



SEAMLESS OBJECT RECOGNITION AND INFORMATION RETRIEVAL USING ANDROID APP FOR DUAL SENSORY LOSS PEOPLE

¹Mrs.SK Jabeena ²P.Geethika, ³K.Aruna Kumari,

⁴G .Pujitha, ⁵M.Swathi.

¹Assistant Professor, Department of ECE, PBR VITS, India,

²UG Student Department of ECE, PBR VITS, India,

³UG Student Department of ECE, PBR VITS, India,

⁴UG Student Department of ECE, PBR VITS, India,

⁵UG Student Department of ECE, PBR VITS, India,

⁶UG Student Department of ECE, PBR VITS, India,

Abstract : The "Seamless object recognition and information retrieval using android app for dual sensory loss people" has evolved by integrating cutting-edge technologies such as Arduino, RFID cards, RFID readers, voice modules, speakers, LCD, and Bluetooth connectivity. This synergy aims to revolutionize product identification and information retrieval processes. When an RFID card is scanned, the system seamlessly activates various outputs, presenting product details visually on an LCD screen for immediate confirmation and articulating the information audibly through a voice module. The inclusion of Bluetooth technology further extends the system's capabilities, enabling users to access detailed product information on external devices, thereby enhancing its overall versatility. This comprehensive solution not only provides a user-friendly interface but also caters to a multitude of applications. From facilitating quick product identification in retail settings to enabling efficient inventory management in manufacturing, this system emerges as a valuable and adaptable tool, poised to elevate operational efficiency and enhance user experience across diverse sectors.

Index Terms - Arduino Mega, RFIDcards and readers ,voice module, Product Detection, Bluetooth, LCD.

I. INTRODUCTION

Seamless object recognition and information retrieval using an Android app represents a groundbreaking advancement in accessibility technology, particularly for individuals with dual sensory loss. By harnessing the power of mobile devices and advanced image recognition algorithms, this innovative solution aims to bridge the communication gap for people who are deaf-blind. Through intuitive interfaces and real-time data processing, the app empowers users to identify objects and access relevant information instantaneously, enhancing their independence and quality of life. In a world where technology continues to bridge gaps and empower individuals, "Sensory Sense" stands as a beacon of inclusivity, designed specifically to cater to the unique needs of those with dual sensory impairments. This revolutionary Android application combines advanced object recognition with intuitive information retrieval, offering a seamless and enriching experience for users facing challenges related to both vision and hearing.

II. LITERATURE SURVEY

Deep Learning-Based Object Detection Techniques for Visual Recognition" by Chuan Li et al. (2018). This paper provides an overview of deep learning techniques for object detection, including convolutional neural networks (CNNs) and their applications in visual recognition tasks. Recent Advances in Convolutional Neural Networks" by Karen Simonyan and Andrew Zisserman (2015) This review discusses recent developments in convolutional neural networks (CNNs), focusing on their architectures, training methods, and applications in computer vision tasks such as object detection. A Survey on Object Detection in Optical Remote Sensing Images" by Shuai Zheng et al. (2019). This survey paper comprehensively reviews object

detection techniques in optical remote sensing images, discussing traditional methods as well as recent advancements in deep learning-based approaches.

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III. EXISTING METHODOLOGY

The existing method for product identification relies on manual input and lacks the integration of advanced technologies, resulting in significant drawbacks. In the absence of automated systems, the process is prone to human errors, leading to inaccuracies in product identification and information retrieval. Moreover, the reliance on manual input makes the procedure time-consuming and labor-intensive, hindering operational efficiency. The lack of real-time data accessibility also poses challenges in dynamic environments, limiting the system's adaptability. Additionally, the absence of features like voice modules and Bluetooth connectivity restricts the accessibility and convenience of retrieving product details. In light of these drawbacks, there is a clear need for a more sophisticated and technologically advanced solution, such as the proposed "Seamless object recognition and information retrieval using an Android app for dual sensory loss people," to address these shortcomings and enhance overall system performance.

IV. DISADVANTAGES OF EXISTING METHODOLOGY

Object recognition technology, especially when integrated into a mobile app, may not always provide accurate results. This can be particularly problematic for individuals relying heavily on the app to identify objects in their environment. False positives or failures to recognize objects correctly can lead to frustration and a loss of trust in the app. The seamless operation of the app may rely on a stable internet connection for real-time information retrieval and object recognition. In areas with poor connectivity or when the user is offline, the app's functionality may be severely limited or even unusable.

V. PROPOSED METHODOLOGY

To address the limitations of conventional methods, a novel approach is proposed "Seamless object recognition and information Retrieval using Android app for dual Sensory loss people" revolutionizes product identification by seamlessly integrating advanced technologies. Utilizing Arduino, RFID cards, RFID readers, voice modules, speakers, LCD, and Bluetooth connectivity, this innovative system ensures efficient product information retrieval. When an RFID card is scanned to RFID Tag, We have taken 8 tags ,each tag is a product. the system activates multiple outputs, displaying detailed product information on an LCD screen for visual confirmation and articulating it through a voice module for auditory feedback. The integration of Bluetooth technology enhances accessibility, allowing users to retrieve detailed product information on external devices. This comprehensive solution not only eliminates the limitations of manual input, reducing the risk of human errors, but also significantly improves operational efficiency.

5.1 Implementation Method :

Computer Vision and Object Recognition: Utilize deep learning models (like convolutional neural networks) for object recognition. Models such as MobileNet, YOLO (You Only Look Once), or SSD (Single Shot MultiBox Detector) are suitable for mobile devices. Integrate libraries like TensorFlow Lite or PyTorch Mobile for running deep learning models on Android devices. Train the model on a diverse dataset containing images of various objects from different angles and under different lighting conditions.

Text-to-Speech (TTS) and Speech Recognition: Integrate a TTS engine to convert text-based information (object names, descriptions, etc.) into speech. Utilize speech recognition to enable users to interact with the app through voice commands.

Sensory Feedback Integration: Provide haptic feedback (vibrations) to confirm object recognition or when interacting with UI elements. Use audio cues (e.g., beeps or tones) to indicate successful recognition or navigation.

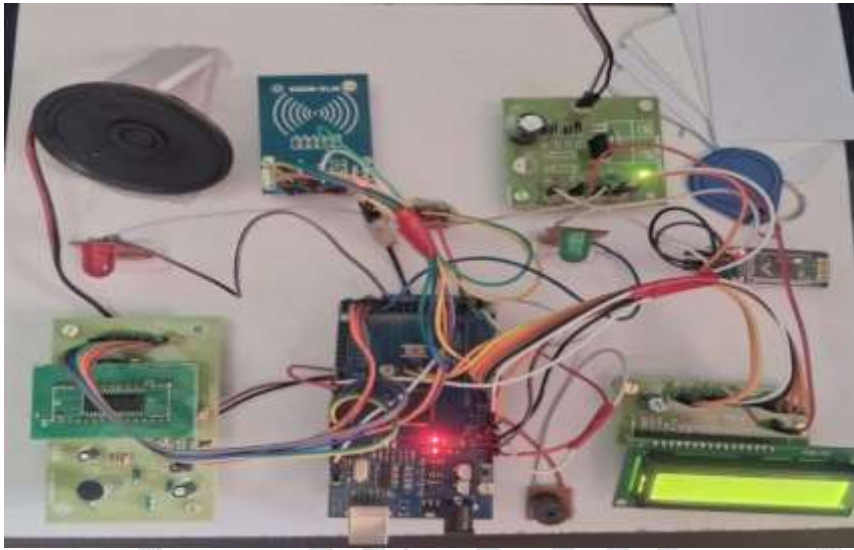
User Interface (UI) Design: Design a user-friendly interface with large, high-contrast elements and clear, simple language. Implement voice-guided navigation to assist users in navigating through the app. Use simple gestures for interaction, like taps and swipes.

Integration with External Databases and APIs: Connect the app to external databases or APIs for accessing additional information about recognized objects. Utilize APIs such as Google Knowledge Graph API or Implement caching mechanisms to store frequently accessed data for offline use.

Accessibility Features: Ensure the app complies with accessibility standards, like providing alternative text for images, supporting screen readers, and allowing text resizing. Implement high-contrast themes and customizable color schemes.

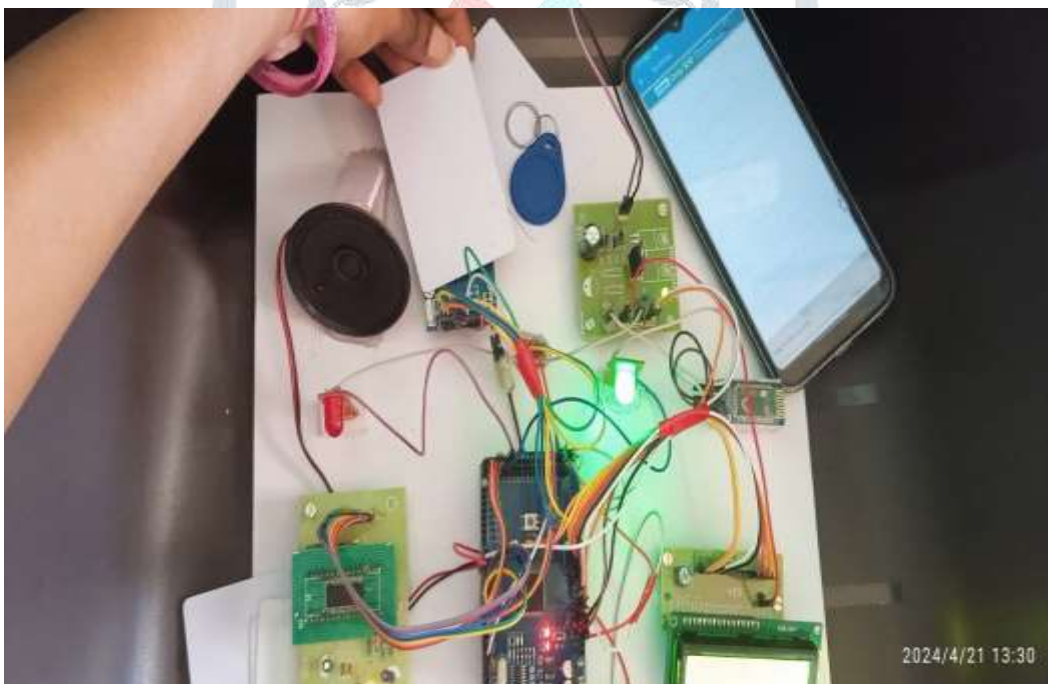
VI RESULTS AND DISCUSSION

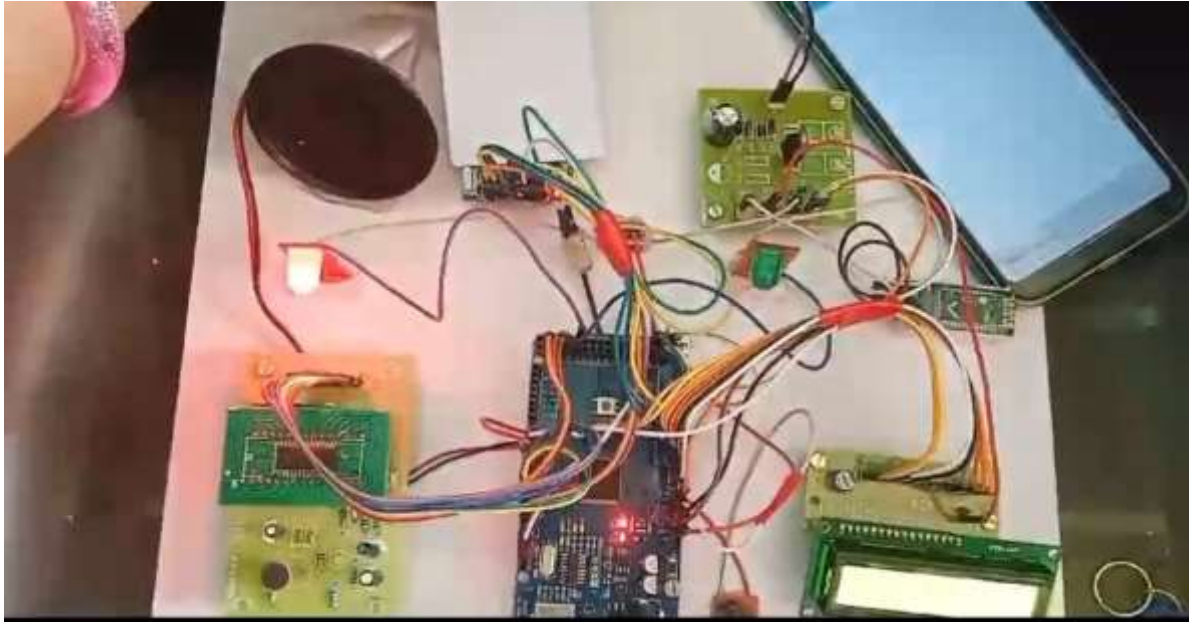
Detecting objects in real-time and converting them into an audio output was a challenging task. Recent advancement in computer vision has allowed the development of various real-time object detection applications. are overwhelmingly positive, leading to increased independence, accessibility, safety, and quality of life.



Sample Output through one of the RFID TAG used in the kit.

The detected objects were then converted into an audio output by using android's text-to-speech library. Overall, the results of implementing seamless object recognition and information retrieval using an Android app for people with dual sensory loss people.





Outputs of Proposed System By RFID Tag scanning card multiple times

VII ACKNOWLEDGMENT

The preferred spelling of the word “acknowledgment” in America is without an “e” after the “g”. Avoid the stilted expression, “Oneofus(R.B.G.)thanks...”

Instead,try“R.B.G.thanks”.Putapplicablesponsoracknowledgmentshere;DONOTplacethemonthefirstpageofyourpaperorasafotnote.

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