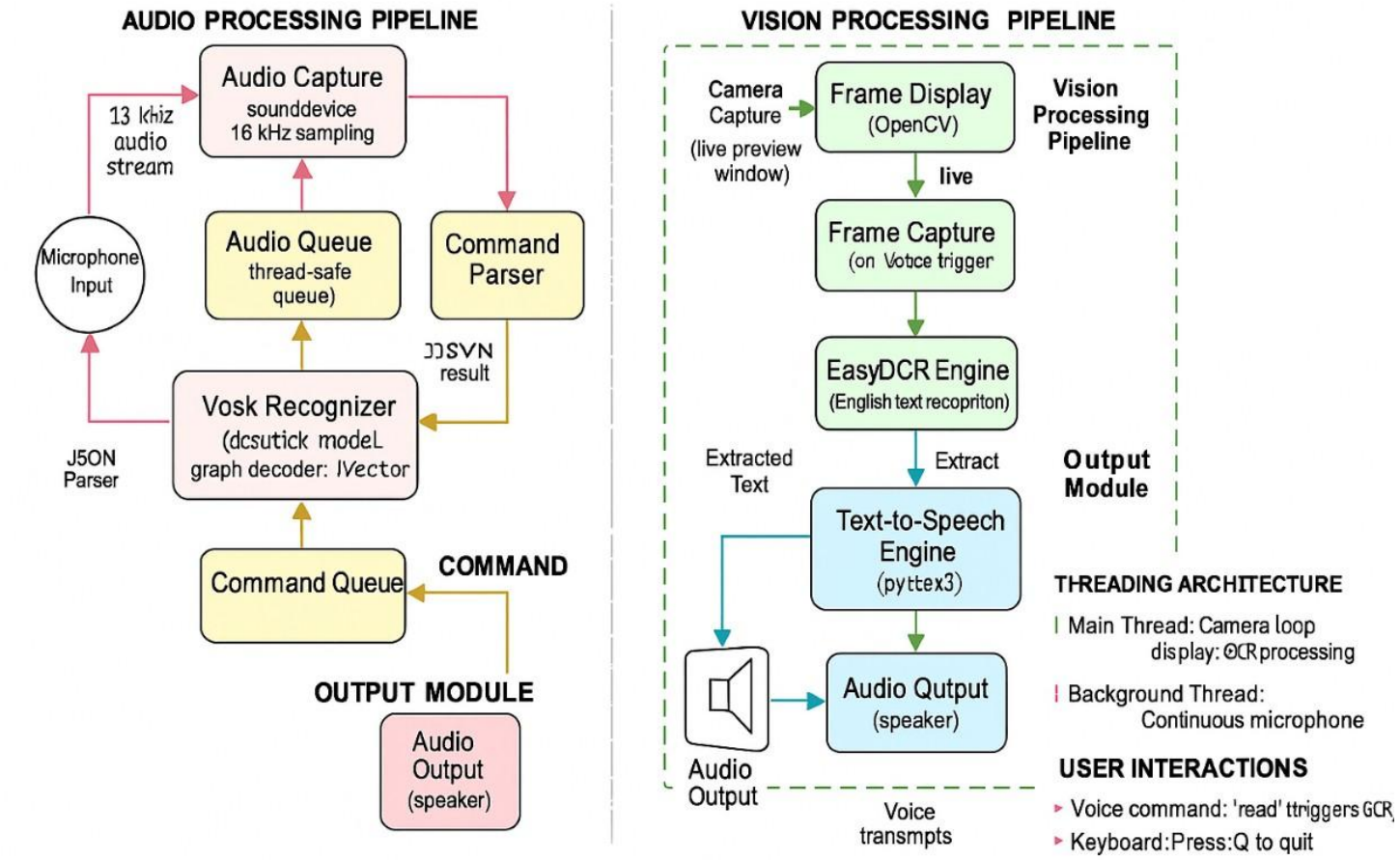
- Visually impaired individuals mainly use white canes for mobility, which detect only nearby obstacles.
- Guide dogs support navigation but are costly to train, maintain, and not affordable for many users.
- Basic electronic aids exist but provide limited functions and are not widely accessible.
- Current tools do not offer real-time voice guidance or smart object identification.
- Most existing solutions lack advanced features and do not fully ensure independent and safe navigation.

PROPOSED SYSTEM

The proposed system combines AI, sensors, and a camera to detect obstacles and recognize objects, providing real-time voice and vibration guidance for safe navigation. It also includes GPS and an SOS feature to support independent and secure movement indoors and outdoors.

- **SMART NAVIGATION:** Provides real-time voice and vibration guidance for safe movement.
- **INTELLIGENT DETECTION:** Uses AI and sensors to detect obstacles and identify objects.
- **INDEPENDENT MOBILITY:** Supports indoor and outdoor navigation with GPS assistance.
- **SAFE & SECURE:** Includes an SOS alert feature for emergencies and user safety.
- **USER-FRIENDLY:** Simple to operate, making it convenient for visually impaired users.

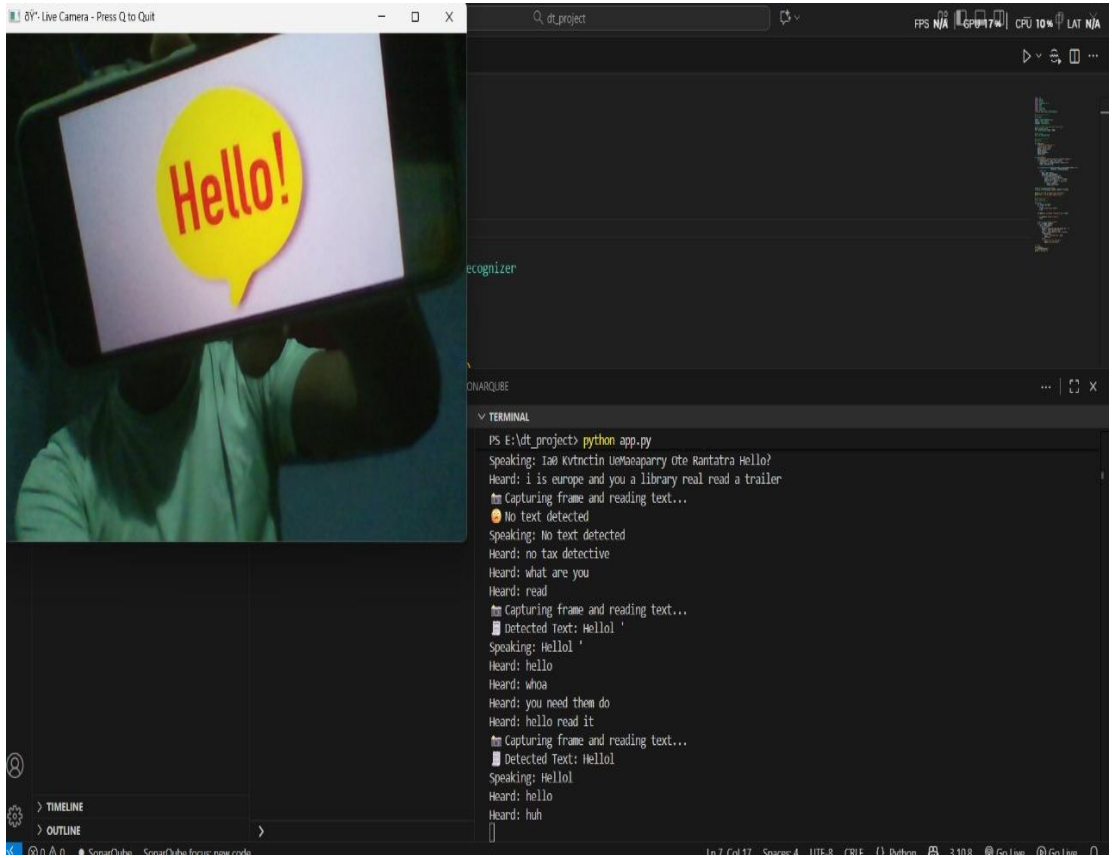
BLOCK DIAGRAM



RESULTS AND DISCUSSION

HARDWARE PROTOTYPE MODEL

SIMULATION AND RESULT



CONCLUSION

The proposed Assistive System for visually impaired individuals provides an effective solution to support independent navigation and enhance safety. By combining obstacle detection, voice guidance, and user-friendly design, the system helps users move confidently in their surroundings. Its low-cost and portable nature makes it suitable for daily use, reducing dependency on others and improving quality of life. Overall, this assistive technology contributes to greater independence, confidence, and social inclusion for visually impaired persons.

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THANK YOU