Android Travel Buddy App using Image Processing

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Abstract— The next generation open operating systems are not on desktops or mainframes but on the small mobile devices people carry every day. In Indian market there was always a huge demand of such an Android Application, which would enable a Tourist sitting in a restaurant to capture, OCR and translate the Hindi language menu in his own country language to order his favrioute dish without any need to know the language of menu therefore we are going to make an application which is useful for travellers who are unable to understand native language of visiting place while travelling. This application enables people to understand the native language of the visiting place and also seamlessly fire a travel specific search to get the information regarding the museums information board, restaurants and hotels menu, Sign boards on the roads, Books etc by translating it into users specified language. This paper presents an extremely on-demand, fast and user friendly Android Application.

Key words: OCR

I. INTRODUCTION

Android Travel Buddy App Using Image Processing it is an application developed for native tourists and travellers who possess Android Smart phones. It enables Travellers and Tourists to easily capture the native language Books pages, signboards, banners and hotel menus etc. The built-in OCR converts the text embedded in the captured image into Unicode text format. It also provides translation facility so that Tourists can translate the Native Language Unicode text into their own country language. This Application has an advanced search feature so that recognized as well as translated text can be used to copy, paste, share and search for travel related queries like museums, places, restaurants, books, culture, signboard etc.

It will provide facility to maintain and create attendance record for all students lecture and class wise. The information is very useful to users, teachers and in-charges in particular, for knowing the track record of a student of attending lecture(s). The information can also be used as proof for representing the number of lectures student has attended whenever claimed. This system will also help in evaluating attendance eligibility criteria of any/a student.

Major need behind the project is digitization, computerization and automation of the traditional way of taking attendance. Another motivation is automatic generation of periodic reports that are required by teachers, H.O.D.s, students etc.

For any academic institution, term attendance management includes several tasks throughout the academic session. These tasks include: recording student attendance, maintaining it, generating periodic reports, contacting students and informing and confirming from g\warden of students about the low attendance record. Basic concept behind this project is to digitize all and automate most of above tasks so that the extra burden the teaching staff feels can be reduced considerably.

II. LITERATURE REVIEW

Every day a Smartphone user may look for a new application dedicated for his need. Android makes it easier for consumers to get and use new content and applications on their Smart phones. The paper on-demand, fast and user friendly Android Application ATBA. ATBA stands for Android Travel Mate Application. This application is useful for native Tourists and Travellers who possess Android Smart phones. It enables Travellers and Tourists to easily capture the native country language Books pages, sign boards, banners and hotel menus etc. The built-in OCR converts the text embedded in the captured image into Unicode text format. It also provides translation facility so that Tourists can translate the Native Language Unicode text into their own country language. This Application has an advanced search feature so that recognized as well as translated text can be used to copy, paste, share and search for travel related queries like museums, places, restaurants, books, culture, hotels, etc. There is no remote computing overhead because the application has built in OCR suite as well as Image Processing suite both installed in the Android device.

- As demand grows for mobile phone applications, research in optical character recognition, a technology well developed for scanned documents, is shifting focus to the recognition of text embedded in digital photographs. We present OCR droid, a generic framework for developing OCR-based applications on mobile phones. OCR droid combines a light-weight image preprocessing suite installed inside the mobile phone and an OCR engine connected to a backend server.[1]

– We demonstrate the power and functionality of this framework by implementing two applications called Pocket Pal and Pocket Reader based on OCR droid on HTC Android G1 mobile phone. Initial evaluations of these pilot experiments demonstrate the potential of using OCR droid framework for real world OCR-based mobile applications.[2]

– Inspired by the well-know iPhone app "Word Lens", we developed an Android-platform based text translation application that is able to recognize the text captured by a mobile phone camera, translate the text, and display the translation result back onto the screen of the mobile phone. Our text extraction and recognition algorithm has a correct-recognition rate that is Android Travel Buddy App Using Image Processing greater than 85% on character level. In this report, we demonstrate the system flow, the text detection algorithm and detailed experiment result.[3]

III. EXISTING SYSTEM

A. Current System

Unfortunately today there is no such existing system to read the information (except Spanish and English) for the image and translated. But to do this touristic usually hire the guide. Basically the provides assistance, information and cultural, historical and contemporary heritage interpretation to people on organized tours and individual clients at educational establishments, religious and historical sites, museums, and at venues of other significant interest.

B. Disadvantage of Current System

– Limited scope: The existing system has limited Scope that is it is applicable for only two languages.
– Time consuming: the Existing system takes long time to convert the language.

IV. PROPOSED SYSTEM

Our project enables Travellers and Tourists to easily capture the native country language Books pages, signboards, banners and hotel menus etc. The built-in OCR converts the text embedded in the captured image into Unicode text format. It also provides translation facility so that Tourists can translate the Native Language Unicode text into their own country language. This Application has an advanced search feature so that recognized as well as translated text can be used to copy, paste, share and search for travel related queries like museums, places, restaurants, books, culture, hotels, etc. This would prove enormously beneficial with respect to the aspects about localization being a common phenomenon now-a-days. Also android platform has been increasingly being common in accordance with its features like low-cost, customizable, lightweight operating system and more. The application describes the following characteristics:

1) It will be very helpful for tourists to understand & adapt local languages with ease.
2) This Application has an advanced search feature so that recognized as well as translated text can be used to copy, paste, share and search for travel related queries like museums, places, restaurants, books, culture, hotels, etc
3) The application enables the users to get text translate as ease as a button click. The camera captures the text and returns result in real time.
4) This application enables people to understand any native country language and also seamlessly fire a travel specific search to get the info regarding the country like museums, restaurants, hotels, culture, temples, books, movies, songs, etc
5) It overcome existing problems with OCR technology i.e. limited memory and limited processing power challenge moreover also overcomes the problem of from networking delay

V. REQUIREMENT

The application consists of four major subsystems/modules as depicted in the system architecture diagram. They are explained below:

A. Camera Capture Component

In this module with the help of built-in camera of smartphones to which the application is installed in, the user is allowed to resize the camera capture box by touching the box corners on the screen so as to capture the only concerned text image from signboard, banner and book pages hence, focusing mostly the text region in the image in order to cover as much image text as possible in one click. The camera keeps continue auto focusing the image automatically throughout the session. The captured image is in binary form. Once the capture button is pressed the beep sound plays and the captured image is sent to Tesseract OCR engine module using Tesseract Android Tools.

B. Tesseract OCR Engine Component

Today, Tesseract is considered one of the most accurate open source OCR engines available. Tesseract OCR Engine was one of the best 3 engines in 1995 UNLV Accuracy Test. Between 1995 and 2006 however; there was little activity in Tesseract, until it was open sourced by HP and UNLV in 2005. It was again re-released to the open source community in August of 2006 by Google. Tesseract has ability to train for newer language and scripts as well. A complete overview of Tesseract OCR engine can be found in. While Tesseract was originally developed for English, it has since been extended to recognize French, Italian, Catalan, Czech, Danish, Polish, Bulgarian, Russian, Greek Korean, Spanish, Japanese, Dutch, Chinese, Indonesian, Swedish, German, Thai, Arabic, and Hindi etc. Training the Tesseract OCR Engine for Hindi language requires in-depth knowledge of

Devanagari script in order to collect the character set. Moreover, Tesseract OCR Engine does not just require training of the collected dataset but also to tackle the character segmentation and clubbing issues based on the script specific features i.e. Shirorekha, maatra etc..In this module, The Binarization of Captured Image takes place, after that the text layout is analyzed, Blobs are detected and finally words and lines are detected. The words are sent to a number of passes. In these passes each word is chopped into characters and characters are checked for the need of joining the broken characters or the breaking of associated characters. Finally chopped characters are recognized with the help of inbuilt fuzzy features matched to language specific training data of Unicode characters. After each pass the words are matched back and forth with the Language specific Dictionary words.

C. Dictionary words Matching Component

In this module each group of sequential characters is searched for a dictionary based word match, which helps in identifying the word more accurately rather than just giving a meaningless word as result. Finally the recognized text is transferred to Unicode text Post processing Module.

D. Unicode Text Post Processing Component

In this module, the recognized characters that came as an output from the OCR engine are displayed as Unicode characters in a text box and the user is allowed to translate the recognized text into his desired language available in the drop down list from settings. From there user may choose one of the two available translators from the drop down list including Bing Translator and Google translator. Moreover the user can use the advanced search feature to search the travel specific related queries like museums, books, videos, songs, culture, images, places and hotels etc. related to recognized or translated text.

1) Functional Requirement for the user
- Functional Requirement 1.1
- Title: Selecting the User language
- Description: The user of the application must select the language to translate.
- Functional Requirement 1.2
- Title: Capture the image
- Description: The user of the application must capture the image.
- Functional Requirement 1.3
- Title: Upload the image
- Description: The user must upload the image.
- Functional Requirement 1.4
- Title: Selecting the language for translate
- Description: The user of the application must select the language to translate.

2) Non-functional Requirement
Following are the non-functional Requirement.
- Availability:
- Flexibility:
- Performance:
- Reusability:
1) The application is availability to the user is 24*7*365 days.
2) Our application is flexible so that new thing can be add or remove from the project.
3) The performance the application is depend on the camera revolution. Higher the quality higher the image revolution. The camera capture component is can be reused in many application such as image capture, important content extraction etc.

3) Hardware and Software Requirement
a) Hardware
- 500MB RAM
- 100 GB HDD.
- Intel 1.66 GHz Processor Pentium 4
- GPRS enabled Mobile Phone with Android.
- OCR Engine
b) Software
- SDK for Android

VI. FEASIBILITY STUDY

A. Economic Feasibility:

System is being developed with keeping economic expenditure on the system minimum. The system requires minimum instalment expense that is occurred for installation of server. The software used for server – Tomcat server and jdk – are freeware there by incurring least installation charges.

Maintenance charges include internet charges and other system maintenance costs. This is though minor costs. With implementation of system, paper usage would be eliminated and thereby reducing cost to institute.

B. *Technical Feasibility*

Technical feasibility of system checks the technology that is to be used for system, its availability and ease of access to them. The technologies used are widely available and cost effective. Android powered smartphones are common in almost every user today. Server requires no special hardware and software that is not available or would not be cost effective.

C. *Operational Feasibility*

‒ Operational feasibility of system checks how easy the system is to access and use by the end user.
‒ System is quite easy to operate and requires no special training to user. The system and all its components are self-explanatory and hence user can access the system quite easily and without any glitch

VII. TECHNOLOGY

A. *OCR Engine*

Optical Character Recognition, or OCR, is a technology that enables you to convert different types of documents, such as scanned paper documents, PDF files or images captured by a digital camera into editable and searchable data.

Imagine you've got a paper document - for example, magazine article, brochure, or PDF contract your partner sent to you by email. Obviously, a scanner is not enough to make this information available for editing, say in Microsoft Word. All a scanner can do is create an image or a snapshot of the document that is nothing more than a collection of black and white or colour dots, known as a raster image. In order to extract and repurpose data from scanned documents, camera images or image-only PDFs, you need an OCR software that would single out letters on the image, put them into words and then - words into sentences, thus enabling you to access and edit the content of the original document.

B. *Android*

Android is mobile operating system currently being developed and managed by Google Inc. Android is based on Linux kernel primarily built for touch screen based mobile devices such as smart phones and tablets. It was initially developed by Android Inc. later bought by Google Inc. Android Interface is based on direct interaction with touch interface using touches and gestures. Android's source code is released by Google under Open Source licenses

VIII. CONCLUSION

This Application provides fast, robust and extremely high Quality performance because of having improved Auto focus behavior, continuous dynamic preview, improved noise tolerance feature and no remote computing overhead.

IX. FUTURE PROSPECT

The project is to be implemented on three interfaces web, OCR engine and android mobile. Development of web is to be done in two stages: static web pages for designing followed by adding of dynamism. Android application is to be developed on Android Studio – IDE supported by Google.

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