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Study of Speech Recognition Apps for Android SmartPhones

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ABSTRACT: Speech recognition app takes the spoken word as input and translates into text. Natural Language Processing (NLP), is broadly defined as the automatic manipulation of natural language, like speech and text, by software. The best dictation software or voice recognition software is a computer program that decodes the human voice. Speech to Text software is mainly used to perform commands, operate a gadget, or write without using any input devices. Speech recognition software uses natural language processing and deep learning neural networks. It means the software breaks the speech down into bits it can interpret, converts it into a digital format, and analyzes the pieces of content. Dragon Anywhere Mobile is professional-grade mobile dictation allowing users to create, edit, and format documents of any length and share information directly from a mobile device. Speech recognition apps, software and websites can be used for speech to text conversion by any person who can type the text like medical professionals, advocates, directors, officers, and persons who are very busy and do not have the time to type. OK Google app is most popular app for speech recognition for searching the information on internet on android smartphones. App performs the tasks of speech recognition and transcription faster and more accurate than a human can. In this paper we have studied some speech recognitions apps on smart mobiles, laptops, desktops to convert the audio into text format for messages, emails, documents, etc.

KEYWORDS: Speech recognition, Smartphone, Android, Speech to text conversion, Google play store

I. INTRODUCTION

Speech recognition app or software is a computer program that is trained to take the input of human speech, interpret it and transcribe it into text. It takes the spoken word as input and translates into text. Natural Language Processing (NLP) is broadly defined as the automatic manipulation of natural language, like speech and text by software. Natural Language Processing is a theoretically motivated range of computational techniques for analyzing and representing naturally occurring texts at one or more levels of linguistic analysis for the purpose of achieving human like language processing for a range of tasks or applications. Natural Language Processing is a field of artificial intelligence that enables computers to understand, interpret, analyze and manipulate natural human language. The best dictation software or voice recognition software is a computer program that decodes the human voice. Speech to Text software is mainly used to perform commands, operate a gadget, or write without using any input devices.

Many people have a recollection of trying voice recognition software some time ago when the computer had to be trained to your voice. Smartphones have evolved with voice recognition apps. Move forward to 1997 when voice recognition software was launched using natural speech. Since then, technology has advanced significantly and that means voice recognition is now virtually plug and play, no longer requiring training.

Voice recognition and transcription technology has come a long way since its first inception. We now use voice recognition technology in our everyday lives with voice search on the rise. Many people are using apps like Ok Google, Dragon Anywhere, Speech to text, etc. At present, there are hundreds of speech recognition apps and software for conversion of speech to text.

II. MATERIALS AND METHODS

For this study of speech recognition apps for android smartphones, we used electronic gadgets namely smartphones, laptops, desktops. Speech recognition apps, software and websites can be used for speech to text conversion by persons who

can speak to convert text like medical professionals, advocates, directors, officers, and persons who are very busy and do not have time to type. High speed internet facility was used namely, broadband internet, LAN, Wi-Fi, Wireless networks, Fibre Optic internet services, mobile internet and other networks for downloading and testing the apps. Internet browser software viz. Google chrome, Internet explorer, Mozilla Firefox, Edge were used for opening the google play store and other related websites for study from the internet. Search engines like Google, Google Scholar, and others have been used for searching the speech recognition apps, software and related information. These apps are downloaded from google play store, and installed on mobile and laptops. Similarly, secondary data are collected from the google play store of a particular app and from the other websites. All related data are collected, cleaned, tabulated, summarised and analysed by using different statistical analysis software and data analysis tools. Results of data analysis have been presented in this paper.

III. WORKING OF SPEECH RECONITION APPS

Speech recognition software works by breaking down the speech or audio recording into individual sounds, analyzing each sound, using algorithms to find the most probable word fit in that language, and transcribing those sounds into text. Speech recognition software uses natural language processing and deep learning neural networks. It means the software breaks the speech down into bits it can interpret, converts it into a digital format, and analyzes pieces of content. From there, software makes determinations based on programming and speech patterns, making hypotheses about what the user is actually saying. After determining, what the users most likely said, the software transcribes conversation into text.

This all sounds are simple enough, but the advances in technology mean these multiple, intricate processes are happening at very high speed. Smart phones or laptops can actually transcribe human speech more accurately, correctly, and quickly than humans can.

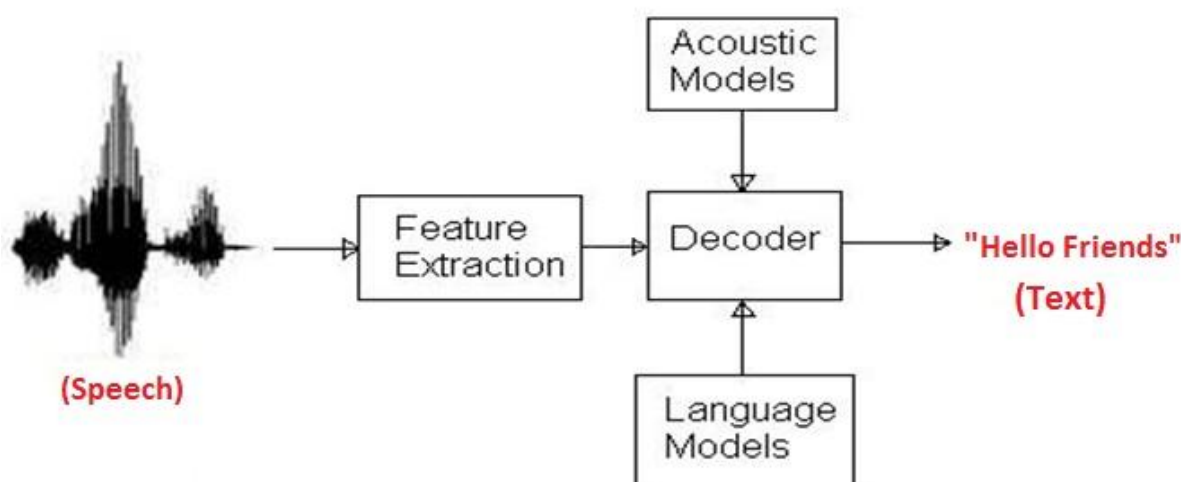


Fig.1: Speech recognition working

(Source: <https://www.rfwireless-world.com/Terminology/automatic-speech-recognition-system.html>)

IV. SPEECH RECOGNITION APPS FOR MOBILE DEVICES AND SMARTPHONES

Many mobile phone handsets, including feature phones and smartphones such as iPhones and Blackberry's, have basic dial-by-voice features built in. Many third-party apps have implemented natural-language speech recognition support. The following table shows the different speech recognition apps for android phones, their updates, size in Mbs, number of installs from google play, current versions, required android versions, rating and name of developer.

Table 1: Speech Recognition Apps for Android smartphones

Mobile Apps name	Updated	Size	Installs	Current Version	Requires Android	Rating	Name of Developer
Dragon Anywhere	2020-09-10	19M	100,000+	1.8	5.0+	3+	Nuance Communications, Inc.
OK Google	April 22, 2021	4.5M	1,000,000+	4.7.1	4.1 and up	3+	SDE Dev Team, Campuslaan, 45, Enschede 7522NG, The Netherlands
Voice Search	October 14, 2020	14M	10,000,000+	3.1.0	4.4 and up	3+	Prometheus Interactive LLC
SpeechTexter - Speech to Text	April 27, 2021	3.6M	1,000,000+	1.4.8	6.0 and up	Everyone	SpeechTexter, https://www.speechtexter.com/
Speech to text	June 4, 2020	3.1M	100,000+	1.0.17	5.0 and up	Everyone	Maruar, 870-1 Bongchun-dong Kwanak-gu Seoul
Voice Notebook - continuous speech to text	March 27, 2021	3.5M	1,000,000+	2.0.0	4.2 and up	Everyone	Simple Seo Solutions, Russia, Moscow, Novopeschanaya 13/3
Hindi Speech To Text	June 2, 2020	6.3M	500,000+	1.21	4.1 and up	3+	JVR Developers, Siddhivihar Apartment Panchsheel Nagar, Borude Mala, Ahmednagar, Maharashtra 414003
Tamil Voice Typing Keyboard – Speech to Text	February 11, 2021	11M	1,000,000+	1.6.5	4.2 and up	3+	Innovative World, Comwave Institute, Pacific Plaza, Basement, Near CBF F8 Markaz
Marathi Speech to Text	October 8, 2020	3.4M	10,000+	1.3	4.0.3 and up	3+	New Channel Apps

V. RESULTS AND DISCUSSIONS

1. DRAGON NATURALLY SPEAKING SOFTWARE AND APP

Dragon It is the oldest software for natural speech recognition. Dragon NaturallySpeaking (Dragon for PC) is a speech recognition software package developed by Dragon Systems of Newton, Massachusetts, which was acquired first by Lernout & Hauspie Speech Products and later by Nuance Communications. It runs on Windows personal computers. Dragon Systems released Naturally Speaking 1.0 as their first continuous dictation product in 1997. Version 15 (Professional Individual and Legal Individual), which supports 32-bit and 64-bit editions of Windows 7, 8 and 10, was released in August 2016.

Dragon NaturallySpeaking uses a minimal user interface. As an example, dictated words appear in a floating tooltip as they are spoken, and when the speaker pauses, the program transcribes words into the active window at the location of the cursor. The software has three primary areas of functionality: voice recognition in dictation with speech transcribed as written text, recognition of spoken commands, and text-to-speech: speaking text content of a document. Voice profiles can be accessed by different computers in a networked environment, although audio hardware and configuration must be identical to those of the machine generating the configuration. The Professional version allows creation of custom commands to control programs or functions not built into NaturallySpeaking. Dragon NaturallySpeaking 12 is available in the following languages: UK English, US English, French, German, Italian, Spanish, Dutch, and Japanese (aka "Dragon Speech 11" in Japan). Dragon Natural Speaking Software have a solution for different businesses like law enforcement, legal, financial services, education, social services, small business, medical, accessibility solutions, transcription solutions, etc.

Dragon Anywhere Apps for Android smartphones

From the above table 1, it shows that Dragon Anywhere app is size 19Mbapp and it installs 100K+ from google play store. Its updated version 1.8 were released on 2020-9-10. Extend the capabilities of Dragon Professional Anywhere with the addition of Dragon Anywhere Mobile. Dragon Anywhere Mobile is professional grade mobile dictation allowing users to create, edit, and format documents of any length and share information directly from a mobile device. Your work doesn't stop when you are in the field and away from your desktop. Whether you are a Certified Financial Advisor, a law enforcement officer, or a case-worker, Dragon Anywhere Mobile extends your ability to capture critical information at the point of interaction.

To help keep busy professionals productive, customizations—like an Auto-Text or unique verbal commands—created in Dragon Anywhere Mobile are automatically synchronized with Dragon Professional Anywhere and vice versa. This allows work started in the field to easily be completed at the office.

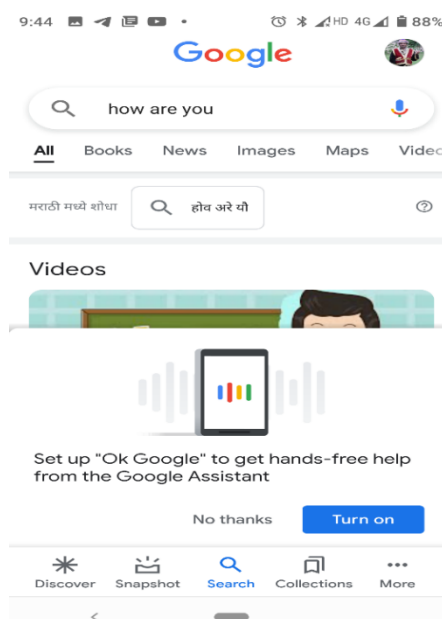
Features

- Assists in several daily activities like sending emails, web surfing, dictating homework assignments.
- Working individuals and small businesses can create and transcribe documents through dragon professional.
- Synchronization is possible with Dragon Anywhere.
- It streamlines the legal documentation with dragon legal individual.
- With speed and accuracy, it controls the computer by voice.

2. OK GOOGLE APP

OK Google app is most popular app for speech recognition searching the information on internet on android smartphones. Its app size is 4.5Mb and updated latest version 4.7.1 on dated 22-4-2021. Its installs are more than 1 million from google play store. Discover new OK Google voice commands for voice control, say OK Google and do things by just commanding with your voice! Find OK Google Assistant commands and phrases in this easy to understand guide and try them right away with Google Assistant! All voice commands work for both Google Assistant and Google Now! Everything you can say to your phone or personal Google assistant is presented to you as a guide of about 25 categories of useful and powerful okay Google Assistant voice actions and commands. By saying OK Google, you can control your phone or any other device, with help of Google Assistant (this app is not Google Assistant!). We also offer you to place a widget which will start OK Google on tap.

Discover commands, see possible examples, understand the usage of over 300 hands-free actions (commands) you can say to Google Assistant in your phone and find them in just a few taps! Everything you may ask your phone to do, from Search and



Navigation, to Messaging are presented to you in the most intuitive and beautiful way in this full OK Google guide.

With these hands-free commands, you will be able to use your phone without touching it, which is awesome. For example, you can use your phone as a hands-free device while driving, while entirely focusing on the road! Just control your device with speech, pronouncing voice commands you find in our application. Ask Google for directions, start navigation etc. And many, many more, all with just your voice and without touching your phone!

Please note that you will need the official "Google" app, which you can download from Play Store in order to control your phone with your voice. Also, consider enabling voice detection from any screen to enhance hands-free device control experience.

3. VOICE SEARCH

Voice Search app is most popular app for speech recognition and conversion of speech to text. Its app size is 14 Mb and updated latest version 3.1.0 on dated 14-10-2020. Its installs are more than 10 million from google play store. It requires the operating system Android 4.4 and above to use on the smartphones.

4. SPEECHTEXTER – SPEECH TO TEXT

SpeechTexter app is popular app for speech recognition and conversion of speech to text. Its app size is very small 3.6 Mb and updated latest version 1.4.8 recently on dated 27-04-2021. Its installs are more than 1 million from google play store. It requires the operating system Android 6.0 and above to use on the smartphones. It is a speech recognition and conversion solution with multi-language speech recognizer, documents & emails transcriber, and more. Its website is Speechtester.com. Best for SpeechTexter is the leading online speech to text converter used by thousands of businesses, teachers, lawyers, writers, students around the world. It has the facility of many Indian languages.



Fig.3: SpeechTexter in English and Marathi language

5. HINDI SPEECH TO TEXT

Hindi Speech to Text app is Indian National language app for speech recognition and conversion of speech to text. This app size is small 6.3 Mb and updated latest version 1.21 recently on dated 02-06-2020. Its installs are more than 500 thousand from google play store. It requires the operating system Android 4.1 and above to use on the smartphones. User now don't need Hindi keyboards to type in Hindi. Just use this application, speak in Hindi and get users Hindi text automatically typed. A very easy and simple application but very useful. The app will capture users voice and convert it to Hindi Text.

Features :

- Speech to text service used to get Hindi typed automatically on speaking Hindi sentences.
- Press mic button and speak in Hindi to get Hindi text typed automatically.
- User can use Hindi text to share using different application as text message, use it to chat on chatting.
- User can copy the text and use it anywhere you like.
- User can use it in many ways like user can tweet in Hindi, draft a text message in Hindi, send message on social websites in Hindi, learn how to write Hindi and many more ways.

6. TAMIL VOICE KEYBOARD

Tamil voice typing app is Tamil an Indian language app for speech recognition and conversion of speech to text. Its app size is very small 11 Mb and updated latest version 1.6.5 recently on dated 11-02-2021. Its installs are more than 1 million from google play store. It requires the operating system Android 4.2 and above to use on the smartphones. Tamil Voice Keyboard is specially design for those people who want to text or write SMS, poetry or lesson and also something in Tamil language an Indian language. Tamil Voice Keyboard bring you another variety of using keyboard. Tamil voice typing is considered reliable while having a fast conversation due to voice recognition feature. Easy Typing Tamil Voice Keyboard, has all latest tools to make keyboard more elegant. Speak to text. Tamil keyboard is a simple and user friendly app. The text will appear after you done speaking text.

Voice to text Tamil keyboard app is the simplest way to type messages in your voice when you cannot type them with your hands. Download this Tamil Voice keyboard for Tamil speakers and text transcriber. Speech to text Tamil keyboard app gives you the best user interface and best and easiest speech to text options to do your tasks. Once you get rid of speech to text Tamil keyboard app, you can use the speech to text app to send quickly long texts and articles in any social media and all messaging applications in your device.

Speak to text Tamil keyboard uses voice recognition and text by voice functionality of device. Audio to text converter also supports speak to text feature which provides an easy way for voice to text conversion in Tamil language in the app. The best Voice Keyboard for Android will allow you to write in a Tamil language. Now any one can compose emails, SMS, post on Social Media and write messages, you can send voice text to all the messaging application on your phone, through this Voice Keyboard.

7. MARATHI SPEECH TO TEXT

Marathi speech to text app size is very small 3.4 Mb and updated latest version 1.3 recently on dated 8-10-2020. Its installs are more than 10 thousand from google play store. It requires the operating system Android 4.0.3 and above to use on the smartphones. Marathi speech to text converter is simple to use for dictating/recognizing text It is a Voice typing in Marathi language which can be sent as an SMS or copied and pasted into all other apps existing in your device. Marathi speech to text converter app provide user to get their Audio in the form of speech to text converter. With speech to Text converter you can convert voice note to text accurately and you can save it for future purposes. Marathi Speech to Text Converter is available Free.

8. SPEECH TO TEXT APPS FOR CONVERSION

Apps like Speech to text, Voice Notebook are tested for speech to text conversion on mobile phone. Apart from the above speech to text conversion apps in google play store, there are hundreds of apps and software available for Windows, Mac, Linux, IOS, Android operating system. There are many speech to text conversion apps for many languages in the world. Most of the world languages like english, russian, japanies, chinese, italian, french, urdu, arabian and so many languages are converted from speech to text using different apps. Similarly, there are many softwares, websites and apps available to convert speech to text for Indian languages. Popular most indian languages are used like hindi, marathi, gujrathi, telugu, tamil, malalam, urdu, karnataka, bengali, and so on. All over the world, people are using apps, software and websites for speech to text conversion for different languages on different operating system on their electronic gadgets for their different type of applications..

VI. BENEFITS OF USING SPEECH RECOGNITION SOFTWARE

Though speech recognition technology falls short of complete human intelligence, there are many benefits of using the technology in many applications. Speech recognition software helps companies save time and money by automating business processes and providing instant insights on what is happening in their phone calls.

Because a software performs the tasks of speech recognition and transcription faster and more accurately than a human can, it means it is more cost-effective than having a human do the same job. It can also be a tedious job for a person to do at the rate at which many businesses need the service performed. Speech recognition and transcription software costs less per minute, is more accurate than a human performing at the same rate, and never gets bored with the job.



VII. CONCLUSIONS

Speech recognition app or natural language processing is a field of artificial intelligence that enables computers to understand, interpret, analyze and manipulate understand natural human language. People uses voice recognition technology in their everyday lives. With voice search on the rise, more people are using speech to text conversion apps like Ok Google, Dragon Anywhere, Speech to text and other apps. Dragon Anywhere app assist people in several daily activities like sending emails, web surfing, dictating homework assignments. Ok google app is popular and use for searching information on smart phones. Most of the world languages like english, russian, japanies, chinese, italian, french, urdu, arabian and so manylangauges are used for speech to text conversion. Similarly, many softwares, websites and apps are available to convert speech to text for Indian languages. Most popular Indian languages are used like hindi, marathi, gujrathi, telugu, tamil, malalam, urdu, karnataka, bengali, and so on to convert speech to text. All over the world, people are using apps, software and websites for speech to text conversion for different languagesa on different operating system on their smart phones for their different type of applications. Software performs the tasks of speech recognition and transcription faster and more accurate than a human can, it means it is more cost-effective than having a human do the same job.

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