Holographic Artificial Intelligence Assistance

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Abstract—The current AI assistant systems are used to take user speech as input and process it to give the desired output. But the current available systems are the Virtual Private Assistant(VPA's). This means you can communicate with the assistant but is not visible to you. So the proposed system will allow you to interact with 3D Holographic Assistant and you can provide input in the form of Speech, Gesture, Video Frame, etc. And will also take form of any object to give detailed idea of required object. This system will be used to increase the interaction between humans and the machines by using 3D Holographic projection in thin air like a real object and makes the holographic effect more realistic and interactive. The system can detect the age of the person with provided input and provide the results accordingly. The system can be integrated within the smartphones for providing inputs and outputs. This system can be used in other different areas of applications, including education assistance, medical assistance, robotics and vehicles, disabilities systems, home automation, and security access control. System can also be used in shops, malls and exhibition to visualize the object in 3D Holographic format instead of real object.

Keywords— Holographic Artificial Intelligent Assistant; Natural Language Processing; Image Recognition; Gesture Recognition.

I. INTRODUCTION

While using the AI Assistant that are currently present we can face a problem that if sometimes the mike of the device fails we are unable to interact with the Assistant. This may createa interrupts in interaction. And also while using the current assistant we are not able to visualize them, they are virtually present so we cannot see them. Also while the kids are using it there are a few concepts that needs to be visualized for better understanding.

The proposed system involves the Multi-Model system in combine with the Holographic view, this includes the advancement in computer graphics and multimedia technologies the way human view and interact with the virtual world, such as the augmented reality (AR) and the hologram display. The usage of AR display devices, such as Smartphone's and smart glasses, allow the user to receive additional information, which is in the form of informative graphics based on his or her field of view through the devices, for example, the street's name, navigation arrow to lead the user to the destination, etc. On the other hand, the use of holographic pyramid prism can produce the holographic results that displayed the 3D objects in the real world environment, by letting the user to look at different perspective of these holograms when viewing from different angles.

This system can also be used in the education system to improve the experience of the learning. This will create the better understanding effect in mind of the students. Also it can be used in malls for demonstration of the material, in case if the material is not available and it will soon be arrived then also the customer can view it using this Holographic AI Assistant

I I. EXISTING SYSTEM

The current Existing systems are as shown below:

Name		Platform
Google Now	Google now	Android & IOS
Cortana		Windows
Siri		IOS
Robin	R	Android
Dragon Go		IOS
Evi		Android
EasilyDo		Android

Fig. 1 Existing System of AI assistance system

Proceedings of Second Shri Chhatrapati Shivaji Maharaj QIP Conference on Engineering Innovations
Organized by Shri Chhatrapati Shivaji Maharaj College of Engineering, Ahmednagar
In Association with Novateur Publications JournalNX-ISSN No: 2581-4230
February, 22nd and 23rd, 2019

As shown in above fig.1 they are the current existing systems which are the virtual AI Assistance system. They are the systems which do not show the assistance in front of you. They are also the systems which accept the simple input mode that is Speech or Text. They are no able to take input in the form of video frames, images, gestures, etc. They are not much interactive.

III. PROPOSED MODEL

This proposed model gives the advance version for the present Existing system. It combines 2 concepts as Holographic projection and Artificial Intelligent Assistant
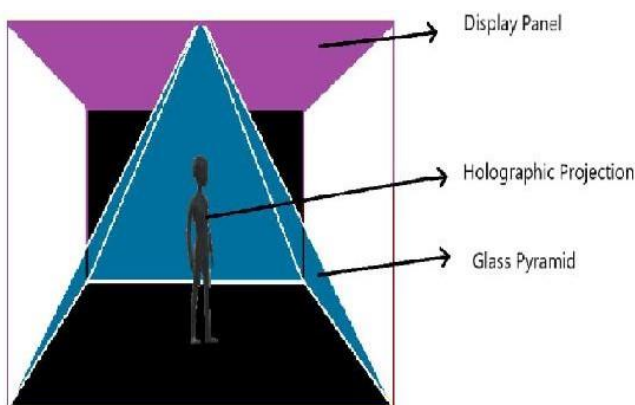

Fig. 2 Architecture of Proposed System

The above shown in fig.2 is the architecture of the proposed system as shown in it the system consist of the transparent box and the monitor is placed in the top part of the box. Inside the box the glass prism is been set at 45° angel. This will help for displaying the projection. The inside projection will consists of the simple human animation. This animation will make the same effects as the human in certain conditions.

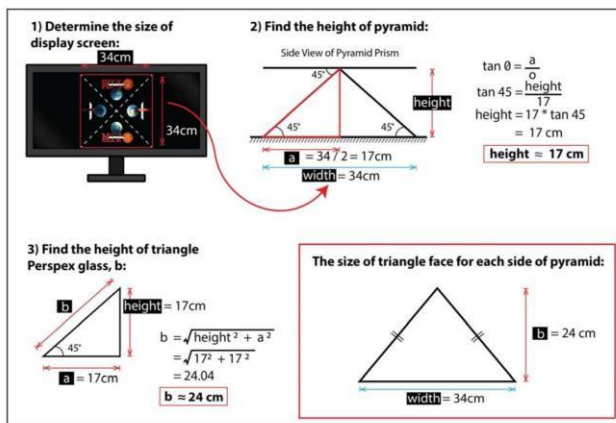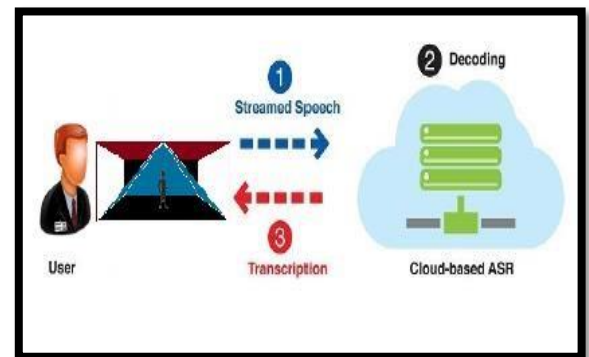As per mention by Authors calculation and the dimensions would be as shown below in

Fig. 3 Dimensions used

a. *Input Module:*

The system will be able to take and recognize the input in different modes. The modes will be:

Speech: In this the simple speech will be taken

as input decoded and result will be provided.

Gesture: In this the input can be given in form of the gesture. That is the user will need to perform the action and they will be recognized and proper output will be shown.
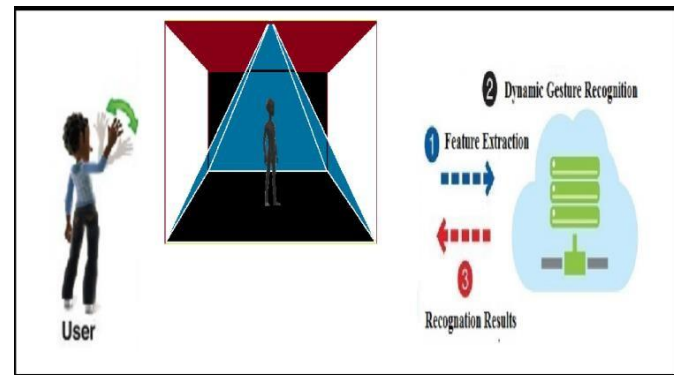

Fig 3.2: Gesture as input

Video Frames: In this module the video frames will be given as input and the data will be decoded in it.
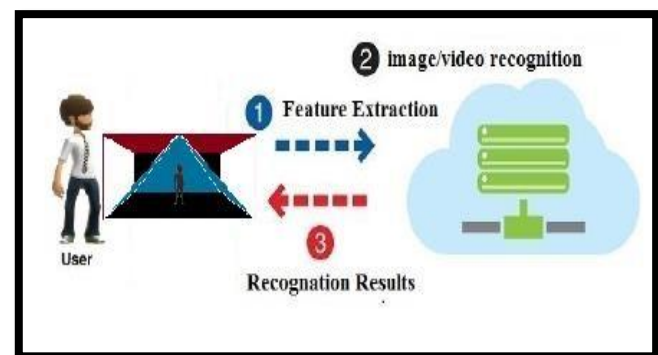

Fig. 3.3 Video Frames as input

b. *Output Module:*

The output module will be in the given form:

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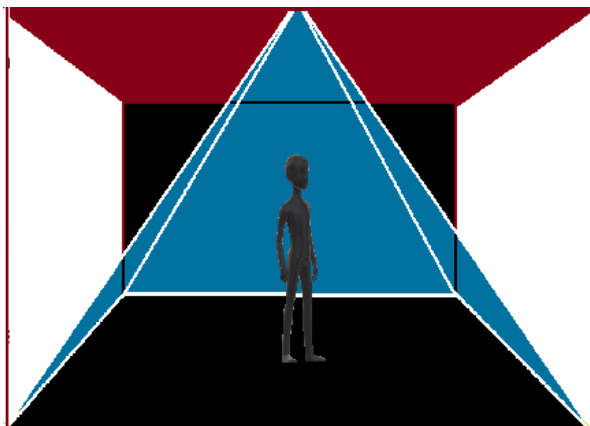**February, 22nd and 23^{rd,} 2019**

Fig.4 Output Module With Assistant

The above shown in Fig.4 is the output module. In case of proper understanding the displayed assistant will take form of the object as shown in Fig.5.
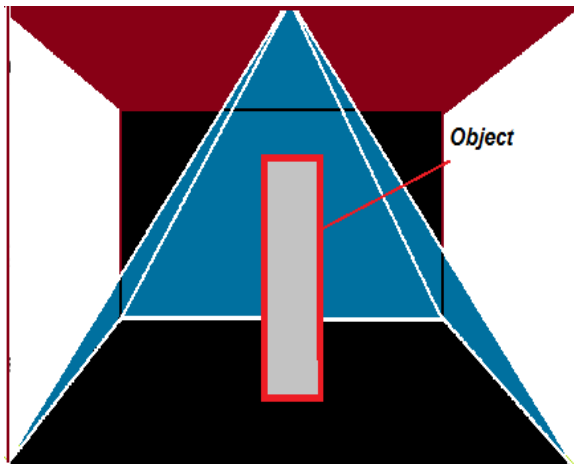

Fig.5 Output module with object

c. *Interaction Module:*

As per mention by VetonKepuska this module consists of the way the interaction is made. It describes how the interaction is made. The Fig. 6 shows it [1].
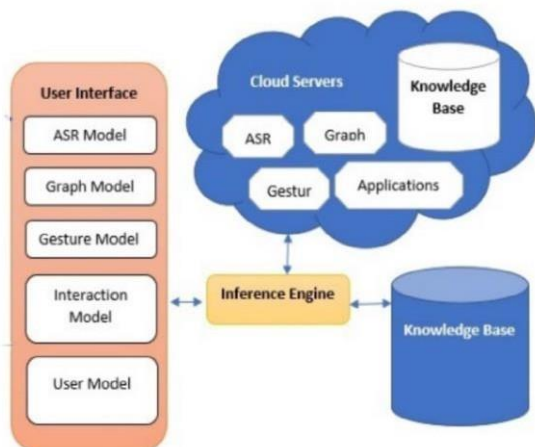

Fig.6 Interaction Module

This is the module that describes the way the interaction is going to take place.

d. *Natural Language Processing(NLP):*

This module gives the proper understanding of NLP which is the basic concept for speech recognition in multimodal system. The Fig.7 shows the proper NLP Structure.
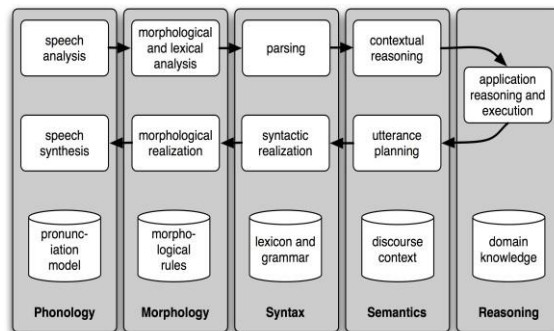

Fig.7 NLP

e. *Knowledge Base :*

Proposed system consists of two knowledge bases. The first one is online and second one is offline where all the data and the facts such as facial and body datasets for gesture module, speech recognition knowledge base, image and video dataset and some user information related to modules will be stored.

f. *Convolutional neural network (CNN):*

The images on computers are read as pixels and it is expressed as matrix (NxNx3)—(height by width by depth).
There are specific patterns in an image which is traced by the convolutional layer. Convolutional layer uses learnable filters which is used to detect these specific features in an image. It is generally expressed as a matrix taking dimensions as small and keeping the depth same as the input file.

Activation Function: Activation function is a node that is put at the end of or in between Neural Networks. To check if the neuron would fire or not, this function is used. ReLU function is the most widely used activation function in neural networks today. ReLU function does not activate all neurons at the same time , which is so far the greatest advantage of ReLU.

Pooling Layer: The functionality of this layer is that it reduces the amount of parameters and computation in the network, controlling overfitting by progressively reducing the spatial size of the network. It can be seen in between convolutional layers in a CNN architecture.

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Fully Connected Layer: In this layer, the neurons have complete connection to all the activations from the previous layers. Their activations can hence be computed with a matrix multiplication followed by a bias offset. This is the last phase for a CNN network.

Convolutional were inspired by biological processes. In that, the connectivity pattern between neurons resembles the organization of the animal visual cortex. Individual cortical neurons respond to stimuli only in restricted region of the visual field known as receptive field. The receptive fields of different neurons partially overlap such that they cover the entire visual field.

IV. EXPERIMENTAL RESULTS

While researching the results which were generated while using single modal AI assistants,we considered efficiency and the correctness as important measures. With the increasing functionalities, the concern of user experience regarding voice recognition, visualization experience , fast tracing of hand gestures ,which we have introduced in Holographic Assistant has been a challenge need to be overcome.

Efficiency: In comparison with the old AI assistants, the Holographic Assistant will prove to be more accurate while using advance technologies such as Natural Language Processing .

Accuracy: On the other hand, the accuracy of the holographic assistant would be better which would handle challenges like noise and accents. Whereas the existing modals were more error prone.

Cost: One of the profitable things about this AI assistant is it's almost free of cost. The overall pre-requisites apart from available softwares is a transparent glass and a monitor screen. Hence, this system would be affordable for all kind of vendors out in the market who will be ready to take innovations on new levels in their businesses.

V. ACKNOWLEDGMENT

We take this opportunity to thank everyone who has helped us in our project. We would especially like to express our sincere gratitude to Prof. R.S.Tambe,our guide and HOD of computer department who extended their moral support , inspiring guidance and encouraging independence throughout this task. We would also thank our Principal Dr. R. S. Deshpande for his great insight and motivation. Last but not the least, we would like to thank our fellow colleagues for their valuable suggestions.

VI . REFERENCE

[1.] Veton Kepuska, Gamal Bohouta, Next-Generation of Virtual Personal Assistants (Microsoft Cortana,Apple Siri, Amazon Alexa and Google Home),2018 IEEE

[2.] Mrs. Paul Jasmin Rani, Jason Baktha kumar, Praveen Kumaar.B, Praveen Kumaar.U and Santhosh Kumar, Voice controlled home automation system using natural language processing (nlp) and internet of things (iot).2017Third International Conference on Science Technology Engineering & Management (ICONSTEM).

[3.] Chan Vei Siang, Muhammad Ismail Mat Isham ,Farhan Mohamed, Yusman Azimi Yusoff, Mohd Khalid Mokhtar, Bazli Tomi, Ali Selamat, Interactive Holographic Application using Augmented Reality Edu Card and 3D Holographic Pyramid for Interactive and Immersive Learning, 2017 IEEE Conference on e-Learning, e-Management and e-Services (IC3e).

[4.] R. Mead. 2017.Semio: Developing a Cloud-based Platform for Multimodal Conversational AI in Social Robotics. 2017 IEEE International Conference on Consumer Electronics (ICCE).

[5.] ChukYau and Abdul Sattar,Developing Expert System with Soft Systems Concept,1994 IEEE.

[6.] Inchul Hwang, Jinhe Jung, Jaedeok Kim, Youngbin Shin and Jeong-Su Seol, Architecture for Automatic Generation of User Interaction Guides with Intelligent Assistant, 2017 31st International Conference on Advanced Information.