# Energy Efficient Business Card Recognition and Translation over Cloud Computing using Google Vision

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## Abstract

Developments in cloud computing and smart phone technology have opened the door for many unique applications to be created. In a world that is interminable becoming more globalize, there are more interactions between different languages. One of such applications is the ability to allow users to use computer vision with a camera on their phone to translate foreign language into their native language. However, early adopters of this. Technologies are far from optimal when it comes to features and robustness of their apps. Exploring options for optimizing allocation of resources and maximizing features of these apps can greatly improve the technology for users and distributors alike. In this project we introduce a scalable and energy efficient computer vision protocol for the text translation using Google Vision and reduce power consumption by uploading the translation computation on server, improving the data usage, and accuracy of translation. Our proposed idea is based on a camera driven process algorithm and an energy-efficient model to improve energy efficiency and provide the scalability support for foreign language translation. To validate the proposed idea, a Java based platform is developed. Our results demonstrate that compared the existing application with our application energy efficient and scalable application showed much better performance than existing applications including Google App.

**Keywords- Cloud Computing, Computer Vision, Energy Efficient, Google Vision, Mobile App, Power Consumption**

## I. INTRODUCTION

One way mobile platforms have provided language translation help is by creating virtual dictionaries and phrase databases. An example of this is provided by the various developers who created language learning apps such as the ones explored in for translating local languages to English. In order to data are properly compare these factors, there are two models: i) The reliable energy efficiency model of alongside in accuracy model with these model in place we created the ground work of our text translation app. ii) when finished can be more energy efficient and reliable then the apps currently available. Our plan is to be created an application that resolves [4]. This problem and improves them in other measurable matrices. In proposed the energy efficient applications are randomly selected to the set of words between languages. This app that reads business cards and converts them into digital contacts. In this app Camera is invoke for capturing photo of a card, convert image into 64 base and send to cloud for translation. Card Information are automatically saved to your locally or cloud, or you can Sync to save them to firebase Database. In Digitize Business Card App OCR works fairly well: It's good at reading image text, but it's not great at deciphering which text should populate which held in a digital contact _le, especially when it's trying to read a creative layout. For example, Digitize Business Card often gets the company name and the person's title mixed up, because many business cards put the title (not the company) after the person's name. The app is excellent at transcribing numbers (and putting them in the correct mobile, work, or fax box) and email addresses, by using regular expression. Digitize Business Card isn't just for collecting others' cards. You can upload your own card info to the firebase database and add augmented reality features, such as links to your work. If another Digitize Business Card user scans your card, they'll get all this information. And user can access card info from cloud. In this project used Google vision for Accuracy detection and extracting image content text by removing background objects. And also use for translation of text. Translation process is done by Google vision so energy consumption is reduced by uploading on server Companies that can make use of image recognition and don't want to invest in developing their own have more choices now. This open API includes useful features. One of the application is allowed user to use a camera for capturing image and translation server to translate a foreign language i.e. Japanese and German into English language so that it very simple for any user to understand the language [11].In this also used to check whether the given translated text is accurate or not, so for that we used accuracy model. All this done on Translation server which provides energy efficiency of mobile app. We have use cloud service for storage purpose using Firebase. All the information which captured from mobile and translation are perform then it stored on cloud Database and

 

when user want to access information then user LOGIN and retrieve info securely[10]. Cloud Storage for Firebase is powerful, simple, and cost-effective object storage service built for Google scale.

## II. RELATED WORK

### *A. System Description*

Now a day's cloud computing development and smart phone technology have given the opportunity for many application. So there is many options for allocation of resources are optimize and increase the features application. In present translation App all computing are done in mobile App so it consume more power. Allows user to use computer vision with a camera for analyze image content and then allows App for translating sign into English language [11]. So we implement scalable and energy efficient computer vision for text translation which reduce power spending or use power for computation in App and also increase the accuracy of translation. In short allowing mobile App to use multiple servers for translation by assigning task to the cloud server which increases the performance in power consumption [10]

### *B. Digitize Business Card*

This app that reads business cards and converts them into digital contacts. In this app Camera is invoke for capturing photo of a card, convert image into 64 base and send to cloud for translation. Card Information are automatically saved to your locally or cloud, or you can Sync to save them to firebase Database. In Digitize Business Card App OCR works fairly well: It's good at reading image text, but it's not great at deciphering which text should populate which field in a digital contact file, especially when it's trying to read a creative layout. For example, Digitize Business Card often gets the company name and the person's title mixed up, because many business cards put the title (not the company) after the person's name. The app is excellent at transcribing numbers (and putting them in the correct mobile, work, or fax box) and email addresses, by using regular expression. Digitize Business Card also keeps a photo of the card, so if the OCR fails, you have a backup. Digitize Business Card isn't just for collecting others' cards. You can upload your own card info to the firebase database and add augmented reality features, such as links to your work. If another Digitize Business Card user scans your card, they'll get all this information. And user can access card info from cloud.

### *C. Image Content Translation*

In the West Hemisphere, companies like Microsoft and Google offer their internal deep learning framework as an open source, and productize their technology as APIs - think Microsoft's Project Oxford and Google's Cloud Vision API, all in order to promote their cloud servers. The fact that Google opened its image recognition technology through the recent launch of Cloud Vision API is a huge benefit for companies that want to build on top of it, and a huge disadvantage for other vendors that didn't specialize into a specific vertical.

In our project we used Google vision for Accuracy detection and extracting image content text by removing background objects. And also use for translation of text. Translation process is done by Google vision so energy consumption is reduced by uploading on server Companies that can make use of image recognition and don't want to invest in developing their own have more choices now. This open API includes useful features. And it's interesting to see that Google opened their Optical Character Recognition capacity too.

### *D. Text or Language Translation*

One of the application is allowed user to use a computer vision with a camera for capturing image and translation server to translate a foreign language i.e. Japanese and German into English language so that it very simple for any user to understand that[11].In this we also used to check whether the given translated text is accurate or not, so for that we used accuracy model. All this done on Translation server which provide energy efficiency of mobile app.

### *E. Global Data Storage*

We have use cloud service for storage purpose. Firebase All the information which captured from mobile and translation are perform then it stored on cloud Database and when user want to access information then user LOGIN and retrieve info securely[10]. Cloud Storage for Firebase is a powerful, simple, and cost-effective object storage service built for Google scale. The Firebase SDKs for Cloud Storage add Google security to file uploads and downloads for your Firebase apps, regardless of network quality. Firebase Authentication makes it easy for you to authenticate your users, Firebase Security Rules for Cloud Storage makes it easy for you to authorize users and validate requests. Storage Security Rules manage the complexity for you by allowing you to specify path based permissions.

In this system is used to scalable and energy efficient application server and consume the power in mobile battery[11].A cloud server that provides the translation service which sends to the translated image and accuracy module are check and extract the content of image. Along with these improvements we also plan to make the App and more effective by these competitions. We proposed to reconstruct the image using translated text.

## III. INDENTATIONS AND EQUATIONS

### *A. Energy Efficient Model for Translation.*

Eq.1 for Total given data to App for translation

$$Sd_x{}^n = t_r \text{X } t \text{ ---------- eq (i)}$$

Where,

$Sd_x$ = Total given data to App for translation in Kbytes.

$t_r$= Data translation rate.

t=time required for translation.

Eq.2 for Translation capacity

$$T_c = \frac{\theta {\sigma_y}^2 \times 100}{Sd_x{}^{-n}} \quad \text{---------eq (ii)}$$

Where,

$T_c$= Translation capacity

$0a_y2$ = Successful translating data

Eq. 3 For Total consumed energy for all translated Texts

$$\Delta E_m = \Delta\beta_t \prod_{u \in S(k)}^{n} Y_{uk} + \prod_{v \in S(k)}^{n} Z_{vk} \quad \text{------- eq (iii)}$$

Where,

$AE_m$= Minimal Energy Consumed.

$Aft_t$= Size of the document

$Y_{uk}$= Number of documents translated in first Language

$Z_{vk}$= Number of documents translated in' N' language

Accuracy Detection Model for Translation.

Eq.4 For calculate the accuracy of the App

$$A\varepsilon = \sum_{k=0}^{\infty} (k_t) - k_j \times \iint_{i=0\ \&\ j=0}^{N+} (\Delta p)^n - (\nabla \mathrm{p}) \quad \text{-------- eq (iv)}$$

Where,

Ae = Accuracy of App.

$K_t$= Acceptable document.

Kj= Untranslated documents

$(Ap)^2$ = Successful total translated documents.

Vp = Unsuccessful words in each translated document.

## IV. SYSTEM DATASETS AND ARCHITECTURE

### *A. Datasets*

In figure includes the actual Data sets which are intersect with another model. There are three model in Venn diagram and where Text Detection and Translation model with Energy Efficient is the Universal set and Accuracy detection, Energy Efficient for text translation and Text Translation model is a subset of Universal set. In that accuracy detection model and Energy Efficient model are intersect with common Dataset i.e. required words translation rate, total energy consumption and also energy efficient model and Text Translation are intersect with common Dataset i.e. total given data for translation. And other Dataset are independent with another model they are separately perform with their operation.

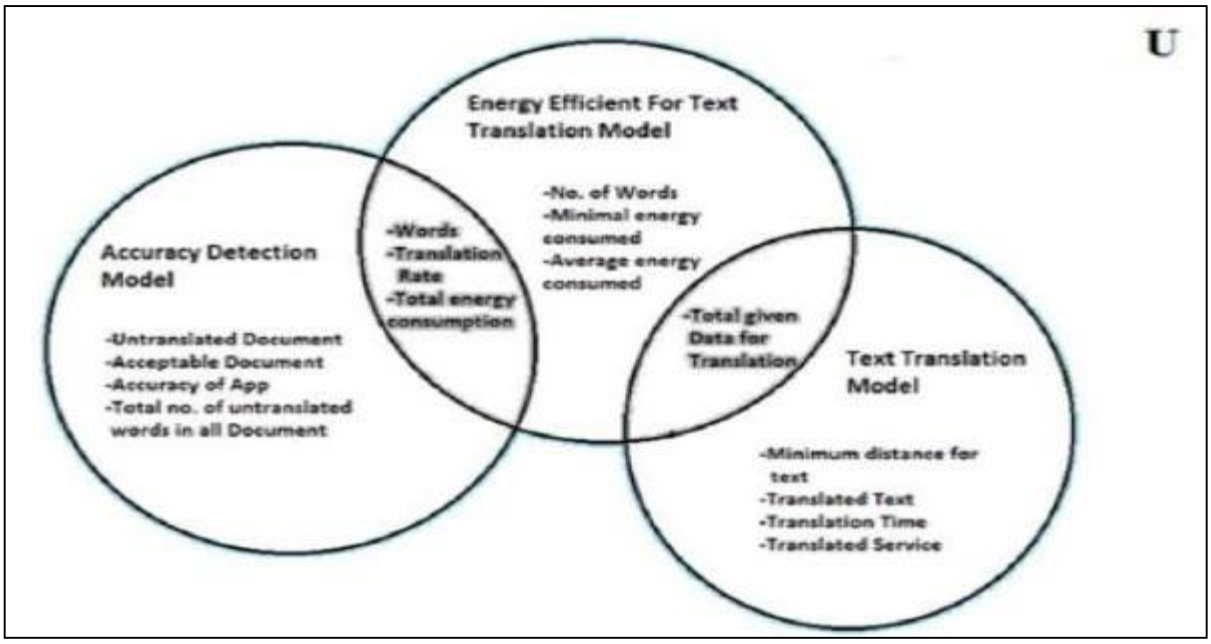


Fig. 1: Datasets for System

### *B. System Architecture*

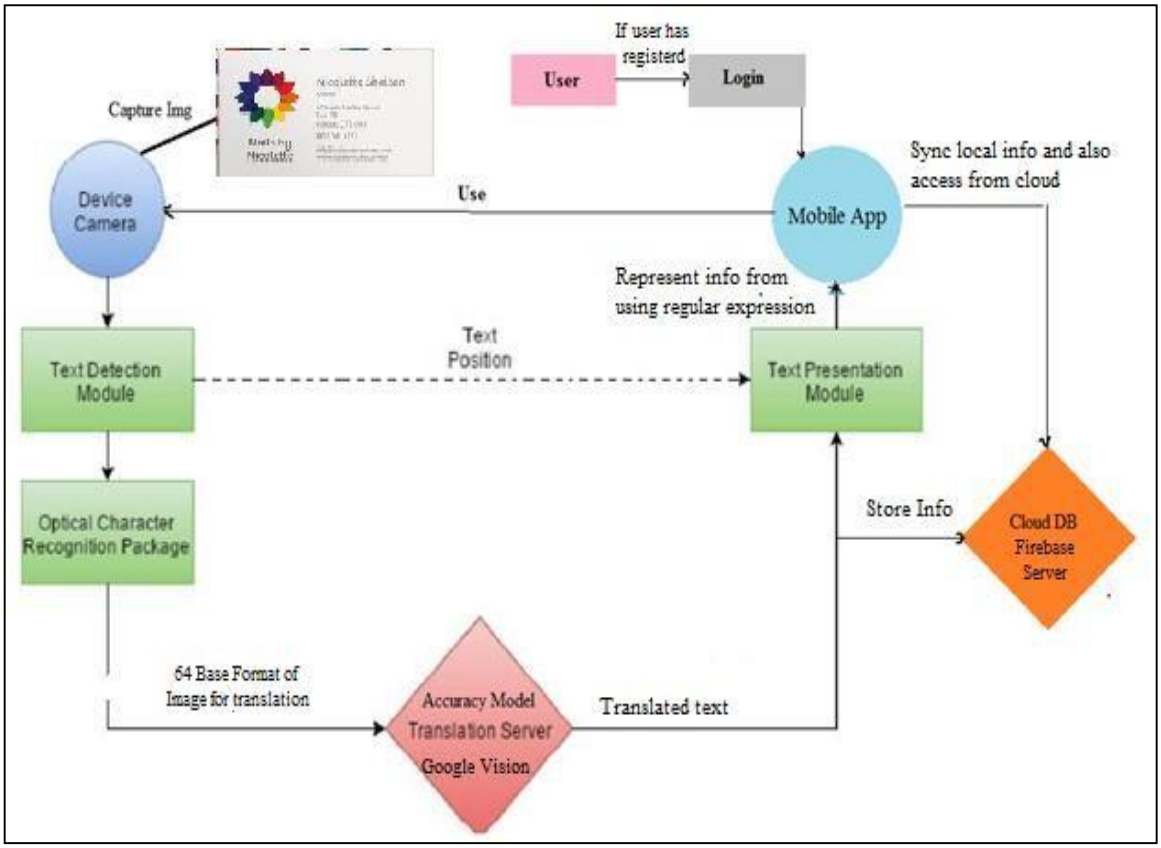


Fig. 2: System Architecture

In Fig 2 shows proposed system architecture. In that firstly user can login with mobile App if user has exist otherwise user will do registration and login into mobile App After that App use mobile camera through capture the image on business card. The data from the camera is given to the text detection module and translate the original image. Which uses methods are discussed in and to detect regions of interest in an image.

This data is then passed to our Optical Character Recognition (OCR) package. And this data is passed to our OCR packages. OCR is are store to the number of array and send to the translation server [3]. This OCR are the only capture the text not

any array. While in an ideal situation we would learn as much as we could of these other languages, we are not always presented with the opportunities or the time to do so. Then translated the text are present module. This would happen in the form of taking a picture of the desired text and sending the compressed image to a cloud server that provides the translation service which sends back the translated image [11]. The text detected from the OCR is sent to a separate cloud hosted translation server which is currently undecided and open to user selection. The text presentation module and then between to the this data are words and this unique energy efficient model In that image content text are extracted and translate with sign into English language and then superimposes the translated text over the original image's text and represent text on mobile App. Text representation module continuous to obtain data from the text detection module. To reposition the translated text to match the position of the original text as the camera moves. One idea to improve on such a situation is to use a phone application that can easily translate written text as necessary. If user wants to information from cloud. Database server and check out the all text are correct or not then its check to the accuracy in that module. When data are totally save to as the cloud and it is access the information on cloud because when data are already store on that the this system when that then user can access information from cloud database using mobile App This can also be presented in a modular fashion allowing the user to select a server for each foreign language [11]. So user can safely store information on cloud and synchronize contact from mobile App to database after network connectivity.

## V. CONCLUSION

In our project goal is reducing the power consumption by transfer the consumption to another server. So it will save energy of mobile. And also main goal is accurately detect the image content text which is captured by camera and also retrieve information from cloud database server. In our plan is to create an application that resolves these problems improves them in other measurable metrics. One way mobile platforms have provided language translation help is by creating virtual dictionaries and phrase databases. in the future we hope to continue development on the app working on challenges such as setting up a proper translation server that can help translate in text over the cloud. In that system we introduced scalable and energy efficient computer vision translation apps with possible improvements in a future in that mobile App.

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