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## ***Virtual Home Robot Using Artificial Intelligence, Internet of Things and Holograms***

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### ***Abstract***

*The Internet has emerged as a key network to make information accessible quickly and easily, revolutionizing how people communicate and interact with the world. The information accessible on the Internet about a given subject may be extensive, allowing the development of new solutions to solve people's day-to-day problems. One such solution is the proposal of virtual home robot, which are software agents that can assist people in many of their daily activities. These robots are capable of accessing information from databases to guide people through different tasks, deploying a learning mechanism to acquire new information on user performance. These can improve the assistance they offer to users by collecting information autonomously from objects that are available in the surrounding environment. To make this idea feasible, these robots could be integrated into ubiquitous computing environments in an Internet of Things (IoT) context. Therefore, it is necessary to integrate wireless sensor networks with the Internet properly, considering many factors, such as the heterogeneity of objects and the diversity of communication protocols and enabling technologies. This approach fulfills the IoT vision. This paper surveys the current state of the art of IoT protocols, virtual AI robots in general, and virtual AI robots based on IoTs.*

**Keywords:** *Terms—Artificial Intelligence (AI), Hologram, Internet Of Things (IOTs).*

## **INTRODUCTION**

Nowadays technology in human life has increased rapidly and allows people to conduct their daily life activities in a simpler way, easing many tasks that once were very difficult to perform. The evolution of the Internet into the global communications network, omnipresent and universal, supports the development of new paradigms and technologies. Moreover, the advances verified in areas such as speech recognition, natural language processing, semantic web, machine learning, and artificial intelligence, combined with the huge amount of available information made accessible by the Internet, has enabled the creation of virtual home robots. Virtual home robots are mobile, autonomous, and software agents capable to perform tasks or services on behalf of humans.

## **VIRTUAL HOME ROBOT**

This robot aims to fill that role by offering a virtual home robot in the form of a projected 3D character living inside a glass tube. It is a projection tube within which a character is projected who can take part in conversations and be hooked up to your home network in order to automate certain tasks such as turning lights ON/OFF, demanding your robot vacuum cleans the floor.

### ***A. Artificial Intelligence***

One vital concept behind this virtual home robot is that it should crack the door between the virtual universe and reality, integrating our lives in the digitalized environment.

This virtual 3D projected home robot comes embedded with behavior-learning technology, which means that the AI will map its owners' habits and respond to them in an appropriate fashion. The reason to develop the 3D character inside the glass tube is that it can be on the same wavelength with its user.

### ***B. Internet of Things (IOT)***

Utilizing Internet of Things (IoT) technology, it can control your home's TV, air conditioning units, lights, email and music. It does a variety of other things as well, like wake you up based on the time you usually do, and await your return at the end of the day, turning on all the lights and the air conditioning in anticipation – provided you have them connected in a smart home network. As with most personal assistants, you can try conversing with an app in development that will allow you to converse with it as if it was an actual human being.

### ***C. Hologram***

This robot uses the latest projection technology and sensing technology, for you to be able to live and communicate with your favorite character. The important parameters are character size and sense of distance. The rear projection technology using a high- intensity short-focus projector and a transparent screen is housed in a desktop-sized machine. This robot is a totally new device created with focus on communicating with characters through speech recognition. It is equipped with sensors such as cameras and human sensors, so that the character can recognize the master's face and movement.

In order for the character to understand and support the master's life, the robot uses communication technologies such as Wi-Fi, Bluetooth, infrared (IR), etc. The character connects to various IoT devices and services such as a smartphone and home appliance. You can also connect the character to your PC via HDMI.

### **WORKING OF THE VIRTUAL ROBOT**

The projected 3D character inside the tube has a distinct personality, two voices, hobbies, likes/dislikes. So it seems likely it can have the option of more characters to interact with Interaction is done through

voice chat in person, with a camera mounted at the top of the tube ensuring the 3D projected character is always able to look at the person she's conversing with. When away from home, an iOS or Android app can be used to continue chatting with the character, or to get her to do things in time for your return.

### ***The Gatebox is capable of:***

1. Utilizing Internet of Things (IoT) technology
2. Controlling your home's TV
3. Adjusting air conditioning
4. Turning your home's lights ON/OFF
5. Handling your email
6. Playing music

### **CULMINATION OF AI, IOT AND HOLOGRAM**

With Artificial Intelligence, Internet of Things and Holograms taking over, this model is simply a culmination of all into one idea. Using the Artificial Intelligence technology, this product can be given a face you choose for it and through hologram projectors, it will be able to exist virtually in a physical world. Using both Artificial Intelligence and the Internet of Things based technology; it will be a solution to your day to day needs. While it will be able to perform day to day tasks like searching for places for you or

answering math questions or simply replying to your questions, it will also be able to operate each electronically run machine in your home.

### CONSTRUCTION AND ANALYSIS

The size of a home coffee-maker, with a footprint no larger than a sheet of A4 printer paper, the device's main feature is a clear projection tube that displays a computer-animated avatar for the AI's "character." The robot measures 22 by 36 by 52cm and weighs 5 kilograms. The projector has a resolution of 1280 by 720, and there's stereo speakers through which the character converses (a headphone jack is also available for a more private listening experience).[3] The array of embedded sensors includes a camera, microphone, motion sensor, warmth and moisture sensors, luminance sensor, and

touch buttons. The microphone hears the master's voice and through voice recognition the robot understands the command. THE camera captures the pictures when the master commands to take a picture, the motion sensor senses the movement and gets notified ,the moisture and warmth sensor senses the temperature and humidity level , the luminance sensor detects the intensity of ambient light on surface area .It uses APDS-9002 analog output ambient light photo sensor. This has responsively closer to human eye. This luminance sensor can be used in application which requires automatic light adjustment in residential or commercial lighting. The robot can be activated with a touch, the touch buttons on the robot help us to choose options such as talk, projection, sensing and network.



**Fig.1** *The virtual 3D projected home robot with camera and microphone embedded*



*Fig 2 construction of the robot in the form of coffee mixer*

**PARTS OF THE ROBOT**

**A. TPS53312**

*Table 1 Constructional Features*

S.NO	PARAMETER	DIMENSION
1	Dimension	360mm×22mm×520mm
2	Viewing angle	panoramic
3	Glass tube resolution	1280×720 pixels
4	Light display	Ultra short focus projector
5	Speakers	stereo
6	Power	AC 100 to 240V
7	Formats specified	3.5mm headphone jack, HDMI, Ethernet
8	Key feature	Voice and facial recognition

mm-millimeter, AC-alternating current, v-volt, HDMI-high definition multimedia interface

The power and speaker driver board lives on the bottom of the stack.



*Fig 3 TPS53312*

**B. TLV320DAC3203**

Ultra low power stereo audio codec



*Fig 4 TLV320DAC3203*

**C. TPA3110D2**

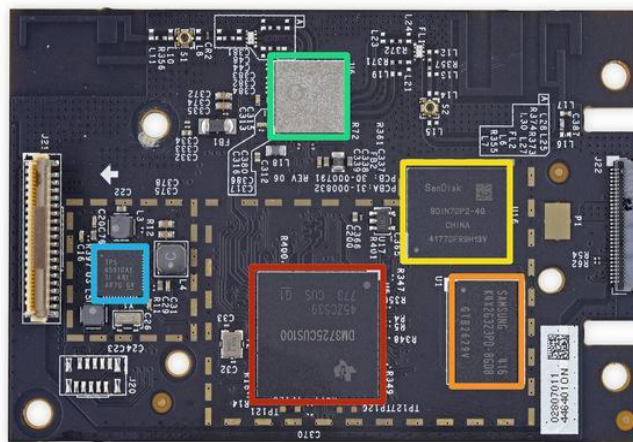
The TPA3110D2 is at the bottom of the stack



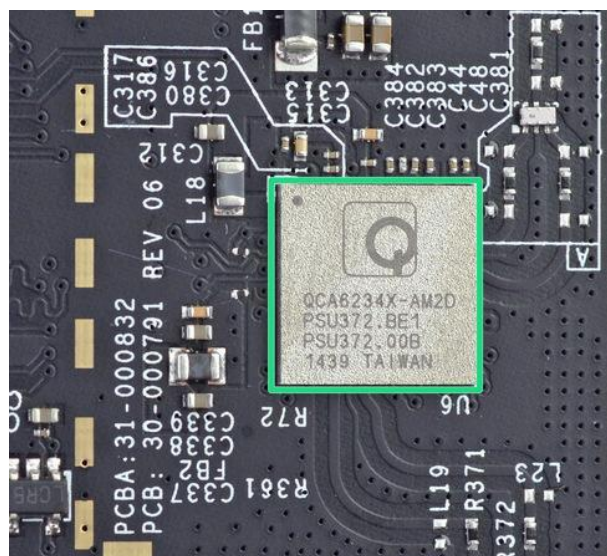
*Fig 5 TPA3110D2*

**D. Media Processors**

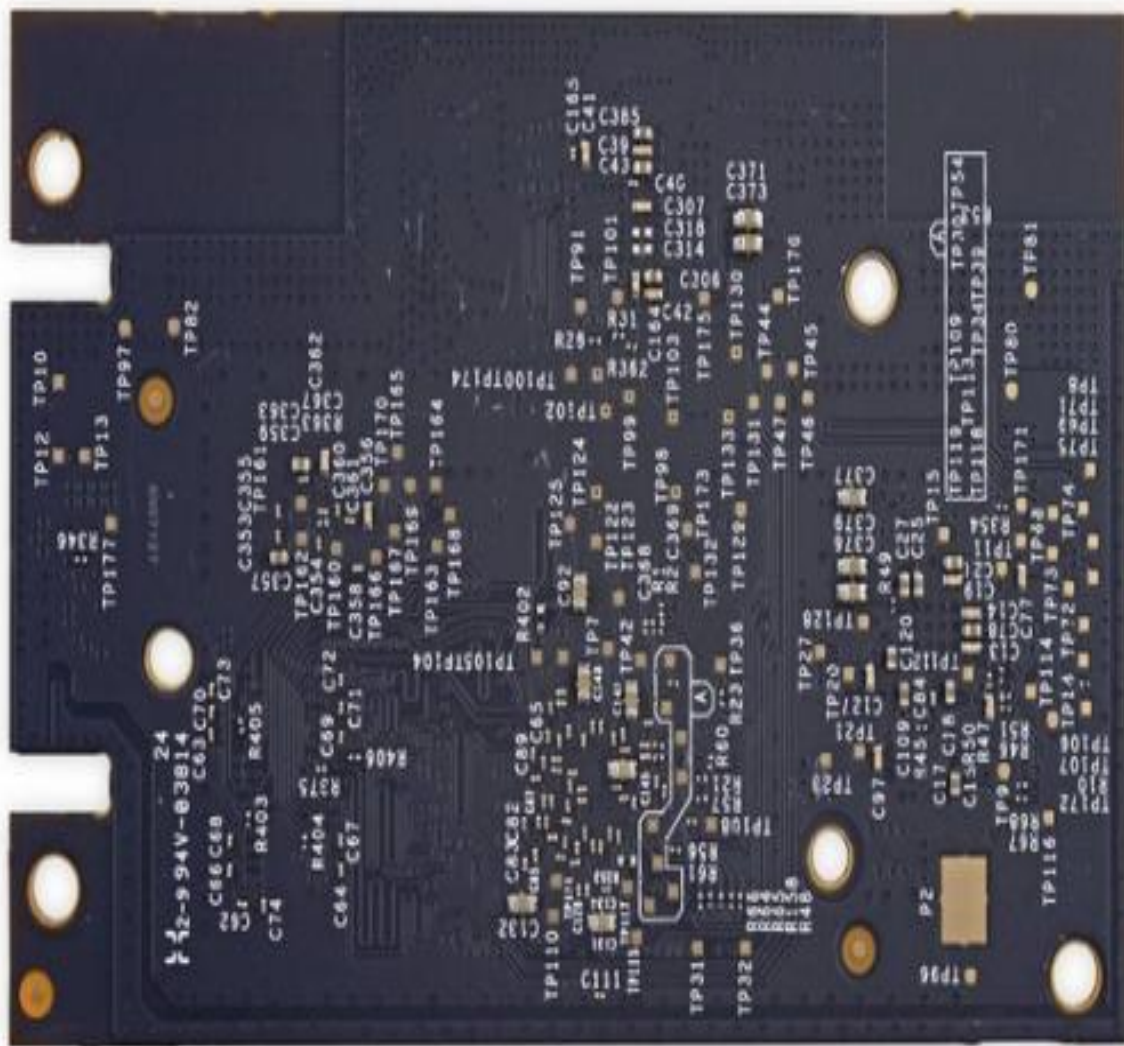
- |   |  |
|---|--|
| <ol style="list-style-type: none"> <li>1. DM3725CUS100 Digital Media Processor</li> <li>2. K4X2G323PD-8GD8 256 MB LPDDR1 RAM</li> </ol> | <ol style="list-style-type: none"> <li>3. SanDisk SDIN7DP2-4G 4 GB iNAND Ultra Flash Memory</li> <li>4. Qualcomm Atheros QCA6234X-AM2D Wi-Fi and Bluetooth Module</li> <li>5. TPS65910A1 Integrated Power Management IC</li> </ol> |
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**Fig 6 SanDisk SDIN7DP2-4G 4 GB iNAND Ultra Flash Memory**



**Fig 7 Qualcomm Atheros QCA6234X-AM2D Wi-Fi and Bluetooth Module**

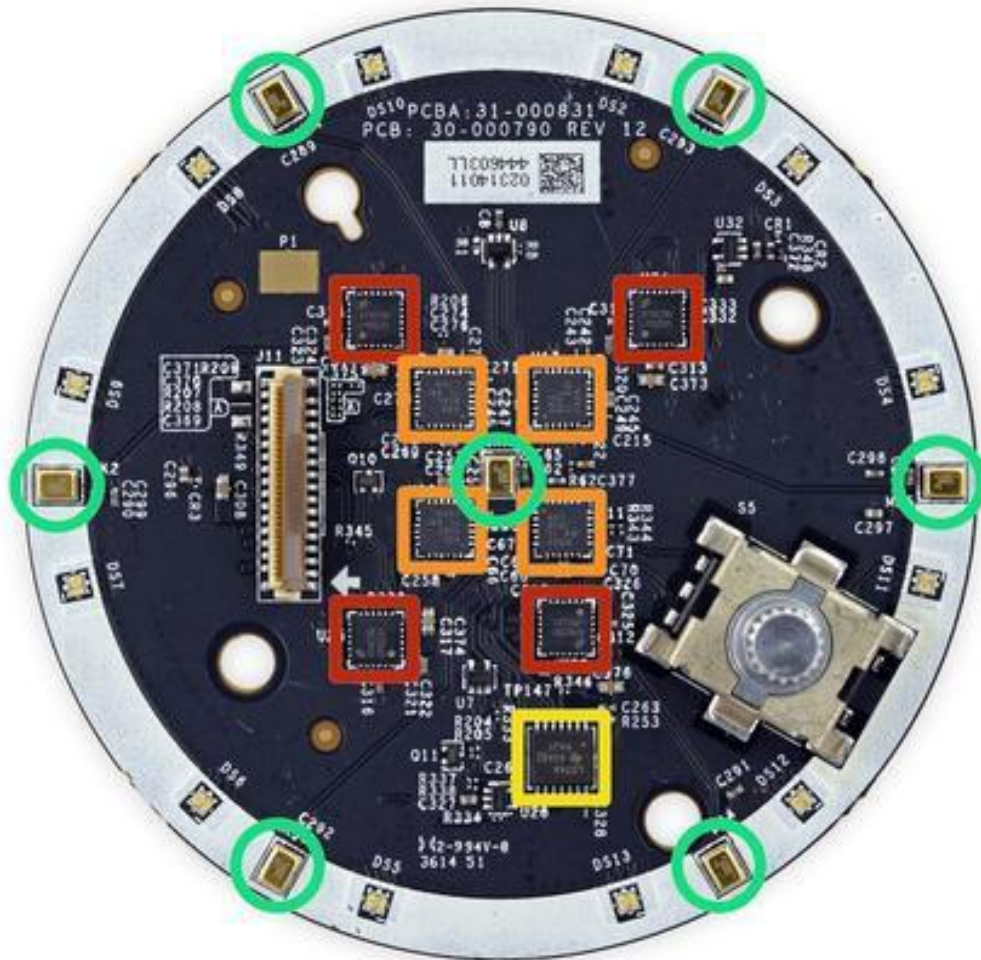


**Fig 8 TPS65910A1 Integrated Power Management IC**

The LED/microphone board from the topmost plastic button covers.

Only a thin layer of precision-cut foam, complete with microphone mesh and plastic window covers, stands between top and daughterboard freedom.

1. LP55231 Programmable 9-Output LED Driver (x4)
2. TLV320ADC3101 92dB SNR Low-Power Stereo ADC (x4)
3. SN74LVC74A Dual Positive-Edge-Triggered D-Type Flip-Flops
4. S1053 0090 V6 Microphone (x7).



*Fig 9 Microphone board used in the robot*

## CONCLUSION

Thus this virtual home robot is the culmination of Artificial Intelligence, Internet of Things and hologram. It uses the latest projection technology and sensing technology, for you to be able to live and communicate with the virtual 3D character projected inside the glass tube. With the help of various sensors, it can operate the electronic devices and sense the movement. The robot can also be operated using an IOS or an app when the

master is not at home. He can converse through the chat bot with the robot and the robot does all the work as per the instructions.

## RESULT

Thus the virtual home robot AI uses face recognition and voice recognition and the Internet of Things to operate the electronic devices. The hologram technology enables to project a 3D virtual character inside the glass tube.



*Fig.10 Virtual home robot model*

This robot also has touch buttons and various sensors which detect movement given.

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