

OCR ON ANDROID-TRAVELMATE

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Abstract: This report presents an android application for accurate recognition and translation of text in varying environmental conditions, given an Android mobile having a camera. This paper presents an extremely on-demand, fast and user friendly Android Application TRAVELMATE. Every day a Smartphone user may look for a new application dedicated for his need. Android makes it easier to get and use new content and applications on their Smart phones. This application can be used by Tourists and Travelers who own an Android Smart phone. It enables Travelers and Tourists to easily capture the native country language Books pages, signboards, banners and hotel menus etc. It also provides translation facility so that Tourists can translate the Native Language Unicode text into their own country language such as Hindi, English, French and German. 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. It provides fast, robust and extremely high Quality performance.

Keywords: Android, Tesseract OCR engine, Bing Translator API, Android SDK, Eclipse.

I. INTRODUCTION

Our objective is to utilize the visual capabilities of the Android mobile phone to extract information from an image. We use the features of the Android to extract text from an already existing image or a realtime image. Extracting information from an image requires accurate recognition of the text. Any camera image would be subject to several environmental conditions, such as variable lighting, reflection, rotation, and scaling.

Optical character recognition (OCR) is a powerful tool for bringing information from our analog lives into the increasingly digital world. This technology has long seen use in building digital libraries, recognizing text from natural scenes, understanding hand-written office forms etc.

The Personal Computer and the Internet have found revolutionary ways to connect people and let them exchange information. But none of these is able to reach each person anywhere and anytime like the cell phone does. Current global mobile phone usage is 4 billion, which is equivalent to around half of the worlds population. The cell phone has become very important in today's society. The Proposed Travel Mate Application helps Tourists and Travelers with the following function :

1. Extract and translate the native country language Books pages, Signboards, Banners and hotel menus etc.
2. Translate the Recognized text into one of 4 languages.
3. Google Search for text related museums, songs, images, videos, hotels and restaurants.
4. Converts the translated text to speech.
5. Currently TRAVELMATE supports English and Hindi text extraction only. The improvements and the support for other languages like Urdu in TRAVELMATE can be carried out in future.

II. CONSTRUCTION OF OCR SYSTEM

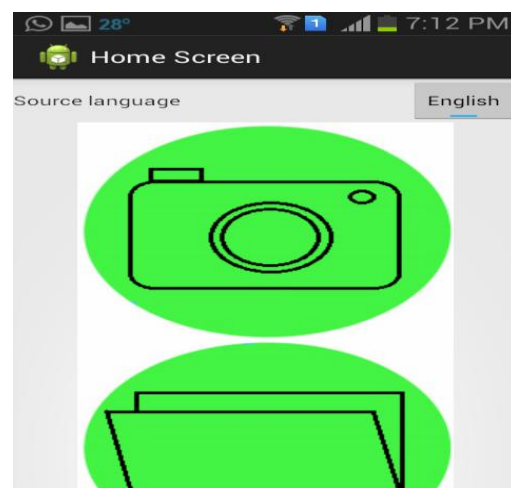
A. Camera Capture Module

In this module 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. The camera keeps continue auto focusing the image automatically throughout the session. Once the capture button is pressed the beep sound plays and the captured image is sent to Tesseract OCR engine module.

B. Tesseract OCR Engine Module

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 characters and characters are checked for the need of joining the broken characters or the breaking of associated characters.



C. Dictionary words Matching Module

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. Translation Module

In this module, the recognized characters are displayed as Unicode characters 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. An easy way to comply with the conference paper formatting requirements is to use this document as a template and simply type your text into it.

III. DATA FLOW DIAGRAMS

The DFD serves two purposes:

1. To provide an indication of how data are transformed as they move through the system.
2. To depict the function and sub-functions that transforms the data.

They serve as basis for the functional as well as information flow modelling.

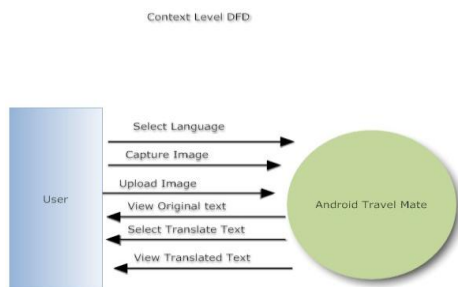


Fig.1 DFD

IV. SAMPLE OUTPUT



Fig.2 HomeScreen

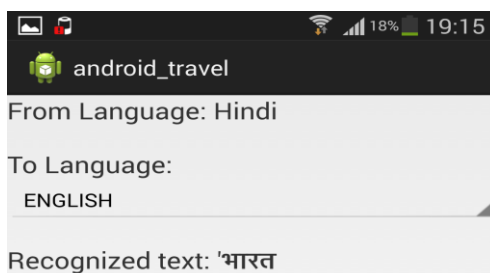


Fig.3 InputImage

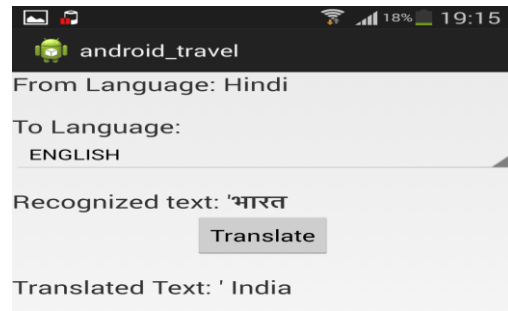


Fig.5 Translated Text

The Tests were conducted on 100 samples each of book's pages, banners, signboards and posters of Hindi and English language captured under Light variations. The results are as follows:

Table 1: Average Recognition results

Language	English	Hindi
Avg. Mean Confidence per word	69	24
Avg. Time taken per word	153ms	681ms
Light and Noise susceptibility	LOW	HIGH
Average Accuracy	97.9%	79.2%

V. CONCLUSION

This paper tells about OCR system for Signboard character recognition. The systems have the ability to yield excellent results. The character extraction step of optical character recognition is the most important one. This system offers an upper edge by having an advantage i.e. its scalability, i.e. although it is configured to read a predefined set of formats, currently English and Hindi, it can be configured to recognize new language formats. It also translates the captured text to languages viz English, Hindi, French and German. One can directly get the additional information about the captured text via the application.

Future research aims at new applications such as extraction of text from video images.

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