A Novel Simplified Android Based Virtual Assistant for Windows Users

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ABSTRACT

The software that is designed to perform tasks or services for an individual based on commands or questions is an intelligent assistant or a personal assistant. It takes a lot of manual steps and valuable time to get several tasks done on our own. Hence, several Virtual Assistants (VA) were built to help individuals to make their general task easier by means of voice. Voice control is one of the mean for Virtual Assistant to make life easier. Assistants like Google Assistant, Apple Siri and Microsoft Cortana are built in such a way that they can get things done only on the platform they are installed on. For example, Google assistant on android can't perform tasks on desktop that is powered by Windows operating system. This work focuses on designing and developing a VA for android that can interact with the end user to get things done on PC.

Keywords : AES, Android, Natural Language Processing, Random Forest Classifier, Virtual Assistant, Windows.

Abbreviations : VA, Virtual Assistant; NLP, Natural Language Processing; RFC, Random Forest Classifier.

I. INTRODUCTION

Personal Computers (PCs) have become one of the most important electronic gadget of our everyday life just like a cellphone. User may send E-mails, open apps to perform some functions, listen to music while working with some tasks. While user does most of the things manually, they might need something that can do most of the tasks for them. This is where personal assistants or virtual assistants comes in. For instance, the user may need to navigate to the chrome and type the name of certain thing that he needs to search. Instead, they can simply ask assistant to do that job. It can save users time in most of the cases especially when the task involves a lot of steps. Thats why most of the Windows users use Cortana to get most of the things done in ease. However, there may be times when users need to exchange data between smartphone and PC. Also, users might wish to have control over their PC even when the PC is far especially when given to a friend or family member. In such cases, users wish to track activities and take certain decisions based on the observed activity(For example, if user observes that his/her friend is trying to alter an important document, user can suspend the same and can take further decisions to remotely encrypt important documents or to lock the PC). Along with these features, it can handle most of the basic stuffs like tweaking some system settings, opening apps, streaming music/videos online and much more. The users will be able to chat with this assistant just like how users can chat with Google assistant, Cortana or any other assistant.

II. MATERIALS AND METHODS

Inorder to perform tasks on windows from android, the devices must be connected. This is achieved using the concept of sockets and port numbers. An application is developed for windows which helps to establish the connection and to perform tasks by receiving the commands from android. Also, the connection must be secured. The data transfer between these devices is protected with AES encryption. Whenever user asks the assistant to do something, the command is transferred to the windows OS, the requested task is perfrormed and a response is sent back to android. When a command is received from android, two major algorithms plays an important role in understanding and predicting the task that needs to be performed.

II.I Natural Language Processing(NLP)

NLP is a technique used to make system understand human interpreted language(for example english). It is difficult to apply and train a model to recognize and understand an english sentence. This is because different sentences may vary in length, may contain unwanted data (to be specific, unwanted words like the, they, to etc and special characters that are not necessary for processing). So, it is recommended to clean up the texts before further processing. NLP technique involves cleaning the texts and creating a bag of words model such that this model can be used in other machine learning techniques for training.
The procedure for NLP is given below :

Step 1: Load the training data
Step 2: For each sentence in training data,
      1.Remove unnecessary words and special characters
      2.Convert all remaining words to lowercase
      3.Convert each word to its basic form
Step 3: Create Bag of Words model

Step 4: Replace training data with this Bag of Words model

II.II Random Forest Classifier (RFC)

Random forest classifier consists of a several individual decision trees where each tree helps in predicting the final value. Several trees are trained with different subsets of the entire dataset. In this way, each tree can predict based on its training. The value predicted by the highest number of trees becomes the final prediction. Due to this reason, Random forest classifier is more accurate when compared to decision tree classifier.

The procedure for RFC is given below :

Step 1: Load training data
Step 2: Split the training data into severalrandom samples
Step 3: Train and make a decision tree forevery sample
Step 4: Collect the prediction value fromevery decision tree
Step 5: Select the most voted value as thefinal prediction

III. RESULTS AND DISCUSSION

The training dataset consist of over 500 entries to predict tasks and over 1000 entries to enable chatting/question answering.

Table 1 shows the analysis of result. The accuracy is calculated as follows :
Accuracy = No. of correct predictions /Total no. of predictions
          = 437 / 500
          = 0.874
          = 87.40 %

Table 1 : Result Analysis

No. of Testing Samples	No. of correct predictions	Total no. of predictions	Result
500	437	500	0.874

IV. CONCLUSION

This paper is concerned with developing virtual assistant that can do things in the platform(Windows) other than the platform(Android) where the assistant is installed. With the help of such assistants, users can keep track of the activities when they are not directly in touch with their PC and make certain decisions based on the observed activity. Apart from this, users can make use of this assistant to make their life easier by asking the assistant to do most of the tasks. The assistant is also trained on question answering which enables the users to chat with the assistant.

V. FUTURE SCOPE

Future work will be adding several more useful tasks that can be done by the assistant. It might be good if the assistant improve over time in terms of accuracy. So, making the assistant to learn from the experience will be a good idea.

VI. REFERENCES

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