An Android Based Language Translator Application

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ABSTRACT

A language translator is a mobile application that can be utilized for translating from English to any other dialect, and vice versa. The problem of language difference has hindered effective information communication over the years. There have been difficulties in information communication amid countries over the years. In modern times, language interpreters must understand and speak both the language being translated to and vice-versa. This traditional approach used for solving the problem of language differences has not been productive and favorable. Also, the teaching of different languages can be difficult due to language difference problems. The individual will also have to be taught by a tutor who will incur extra expenses and may not be the most efficient and favorable method. Therefore, the study develops an android phone language converter app in order to make learning and language translation easy and facilitates stress-free communication. The proposed language translation uses ML(Machine Learning)Fire base kit with Java programming language to develop the application. This application can be useful for Tourists for communication purposes, thus allowing them to integrate with the local people and access the right information.The system will also be able to evaluate language translation to determine their suitability for everyday conversation given the fact that it is an android application one will always be willing to use their phone to learn, compared to having them on a computer or learning from a physical tutor when your phone can be your tutor.

Keywords: language translator, mobile application, ML Fire base kit, Machine Learning, Android Application

CHAPTER I
INTRODUCTION

Because of the increasing utilization of mobile gadgets, the idea of mobile and omnipresent computation is becoming an extremely significant aspect of our daily lives due to its rising processing power, vast storage capacity, simple user experience, and enhanced network infrastructure. There is an increasing request for mobile utilization to sustain our day-to-day events and offer diverse amusement.Android is easiest-to-use tools.For the modern implementation of the education system, translation and language learning tools are needed. Often there is a boundary to the functionality and functions of current online submissions and a substantial increase in the number of cell phone apps providing such services.Machine Translation (MT) is an automated transformation of one natural language into another employing computer Arithmetical Machine Translation is a method to MT that is categorized by the utilization of machine learning approaches. There are nearly 6,500 spoken languages globally, and 4,500 of them have more than 1000 speakers.In information communication, language has been a significant barrier for centuries now, and human beings have always tried to provide a solution to the issues of language translation.Over the decade's humans have developed different ways of translating languages in order to solve the problems associated with language differences. The first approach which was implemented in solving this language problem was by using human translators that will be able to understand and translate both languages to the involved parties. This method was the first method introduced and has been used for decades, which has proven not to be the most efficient and effective method of language translation proven over the years. This method involves the translator being able to comprehend and express the language being translated and also understand and talk about the language of the party in which the language is going to be translated. Translation of languages is useful in many aspects, such as education. It is challenging to teach in a specific language if the people being led do not understand the language of the tutor. For the students to have a complete understanding of what they are being taught, an interpreter will be needed. In tourism, tourists may not be able to communicate with people successfully in the tourist country he visited, thus hindering communication.In communicating in general language, differences could lead to hindrance inaccurate dissemination of information In politics, language understanding is an essential factor in some countries like Nigeria, which has about 520 languages spoken in

Most of the best-selling paid apps in the education category are targeted towards children. At the same time,

probably the most popular operating system that millions of smartphones and tablets are using today and is increasing by leaps and bounds. Hence, the android phone is one of the most advanced and significant factor because, for viewers to understand any content concerning entertainment, the viewers must also understand the scope of language in many other sectors.

Language is a significant factor in communication, without which it is impossible to accomplish meaningful results. For these reasons, language translation is significant in Society at large irrespective of the sector. Hence, it is of importance to find a different approach other than standard human language translation by using a mobile phone, computer, or machine translation, which forces on translating the major languages spoken across the world. Therefore, the paper has chosen Android as a platform to develop an android-based language translation application that solves the significant languages commonly spoken around the world. The android-based system provides a solution for people who can't read a language because they don't share a common language, or for other purposes. This paper applies an erudition procedure to the extraordinary form of the earlier interpreted language, identified as a comparable corpus,equivalent text, bi-text, or multi-text in various ways. This will help solve the limitation of human translation concerning cost, more extensive language translation options, and efficiency.Today we will make a language translator. Language translators are very important, especially for people who travel abroad. This app allows users to speak any language they want without even knowing that language.In this app the user will enter the text that he/she wants to convert. The user will get the translated text on a button click. the user will only be able to read the translated text.

CHAPTER II
LITERATURE SURVEY

MOBILE EDUCATIONAL APPLICATIONS FOR CHILDREN.WHAT EDUCATORS AND PARENTS NEED TO KNOW

Author Name: Stamatios Papadakis and Michail Kalogiannakis
Year:2017

The popularity of smart mobile devices is growing fast. These Digital devices represent a new generation of technological tools that offer remarkable access to content as well as opportunities for creative use even by young children We present a simple and effective approach to incorporating syntactic structure into neural attention-based

the educational value of those applications are difficult to determine. Parents and educators, who are turning to those devices for the potential educational benefits they expect for their children and/or their students, have a limited number of tools with which to evaluate these apps.With regard to the literature review, we present the latest findings related to the real educational value of these 'self-proclaimed educational apps. Our analysis concludes that while there are thousands of apps available today,choosing the most appropriate educational ones for children is difficult and problematic for both teachers and educators.

PRELIMINARY DESIGN OF A DUAL-SENSOR BASED SIGN LANGUAGE TRANSLATOR DEVICE

Author Name: Radzi Ambar, Chan Kar Fai, Chew Chang Choon, Mohd Helmy Abd Wahab, Muhammad Mahadi Abdul Jamil & Ahmad Alabqari Ma'Radzi
Year:2018

There are many different types of sign languages that are used around the world which are important as the medium of conversation among the hearing impaired community. However, the majority of hearing people do not know or understand sign languages. Thus, communication between a hearing-impaired person and a hearing person is a difficult issue. In order to solve this problem, this project proposes a development of a dual-sensor based sign language translator. The goal of the project is to translate sign language into speech and display on screen by using the device. The device was developed in a glove-based system which was able to read the movements of every finger and arm using two (2) types of sensors, an accelerometer and five (5) units of flex sensors. This paper describes the design of the glove-based sign language translator. Subsequently, the preliminary experimental results show the usefulness of the accelerometer and flex sensors.

GRAPH CONVOLUTIONAL ENCODERS FOR SYNTAX-AWARE NEURAL MACHINE TRANSLATION

Author Name:Jasmijn Bastings, Ivan Titov, Wilker Aziz, Diego Marcheggiani, Khalil Sima'an
Year:2017

Technology, it is possible to apply some techniques to perform text detection and translation. Therefore, an application that allows smartphones to capture an image and extract the text from it to translate into English and speech it out is no longer a dream. In this study, an

encoder-decoder models for machine translation. We rely on graph-convolutional networks (GCNs), a recent class of neural networks developed for modeling graph-structured data. Our GCNs use predicted syntactic dependency trees of source sentences to produce representations of words (i.e. hidden states of the encoder) that are sensitive to their syntactic neighborhoods. GCNs take word representations as input and produce word representations as output, so they can easily be incorporated as layers into standard encoders (e.g., on top of bidirectional RNNs or convolutional neural networks).

ENGLISH TEXT TO MULTILINGUAL SPEECH TRANSLATOR USING ANDROID

Author name: Hanumante.V, Debnath.R, Bhattacharjee.D,Tripathi. D, & Roy.S
Year:2014

This paper aims at providing a design and development solution of an Android application whose objective is to provide a solution to overcome the barrier of languages by implementing text to speech conversion in different languages. The Android application developed text to speech conversion to facilitate the translation of English language text into speech output in different languages. We have also proposed a few improvements which can further advance this system to include more target audiences so as to make it more beneficial and useful. The proposed English Text to Multilingual Speech Translator using Android (T2MSTA)aims at providing assistance to the people lacking the power of speech or non-native speakers like people who do not share a common language.

DETECTING TEXT BASED IMAGE WITH OPTICAL CHARACTER RECOGNITION FOR ENGLISH TRANSLATION AND SPEECH USING ANDROID

Author Name: Sathiapriya Ramiah, T. Y. Liong, M. Jayabalan
Year:2015

Smartphones have been known as the most commonly used electronic devices in daily life today. As hardware embedded in smartphones can perform much more tasks than traditional phones, the smartphones are no longer just a communication device but also considered as a powerful computing device which is able to capture images, record videos, surf the internet, etc. With advancement of
Machine translation helps resolve language incomprehensibility issues and eases interaction among people from varying linguistic backgrounds. Although corpus-based approaches (statistical and neural) offer reasonable translation accuracy for large-sized corpus,

Android application is developed by integrating Tesseract OCR engine, Bing translator and phones' built-in speech out technology. Final deliverable is tested by various types of target end users from a different language background and concluded that the application benefits many users. By using this app, travelers who visit a foreign country are able to understand messages portrayed in different languages. Visually impaired users are also able to access important messages from a printed text through a speech out feature.

ROUND-TRIP TRAINING APPROACH FOR BILINGUALLY LOW-RESOURCE STATISTICAL MACHINE TRANSLATION SYSTEMS

Author Name: Ahmadnia, B., Haffari, G., & Serrano, J
Year:2018

Statistical Machine Translation (SMT) is making good progress in recent years. Since SMT systems are based on a data-driven approach, they learn from millions or even billions of words from human-translated texts. The quality of SMT systems heavily depends on the data that we use for the training step, not only its quality and amount, but also on how relevant it is for the texts that we wish to translate. However, human labeling is very costly and time consuming. In this article we develop a learning mechanism by proposing a round-trip training scenario as a reliable retraining approach through a communication framework for making effective use of monolingual text to tackle the training data scarcity, and improve translation quality. We present detailed experimental results using Spanish-English as a high-resource language pair, and Persian-Spanish as a low-resource language pair. We demonstrate that in all cases translation quality is improved.

ENGLISH–MIZO MACHINE TRANSLATION USING NEURAL AND STATISTICAL APPROACHES.

Author Name: Amarnath Pathak, Partha Pakray & Jereemi Bentham
Year:2018

For a variety of systems, performance was best for translations of simple, less technical sentences and from English to Western European languages. Conclusions: MT is currently being developed primarily through pilot studies to improve multilingual communication in health settings and to increase access to health resources for a variety of languages. However, continued concerns about accuracy limit the deployment of MT systems in these settings. The variety of piloted systems and the lack of

robustness of such approaches lie in their ability to adapt to low-resource languages, which confront unavailability of large-sized corpus. In this paper, prediction aptness of two approaches has been meticulously explored in the context of Mizo, a low-resource Indian language. Translations predicted by the two approaches have been comparatively and adequately analyzed on a number of grounds to infer their strengths and weaknesses, particularly in low-resource scenarios.

DEVELOPMENT OF MACHINE TRANSLATION TECHNOLOGY FOR ASSISTING HEALTH COMMUNICATION: A SYSTEMATIC REVIEW

Author Name: Kristin N Dew, Anne M Turner , Yong K Choi , Alyssa Bosold , Katrin Kirchhoff

Year:2018

To (1) characterize how machine translation (MT) is being developed to overcome language barriers in health settings; and (2) based on their evaluations, determine which MT approaches show evidence of promise and what steps need to be taken to encourage adoption of MT technologies in health settings. Materials & methods: We performed a systematic literature search covering 2006-2016 in major health, engineering, and computer science databases. After removing duplicates, two levels of screening identified 27 articles for full text review and analysis. Our review and qualitative analysis covered application setting, target users, underlying technology, whether MT was used in isolation or in combination with human editing, languages tested, evaluation methods, findings, and identified gaps. Results: Of 27 studies, a majority focused on MT systems for use in clinical settings (n=18), and eight of these involved speech-based MT systems for facilitating patient-provider communications. Only one system has been fully deployed. Text-based MT systems (n=19) aimed at generating a range of multilingual health materials including health promotion, biomedical literature, and nursing education. Almost a third of all studies (n=8) pointed to MT's potential as a starting point before human input. Studies employed a variety of human and automatic MT evaluation methods. In comparison studies, statistical machine translation (SMT) systems were more accurate than rule-based systems when

Language Comprehension to return the interpreted text's feeling & emotion.4. Recognised text, language converted, feeling, and emotion tests are returned to the mobile app for view.

shared evaluation criteria will likely continue to impede adoption in health settings, where excellent accuracy and a strong evidence base are critical. Greater translation accuracy and use of standard evaluation criteria would encourage deployment of MT into health settings. For now, the literature points to using MT in health communication as an initial step to be followed by human correction.

CHAPTER III
EXISTING SYSTEM:

This android application which can translate the most used languages in the world (i.eEnglish, Spanish, French, Hindi, Arabic, and Chinese) to any selected languages, the android application will be using the IBM Watson Language translator, an API that uses machine learning and AI. IBM Waston employs rule-based AI and a broad range of other mechanisms (e.g.,information retrieval systems) and the latest Neural network AI [60]. In Theory, the application was created using Apache Cordova and Node.js application platform operating on IBM Cloud Kubernetes software that uses Tesseract OCR to identify text in pictures, Watson Language Converter to interpret the approved text, and Watson Natural Language Comprehension to extract sentiment, the meaning of the book.

The existing system is displayed in figure demonstrates the developed system flow

and functionalities. The flow is discussed outlined below as follows:

1. The user connects with the mobile app and takes a screenshot or selects a shot from the file.

2. The picture is forwarded to the framework Node.js server operating on IBM Cloud Kubernetes infrastructure that uses Tesseract OCR to identify text in an image.

3. Node.js app uses the Watson language-translation tool to interpret the accepted text and Watson Natural communicate without a human translator or spending months learning a language.In the android app the user give the input (text or voice) and select the language to translate.The user given input is given to the text preprocessing block it removes punctuation,emotion,text in different cases and noise in the text.The preprocessed input is given to the next block ML Firebase Kit .MLFirebase kit is a mobile Software Development Kit(SDK) it comes with ready to use APIs for common mobile use cases that are recognized text,voice recognition,identifying the language of text,scanning barcodes ,detecting faces etc,.ML Firebase Kit recognizes text in 103 different languages.Simply pass data in to the
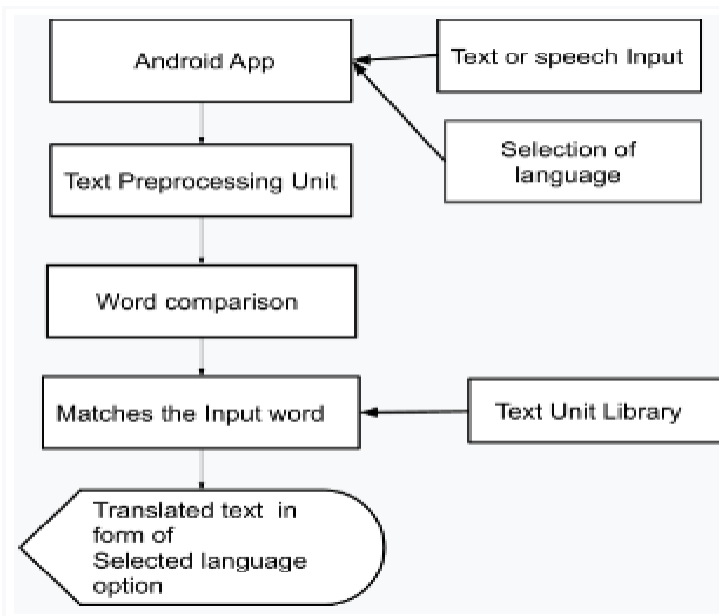
Fig.Existing System Architecture

DISADVANTAGES OF EXISTING SYSTEM:
- It supports only some languages(i.e., English, Spanish, French, Hindi, Arabic, and Chinese) as input languages.
- It supports only text to text translation.
- More energy consumption.

CHAPTER IV
PROPOSED SYSTEM:

A language translator (LT) supports voice and text translation in many languages. We can use it every day for business, travel, and education. LT provides many features like text and voice translation, voice recognition.A language translator (LT) is an online android mobile app that translates any sentence or phrase or word into the targeted language.Translation apps are fairly important in daily life especially when you travel abroad.They help people refraction, and analysis. Applications built in Android Studio are then compiled into the APK format for submission to the Google Play Store.

The JDK is a key platform component for building Java applications. At its heart is the Java compiler. IDG / Oracle / Vasabii / Getty Images. The Java Development Kit (JDK) is one of three core technology packages used in Java programming, along with the JVM (Java Virtual Machine) and the JRE (Java Runtime Environment).Developers new to Java often confuse the Java Development Kit and the Java

ML Firebase Kit and it gives the information we need.It translate the user given input and pass the result to the final display block.Finally, the app display the translated text.

ADVANTAGES:
- It supports both text and speech input.
- It supports translation between any selected language to any target language.
- Less time and energy consumption.
- Easy to use.
- Bridging the linguistic barriers between countries.
- Helping as you learn a new language

SYSTEM MODULES:

1.Design module
2.Input getting module
3.Text preprocessing module
4.ML Firebase kit module

1.Design Module:

The design module define the layout for a user interface of the app.We use xml code to define the layout.This layout only defines the appearance of the app.Define what the app does by writing java code.If a layout,includes a button,need to write java code in the activity to define what the button should do when press it.The main.xml file stores the main activity's layout information and it also have some sub-file used in the main.xml file.They are,

- colors.xml-In this file we define the colors used in the main.xml file.
- string.xml-This file is used to store string data.
- gradle-This file is used to build the app's application package (APK) file.
- Drawable-It is a subdirectory used to import icons,images,clip arts and videos,etc.

Runtime Environment. The distinction is that the JDK is a package of tools for *developing* Java-based software, whereas the JRE is a package of tools for *running* Java code.The JRE can be used as a standalone component to simply run Java programs, but it's also part of the JDK. The JDK requires a JRE because running Java programs is part of developing them.
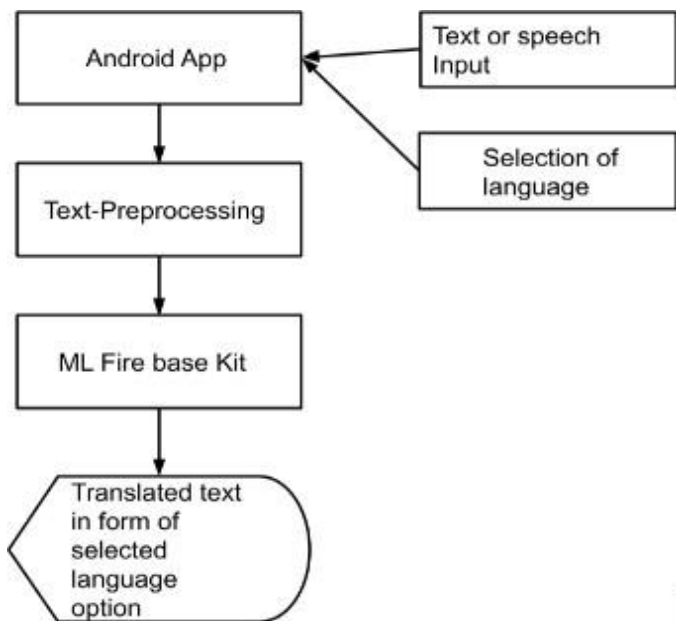
Fig.Proposed system architecture diagram

SYSTEM REQUIREMENTS:
HARDWARE REQUIREMENTS:
- Laptop or System:with any OS.
- Internet: Connection must.
- Android mobile with USB Cable.

SOFTWARE REQUIREMENTS:
- Android Studio
- JDK (Java Development Kit)

SOFTWARE DESCRIPTION
Android Studio is the official integrated development environment (IDE) for Android application development. It is based on the IntelliJ IDEA, a Java integrated development environment for software, and incorporates its code editing and developer tools.To support application development within the Android operating system, Android Studio uses a Gradle-based build system, emulator, code templates, and Github integration. Every project in Android Studio has one or more modalities with source code and resource files. These modalities include Android app modules, Library modules, and Google App Engine modules.Android Studio uses an Instant Push feature to push code and resource changes to a running application. A code editor assists the developer with writing code and offering code completion,

2.User Module:
In the user module, the user gives the information.In the android app the user gives the input in two ways 1)Text input or 2)Speech input .The text input is given by using the keyboard and type the text input.The speech input is given by using the microphone displayed on the screen.The user give the input and also select the language from to language to translate.The given input is given to the next module named Text-preprocessing module.

3.Text-Preprocessing Module:
Preprocessing means translation. Preprocessor is a simple program that processes its input data to produce output that is used as input to another program.Text preprocessing is a method,that cleans the text data and make is ready to feed data to the next model .It removes emotions,punctuations,text in a different cases and noise in the text .The preprocessed text is given to the next step.

4.Ml Firebase Kit Module:
ML Kit is a mobile SDK that brings Google's machine learning expertise to Android and iOS apps in a powerful yet easy-to-use package. Whether you're new or experienced in machine learning, you can implement the functionality you need in just a few lines of code.Firebase kit also comes with a set of ready to use API for common mobile use cases that are,Recognized text,Detecting faces,Voice recognition,Scanning barcodes,Labeling text.Firebase is a mobile platform that helps you quickly develop high-quality apps, grow your user base, and earn more money. Firebase is made up of complementary features that you can mix-and-match to fit your needs.Simply pass the data in to the ML Firebase Kit and it gives the information we need.Integrate the SDK using gradle or cocoapods.ML Firebase Kit recognizes text in 103 different languages in their native scripts.

CHAPTER V
TESTING
The purpose of testing is to discover errors. Testing is the process of trying to discover every conceivable fault or weakness in a work product. It provides a way to check the functionality of components, sub assemblies, assemblies and/or a finished product. It is the process of exercising software with the intent of ensuring that the Software system meets its requirements and user – interact without error.**Test Results:** All the test cases software applications, e.g. components in a software

There are various types of tests. Each test type addresses a specific testing requirement.

White Box Testing

White Box Testing is a testing in which the software tester has knowledge of the inner workings, structure and language of the software, or at least its purpose. It has a purpose. It is used to test areas that cannot be reached from a black box level.

Black Box Testing

Black Box Testing is testing the software without any knowledge of the inner workings, structure or language of the module being tested. Black box tests, as most other kinds of tests, must be written from a definitive source document, such as specification or requirements document, such as specification or requirements document. It is a test in which the software under test is treated as a black box. The test provides inputs and responds to outputs without considering how the software works.

Unit testing

Unit testing involves the design of test cases that validate that the internal program logic is functioning properly, and that program inputs produce valid outputs. All decision branches and internal code flow should be validated. It is the testing of individual software units of the application .It is done after the completion of an individual unit before integration. This is a structural testing that relies on knowledge of its construction and is invasive.Unit tests perform basic tests at component level and test a specific business process, application, and/or system configuration. Unit tests ensure that each unique path of a business process performs accurately to the documented specifications and contains clearly defined inputs and expected results.

Integration testing

Integration tests are designed to test integrated software components to determine if they actually run as one program. Testing is event driven and is more concerned with the basic outcome of screens or fields. Integration tests demonstrate that although the components were individually satisfied by successfully unit testing, the combination of components is correct and consistent. Integration testing is specifically aimed at exposing the problems that arise from the combination of components. Software integration testing is the incremental integration testing of two or more integrated software components on a single platform to produce integration test is to check that components or

system or – one step up – software applications at the company level mentioned above passed successfully. No defects encountered.

System Testing

System testing ensures that the entire integrated software system meets requirements. It tests a configuration to ensure known and predictable results. An example of system testing is the configuration oriented system integration test. System testing is based on process descriptions and flows, emphasizing pre-driven process links and integration points.expectations and does not fail in an unacceptable manner. failures caused by interface defects.The task of the

CHAPTER VI
CONCLUSION AND FUTURE ENHANCEMENT

CONCLUSION

Smartphones are recognised in real life today as the most widely used mobile devices. Since smartphone-integrated hardware can perform far more functions than conventional phones, smartphones are no longer just a contact unit, but rather a powerful computer unit capable of taking images, recording videos, browsing the internet, etc. With the growth of technologies, such tools can be used to perform text identification and conversion. The developed application can translate from text to text.The application performs the translation within 37 seconds , which is relatively fast.

FUTURE ENHANCEMENT

This report presents the techniques that will be used to develop an android based language translator application.The comparative study of various other language translator application approaches being used elsewhere in the world.And also how our system is preferable to those mentioned.The use of ML Firebase Kit module in the embedded system will help to translate from any input language to any selected language.For further research, the application should include text to speech and speech to speech translation, which will help visually impaired people.

CHAPTER VII
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