

METAPHRASE-A Mobile Application for Language Translation

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ABSTRACT: We are living in an age of translation and the avenues for translators are constantly expanding. Translation also plays a role in extending the scope of a language and reframing the boundaries of the speaker. One can even add without exaggeration that a country like India with 22 languages would not have been a nation without translation and we keep translating almost unconsciously when we converse with people who use a language different from ours. But in real time, we happen to encounter situations wherein the physical presence of an explicit translator is expected in order to communicate with our fellow beings. It is in this context the new automated technology comes in handy as it is capable of translating one language to another with minimum delay and cost. The proposed system, “Metaphrase” is a user friendly Android-platform based speech translation application which records speech in one language, translates it and produces speech output in another language. These tools eradicate the need for physical translator and deracinate the language barriers.

KEYWORDS: Google Translate API, FFmpeg framework, Translating system ,Automated Dubbing system , Android Framework.

I. INTRODUCTION

All For a man to convey his ideas to the world, he needs a communication medium called language. Language is a powerful tool that converts thoughts into actions. Language helps one to express oneself. Since there are 6500 languages that are spoken across the globe, one might find it difficult to communicate in his/her language to some other person from some other part of the globe with a different linguistic background.

The world as we know is rightly called a “Global Village” as it is a perfect blend of countless number of people, cultures and languages. Today’s world has shrunk, if not in size, in technology. With the added advantage, comes the disadvantage. Since millions of people speak thousands of languages, one might find it very difficult to understand a lecture on new technology. For a “global citizen” residing in the “global village” there is always a need to understand different languages.

II. RELATED WORK

A. ANDROID

Android is probably the most popular operating system being used by millions of smart phones and tablets today and is growing by leaps and bounds. This is one of the most sophisticated and user friendly platform. Thus we have selected android as a platform to develop a system that provides a solution for the people who are unable to read or speak a particular language either because of illiteracy or not sharing a common language, or for other reasons.

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The idea of human machine interaction led to research in speech recognition. Automated speech recognition uses the process and related technology for converting speech signals into a sequence of words or other linguistic units by means of an algorithm implemented as a computer program.

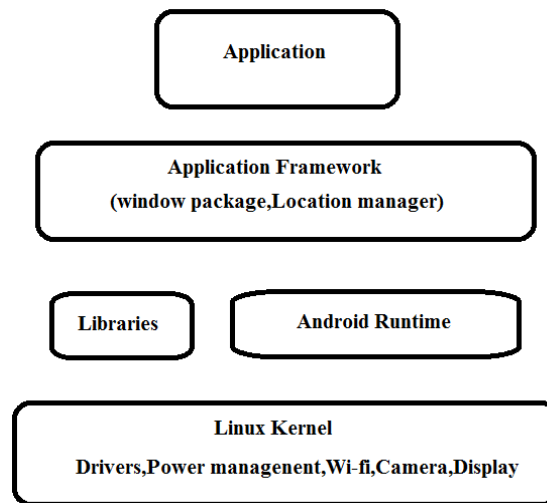


Figure 1: Android Architecture

The Figure 1 shows the architecture of the Android framework. At the bottom of layers is Linux kernel with approximately 115 patches. This provides level of abstraction between the device hardware and it contains all the essential hardware drivers.

On top of Linux kernel there is a set of libraries including open-source Web browser engine Web kit, SQLite database which is a useful repository for storage and sharing of application data, libraries to play and record audio and video etc. Android libraries category encompasses those Java-based libraries that are specific to Android development. Android Runtime is the third section of the architecture and available on the second layer from the bottom. This provides set of core libraries which enable Android application developers to write Android applications using standard Java programming language.

The Application Framework layer provides many higher-level services to applications in the form of Java classes.[3]

B. SPEECH UNDERSTANDING

Speech understanding system presently are capable of understanding speech input of vocabularies of thousands of words in operational environments. Speech signals convey two important types of information: (a) speech content and (b) Speaker identity. Speech recognizers aim to extract the lexical information from the speech signal independently of the speaker by reducing the inter-speaker variability. Speaker recognition is concerned with extracting the identity if the person.[1]

The “METAPHRASE” system, enhances communication, removes language barriers and help in unifying the world. This results in spread of Technological developments at a fast pace, exchange of ideas which take place resulting in revolution of technology.

III. EXISTING SYSTEM

The well-known technologies, Google text to speech translate API takes English text as input and convert it to the desired language audio. But the main drawback of Google text to Speech recognition API is that there is a maximum

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time limit for an individual Speech Recognition “session” which seems to be around 60 seconds. That means that one can have Google process a sentence but then one needs to end that session and start a new one.

There are many procedures available in the market for text to speech conversion. Each language uses different sets of algorithms and these cannot be employed to translate languages. Some multilingual translators are also available but they are limited for text to text.

A. Abbreviations and Acronyms

- FFmpeg- Fast Forward mpeg
- Android SDK- Android Software Development Kit
- JDK- Java Development Kit

B. Some Common Mistakes

- Since English is foreign to many countries around the world, there are a lot of changes in their accents. Hence the proposed system should use grammar check API to check the grammatical errors.
- The other criteria is context awareness which includes obtaining the meaning of a word based on the position of that word in the sentence. This is done by clustering the words to ascertain the meaning of the word “sign” in the phrase “sign board” indicates direction.

IV. EASE OF USE

A. User Interface

The proposed Android application provides an easy to navigate and user friendly GUI. This allows the user to easily record and translate speech on the go.

B. Mobility

METAPHRASE being a compact mobile Application serves the user as a translation companion whenever and wherever required.

V. NEED FOR THE PROPOSED SYSTEM

The whole idea of building METAPHRASE sparked when

- Our Prime Minister, Sri. Narendra Damodardas Modi visited the Facebook headquarters to meet Mark Elliot Zuckerberg, CEO, Facebook. A translator kept translating whatever was told by Modi in Hindi to English and vice-versa.
- Recently, German Chancellor, Ms. Angela Merkel visited India for a bilateral meeting with Prime Minister of India Sri. Narendra Modi. As the two leaders speak in different languages there was a necessity of a translator to make the conversation understandable to each other

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VI. WORKING MODEL

The user is provided with a menu consisting of three options as shown in Figure 2

- A. Audio Recording
- B. Video Recording
- C. Video Upload

If the user selects the Audio Recording Option

- He will be provided with an option to record speech
- The speech in English will then be converted to text
- The English text is then translated to Hindi text
- The text in Hindi is converted to speech in Hindi
- Finally the translated Hindi speech is outputted to the user.

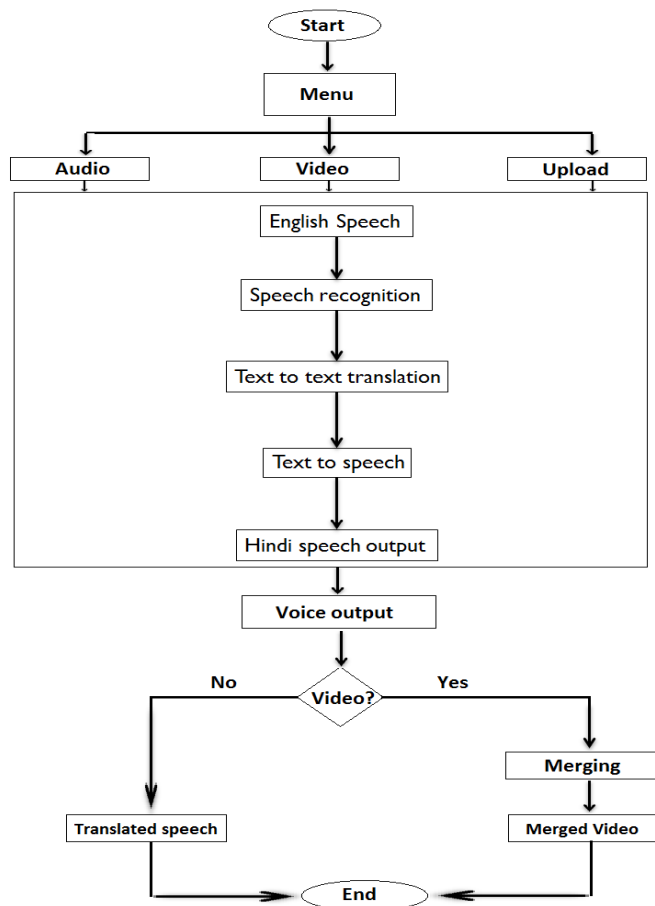


Figure 2: METAPHRASE dataflow diagram

If the user chooses Video Recording/Upload Option

- A recording option is provided in case of Video Recording which directs the user to the phone’s camera for recording purpose

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- In case of Video Upload, the user will be able to browse through the video files in the mobile and can select one of the video files for translation
- Once the video is obtained the speech is extracted from the video
- This speech in English is converted into English text
- The English text is then translated to Hindi text
- The text in Hindi is converted to speech in Hindi
- The Speech is finally merged with the original video
- The merged video with the translated speech is given as the output to the user.

VII. SCREENSHOTS

The METAPHRASE being a mobile application provides a user-friendly interface that enables the user to input the speech in the form of Recording. The Figure 3 is the illustration of the user interface provided by the METAPHRASE.

Figure 3(a) represents the screenshot of the METAPHRASE system in which the user provides a speech input as desired in English. The METAPHRASE after Translation produces the output in Hindi speech format and also provides the output in Hindi Font as illustrated in Figure 3(b).

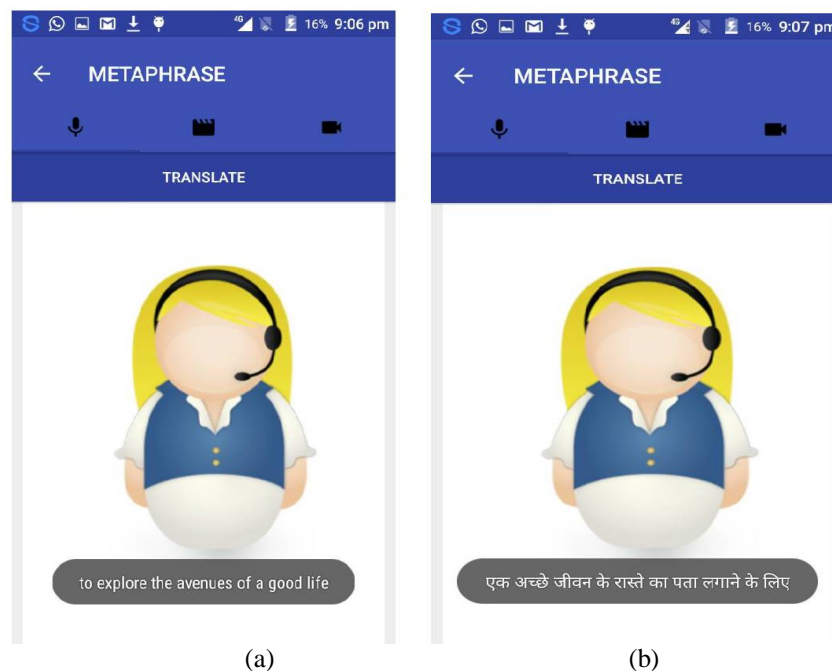


Figure 3: METAPHRASE screenshot during (a) English input (b)Hindi output

Hence the METAPHRASE provides a handy solution to the translation problems.

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VIII. CONCLUSION

The METAPHRASE is an Application that can help the user with the translation issues and can come in handy when the user wishes to translate from the Foreign language English to the Native language i.e., Hindi. This system can eradicate the language Barriers and help in thus help in communication by facilitating the user on the go.

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