

Camshot-Hand Written Text Recognition and Object Detection Application

Suvarn Badkas, Deep Desai, Harshrajsinh Jadav

Department of Computer Science Engineering Parul Institute of Technology, Vadodara, Gujarat, India

ABSTRACT

Text recognition is a technology which has ability to recognize text from images automatically developed in computer device. Tremendous demand is seen for storing the information available in physical papers into a storage disks and can be reuse this data by searching process. A simple way is to scan documents and store it as image. But reusing this data is becomes difficult to read contents and search these documents line by line or word by word. Quality of images and font characteristics of paper are main concerns. Computer devices are unable to identify these characters while reading them. Thus, character recognition methods are much needed to identify texts from images which converts paper format to digital format. In this paper we have discuss a method for text recognition from images using google firebase services like ML kit, in particular order of different processing module for better understanding.

Keywords : Text recognition, Object detection, Android, Firebase, ML kit

I. INTRODUCTION

The importance of efficiency is a very crucial factor in IT industry. The user uses only that software or application which provides ease and efficiency of the service given by a that particular application. There are number of software and applications present in the market but user will obviously choose which has good performance, faster speed and quality in the service provided by the application. Those who will present more unique features and user-friendly experience in their application makes success rate higher than others. The goal behind this research is to develop an application which will provide very faster and very efficient recognition of hand written text and object detection integrated with some more features through an application which can be installed in smartphones. Software systems are so much in urge that recognizes text when information is scanned through physical paper documents like newspapers, books, handwritten bills, etc. in printed form containing important

information related to different subjects which are available in huge size. The is massive requirement in saving the data/information available in physical

documents form, as it is stored once in a storage disk it can be reused later when needed just by the simple searching in computer rather than always searching physical papers which very time consuming and slow process. One the easiest way is to scan to save information is to scan it through a computer device and save it. The information stored will be in the image format. But the problem is the user cannot edit text containing by these images, that's makes it difficult for the computer system to read the contents individually and searching these documents contents line by line and word by word. Font characteristics of the characters in paper documents is the reason behind this difficulty whereas characteristics of characters are different to font of the characters in computer system. Thus, it is unable for the computer to recognize the characters of the papers while it is

trying to read. This concept is called as document processing where storing of the information contented by paper documents in computer system and then reading it and searching the information. The process called as document Image analysis is used sometimes when it is needed to process information which related to other languages than the English. Thus, there is a to develop a text recognition tool using some methods which recognize text from the handwritten text into a digital from which is readable by computer as well as object detection of nearby objects integrated in same system.

Main features of the system proposed is summarized as following:

1. Text recognition from an image captured is done only in a single click
2. Pdf generation of the recognized text directly in folder
3. Objection detection of nearby objects available in single click.
4. Objection detection can detect fruits and vegetables.
5. History button tab for previously accessed files which is editable again.

II. LITERATURE REVIEW

Text recognition is still an active research in the field of pattern recognition. Many researchers have proposed different technologies for text recognition. Each approach or technology tries to address the issues in the field of text recognition. In forthcoming section, we present a detailed survey of approaches proposed related to text recognition.

Tridib et al. [1] described algorithm for solving the problem of offline character recognition. The proposed method is extremely efficient to extract all kinds of bimodal images including blur and illumination. Pre- processing and segmentation and

detect the line is done. A brief survey of the applications in various fields along with experimentation into few selected fields is been presented.

Shashank et al. [2] proposed method text recognition. The applications of text recognition is discussed along with the related work done in field of image to text recognition. Experimental results of this system are also mentioned. A briefing of optical character recognition along with the challenges in OCR is also mentioned in the paper.

Ajay et al. [3] discussed about text detection application in real world scenarios like artificial intelligence, optical character recognition, object detection. Information for text detection process is discussed. The difficulties in the process due to variation in environment in which the image is captured is mentioned. A system to detect text and classify of the same is presented.

Monika et al. [4] studied modern day techniques like neural networks to implement deep learning. Also studied using the EMNIST data set to train their model and tested different optimizers to finally select Adamax as it not only yielded a high accuracy with each epoch on train data but also test data. A discussion about the app developed which identify the alphanumeric character from drawn/ written text on the screen by analysing it.

Ashwini et al. [5] presented stages of text detection and recognition and various methods used for that along with comparison of approaches used to undergo the various stages. A brief analysis of advantages, disadvantages and applications of different approaches are also been performed. Various text related applications for imagery are also presented.

III. METHODS AND MATERIAL

For the front-end design of the proposed application we are using the highly compatible and extremely user-friendly software that's android studio. it's easily adaptable with immense number of libraries which might be easily used and linked with other software's. the employment of android studio is to completely develop the frontend by using Edit Text, Text view, Image view etc such keywords.

Secondly, using google API for its vast and widely used interface which might be easily used and access its services by all age groups whether it's young or adult or old ones. Using differing types of keyword to induce it. For example- firebase.

We have used google firebase for database because it's difficult to teach data from very starting so firebase provides service said as ML kit which provides trained database which is is accustomed match capture images. Firebase is extremely advanced technology that enables to be used easily and it's very highly compatible with android studio. And it's easier to share the database. Google firebase provides services like authentication and ML kit which are utilized in our application.

We have used google firebase and its services for text recognition and object detection using tool called as ML kit and mobile OTP authentication for user identity. For using google firebase user must should install android studio and project should meet requirements like API level 16(jelly bean), gardle 4.1 or later and uses jetpack.

you'll create and register your project similarly as check how to link it with android studio at google firebase website. we have used two services of google firebase i.e. authentication and ML kit

Most apps must know the identity of a user. Knowing a user's identity allows an app to securely save user data within the cloud and supply the identical personalized experience across all of the user's devices. Firebase Authentication provides backend product services, simple and easy SDKs, and pre-made UI libraries to verify users to your app.

Authentication: you'll use Firebase Authentication to check in an exceedingly user by sending an SMS message to the user's phone. The user signs in employing a one-time code contained within the SMS message. the most worthwhile thanks to add number sign-in to your app is to firebaseUI, which has a drop-in sign-in widget that executes sign-in flows for number sign-in, similarly as password-based and federated sign-in. to check in users by SMS, you'd wish to first enable the number sign-in method for your Firebase project is to travel in firebase console and open authentication. Then To initiate number sign-in, present the user an interface that prompts them to type their number. Legal requirements vary, but as a best practice and to line expectations for your users, you must inform them that if they use phone sign-in, they could receive an SMS message for verification and standard rates apply.

ML kit:it is additionally a mobile SDK that brings Google's machine learning expertise to Android and iOS apps in an exceedingly powerful yet easy-to-use package. Whether you're new or experienced in machine learning, you'll implement the functionality you'd like in precisely some lines of code. there is no must have deep knowledge of neural networks or model optimization to induce started. On the choice hand, if you're an experienced ML developer, ML Kit provides convenient APIs that facilitate your use your custom TensorFlow Lite models in your mobile apps. ML Kit comes with a group of pre made APIs for common and ordinary mobile use cases: recognizing text, detecting faces, identifying landmarks, scanning barcodes and qr codes, labelling images, and

identifying the language of text/characters. Simply pass in data to the ML Kit library and it gives you the knowledge you'd like

Text recognition: can automate tedious data entry for credit cards, receipts, shopping bills and business cards . by the Cloud-based API, you will also pull out text from images of paper documents, which you will use to increase accessibility or translate/transform documents. Apps can even keep track of real-world objects, like by reading the numbers on trains. using ML Kit to acknowledge text in images. ML Kit has both a general-purpose API appropriate for recognizing text in images, a bit like the text of a sign, and an API amended for recognizing the text of documents. The common purpose API has both on-device and cloud-based models.

Object detection: with ML Kit's on-device object detection and tracking API, you'll localize and track in real time the foremost prominent objects in an exceedingly picture or live camera feed. you'll also optionally classify detected objects into one altogether several general categories.

Object detection and tracking with coarse classification is beneficial for building live visual search experiences. Because object detection get it done so fast and completely on the system, it works very well because the front of a broaden visual search pipeline. After you finding or detecting and filter objects, you will advance it to them to a cloud backend, like cloud vision product search.

IV. IMPLEMENTATION

The implementation of the Camshot application is the help of android studio and firebase its services.

To develop frontend of the application android studio is used because it is lot of advantages like gradle-based form support. Built-in emulators same as mobile

phones to get the execution, adaption, convenience similarity and different types of issues. Wizards which are layout based used to make android design and its components efficiently. There is feature named as editorial manager that enables to drag and drop UI components for users, the alternatives to see designs on different types and sizes of the screens, making them all work together through coding of frontend. Support for building android apps on mobile as well as other portable devices.

After android studio, we have used two services of google firebase so implementation of it is given below:

Adding firebase using firebase console

Step 1: creating firebase project to connect to your android app.

Step 2: registering your app with google firebase

Step 3: adding a firebase configuration file(google-service.json) and to enable firebase services in the app , adding google-services plugin in the gradle files

Step 4: adding firebase SDKs in the app.

Implementation of text recognition and object detection for the integration of SDK is needed and applying ML model in the data.

We have just added the dependencies for the ML Kit Android libraries to your module (app-level) Gradle file (usually app/build.gradle).

V. RESULTS AND DISCUSSION

There are many impressive functions that are featured in our application which enrich the user experience while using it. As soon as registration is done via otp username is stored in firebase and user can login. As user logged in app it can access all the functions of app like text recognition, object detection as well as fruits and vegetable detection with other supportive features.

After the user is logged in he/she is introduced with multiple features as shown through the use case in Figure 1.



Figure 1

Figure 2 is screenshot of our sign in page which is the 1st page coming up whenever your app open(if you were logged out in previous session)

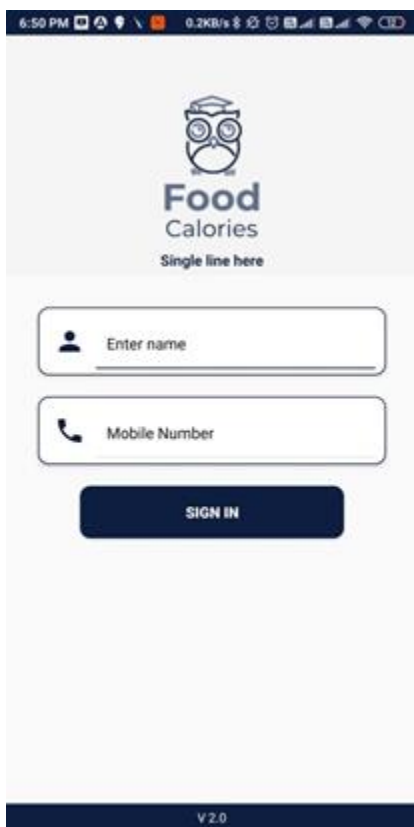


Figure 2



Figure 3

Figure 3 is homepage of application where you can see our feature buttons



Figure 4



Figure 5

Here you can see the result of text recognition, in figure 4 handwritten text was captures and in figure 5 you can see application recognized the text precisely. Further it can be edited and can be changed it other fonts and different font sizes and it will saved as pdf automatically in folder.



Figure 6



Figure 7

Here is the result of how our application is to detect objects, in figure 6 camera capture chair as a image and

in Figure 7 application as that is a chair by mentioning it below.

VI. CONCLUSION

The application helps user to convert handwritten text into digital format which is editable further. Number of handwritten paper documents are available which are needed to convert into digital format so it can be easily readable and searchable by computer system which will help user to make the task easier and faster. Application provides feature like object detection which can detect nearby objects captured with the proper camera angle. It can also detect the fruits and vegetables which can be differentiable by application.

Google firebase with its latest and advanced technology has proved that its services and tools are very efficient to use which can help beginners to develop their projects.

VII. REFERENCES

- [1]. Chowdhury Md Mizan, Tridib Chakraborty* and Suparna Karmakar, "Text Recognition using Image Processing," International Journal of Advanced Research in Computer Science, 2017.
- [2]. Pratik Madhukar Manwatkar, Shashank H.Yadav, "Text Recognition from Images," IEEE Sponsored 2nd International Conference on Innovations in Information, Embedded and Communication systems (ICIIECS), 2015.
- [3]. C.P. Chaithanya, N.Manohar, Ajay Bazil Issac, "Automatic Text Detection and Classification in Natural Images," International Journal of Recent Technology and Engineering (IJRTE), 2019.
- [4]. Shubham Sanjay Mor, Shivam Solanki, Saransh Gupta, Sayam Dhingra, Monika Jain, Rahul Saxena, "HANDWRITTEN TEXT RECOGNITION: with Deep Learning and Android," International Journal of Engineering and Advanced Technology (IJEAT), 2019.
- [5]. Chaitanya R. Kulkarni, Ashwini B. Barbadekar "Text Detection and Recognition:A Review,"

International Research Journal of Engineering and Technology (IRJET), 2017.

Cite this article as :

Suvarn Badkas, Deep Desai, Harshrajsinh Jadav, "Camshot-Hand Written Text Recognition and Object Detection Application", International Journal of Scientific Research in Computer Science, Engineering and Information Technology (IJSRCSEIT), ISSN : 2456-3307, Volume 6 Issue 2, pp. 276-282, March-April 2020. Available at doi : <https://doi.org/10.32628/CSEIT206282>
Journal URL : <http://ijsrcseit.com/CSEIT206282>