Object Identifier with Description Using Cloud Vision

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ABSTRACT

The Object Identifier App is a cross-platform mobile application developed using react native that integrates text extraction and object identification to offer a flexible and intuitive user experience. The program lets users upload photos from their media gallery or utilize the camera on their device to recognize objects in real time. It offers a thorough description to improve comprehension and use in addition to displaying the recognized object's name in several languages, guaranteeing accessible for a worldwide audience. The application guarantees seamless operation on both the iOS and Android platforms by utilizing React Native's capabilities. The program meets a variety of user demands by combining object identification, multilingual support, thorough descriptions, and text recognition to provide a full solution for education, accessibility, and daily help.

Keywords

Object Recognition, Text Recognition, Multilingual Support, User Accessibility.

INTRODUCTION

Using React Native, the Object Identifier App is a creative and user-focused mobile application that makes text extraction and object recognition easier for a variety of users. The application uses cutting-edge machine learning and computer vision technology to recognize items in real time from photographs uploaded from the media gallery or from a device's camera. By showing the name of the discovered object in several languages, it improves accessibility for users with varying linguistic backgrounds and offers thorough descriptions to improve comprehension and learning. The application also includes Optical Character Recognition (OCR) capabilities, which allow users to easily read signs, labels, or documents by identifying and extracting any text contained in uploaded photos.

A consistent and responsive user experience is provided by the usage of React Native, which guarantees flawless performance and compatibility across the iOS and Android platforms.

With its multipurpose and inclusive design, the app is a potent tool for education, accessibility, exploration, and daily support.

I. LITERATURE REVIEW

[2.1] K. Hasan; B. Ramsay; S. Ranade; C. S. Ozveren; "An Object-oriented Expert System for Power System Alarm Processing and Fault Identification", PROCEEDINGS OF MELECON '94. MEDITERRANEAN ELECTROTECHNICAL ..., 1994.

Alarm processing is a traditional feature of energy management systems (EMS) and has not changed significantly over several generations of SCADA design. However recent applications of artificial intelligence have dramatically altered the methods of handling this information. This paper describes two parts of a project carried out at the University of Dundee for Scottish Hydro- Electric plc (HE) on the use of an artificial intelligence system for alarm processing and fault diagnosis. The first part of the project was an overview and comparison study of three real- time object-oriented toolkits: Muse, Kappa and Nexpert Object.

[2.2] Alexandre Meneses de Melo; "Estudo E Sistematização Da Identificação Do Objeto De Estudo De Benchmarking", 2001.

Benchmarking is a process through which the organization identifies the best practices of a selected object of study, and makes improvements necessaries to reach them. The identification of the object of study is an important stage to prevent that resources be placed

towards projects that little or no competitive advantage bring to the organization. This article presents a systematization of the benchmarking object of study identification stage that considers the importance of the competitive dimensions to the customers, its performancewith relation to the competitors, and the alignment between the benchmarking projects and the strategical priorities of organizational performance improvement.

[2.3] Romi Satria Wahono; Behrouz Homayoun Far; "A Framework for Object Identification and Refinement Process in Object-oriented Analysis and Design", PROCEEDINGS FIRST IEEE INTERNATIONAL CONFERENCE ON ..., 2002.

There are many projects focusing on computer aided software engineering (CASE) tools for object-oriented analysis and design. There are certain limitations to such solutions, as they concentrate on object-oriented notation and forward/reverse engineering, and the methodology for object identification and refinement is not implemented well. This paper presents a methodology for object identification and refinement from software requirements, based on object-based formal specification (OBFS).

[2.4] Michèle M M Mazzocco; Neha Singh Bhatia; Katarzyna Lesniak-Karpiak; "Visuospatial Skills and Their Association with Math Performance in Girls with Fragile X or Turner Syndrome", CHILDNEUROPSYCHOLOGY, 2 006.

The present study was designed to assess object identification (“what”) and location (“where”) skills among girls with fragile X or Turner syndrome and girls with neither disorder. Participants completed standardized subtests of visual perception and tasks of visuospatial “what” and “where” memory. Girls with fragile X had average performance on most object identification tasks, yet 53% failed to accurately recreate the gestalt of a design during the “where” memory task. Fewer than 7% of girls in the Turner or comparison group made this error. Girls with Turner syndrome had lower scores and longer response times on object perception tasks.

II. METHODOLOGY

3.1 EXISTING SYSTEM

Only rudimentary functionality is offered by the current object identification systems, which are mainly concerned with identifying and displaying an object's name. Users can upload an image from their gallery or use the camera on their device to take a picture of something. To identify the object, the system uses machine learning models and computer vision algorithms to process the image. Nevertheless, the output usually just shows the recognized object's name in a single language and provides no further context or specific details about the object. The system's utility is greatly diminished by this restriction, particularly for users who might wish to learn more about the object's properties, function, or background.

Additionally, these systems don't support multiple languages, which limits their usability for a worldwide audience. The system's inclusivity may be limited if users who are unfamiliar with the displayed language have trouble understanding the output. Their adaptability is diminished by this omission, rendering them inappropriate for jobs such as reading documents, labels, or signs.

The user interface is frequently overly basic and does not prioritize offering a smooth or interesting experience.

Overall, even though the current systems provide a fundamental tool for item identification, they fall short in meeting users' more general goals, such as those related to education, accessibility, and practicality. Thisemphasizes the need for a more sophisticated and user-focused solution, like the suggested Object Identifier App, which combines accessibility features, multilingual support, thorough descriptions, and OCR functionality to provide a more thorough and powerful user experience.

3.2 PROPOSED SYSTEM

With a number of important features that improve its functionality and user experience over the current systems, the suggested Object Identifier App provides a thorough and sophisticated object recognition solution. By offering not only the name of the recognized object but also comprehensive descriptions, linguistic support, and text recognition capabilities, this system aims to overcome the shortcomings of the existing object identification systems.

The capacity to instantly recognize items using the device's camera or by uploading pictures from the media gallery is the main characteristic of the

suggested system. The application makes itself available to a wide range of users worldwide by displaying an object's name in different languages after it has been detected. This multilingual feature promotes inclusivity by guaranteeing that users from different geographical locations can engage with the app and comprehend the object's name in their local tongue.

The app not only identifies the object but also gives a thorough description of it, which may contain details about its traits, applications, or background. The app's educational and practical worth is increased by this extra layer of knowledge, which makes it beneficial for

tourists, students, and anybody else who wants to know more about the things in their environment. Optical Character Recognition (OCR), which enables the software to recognize and extract any text

contained in uploaded photographs, is another essential component of the suggested system. This feature extends the app's capabilities beyond object recognition and is particularly useful for reading labels, signs, documents, or any other text-based content that might be present in the photographs.

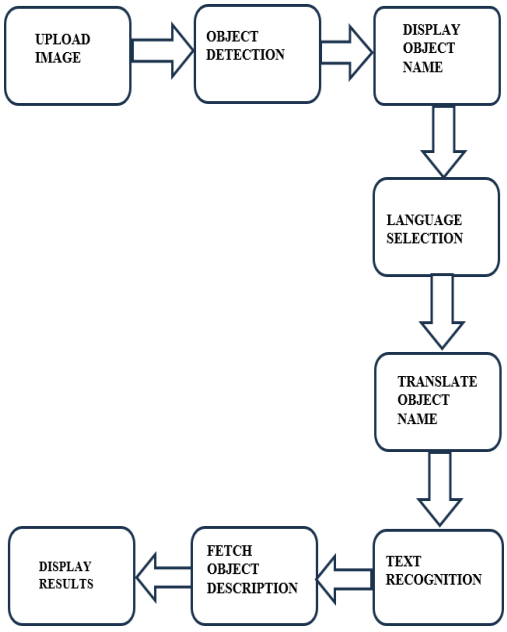


FIG 3.3 FLOW DIAGRAM

III. SYSTEM SPECIFICATION

4.1 SOFTWARE REQUIREMENTS

- React Native
- Clarifier API
- Google Cloud Vision API
- Tenser flow

4.1.1 SOFTWARE DESCRIPTIONREACT NATIVE

Using JavaScript and React, developers can create mobile apps for iOS and Android with the help of the open-source React Native framework. It combines native performance with the flexibility of web development by enabling a single codebase to run on both platforms. React Native facilitates the development process by utilizing native components and providing capabilities like hot reloading, all the while preserving the option to use native code as necessary.

4.1.2 CLARIFIER API

The Clarifier API, which provides text analysis, image and video recognition, and other AI- driven services, is an effective tool for incorporating artificial intelligence (AI) capabilities into applications. With the use of pre-trained models or custom models, developers can quickly scan and analyze textual and visual data, enabling capabilities like content moderation, object detection, and facial recognition. Without requiring in-depth knowledge of machine learning, developers can more easily incorporate AI capabilities into their projects with Clarifier's straightforward RESTful API.

4.1.3 GOOGLE CLOUD VISION API

Developers may incorporate picture identification and analysis features into their apps with the help of the robust Google Cloud Vision API. It makes use of machine learning models to identify faces, language, locations, objects, and other information in pictures. Additionally supported by the API are functions like content moderation, image tagging, optical character recognition (OCR), and more. Developers can immediately access powerful AI functionalities with

straightforward RESTful queries, which makes it

simple to automate image processing chores and add visual analysis tools to apps.

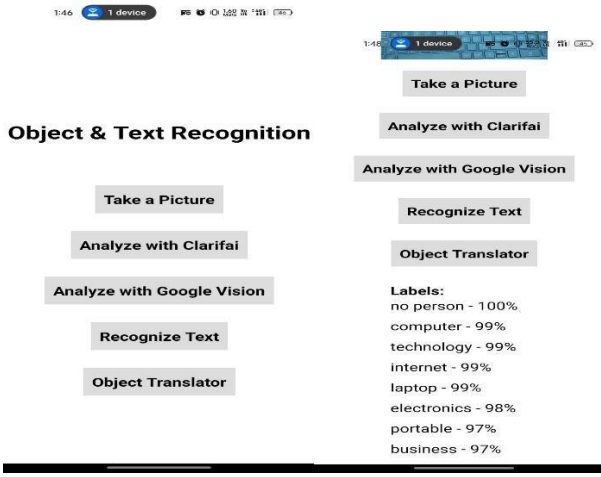
4.1.4 TENSER FLOW

Google created the open-source TensorFlow machine learning framework to make creating and implementing machine learning models easier. With tools for deep learning, neural networks, and dataflow programming, it offers a complete ecosystem for creating and refining models. With its low-level APIs for sophisticated adaptations and high-level APIs like Keras for rapid model construction, TensorFlow provides flexibility for both research and production settings. It is frequently employed for applications like predictive analytics, natural language processing, and picture identification.

IV. EXPERIMANTAL RESULT

5.1 TEST CASE 1:TEST CASE 2:

5.3 TEST CASE 3:



5.4 TEST CASE 5:

V. RESULTS AND DISCUSSION

By offering a creative and useful solution for text extraction and object recognition, the Object Identifier App effectively achieves its goals. It enables users to upload photos from their media collection or utilize a camera to recognize objects in real time. The application ensures accessibility for users with different linguistic backgrounds by appropriately displaying the name of the recognized object in numerous languages.

The application performed accurately and consistently in a variety of scenarios throughout the development and testing stages. In most situations, the real-time object identification system performs well; nevertheless, issues were seen when there is inadequate

lighting, blurry photos, or extremely complex objects with overlapping features. Similar to this, the OCR tool did a good job of recognizing and extracting text from clear photos, but it had trouble with low-resolution inputs, stylistic fonts, and handwritten text. These drawbacks point to areaswhere the app's machine learning models and algorithms could be improved in the future.

React Native was used in the cross-platform development of the app to guarantee seamless operation on both the iOS and Android platforms, offering a responsive and uniform user experience. Its usefulness and inclusivity were further improved by its user-friendly interface, multilingual support, and accessibility features, like possible audio descriptions for people who are blind or visually impaired. The evaluation's discussions also emphasized the app's wide range of applications, making it an effective tool for a number of user groups, such as students, tourists, people with visual impairments, and others who require help learning or exploring. Combining text extraction, object identification, multilingual support, and accessibility features, the app shows promise as a vital tool for everyday help, education, and accessibility, meeting a range of user needs.

VI. CONCLUSION AND FUTURE WORK

7.1 CONCLUSION

The Object Identifier App effectively overcomes the shortcomings of current systems by providing a flexible and effective solution for text extraction and object recognition. Through the use of cutting-edge computer vision and machine learning technology, the app enables users to upload photographs from their media collection or utilize a camera to identify items in real-time. In addition to providing thorough details that enhance the user's knowledge and comprehension, it shows the name of the recognized object in different languages,

making it accessible to a worldwide audience. The app, which was created with React Native, guarantees consistent and user-friendly performance on both the iOS and Android platforms.

To sum up, the Object Identifier App is a reliable, inclusive, and scalable solution that not only satisfies the needs of users today but also offers a solid platform for expansion and innovation in the future. It is a prime example of how technology can be used to provide tools that are both significant and influential, bridging the gap between accessibility and functioning for a wide range of people throughout the world.

7.2 FUTURE SCOPE

There is a lot of room for the Object Identifier App to develop further in the future, opening the door to more extensive use and influence.

The incorporation of augmented reality (AR) to offer real-time overlays of object information, enhancing the user experience and fostering interaction, is a key area for future research. The app's inclusivity and worldwide reach can be further increased by adding more regional dialects and unusual languages to the language collection. The accuracy and effectiveness of object detection will be increased by strengthening the app's machine learning models, especially for complicated objects, overlapping objects, or low light levels.

Integration with wearable technology, like smart glasses or augmented reality headsets, is another area of emphasis to further facilitate text extraction and object detection in practical situations. Over time, collaborative capabilities that let users add to and enhance the object database could make the application more robust and dynamic. Partnerships with assistivetechnology companies and educational platforms can also increase the app's usefulness in the accessibility and academic fields.

The Object Identifier App can develop into a comprehensive tool that meets a range of demands in education, accessibility, exploration, and daily work by consistently inventing and increasing its features, guaranteeing its long-term relevance and utility.

VII. REFERENCES

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