

## Smart Home Assistant

**Mrs. P.VIJAYA LAKSHMI**

ASSISTANT Professor, CSE.

Sreyas Institute of Engineering and Technology, Telangana, India

[vijayalakshmi.p@sreyas.ac.in](mailto:vijayalakshmi.p@sreyas.ac.in)

**HARIPRIYA KANIKE**

Department of CSE,

Sreyas Institute of Engineering and Technology, Telangana, India

[kanikeharipriya1234@gmail.com](mailto:kanikeharipriya1234@gmail.com)

**SAIPAVAN GANGISHETTI**

Department of CSE,

Sreyas Institute of Engineering and Technology, Telangana, India

[saipavangangishetti@gmail.com](mailto:saipavangangishetti@gmail.com)

**THUMMALAPALLI V L B GAYATRI**

Department of CSE,

Sreyas Institute of Engineering and Technology, Telangana, India

[gaayatri.t@gmail.com](mailto:gaayatri.t@gmail.com)

**SNEHITH YARLAGADDA**

Department of CSE,

Sreyas Institute of Engineering and Technology, Telangana, India

[snehithsai602@gmail.com](mailto:snehithsai602@gmail.com)

**Received 2022 April 02; Revised 2022 May 20; Accepted 2022 June 18.**

---

### ABSTRACT

The system uses Haar Cascade Classification Algorithm in OpenCV, LBPH Face Recognizer to detect and recognize the user's face, a voice communication module to communicate with the registered user by capturing the user's face through a webcam and stored in the system, and uses it for training the machine and verifying the valid user. In this project, we train our model by feeding the 30 sample images of the user. Our proposed model operates through human voice commands and the results present many forms of actions that the voice assistant can perform to answer the user's queries. The undertaken operations can be vocal answers in the form of text messages.

**KEYWORDS:** Smart Assistant, Voice Communication, OpenCV, Haar Cascade Classification Algorithm, LBPH Face Recognizer, Eye-Aspect-Ratio, and Image Processing.

---

### INTRODUCTION

A digital home assistant is a model or a device which responds to voice commands to do things for you such as answer questions. An Home Assistant is a free and open-source software for home automation designed to be central control system for smart home devices with a focus on local control. Using your home Internet network, You can command the smart home assistant to operate the connected smart home gadgets as per requirements. You can also command the smart home assistant to play any desired music, check the current weather conditions, ask questions to get answers, send text messages, make phone calls, set reminders, take notes, do shopping, and can adjust lights, heat, garage doors, play music, and search the Internet and much more.

Over the last years, smart assistants have come to be increasingly used to operate appliances in our homes. These assistants can be found on computers, phones, or voice-enabled speakers. Dealing with Google Assistant is alright as long as you restrict them to a select few, but quickly become a nightmare once you have more than a dozen or so. The setup flow too is woefully inadequate for power users. Need multiple triggers for a routine to activate[1], and similar to other assistants such as Siri, and Alexa are among the most popular technologies. The contribution of this work consists in integrating Artificial Intelligence software model dedicated to control and operate in a smart home. The motivation for developing a smart home assistant system comes from many reasons, however, the most prominent reasons are convenience and security. This project is mainly designed for security and its main purpose is to offer voice assistance to registered users. Voice assistant operates through human voice commands and to output many forms of actions that the assistant can perform to answer the user's queries. The undertaken operations can be vocal answers in form of a text message. Our model operates through human voice commands and performs operations like giving answers to user queries in the form of text messages if he/she is the registered user.

### **LITERATURE SURVEY**

A literature survey or a literature review in a project report is that section that shows the various analyses and research made in the field of your interest and the results already published, taking into account the various parameters of the project and the extent of the project. It's been nearly a decade since Eric Schmitt, Google's former chief executive officer (CEO), famously remarked, "If you have something that you don't want anyone to know, maybe you shouldn't be doing it in the first place." Despite such nonchalance toward consumer privacy by big tech companies, it's taken scandals involving shared private data, targeted advertising, and suspected manipulation of elections for mainstream users not always being handled with due respect and privacy [1]. It is the most important part of your report as it gives you a direction in the area of your research. It helps you set a goal for your analysis - thus giving you your problem statement.

#### **Description:**

IoT today was invented for creating, editing, and sharing information and data. Some sources predict the number of tens and hundreds of billion connected devices for the year 2020-2025. One of the most popular standard machine-to-machine application layer protocols to interconnect the things and applications to the Internet of Things is the Message Queuing Telemetry Transport protocol. Quality of service (QoS) deal with network performance elements like latency, error rate, 4 and uptime. MQTT provides three levels of QoS. The usage time of IoT devices is constrained by its most critical resource - battery. This paper deals with the estimation of energy consumption in transferring data using lightweight MQTT protocol over its different QoS levels. For experiments, we implemented client-server architecture and employ MQTT publish protocol to transfer data between nodes.

MQTT Quality of Service versus Energy Consumption Jevgenijus Toldinas, BorisasLozinskis,2019

It's been nearly a decade since Eric Schmitt, Google's former chief executive officer (CEO), famously remarked, "If you have something that you don't want anyone to know, maybe you shouldn't be doing it in the first place." Despite such nonchalance toward consumer privacy by big tech companies, it's taken scandals involving shared private data, targeted advertising, and suspected manipulation of elections for mainstream users of free web or mobile apps to realize that their data are not always being handled with due respect and privacy.

Entrepreneurs in Consumer Electronics: Steve Penrod of Mycroft AI, Tom Wilson. 2019

IoT is gaining high popularity in today's world. Embedded systems have become a major part of our lives. People can control, monitor, and do a lot more from a remote distance. This is done by connecting various objects reducing physical distance. IoT is the connectivity of various objects with network connectivity. Many a time these systems are battery operated and need a high battery backup. These systems require a technology that consumes less power and also covers long 5 distances. But many technologies such as Zig-Bee, Wi-Fi, Bluetooth popularly used at present consume high power and are not suitable for battery-operated systems. Lora is a newfound technology that is emerging rapidly. The LoRa technology addresses these needs of a batteryoperated embedded device. The LoRa technology is a long-range low-power technology. This paper discusses the advantages of LoRa over the existing technologies used in IoT. It also discusses the

features of LoRa. LoRaWAN(Long Range Wide Area Network) is an open grade secure standard for IoT connectivity.

The LoRa Alliance is an open non-profitable group that shares its experience to drive LoRa. Lora Technology - An Overview Shilpa Devalal; A. Karthikeyan,2018

In this paper, the authors have focused on controlling hybrid energy systems using IoT. There is the various combination of energy and all of them are alternative to each other like solar energy, wind energy, biofuel, fuel cell, etc. But the need for control of hybrid energy system arises when it is installed for domestic or commercial purpose. At this point, IoT plays an important role in controlling the system. The main criteria are switching between the two sources of energy i.e. solar and wind energy without any inconvenience through a website using ESP8266 Wi-Fi module. The data is transmitted wirelessly through the website to the ESP8266 module which controls the sources of energy. The transmitted data is controlled remotely using IoT. This enables the user to have flexible control mechanism remotely through a secured internet web connection. This system helps the user to control the sources of energy, manually and remotely using a smartphone or personal computer. This system is very efficient, cheaper, and flexible in operation.

IOT Based Controlling of hybrid Energy System using ESP8266 Prakhar Srivastava; Mohit Bajaj, 2018

This paper presents the implementation of the image to text conversion. The paper describes various steps required to extract text from any image file (jpeg/png) and create a separate text file consisting of information extracted from the image file. It considers the shortcomings of various image processing applications available and works on overcoming them by employing a variable level of image processing and filtration. The CV2 OpenCV library using Python language is used for image processing and Tesseract is used for text extraction from the processed image. The variable level of image processing ensures that different images get different levels of treatment to produce optimized text results. After the image processing step is employed the output text file are formatted by filtering out commas, semicolons, apostrophes, colons, and other such characters using ASCII filtering as these characters are not part of any standard license plate.

Real-time license plate detection using OpenCV and tesseract Rahul R. Palekar; Sushant U. Parab ,2017

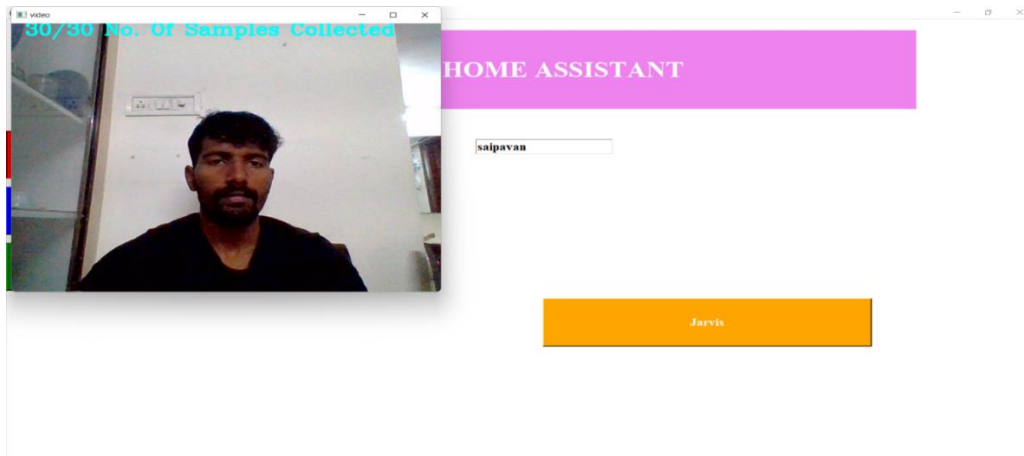
An analysis is done to know about the existing system. Comparison is made to check the difference between the existing system and the proposed system. The existing system suffers few disadvantages and the proposed system fights with all the problems of the existing system and gives a user-friendly proposed system.

## **PROPOSED SYSTEM CONFIGURATION**

Smart home assistants are newly or recently hyped terms, usually people do all the work themselves. Many do not have time to work for small things or they do not prefer spending their time for small things. For example, Switching off fans or lights, Turning on AC's. These actually consume time when someone's in rush or if they forget, This may lead to power wastage. Already there are many pre-existing smart home assistants works in many ways to lead a better life but does not provide that security to user. In this project we have provided a model which gives user better security. By providing the user with safe authorization using Face recognition. and a voice assistant that operates through human voice commands, recognizes, locates, and counts people's faces by capturing through a webcam and stored in the system, and uses it for training the machine and verifying the valid user.

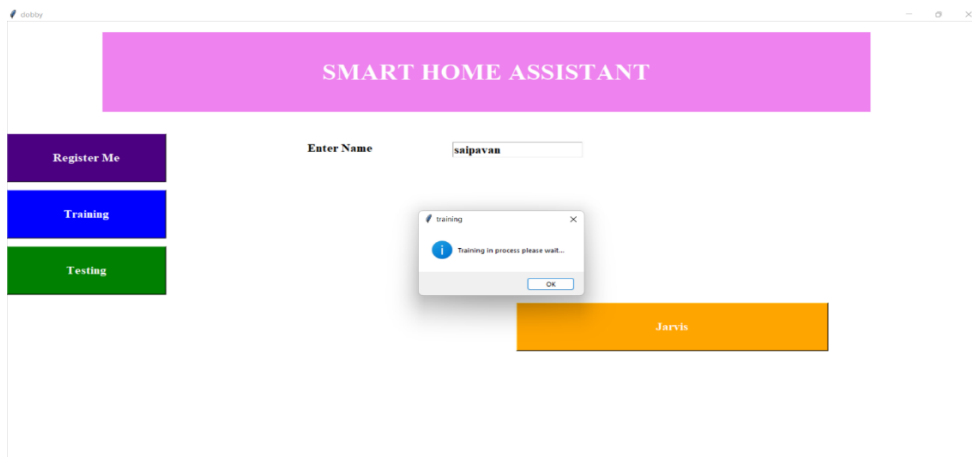
Here in this project, we train our model by feeding the 200 sample images of the user and the results present many forms of actions that the voice assistant can perform to answer the user's queries. The undertaken operations can be vocal answers in the form of text messages. This Face recognition gives access to the Registered-Users only. So any random person trying to access the model will fail. The camera and audio devices are set for communication and interaction with the users. Our main aim to provide user a safe experience, with good performing model, which will help to access other devices as well.

**User Registration with Facial Detection:**



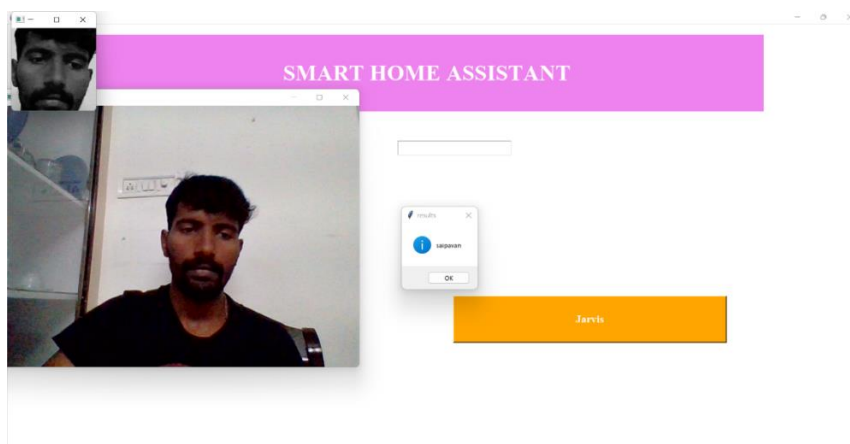
**Fig. 1** User Registration- Registering a new user.

**Training the model with snaps taken:**



**Fig 2** Training the model

**Testing the model:**



**Fig 3** Testing

User passing Commands:

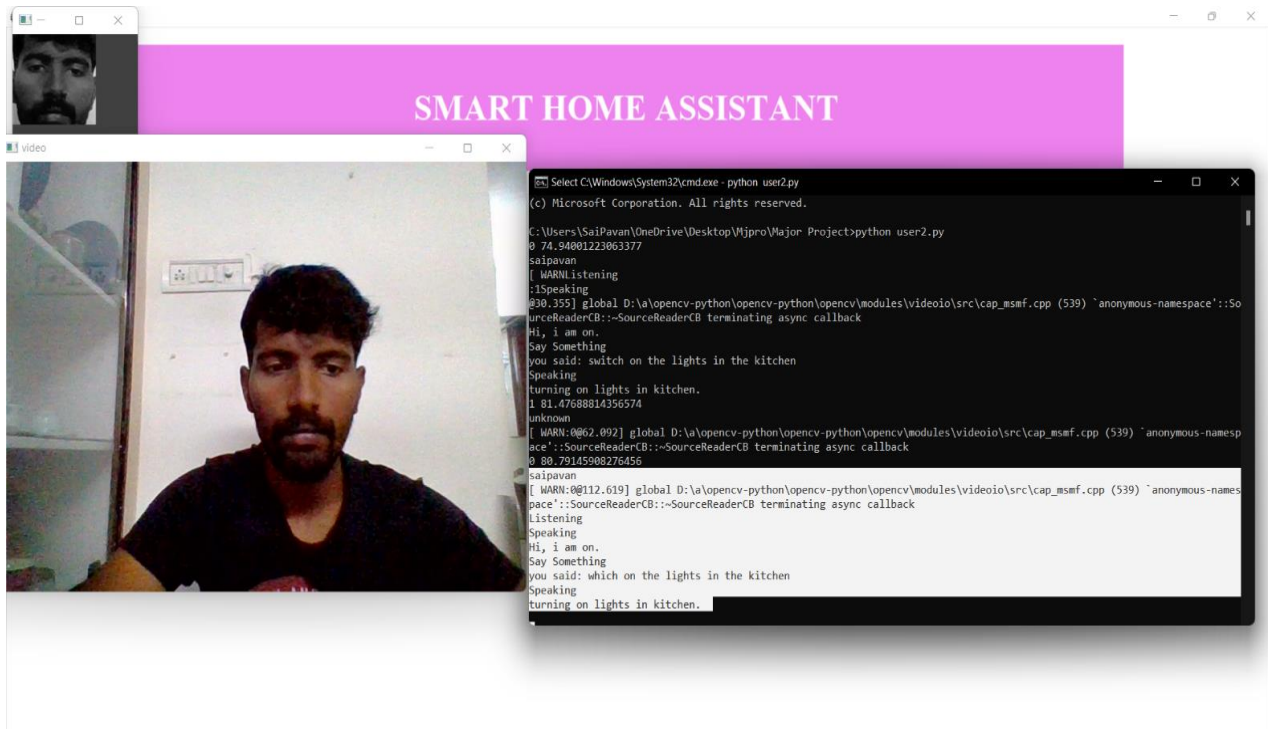


Fig 4 output

Unknown user trying to access the system:

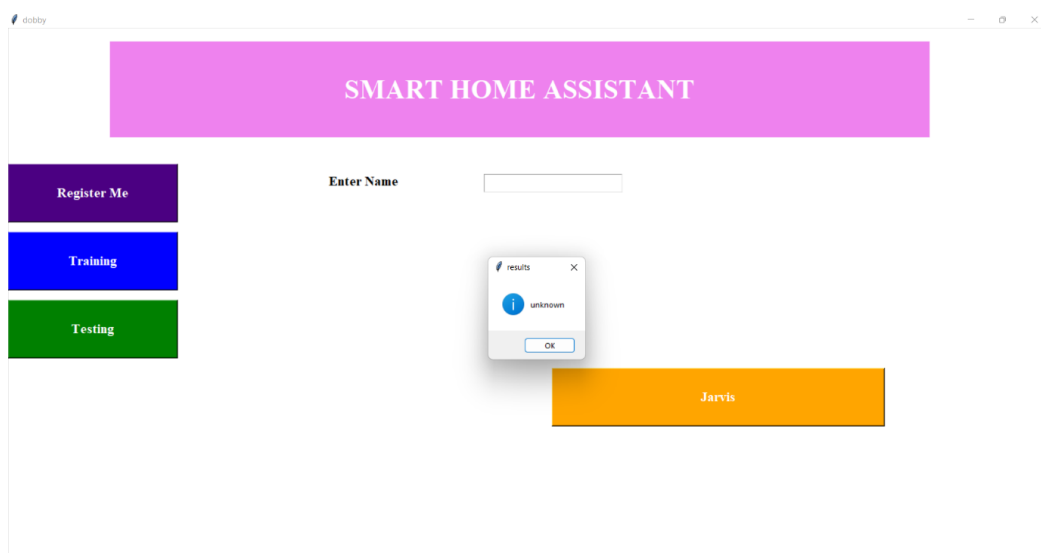


Fig 5 Not a registered user

CONCLUSION

In this paper, we presented a prototype of a smart assistant, designed to assist people in a smart home environment. This system helps the user to control the sources of energy, manually and remotely using a smartphone or personal computer. This system is very efficient, cheaper, and flexible in operation.[6]Based on an open-source solution, the fully stand-alone

smart assistant can interact faces, set up tasks, and answer specific questions and requests. The whole actions made by the assistant can be in form of vocal answers, mechanical moves, and motions with humans as well as with home appliances. The software platform includes many applications implemented to recognize, software tasks, or just text messages.

## **FUTURESCOPE**

The achieved results demonstrate how smart assistants can be used to control devices and appliances in our homes and show many forms of interactivity that the robot can perform to answer the user's inquiries

## **APPLICATIONS**

- Security
- Smart Home
- Monitoring
- Personal Assistance

## **REFERENCES**

1. J. Toldinas, B. Lozinski's, E. Baranauskas and A. Dobrovolskis, " MQTT Quality of Service versus Energy Consumption ", International Conference Electronics, 2019.
2. T. Wilson, " Entrepreneurs in Consumer Electronics: Steve Penrod of Mycroft AI ", IEEE Consumer Electronics Magazine, July 2019.
3. R. A. Atmoko and D. Yang, " Monitoring & Controlling Industrial Arm Robot Using MQTT Protocol ", International Conference on Robotics, Biomimetics, and Intelligent Computational Systems (Robionetics), 2018.
4. IEEE-RAS 18th International Conference on Humanoid Robots (Humanoids), Beijing, China, 2018, pp. 1-10, 2018.
5. G. Gardasevic, H. Fotouhi, I. Tomasic, M. Vahabi, M. Bjorkman and M. Linden, "A Heterogeneous IoT-based Architecture for Remote Monitoring of Physiological and Environmental Parameters", 4th EAI International Conference on IoT Technologies for HealthCare, October 2017.
6. R. R. Palekar, S. U. Parab, D. P. Parikh, and V. N. Kamble, " Real-time license plate detection using OpenCV and tesseract ", International Conference on Communication and Signal Processing, pp. 2111-2115, 2017.
7. United Nations, Population Division «World Population Ageing 2017 - Highlights », 2017.
8. D. Zhang, S. Lin, Y. Fu and S. Huang, " The Communication System between Web Application Host Computers and Embedded Systems Based on Node.JS ", International Congress on Image and Signal Processing, BioMedical Engineering and Informatics, October 2017.
9. X. Liu, X. Fu and G. Sun, " Recovery of deleted record for SQLite3 database ", International Conference on Intelligent Human-Machine Systems and Cybernetics, pp. 183-189, 2016.
10. E. Govea, G. González, J. Rocha, S. Hernández, A. Chávez and J. Castillo, " Diseño Cinemático y Construcción de un Robot Humanoide con Movimientos Básicos de Caminado", IEEE Biennial Congress of Argentina (ARGENCON), pp. 119-124, June 2014.
11. Y. Yang, "Is Old Age Depressing? Growth Trajectories and Cohort Variations in Late-Life Depression", Journal of Health and Social Behavior, pp. 16-32, 2007.