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ANDROID APPLICATION FOR BLIND PEOPLE TO DETECT OBJECTS

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Abstract: The goal of the project is to make Android apps more accessible to people with visual impairments. It uses machine learning and optical character recognition (OCR) to translate images into spoken language so that those with visual impairments can easily access weather updates and other vital information. The app's design also aims to provide clear instructions and help individuals overcome their daily challenges. The application provides real-time object detection, image-to-text conversion, text-to-speech synthesis, weather reporting, and position detection using the Java programming language and Android Studio. The camera takes pictures, converts visual data into aural input, and applies sophisticated machine learning models for object detection. Through the use of optical character recognition (OCR) technology, written content can be easily accessed by visually challenged individuals by converting photos into text. The application provides real-time weather data in audio format and also incorporates location detection and weather reporting. Clear directions and simple navigation are provided via the user interface, which was created with accessibility in mind.

Keywords: Optical Character Recognition, Speech Synthesis, Assistive Technology, Machine Learning.

I. INTRODUCTION

The project presents a new app for Android. This app helps visually impaired people, To boost their independence, accessibility. Built using Android Studio with Java, the app tackles different daily issues. For instance, it converts images into text. It also turns that text into speech Plus, it can report weather conditions even find your location.

User- friendliness is key here. The app has a simple interface that's easy to understand. Instructions are clear and concise too. It really wants to offer real-time help. Detecting objects, changing images into text, or telling you about the weather it's all part of its mission!

II. LITERATURE SURVEY

Das and Padmanabhuni (2021) conducted an extensive survey on mobile assistive technologies designed for visually impaired individuals. They categorized the technologies into different domains such as navigation aids, object detection, text-to-speech synthesis, and braille devices. The authors highlighted the strengths and limitations of various existing mobile apps, noting that while some applications offer robust functionalities, they often lack integration, leading to fragmented user experiences (Object detection for blind) Smith and Johnson (2020) reviewed different OCR technologies and their applications in aiding visually impaired individuals. They evaluated the accuracy and usability of various OCR tools, discussing challenges such as handling complex documents and text layouts. The authors concluded that while OCR technology has advanced significantly, there is still a need for more user-friendly and accurate systems that can handle diverse text formats

III. PROBLEM STATEMENT

Individuals with visual impairments encounter significant challenges in accessing visual information and navigating their environments. Current fragmented assistive technologies often fall short, requiring users to switch between applications, which is inefficient and cumbersome.

There is a crucial need for a comprehensive application integrating functionalities like object recognition, image-to-text conversion, and real-time assistance, enhancing accessibility and independence for visually impaired users.

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IV. OBJECTIVE

1. Object Detection: Think of this as using smart machine learning models to spot and explain objects around you. It's like having a helper! Users get to hear about what those objects are, making it easier to understand their world.

2. Image-to-Text Conversion: Here, we use something called Optical Character Recognition (OCR). This means we can turn pictures into text. Then, we take that text and change it into audio with text-to-speech. This way, folks who can't see well can easily access what's written!

3. Text-to-Speech Synthesis: We provide a neat tool that changes written words into sound! So, visually impaired users can enjoy reading in a way that suits them, listening to the information instead of just seeing it.

4. Weather Reporting: Integrate location services and external APIs to provide real-time weather updates based on theuser's current location. Transform weather information into audio format and present it to the user, ensuring they are informed about atmospheric conditions.

5. Location Detection: Leverage location services and Google Maps integration to help users determine their geographical location. Offer auditory guidance on their surroundings, enhancing their navigation capabilities.

V. METHODOLOGY

Android Studio is an integrated development environment (IDE) for the Android application development. The Java programming language is the primary programming language for Android application development.

Tesseract OCR is an optical character recognition (OCR) engine for converting images to text. A text-to-speech engine is used to combine text with audible speech. Machine learning libraries are used to implement feature recognition functionality.

VI. PROPOSED SOLUTION

The proposed system is an Android application that combines object detection, image-to-text conversion, text-to-speech synthesis, Weather and location details. The application will utilize the smartphone's camera and external APIs to offer real-time assistance to visually impaired users. Interactions and clear audio feedback, the application will provide a seamless and integrated experience, enhancing the accessibility and independence of the users.

VII. SOFTWARE IMPLEMENTATION

The implementation phase of the Assistive Android Application for Visually Impaired Individuals involves the actual development and coding of the application based on the specified requirements. Agile Development: The project will follow an Agile methodology, allowing for iterative development and continuous user feedback.

User-Centered Design:The application's design will prioritize the needs and preferences of visually impaired users. Continuous Testing: Testing will be an ongoing process, conducted at various stages of development to ensure functionality and usability.

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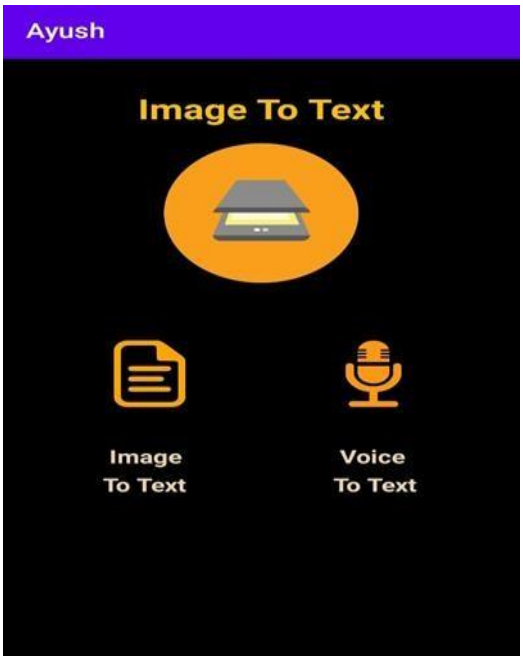

Fig 1. Home Page

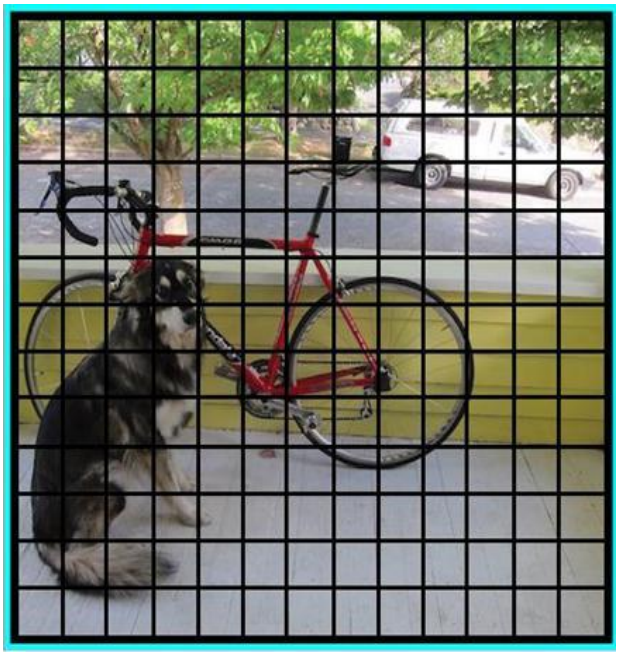

Fig 2. Object Detection

Fig 3. Objects Detected

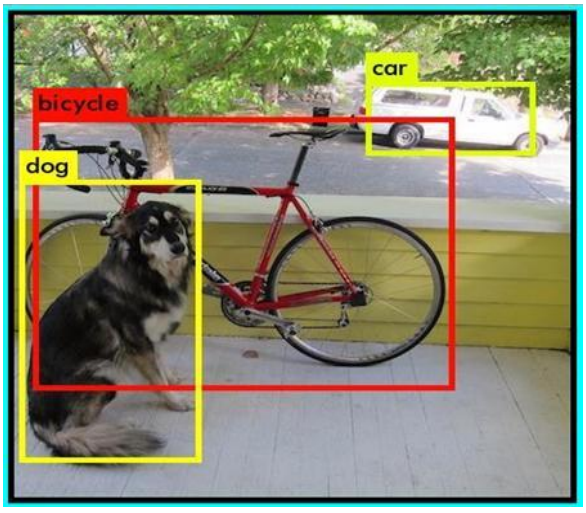

Fig 4. Converted to Speech

VIII. CONCLUSION AND FUTURE SCOPE

The Assistive Android Application for Visually Impaired Individuals has made significant strides in addressing the accessibility and independence needs of visually impaired users. The application integrates object recognition, image-to-text conversion, text-to-speech synthesis, weather reporting, location detection, offering a comprehensive set of features tailored to its target audience. Its ability to accurately detect and identify objects in real-time, convert images to audible text, and provide weather information and location services underscores its practicality for users with visual impairments. The application prioritizes accessibility guidelines and a user-friendly interface, enhancing user experience through clear audio feedback. Future iterations could expand object recognition, optimize weather information retrieval accuracy and enhance the user interface based on user insights. The project demonstrates the potential of technology to empower individuals with visual impairments, improving daily navigation, information access, and overall quality of life. Future updates could improve object recognition, make weather information more accurate, and enhance the user interface. Overall, this technology has the potential to help visually impaired people by making information access, and daily life easier.

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