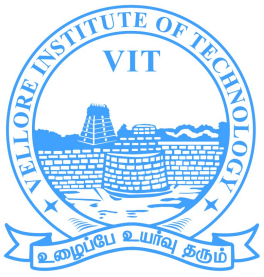

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Word Encyclopedia using OCR technology

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Abstract

In our day to day life, when we read, we come across many specific words whose meaning is not clear to us. And rather than understanding, we just tend to skip it. The situation becomes even more relatable when we come across an unknown word of an unknown language and we cannot search it as we do not know to type the particular language. For this, an idea to automatically tell the meaning, synonym and antonym of a particular word by tapping the word through the camera of the mobile can be of great help. So, making an Android app for the same is a feasible idea, which can be done by using automatic recognition patterns, image processing, (OCR) optical character recognition techniques, etc. The project “Word Encyclopedia” is a very innovative idea to improve one’s language skill. This app will help to give meanings of words easily which we find difficult to understand while reading with just a tap on the screen. Students preparing for examinations can make the best use of app and will save a lot of time for them.

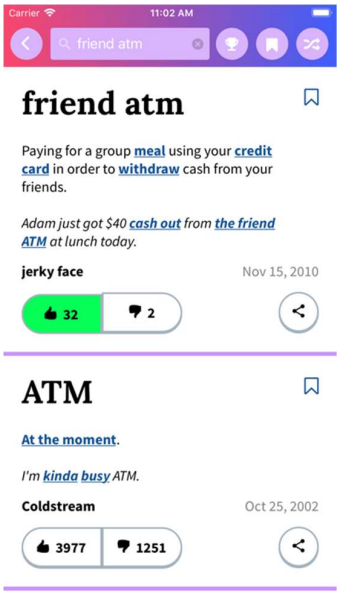
Introduction

The standard thought in automatic recognition of examples is first to instruct the machine which class of examples that may happen and what they look like. In OCR, designs are letters, numbers and some exceptional images like commas, question marks and furthermore exceptional characters. The teaching of machine is performed by demonstrating the machine cases of characters of every single distinctive class. In light of these illustrations the machine constructs model or depiction of each class of characters. During recognition the unknown characters are contrasted with previously obtained descriptions and allocated to class that gives the best match. A recent development has been to improve OCR postprocessing by considering the visual relations between words that exist in normal English language documents.

A typical OCR framework comprises of several parts. The initial step is to digitize document utilizing an optical scanner. At the point when regions containing content are found every symbol is extracted through division or segmentation process. The extracted images are pre-processed, eliminating noise to facilitate feature extraction. The personality of every image is found by contrasting separated highlights and depictions of image classes got through a previous learning stage. Finally, contextual information is used to reconstruct words and numbers of the original text

DESIGN SURVEY

- We surveyed different applications and they were quite slow application and often provided incorrect solutions
- Inaccurate character recognition and limited encyclopedia was one of the major concerns.
- They all had a complex interface and were highly paid

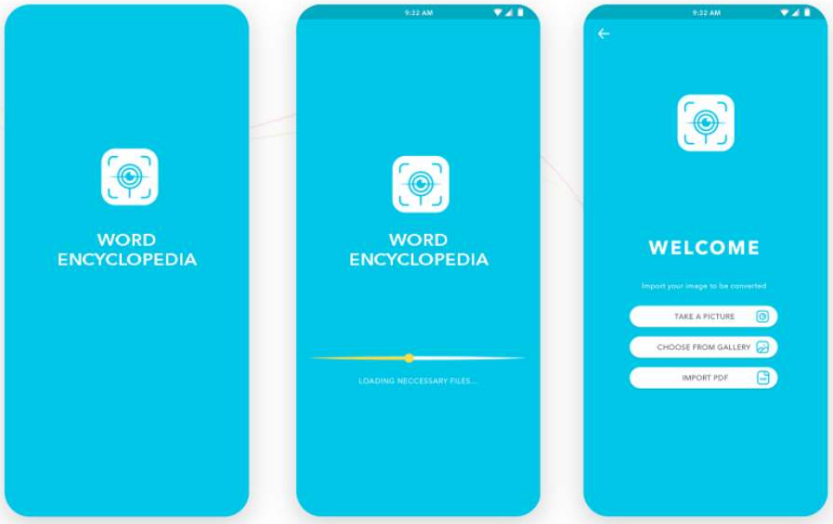


Existing Designs

DICTIONARY. FARLEX, INC. often provides grammatically incorrect results and it is paid.

Linxy has difficult to use tools which are not suitable for novice users and the application is very slow

New Design and Development



SPLASH SCREEN

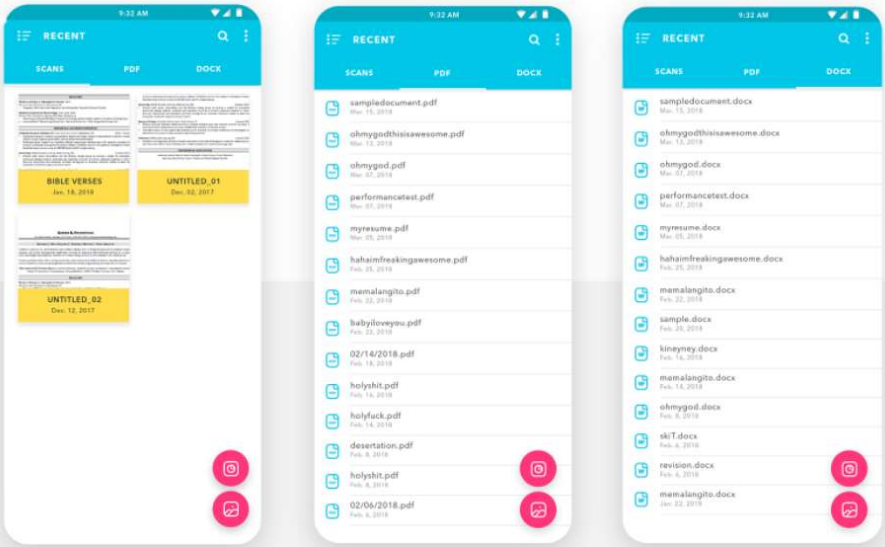
The first screen to show when the app is opened.

LOADING SCREEN

Loading neccessary files will only occur on first time use. It will only take 15-20 sec. to complete.

IMPORTING IMAGE

First time user will be redirected to welcome screen where they can now import text images or pdf.



MAIN SCREEN

This is the main screen to recent user with a history of recent scan use.

RECENT EXPORTED PDF

User can navigate to the exported pdfs.

RECENT EXPORTED DOCX

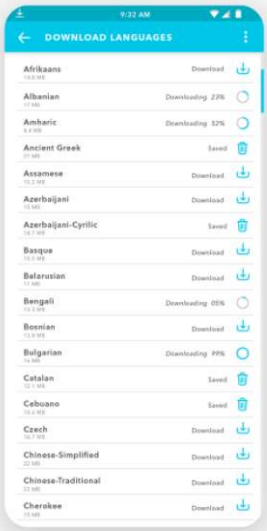
User can navigate to the exported word documents.

TRANSLATION

This also include offline translation feature where you can download language pair for offline use.

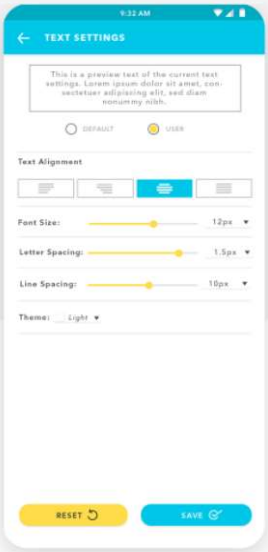
RESULT SCREEN

Here goes the scanned document. You can now edit and do a lot of things with the text.



DOWLOADING LANGUAGES

You can download 156 different ocr languages for an effiecient use.

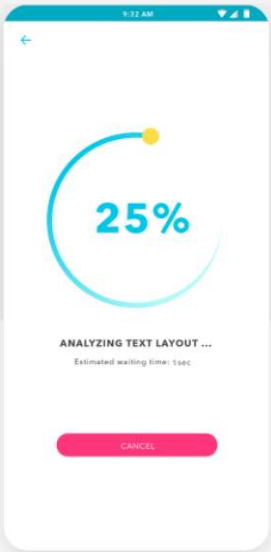


TEXT SETTINGS

User can customize the text settings and themes.

HELP SCREEN

Some helpful tips for using the app espcially for new users.



OCR PROGRESS SCREEN

User can track the progress of proces for them to know if the process will take time and have to wait for it.

Evaluation Plan of the Interface

Scanning new image

Description	Operation	Time (Sec)
Picking Stylus	PS	0.3
Homing Stylus to somewhere	HS	0.5
Tapping with stylus	T	0.5
Use Camera	R	2
Taping with stylus to verify input	OB- TV	1
Finding object on screen and tapping with stylus	OB-FT	1
Putting stylus down	PS	0.3

Total time: 5.6 sec

Uploading the existing image

Description	Operation	Time (Sec)
Picking Stylus	PS	0.3
Homing stylus to somewhere	HS	0.5
Tapping with stylus	T	0.5
Browsing	R	2
Tapping with stylus	T	0.5
Tapping with stylus to verify input	OB-TV	1
Finding object on screen and pressing corresponding button	OB-FK	1.3
Putting stylus down	PS	0.3

Total time: 6.4 sec

Time taken to scan a new image is 5.6 sec which is lesser than uploading the existing which is 6.4 sec

Conclusion

On the basis of the evaluation tests we performed on different Interface models (both preexisting and self-developed), we can safely conclude that the preexisting models are difficult to use and are not accurate. The developed models are better not only for the students and elderly people but also time save for the novice users.

Inferences about the already existing models

- Slow application
- Frequent incorrect results (synonyms)
- Inaccurate character recognition
- Paid application
- Limited encyclopedia

Improvements suggested on the existing interfaces

- Slow application: By using the latest Machine Learning technologies we can now provide with better regression and clustering and can deploy faster
- Frequent incorrect results: In our database we have the correct synonyms, antonyms grammatically and we are using oxford dictionary api for that.
- Inaccurate character recognition: We use new optical character recognition technology which will provide the accurate character recognition
- Paid application: Our application is free for all the users.
- Limited encyclopedia: We have provided a vast encyclopedia database from oxford dictionary api and Encyclopedia Britannica api.

References & Tools

Tools:

(a) Android Application Development Environment: Android Studio

(b) OCR Library which is to be included in Program code (Google Play Services Vision)

(c) A smartphone having Android OS.

(d) Java Development Kit

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