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Voice Recognition System Using Natural Language Processing

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Abstract: The Natural language processing helps user to perform their goals with the task system. The informal voice-based task is used to generate the user understandable text for performing certain tasks. The internet of things is widely preferred technology to reduce the manual work. In this paper, we proposed a system as an android interface used to provide communication between user and application based on voice input. The important feature of this application is that registered devices can connect to cloud-based service for providing notification to authorized user. The android application used to enable home-automation also has security feature by providing authentication. The android application automates voice input and generates cloud notification at client side. The authorized response from user will be taken for accessibility to entering house. The system has a speech recognition module using natural language processing and hence voice input can be understood by system and notification for each voice sample is sent to user accordingly.
Keywords: Google speech recognition, Android Application, Cloud Push Notification, Natural language processing.

I. INTRODUCTION

The development of natural language processing technologies enable user to provide natural language interface. The significance development of cloud-based automation provides protocol to reduce manual work. To reduce manual work and increase work efficiency by using internet of things where user can express their goals using natural language. The key requirement of proposed system is to provide interaction of application and cloud services. The non-expert user can communication with system and recognize the informal task goals. The problem with natural language processing system development is the interface used to provide utterances of sentence and fuzziness of their semantic meaning. This will lead to problem because of different voice sample and different voice pitch.

II. LITERATURE SURVEY

Home automation using application and speech recognition Author – Cyril Joe Baby, Nalin Munshi, Ankit Malik, Kunal Dogra, Rajesh R Publish by - Microelectronic devices, Circuits and Systems (ICMDCS), 2017 International conference, 10-12 Aug. 2017

III. PROBLEM STATEMENT

The home automation is almost required for reducing the manual work burden. The unauthorized person who want to interact with owner of house and asked for permitting enter to home. The home automation system is that any devices connected to local area network are controlled by application interface or speech recognition interface. The cloud-based system is rarely used for providing access to other than house owner or member for gaining the authority to enter in to house. There is no efficient system to provide application interface for allowing other than house owner or member by authorized person.

A. Goals And Objectives

The main goal of this system The system should be able to interact the person at outside the door and should provide the cloud-based notification service on android application. The natural language processing for reducing communication gap between end users. to interact of cloud-based services and application. Proper utilization of cloud services for authorization in home entrance.

B. Statement Of Scope

This system is useful for non-technical user to interact efficiently with hardware system. The natural language processing technology for speech recognition and adaptation of voice input to generate system as well as user understandable data. The system provides feasible way to implement cloud-based notification services for using automation accessibility service. The voice recognition system uses lexical analysis over user provided data. The different sequence of words is pre-trained to the system that

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will be used to generate instruction for sending the notification and return the access of door. The notification will in the form of wave file and stored on cloud services. User can access those files along with log file anytime.

C. Methodologies of Problem Solving And Efficiency Issues

The proposed system will use Google API for online speech recognition and snow boy for offline speech recognition. This helps the problem of natural language processing utterances. The Firebase provide notification services for sending notification to authorized user as well provide storage services for storing the voice inputs with their timestamp. The developer need not to worry about communication between devices and cloud messaging. The device should be connected to internet for accessing the voice data from cloud.

D. Outcomes

The outcome of proposed system will be, The unauthorized user can request for gaining accessibility of door. To providing security from intruder and providing authorization at outside door Reducing the unauthorized access for entering to house.

E. Application

The application of proposed system will be, notify end user for every new guest To exchange data between machine to machine communication using cloud. To provide accessibility to unauthorized after providing confirmation through android application.

IV.   DETAILED DESIGN

A.   NLP Module

The approach is based on voice data for task goals which contains following steps: lexical analysis, syntax analysis, verb-relevance preselection. The utterances of voice are converted to text using speech recognition methods. The following structure shows the voice to text conversion steps Fig 1.
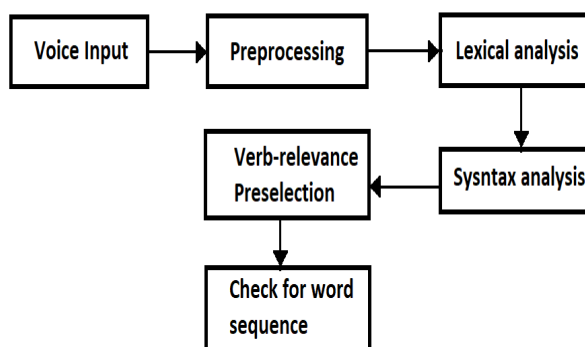

Fig -1: NLP Module

First, the preprocessing of voice data is removed. Second, the structure of words and sentence formation through lexical and syntax analysis is done. Third, the sequence is checked for accessing the pre-trained services. Finally, the most similar commands are selected out based on sentences.

B.   Architectural Design

Following diagram shows the architectural view of proposed system. The android application is authorized device which is used to provide user interface. The cloud service used to access the database and notify end user. The voice data provided by unauthorized user is converted to text commands using speech recognition API. The captured data is analyzed and process by voice processing API's and passed to cloud for storing the user log structure.
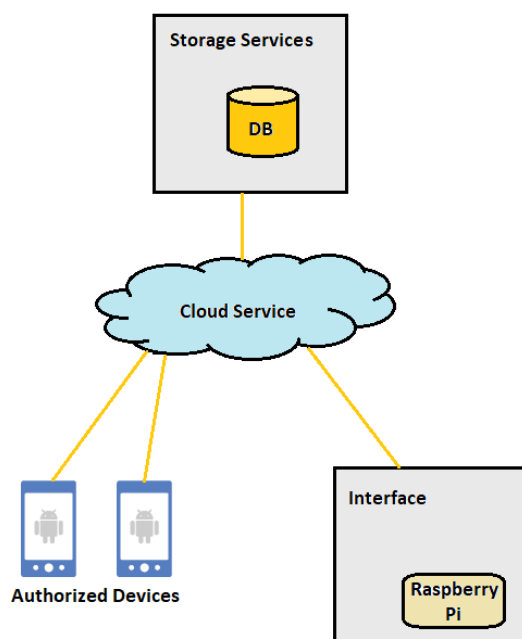
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Figure-1: Architecture design

V.   CONCLUSION

We have prepared a system for reducing manual work and to provide security from unauthorized user or intruders. The system captures data from unauthorized user and process the analysis for notifying and storing purpose. Thus, we implement an authorized access providing system to end user using cloud-based system.

VI.   ACKNOWLEDGMENT

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