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VOICE RECOGNITION SECURITY FOR ANDROID

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ABSTRACT

On this platform, speech recognition is achieved by converting the input voice signal into textual output, which is then transmitted via Bluetooth to an embedded system containing an arduino atmega328 microcontroller as a means of serial communication between an android application and a control system. Android is a mobile software stack that consists of an operating system, middleware, and critical apps. The Android platform provides the tools and APIs required to begin building applications using programming language, which leads to today's digitalized world where voice recognition is a rapidly growing area. The use of voice recognition technology on an Android platform lends a nice touch to this project. Android is a much-anticipated open- source mobile operating system that serves as a foundation for other operating systems. Android features entail a distinct security model that provides the user's control over the device. The open nature of the platform allows for proprietary additions and updates, thus Android devices don't all originate from the same location. We should be familiar with Android's core architecture and important abstractions, such as Intents, Activities, Broadcast Receivers, Services, Content Providers, and Binder, before starting this article. The received text string on an arduino may be compared to a predetermined voice command that was previously supplied using embedded c programming. The required process is completed by setting the corresponding pin of an arduino to high if they match in c programming. In the disciplines of industrial automation, home automation, and digitalized robotics, this concept is immensely valuable. where an electrical system is triggered by voice command via Android application as depicted in this article.

Keywords: voice recognition, android security

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1 Introduction

Voice recognition is a technique for converting an input voice signal into its matching text or string by programming a machine to comprehend human speech. This technology can only understand the words spoken aloud, but not their meaning. Android is the first step in accomplishing that goal of making a better phone. Google has released a whole open mobile platform software stack. Android may be installed on phones made by firms that have joined together to establish the Open Handset Alliance. Motorola, T-Mobile, and Sprint-Nextel are among the 34 firms that make up the Alliance. These businesses have decided to provide open access to their gadgets. [1]. The integrated system is intended to recognize a word string and then execute a condition check using pre-programmed instructions. If the condition is met, the given work is completed in accordance with the user's requirements. This is a thorough explanation of how a voice recognition system works. The quality of the signal preprocessing stage has an impact on the speech recognition system's performance. [2]. Some voice activation programs use a hardware module to link to a microprocessor, but this project interacts with the control system using an android application, which helps to progress digitization. This method accomplishes the goal of simplicity, making it suitable for those with disabilities. [3]. The speech recognition system concept focuses on the usefulness and significance of automated switching rather than manual switching. Giving a single voice command to an android app, which then interprets real-world procedures, is one way to leverage this technique. In the realm of robotics, we may construct a variety of projects based on speech recognition; This method gives new iteration pupils a creative outlet while also assisting scientific studies and growth [4]. The

Arduino uno Atmega328, which can be programmed using the Arduino IDE, was among the controller ICs we used for this work (Integrated Development Environment).

Related work

The Android was built with the clear intention of providing programmers with the tools and freedom they need to create interactive mobile apps that take use of all that the mobile device has to offer.Android is built on the Linux kernel, which is a free and open source operating system. This software solution is open source, allowing developers to include any technological advancement. Android, which would be built on a proprietary virtual machine, gives its users more functionality and application power, allowing them to launch dynamic and functioning apps for their phone.

Google's mobile operating system, Android, is a monumental success in the development of software programs for cellphones. It also works with your phone's g-juice, allowing customers to explore a whole new world of mobile technology.

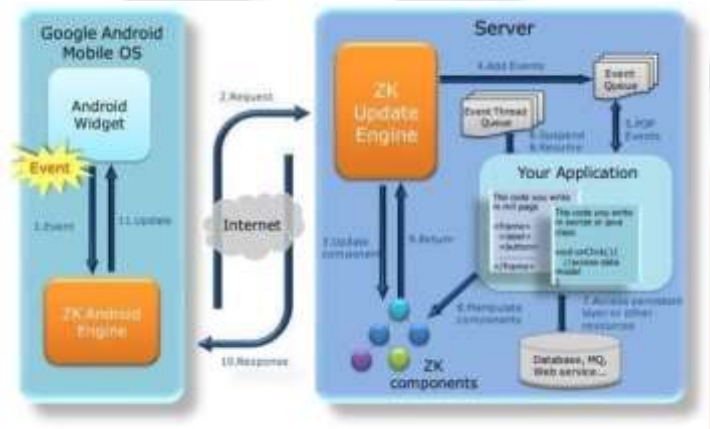

Fig 1. Android Architecture

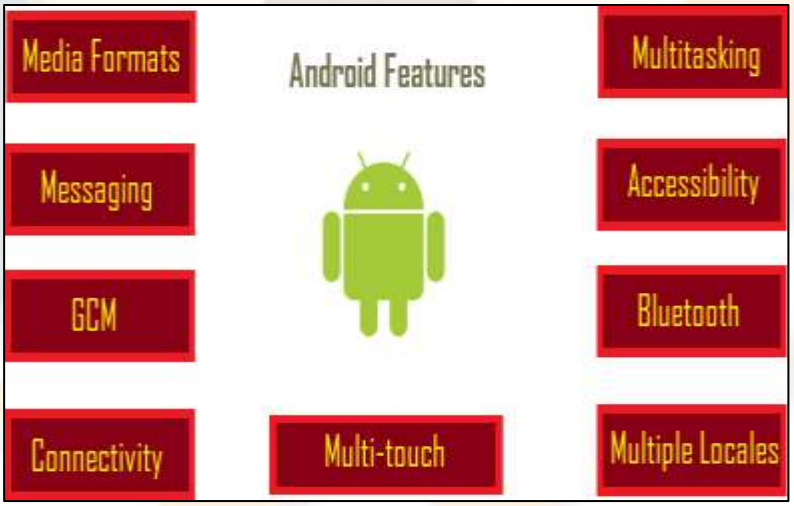

Fig 2. Android features

3. Evolution of security for Android

Years ago, smartphones were no longer just fancy phones. Most people now carry a significant amount of sensitive data on their cellphones, including everything from trust funds to personal information. As a result, smartphone manufacturers are working hard to improve smartphone security, and many of the most recent phones have cutting-edge security measures to help protect your personal information. Let's take a look at the history of smartphone security and how far we've come with it: Unlock by sliding.

Lock screens: on Android 2.0 and iOS 5 phones were the first step toward smartphone security. To unlock the phone, all you had to do was slide the home symbol across the screen. While it was preferable than having your screen displayed at all times, it was far from safe; even so, anybody with a finger could unlock it. Passcodes were introduced to smartphones to cope with this

problem. Every time you wanted to access your main screen, you had to enter a PIN.

Fingerprint: Leading smartphone manufacturers added fingerprint scanners to their devices a few years ago. This was the first hardware security feature on a smartphone, and it was a hit with buyers right away.

Iris and face recognition: An iris scanner is said to be included in the iPhone 8, allowing you to validate your identification with your eyes. You have a random pattern on your iris that is unique to you. Indeed, according to Princeton Identity CEO Mark Clifton, the FBI utilizes 13 points on a fingerprint to identify you (for a total of 130 points for all ten fingers), whereas your iris has 200 detection points (or 400 for both eyes). This implies that having an iris scanner on your phone makes it extremely secure.[5]

4. Proposed work

Voice Recognition Security: Recent android versions are more user-friendly and very sensitive to lots of features such as the touch feature and face recognitions and thumb/finger print and voice recognition features, text to voice and voice to text. All these falls under the artificial intelligence aspect of this technology.

The Lochan Voice Control is an android application that recognizes human voice and translates it to text. This text as a string may then be delivered through Bluetooth as a wireless communication channel from a smartphone to an Arduino Uno circuit with a Bluetooth module HC-05 for serial communication. This communication technique sends data one bit at a time. When serial data is received by an arduino, it is compared to a specific string, and if the two are equal, the accompanying actions are carried out using the arduino's digital pins. This Android app was created using MIT App Inventor 2, which enables for simple construction using drag-and-drop block programming.

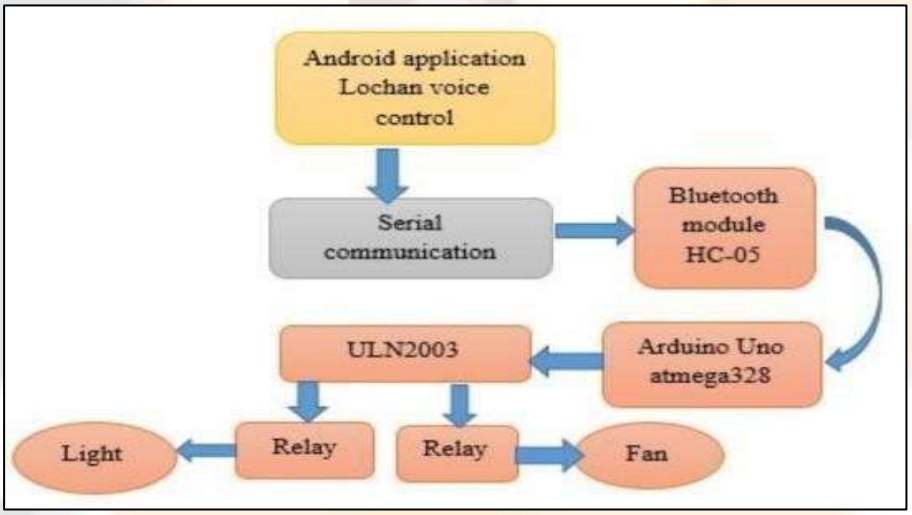

Fig 4. System architecture for voice control

One may use voice recognition (also known as speech recognition) to quickly type text by just speaking to your phone. An Internet connection is required for the best results. Accuracy varies depending on your accent, how quickly you speak, the amount of background noise, and the subject (technical terms and people's names may be difficult). Over 90% accuracy is usual, but you'll need to use the keyboard to correct any errors.[6]

Moreover, the implementing the voice system of security for android is an additional feature which could be an actual plus to the system. There are lots of persons who are handicapped and these handicapped persons wish to use technology. Sure, there is the voice assistant technology, but no security implemented once his device is unlocked, for example. There are many other instances where this happens and the voice recognition for android will be one of its kind. Android systems have the face id which must be accompanied by a pin or pattern, or a pattern which must be accompanied by a pin which shows a double system of security. The voice on its part is an extremely unique feature, as it stands out for verification based on voice. Voice recognition could also be configured along side other security settings in Android technology.

5. Functions of Existing Technology

It can also be a quick way to take notes - for example, from a text book - especially if you

don't want to jot them down on paper and then type them up later. You can email yourself whatever you type on your phone to copy and paste into a document. It might also assist if you have trouble spelling or type poorly.

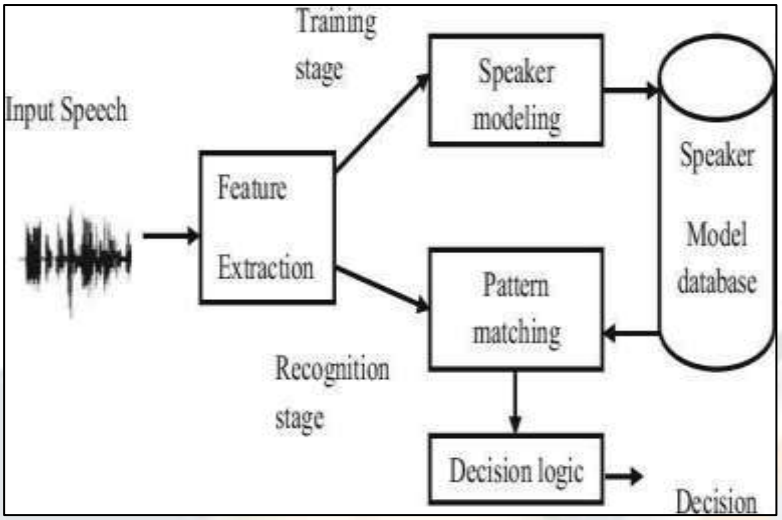

Fig 5. Existing voice recognition system for android

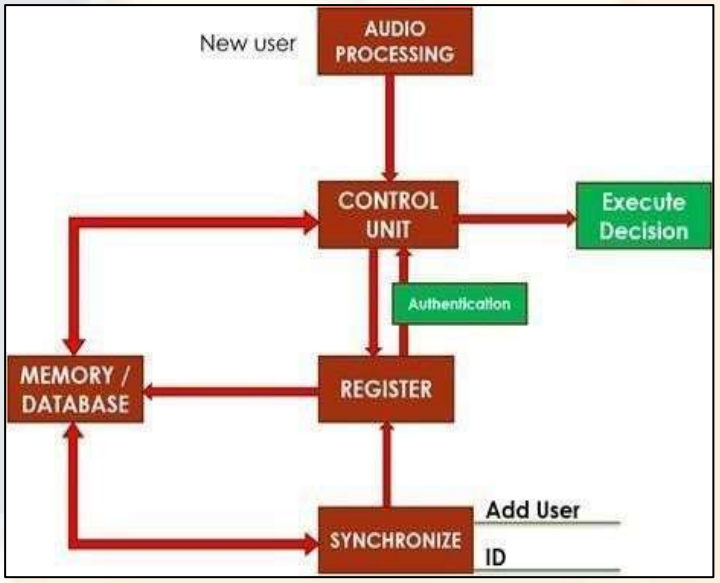

Fig 5. Proposed Voice recognition block diagram

Future work

Voice recognition has been fairly used for a wide range of devices and features on android devices and more. There are lots of other AI features which enhance security on androids. Such security features are finger print features, the face

ID feature.

The voice ID could also be an outstanding feature which enhances security and authentication processes for androids. Having this feature increases the range of security aspects in androids. Voice recognition security is extremely useful in voice biometry, which could be widely utilized by businesses and contact centers. It could also be used to It surpass other authentication techniques such as passwords and secret security questions in terms of security. Furthermore, it can be implemented to improve customer experience by eliminating time-consuming login processes and enhancing the security of critical credentials.

Voice recognition for security can enabled businesses to develop digital profiles of their consumers based on the precise qualities of their voice requests, which is impressive.

Voice biometrics of high quality can ensure that users' sensitive personal information (which is

gathered over time through their voice commands) is not jeopardized. Medical transcribing in the digital age[7]

The healthcare business has been on the lookout for a potential speech recognition and transcription solution to improve the way it organizes documents and appointments for a long time. Speech-to-text software has been around for about half a century in the business.[8]

Previously, healthcare companies attempted to do this by hiring transcriptionists, but this proved to be an ineffective, time-consuming, and costly strategy.

Medical transcription can become a necessary requirement for doctors nowadays, since it allows for convenient storage and retrieval and securing of medical information. In medical settings, digital transcription based on speech recognition technology provides lots of new advantages to healthcare practitioners.

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