OCR Application for Multilanguage

[1]Prof. S. Sankareswari, [2]Nehal Dhuri, [3]Tushar Maragale, [4]Shruti Desai, [5]Ganesh Arondekar

[1]Assistant Professor, [2] UG Student, [3]UG Student, [4]UG Student, [5]UG Student

Department of Information Technology

Finolex Academy of Management and Technology, Ratnagiri, Maharashtra, India

Abstract: People face many difficulties in understanding languages in their daily lives. For example, if people move from one state to another and do not understand the language, this Mobile Application will assist them. The existing system includes a separate application for each process such as a camera, Google Translate, and an Optical Character Recognition (OCR) text scanner. But people expect the application which consists of all three facilities together. So, the application that we have proposed makes it simple for people to translate an unfamiliar language into their native language or languages that they are familiar with. So, this mobile application captures images that are text-based and has important messages or any documents from the real world that are important to be translated, and once capturing of the image is done then the text is extracted and at the same time identification of language is done of extracted text, and then using Google translation API language is translated into their chosen language(we have more than 55 languages to choose) and then the result is displayed on the screen and then if the user wants to save the result they can save it and share it on another platform.

I. INTRODUCTION

As it is known and also very often discussed that in the real world there are many important messages, and important documents that also contain many historical, geographical, and scientific articles that could be useful for us, but unfortunately most of these Documents exist or are discovered in different languages depending on many factors such as: If the messages contained in these documents are very useful and meaningful but unattainable for mankind only because of the language barrier, it could have a bigger impact and we could miss some of the important messages, otherwise they would have been possible if the base language used would have been known. for everyone else in this world. But we know that this scenario is highly impossible as there are so many languages spoken around the world that it would be impossible for anyone to master them all. Therefore, many researchers also found that recognizing and translating text is a very important process, especially in today's scenario where everything is digital and all information is stored and accessed online. To overcome these problems which might be due to the language barrier, we have developed our "OCR Application for Multilanguage" app which is an Android-based app that uses one of the well-known ML techniques such as optical character recognition. The main purpose of our app is to help people to translate the unknown language into their native language or the language that they are familiar with. It captures images based on text and then, after extraction, translates them into other languages using the translator created with the ML Kit technique.

II. PROBLEM STATEMENT

As technology advances, the world is seen as "connected". But often, sometimes communication around the world has problems with language barriers. When traveling to another country and studying a certain subject, it comes naturally to immediately understand the meaning of unfamiliar texts and translate them into the preferred language. Therefore, a tool is needed that allows users to extract these unknown texts from images or even handwritten texts to facilitate global connectivity. Optical character recognition (OCR) is recognized as a key problem in machine learning and artificial intelligence. While most people assume this is a simple example, the difficulty arises when the data is imprecise and unregulated, as is the case with handwriting recognition. To overcome these problems, we have proposed a comprehensive solution that uses OCR technologies not only to extract texts but also to identify the language and the user can translate it into their preferred language for a better understanding.

III. LITERATURE REVIEW

1) *"Extraction of Text from an Image and its Language Translation Using OCR" by G.R.Hemalakshmi, M.Sakthimanimala J.Salai Ani Muth*:

This paper is a discussion on using optical character recognition to translate text from one language into another language. This paper presents a simple, efficient, and minimum-cost approach to constructing OCR for reading any document that has a fixed font size and style or handwritten style. Traditional OCR methods are used here.

2) *"Design of an Optical Character Recognition System for Camera based Handheld Devices" by Ayatullah Faruk Mollah, Nabamita Majumder, Subhadip Basu ,and Mita Nasipuri:*

This study shows that compared to Tesseract, acquired recognition accuracy (92.74%) is good enough. The recognition system proposed in this study is computationally efficient, making it suitable for low-resource computers such as mobile phones, according to analysis.

3) *"Text Extraction Approach towards Document Image Organisation for the Android Platform" by M. Madhuram, and Aruna Parameswaran:*

The purpose of this paper is to provide an automated interface for performing document image processing, text extraction, and information organization by proposing a simple method for content-based categorization of document images using a Bag-of-Words model.

4) *"Detecting text based image with optical character recognition for English translation and speech using Android" by Sathiapriya Ramiah, Tan Yu Liong, and Manoj Jayabalan:*

This paper proposes a system to help tourists overcome linguistic barriers when visiting another country where different languages are used to convey information.

5) *"LANGUAGE IDENTIFICATION USING ML KIT" by Koushik Modekurti and K. N. V. R. S. Sai Kiran:*

This research proposes a system for Language Identification that makes use of Google Firebase's Machine Learning (ML) Kit's Language Identification Application Program Interface (API).

IV. PROPOSED ARCHITECTURE

Our proposed system allows the user to capture the image based on text and then view the translated text in their preferred or chosen language (the user has the option to select their own language that the application offers more than 55 languages). After capturing the image, the text is extracted and meanwhile the language is identified and then with the help of a translator, the text is translated into the user's preferred language and the result is displayed on the screen. Other than translating the text user can copy the extracted text, share that text on other applications, save that text for future use, and also listen to the extracted text using text to speech feature.
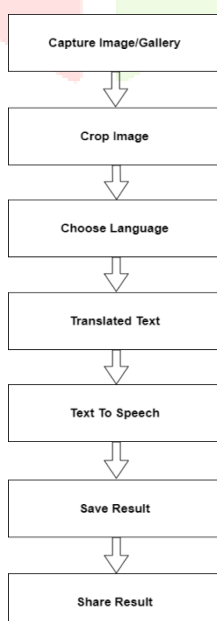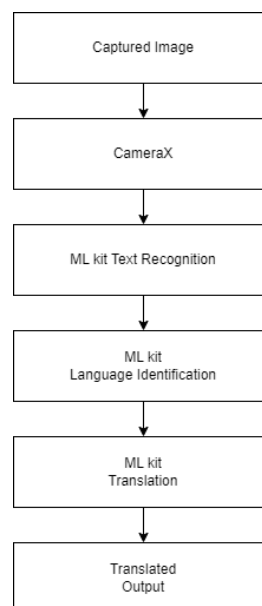

Fig.1 System Architecture

Fig.2 Backend Flowchart

1) From the Figure, we can see that the input can come from the device's camera. The first step is to pre-process the image, which then converts it to the image in a preferred format that would be suitable for further processing. This will be done using the CameraX library.

2) This scanned image may be unstructured and noisy. So it's important to enhance it by removing noise and then converting the image to a binary format. By denoising, we can increase the accuracy of text recognition.

3) After pre-processing, individual characters are separated by the segmentation process. Then any existing meaningful data is retrieved from the unrefined and raw data via the feature extraction step. Step 2 and 3 are done by ML kit text recognition API.

4) This app will use the ML Kit Text Recognition on the device API to identify the language of the recognized text. Finally, the system will be able to translate the text into any (preferred) language, users will have an opportunity to choose their preferred language from languages available in the system, and all this will be done with the ML Kit translation API.

5) The generated translated text is the output of our system. The result will be displayed in our user interface and if user want, they can share it on other platform using share option which will be provided in app.

6) If user wants, they can save this result. This result will be saved locally and this will be done using the Room library.

V. PROPOSED FEATURES

1) Text Extraction: Users can scan text from both printed and handwritten images.
2) Language Recognition: Users can identify the language of the scanned text.
3) Text Translation: Users can translate the extracted text into their preferred language.
4) Text sharing: Users can share the text on their other favourite applications.
5) Text-to-speech: Users can listen the text using text to speech feature.
6) Save the Result: Users can save the extracted or translated text in application.

VI. CONCLUSION

As we see, with the rapid rise of technology, everything is coming online, especially in these unprecedented COVID times. According to many surveys, the number of people spending their time online has suddenly increased, regardless of age group. Everything is remotely accessible at the tap of a finger for anyone anywhere in the world. Similarly, documents are also kept online through various technologies, be they trivial documents or your most important ones. Therefore, with this large increase in the storage of information in paper documents and digital information, the recognition of text from images is an important process. So, in order to help mankind, we have proposed an application that will help to preserve information, facilitate storage, and, if necessary, also allow information retrieval. In addition, the user will be able to do this with the help of the translator, who will be able to translate the extracted text and will be able to share it with others.

REFERENCES

[1] G.R.Hemalakshmi, M.Sakthimanimala, J.Salai Ani Muthu, Extraction of Text from an Image and its Language Translation Using OCR: https://www.technoarete.org/common_abstract/pdf/IJERCSE/v4/i4/Ext_14086.pdf

[2] Ayatullah Faruk Mollah, Nabamita Majumder, Subhadip Basu, and Mita Nasipuri, Design of an Optical Character Recognition System for Camera based Handheld Devices: https://www.researchgate.net/publication/51937819_Design_of_an_Optical_Character_Recognition_System_for_Camera-basedHandheld_Devices

[3] M. Madhuram, Aruna Parameswaran, Text Extraction Approach towards Document Image Organisation for the Android Platform: https://scholar.google.com/citations?view_op=view_citation&hl=en&user=SG1_0_8AAAAJ&citation_for_view=SG1_0_8AAAAJ:u-x6o8ySG0sC

[4] Sathiapriya Ramiah, Tan Yu Liong, Manoj Jayabalan, Detecting text based image with OCR for English translation and speech using android, Dec 2015: https://www.researchgate.net/publication/301443412_Detecting_text_based_image_with_optical_character_recognition_for_English_translation_and_speech_using_Android

[5] Koushik Modekurti and K. N. V. R. S. Sai Kiran, Language Identification Using ML Kit: https://www.academia.edu/42349511/LANGUAGE_IDENTIFICATION_USING_ML_KIT