AUGMENTED REALITY CHATBOT USING UNITY

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ABSTRACT

Augmented Reality chatbot is a program that starts the conversation with humans through voice commands. Currently, every corporation is trying to reduce the manpower in multiple ways to increase the efficiency of the output and to gain more profits. AR Chabot is one of the way to achieve the above requirements that is reduction of manpower and to reduce the human inference. In early days,with the help of websites people use to guide there users to meet their respective outcomes. But now days, we are interacting with clients,so that in our paper we want to create a Augmented Reality Chatbot using Unity. The technology of Augmented Reality is emerging and latest development in mobile world, permitting, inclusion of external data on top of the camera input and produce the output in 3D user friendly form. AR is used in many sectors such as education, navigation system, tourism gaming world, and tool etc. Our objective is to create a chatbot which interact with humans just like talking to another human and to increase interconnections. By using this chat bot, the organization met the criteria precisely with less human power.

Keywords: *Augmented Reality, Unity, 3D User, Chatbot, Artificial Intelligence, Natural Language Processing.*

1. INTRODUCTION

Augmented Reality, abbreviated as AR, defined as a real-time indirect or direct view of a physical existed real-world environment that has been amplified by addition of virtual computer-generated information. AR is both interactive in 3D and also it combines real and virtual objects. The main aim of Augmented Reality is to make the user life much better by bringing virtual information to his immediate surroundings, and also any indirect view of the real-world environment, such as live-football games and live video streams where different colour lines help the viewer having better understanding regarding important positions where players are located which results in change of perception. Augmented Reality improves the users view point and interaction with real world entities. Augmented Reality technology offers the user with both real and synthetic environment in which the virtual objects are added to the augmented reality user perception in real time in such way that it provides the user a better understanding of real world environment.

2. BACKGROUND AND RELATED WORK

One should probably need to get a reference to the Android app context if your plugin is going to do anything interesting. You can do this by adding the classes.jar file from your Unity install to your Android project as a library. So go to file project structure and then choose the dependencies tab for the app module. Here you can click the plus button to add the jar file. Go to your Unity build, playback engines, android player, variations, mono, development, classes, and finally classes.jar. Change the scope to compile only. Now, in a new java file you can do UnityPlayer.currentActivity.getApplicationContext(); and use that reference where ever you need it.

Our project comprises of 3 fragments. First part describes the creation of pandabot in unity. Second part tells off how we added voice plugin in Android Studio. At last we are generating APK.

Our background related work is as follows:

1. Download Unity 2019.3.11f1.

2. Download java version 1.8.0_291 and add path to environment variables.

3. Download Android Studio and updated GradleWrapper.

4. If there is no SDK manager in Android Studio, then we have to download the SDK manager packages in Android Studio by opening

Android Studio->Settings->SDK.

5. Set SDK manager and JDK path in unity and it should match with Android Studio's SDK manager and JDK path.

6. If JDK path present in unity doesn't match with JDK path present in Android Studio,we have to change the following settings in Unity: Edit->Preferences->External tools->SDK path.

7. To build the project in Unity: open File-> build Settings->platform(Android)->build.

8. Store the generated APK in required location.

Natural Language Processing (NLP):

Natural Language Understanding: Natural languages are similar to human languages such as English. In this Section we make the computer to understand the English. Which allows non program mess to use them with little training.

Natural Language Generation: Natural Language Generation means making the computer to generate natural languages. It is much easier than previous process i.e Natural Language Understanding.

Machine Translation: Computer generate a text written in one language into another language is called as machine translation. It is important for organization that operates in many countries.

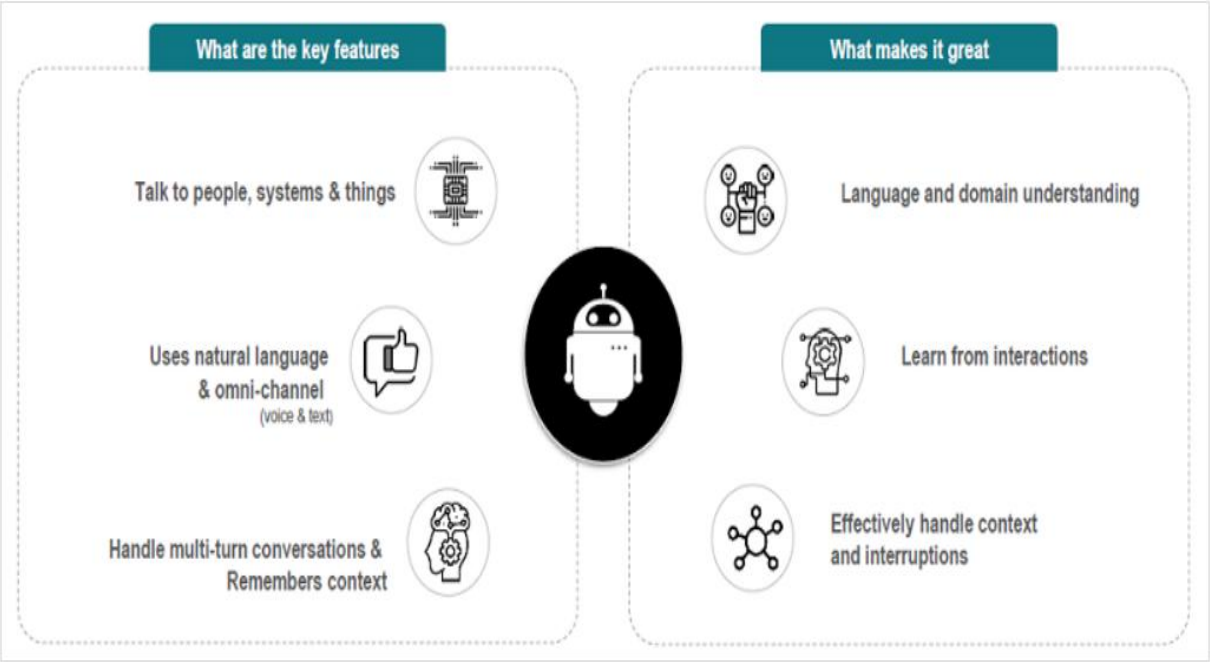
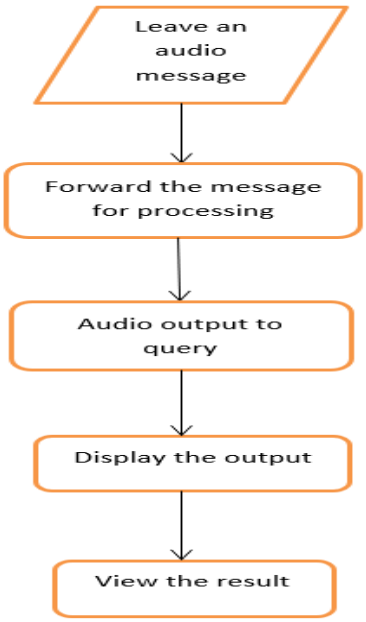


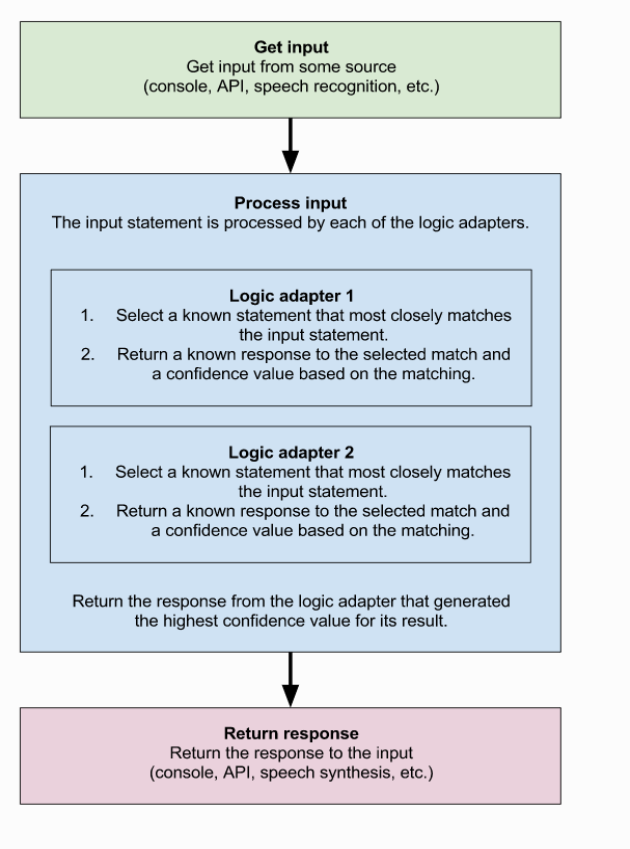
Figure-1: Features of Natural Language Processing

Workflow of system:



When user leaves an audio message,the message is forwarded for process and audio output to query is displayed on the screen

Figure-2: Workflow of system



3. PROPOSED MODEL

Figure-3: Flowchart of our proposed model

In our proposed model, we use technologies like AI natural language processing, Augmented reality and more robust network connectivity are opening up a new dimension for today's traditional robotic voice based chatbots. This proposed model can create a chatbot which interact with humans like there is another human talking to him and to increase interaction. The flow of our proposed model is as follows:

1. Our pandabot/chatbot takes the input as audio message from user.

2.Later the message is sent to voice messenger for processing and passed to API chatbot.

3.The message is processed in AI natural language processing.

4. The output is extracted entities and intents to chatbot.

5. The output comprises audio output to message and message sent to messenger.

6. Ultimately the result is displayed & viewed by the user.

Limitations:

1. Personalized answers

2. Standards regarding Augmented Reality App Design & Development is limited

3. The technological gap between AR devices and smartphones so we have to design full pledged AR gear.

4. In Augmented Reality we have to deal with Ethical and Legal Issues.

5. Considering that the majority of the users are not interested to purchase AR gear because it not practical and high prices.

4. EXISTING MODEL

Technology has developed day by day ensuring that every client gets nothing less of their expectations. Chatbots are developed day by day we have many versions of chatbots for a while now. But it is the only recent glows up technology to become the power house. With the help of chatbots we get more profits in the section of E-commerce and the main reason for this is they are always available i.e 24/7 and also due to influence of Machine Learning, the bot can understand more and can do more in return.

In Future chatbots was all cemented when social media giant Facebook ventured into the territories. With more than 2 billion users in a monthly span, there incorporation of service branded chatbots into their platform was huge game changer. With a proper application of Strategy, this business should leverage Facebooks numbers and turn them into conversations. So, we developed Voice based panda chatbot for more methodical experiences and refreshing conversations to make it as user friendly.

5. EXPERIMENTAL SETUP

In this section, we describe all the elements used in the experiment to explore our proposed model approach in Augmented Reality Chatbot Using Unity.

4.1 Unity: Unity3D is a powerful cross-platform 3D engine and a user friendly development environment. Easy enough for the beginner and powerful enough for the expert; Unity should interest anybody who wants to easily create 3D games and applications for mobile, desktop, the web, and consoles.

Using Unity version of 2019.3.11f1 we are creating pandabot. We can only view the movement of panda when we click on play button. Here we have created two button that is AR and Exit. When you open the mobile app, Panda speaks and displays text like this 'Hi, I am AR Chatbot, Please speak something!'

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Figure-4: Creating panda using Unity

Figure-5: Scene View f Mobile

4.2 Android Studio: Android Studio is the official integrated development environment (IDE) for Android application development. It is based on the IntelliJ IDEA, a Java integrated development environment for software, and incorporates its code editing and developer tools. In Android Studio, We are adding Voice Recognition. Adding Jar file as dependency to the android studio.Voice Recognition is established.

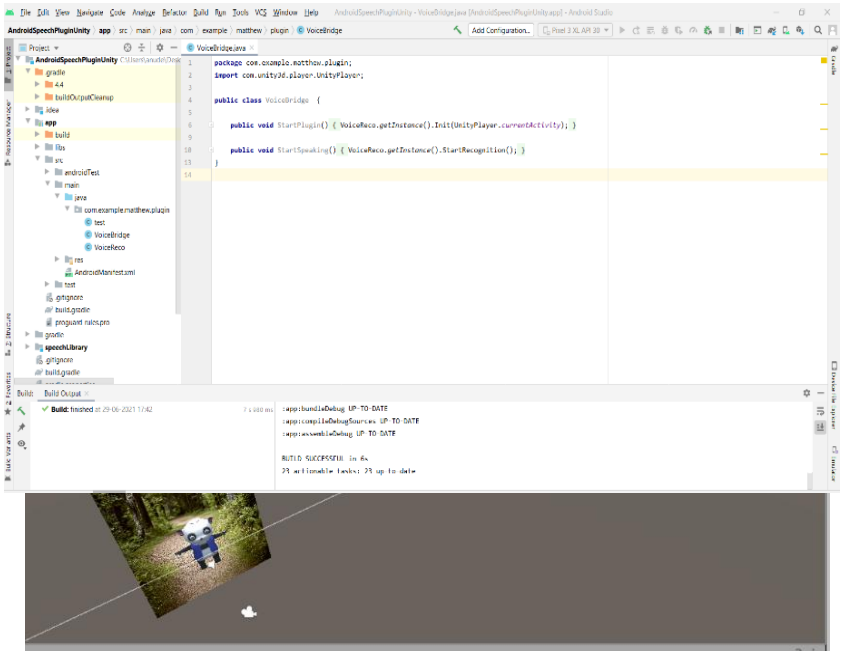


Figure-6: Voice Plugin Build Successful in Android Studio

Generating APK: After Adding Jar file in Android Studio, we have to generate apk**.** Signed apk generates a key and this key can be used to release versions of the app, so it is important to save this key which will be used when the next version of the app is released. The android system needs all installed applications be digitally signed with a certificate whose private key is owned by application's developer. Android system applies the certificate as a means of recognizing a author of an application and establishing trust relations between applications. The essential points to understand about signing Android applications are:

- When developers are ready to publish the android application for end-users, they are required to sign it with suitable private key. They can't publish an application that is signed with the debug key generated by the SDK tools.
- Applications can only be installed when they are signed. Android does not allow unsigned applications to get installed.
- Developers can apply self-signed certificates to sign the application. No certificate authority is required.
- To test and debug the application, the build tools sign the application with a special debug key that is created by the Android SDK build tools.

Importance of Signed APK

- **Application Modularity:** The applications signed by same process are recognized as a single application and are allowed to run on the same process. This allows the developers to make the application in modules and so users can update each module independently.

- **Application Upgrade:** To update the application, the updates must be signed with the same certificates. When the system is installing update to application, it relates the certificate in the new version with those in the actual version. If the certificates match correctly, including both the certificate data and order, then the system releases the update. If we sign the new version without using matching certificates, we need to attach an different package name to the application and in this case, the user installs the new version as a completely new application.

6. EXPERIMENTAL RESULTS

This section specifies the results obtained by conducting the experiment. We depict the testing results on various conditions.

5.1 Test case 1: Surface Identification

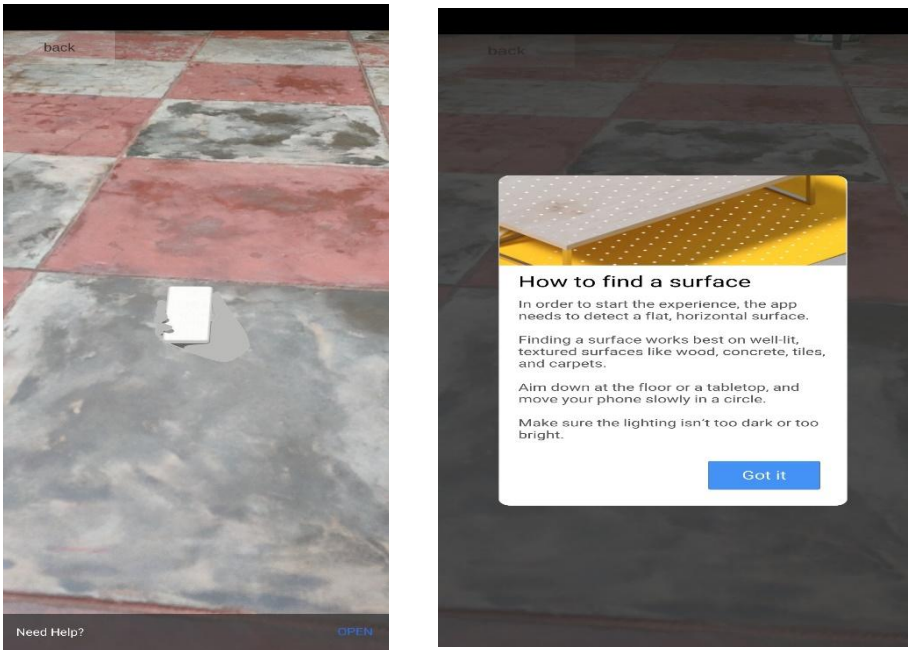


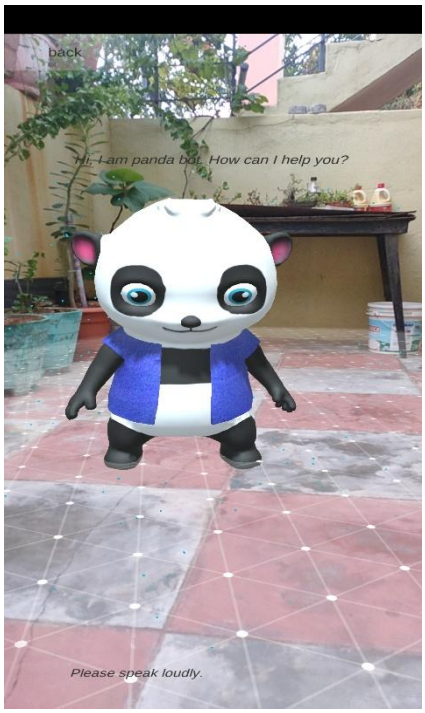
Figure-7: Surface Identification

From the above figures, when you open AR it asks for move your phone for surface identification. If still unable to find surface, then a popup is displayed to guide the user.

5.2 Test case 2: Identifying Surface

Figure-8: Identifying Surface

In the above figure, camera identifies surface and it creates a virtual base for panda to display it.



5.3 Test case 3: Virtual Image Created On Surface

Figure-9: Virtual Image

In the above figure, a virtual image is created on surface and introduce itself as “Hi Iam Pandabot. .How Can I Help You ?”.And it Listens to your command and respond according to your question.

5.4 Test case 4: Quick Responses and Displaying Text

Figure-10: Quick Responses and Displaying text

Above picture tells how panda responds to user questions and displaying output .

5.5 Test case 5: Without Augmented Reality

Figure-11: Without Augmented Reality

When user is unable to open AR then Pandabot is displayed with a default background and responds according to user.

7. CONCLUSION

This thesis addressed the process of implementing and evaluating an assistive application for the users to use in conversational situations. The main contributions of this work are the AR mobile application and the validation of the approach by user testing. In addition, the work explains the setup of a remote and scalable speech recognition server using existing open-source software to handle the computationally heavy modern automatic speech recognition difficult for mobile devices. The user tests were organised in a similar way to the previous work, where one-on-one conversations were simulated in a noisy and challenging acoustic environment using background noise recordings. The primary goal of the user tests was to find out whether the users preferred the AR approach of this work or a text-only version similar to the previous work.

The results show most preferred the AR version because they could continue the use of lip reading this way. However, some liked the text-only version or could not choose their favourite. This leads to the conclusion that the best system includes both versions.

Future Scope:

Enhancement of this project can be done in few ways such that we can use this project fullest. In Case of Products Shopping, when we use this Augmented Reality Chatbots which increase costumer engagement and customer seek personalisation.day by day online purchases increases rapidly,business are turned to facilities to facility more interaction in best buying experiences for these customers. An Upcoming trend in this section is the use of augmented Reality in customer facing chatbot .since customers grown today has habitual to communicating with chatbots for queries and purchasing of products. Addition of Augmented Reality to this spectrum open to a new world of immersive shopping experiences.

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