

# IOT BASED SMART MIRROR FOR A SMART HOME: MIRRORS I LIKE TO FACE

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**Abstract** -Computerized reasoning innovation are being utilized all the more every now and again in our everyday life, this is encouraged by the presence of Internet of Things(IoT), and with the evident advancement of new technology, which can interface with each other with the assistance of a system, the Internet of Things was raised to its prevalence. The paper reviews the concept of the smart mirror, which allows the user to experience smart home environment, Mirrors I Like to Face, is a smart mirror whose main objective is provide the user with ease of life, by achieving with features of voice navigation and a voice assistant, the proposed system will be able to help the user to gain basic common amenities such as weather, latest updates of news etc..., The mirror also helps the user navigate via hand gestures, hand gestures navigation has also become a popular approach in many modern day technologies. The give proposed system also seeks to improve home safety by enabling the use of a camera for video surveillance and special sensors to help the system detect intrusion, and this will be made available to the users to their android device. To make emergency response available in real time, IoT enhances the way first responds and provides emergency managers with the necessary information and communication to make use of the given assets. Hence, Mirrors I Like to Face is smart Mirror which helps the user experience a

smart environment in the comforts of their house.

**Key Words**– *IoT, Voice Assistant, NLP, Hand Gestures.*

## I. INTRODUCTION

Internet of Things(IoT) is a catenate of physical articles and different gadgets inserted with hardware, programming, organize network and application particular sensors and actuators that empowers the items to gather and trade information. It is a vital theme in innovation industry and its applications has picked up prevalence as of late and is anticipated to have billions of shrewd items associated together continuously 2020.

IoT alludes in a system of exceptionally identifiable entities with their virtual portrayals of a Internet form like structure, where we can gather and trade information and are remotely controlled crosswise over existing system foundation. It contains real segments including detecting capacity,

heterogeneous access, data preparing, security protection, applications and administrations.

The International Telecommunication Union, defined the term Internet of Things (IoT) as a universal block builder for public which allows the Internet service to be connected to a physical device based on information and communication technologies available.

Alongside the advancement of innovation, different data is found effectively, with the rise of the idea of a Smart Mirror for a Smart Environment has turned out to be progressively far reaching. Mirrors I Like to Face is a framework depending on the idea of Internet of Things (IoT) is created particularly help enable clients in overseeing and enable control over house machines with voice acknowledgment and hand signals.

For this situation, overseeing house machines has been distinguished as the fundamental issue looked by the vast majority. There are basically an over the top number of things that are to be done at a solitary case and on a specific point, clients will not be ready to perform various tasks with such overwhelming errands. Example, at the point when an arrangement for the day with different house errands has been recorded on a paper, yet the paper is lost since it's lost. To manage this circumstance, Smart Mirror is created to give accommodation to clients in overseeing machines and control the use of various apparatuses available with system association in the light and the gadget. Clients will need to offer directions to the framework verbally, and the framework's sensors shall perceive the sound generated, of the purchaser to get guidelines and react to clients needs.

The intelligent mirror helps in the improvement exertion to increase the mirror with legitimate installed insight for offering upgraded highlights, for example, climate of the city, most recent updates of news and features and neighborhood time relating to the location. The keen mirror would help in creating brilliant houses with inserted artificial intelligence, as well as discovering application in enterprises.

Security has turned into a noteworthy issue all over the place and its significance and the requirement for it cannot be denied in this wrongdoing filled society. The job of an IoT foundation in the improvement of home security framework is significant. The security of home individuals goes about as a fore sprinter in the advancement of home security system. One of the numerous points of this proposed is to actualize a home security highlight which utilizes a sensor to distinguish any break-in and alarm the proprietor.

The end-clients can speak with IoT through various modalities. A standout amongst the most widely recognized approaches to collaborate with electronic gadgets is through a Graphical User Interface (GUI). In any case, graphical interfaces can be confounding and hard to work with. As the principle methodology that people use to speak with one another, discourse is a standout amongst the most advantageous methods for cooperation with IoT. End-clients want to normally address their gadgets, rather than pushing the catches or tapping the symbols on a GUI. Ongoing progressions in discourse acknowledgment and common dialect understanding have been connected in remote helpers to enhance human-PC collaboration. Discourse interfaces are pulling in more consideration consistently, and hence, discourse acknowledgment innovation is turning into a basic piece of communicating with IoT.

The proposed framework is fit for identifying smoke, distinctive combustible gases and fire. This framework is equipped for giving peril area directions to the adjacent fire office. This fire peril detecting framework with methodical IoT structure accentuation an application development to general society wellbeing and business benefit segment The system proposed is implemented based on the following objectives:

1. To provide multiple widgets for weather, news, updates etc.
2. To provide virtual assistant (implemented using NLP) for interacting with the mirror.
3. To provide UI navigation via hand gestures using sparkfun ADPS.
4. To provide home security system.
5. To allow the user to control his/her home appliances.
6. To provide personalized user experience.
7. To provide hazard detection system.

## II. SMART MIRROR CONCEPT

### A. DEFINITION

A smart mirror can be characterized as "A keen mirror is a two-path reflect with an electronic presentation behind the glass. The showcase can demonstrate the watcher various types of data as gadgets, for example, climate, time, date, and news refreshes. This item would be valuable for occupied people that need to perform various tasks and remain educated while in a hurry. Rather than continually hauling out a gadget, one could get educated while completing day by day prepping assignments".

### B. Smart Mirror Applications

- Convenience and Entertainment: The proposed framework gives a simple and agreeable way of life can accomplished via robotizing gadgets associated through web inside the home, and controlling them according to the clients wish with in the home.

- Safety and Security: Through observing the camera and sensor we can give home security to the end client if there is a break in or any irregularity in the earth then it triggers the sensor and the camera naturally sends pictures to the client or proprietor.

- Fire peril identification: Through smoke sensors we can keep any fire danger that may happen which will caution the fire office and the particular proprietor.

- Personal Virtual partner: Implementing a voice aide through Natural Language handling to practice simple route and give a snappy and all knowing aide for the client.

## III. Proposed System and Components

### A. System Overview

Proposed system and block diagram for mirrors i like to face is as shown in figure 1. The point of structuring this model is to make an intuitive interface which can be helpfully utilized in home condition and also business space. Different administrations like climate, logbook, activity, news stock updates and so forth can be gotten to and controlled utilizing voice directions and hand gestures. The Raspberry Pi 3 is associated with a Monitor by means of HDMI link and a camera is connected to it.

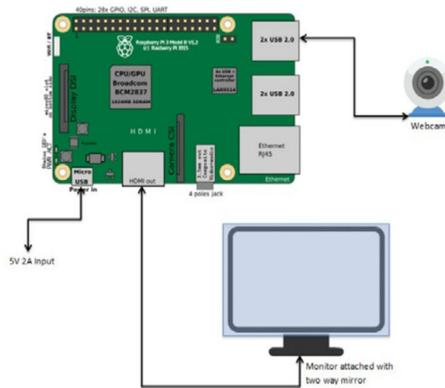


Figure 1: High level system architecture

**B. Raspberry Pi**

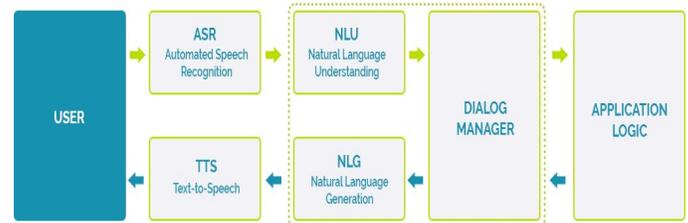
Raspberry Pi 3 goes about as the fundamental control community for this proposed model. The Raspberry Pi is furnished with a smaller scale SD card which can be stacked with working frameworks like Raspbian or Windows 10 IoT center. After the OS is running the mirrors I jump at the chance to face code will can be executed on it to run the application. The Monitor will get contribution from RPi utilizing HDMI link and voice directions can be given to Rpi.

**C. Virtual Assistant**

Common Language Processing (NLP) is really a kind of discourse acknowledgment. While joining discourse acknowledgment into MILL the key difference between discourse acknowledgment, which endeavors to figure out what, precisely, was stated, and NLP is, which attempts to decide the expectation of information disclosed. At the point when a framework accepts characteristic dialect as information, forms it, makes some business rationale, and appropriately reacts with a characteristic yield. So it looks more like a discourse or discussion with a machine, which closes with a particular business exchange being performed, e.g. exchanging cash, requesting pizza or making a medicinal arrangement.

The proposed System utilizes a menial helper specifically "Plant" executed utilizing Natural Language Processing which is worried about the communications among PCs and human (common) dialects, specifically how to program PCs to process and investigate a lot of characteristic dialect information.

Factory causes the client to get to and interface with the mirror, which gives simplicity of route over the mirror. Mill is a partner which will gives different data in regards to any



broad issues, the Figure 2 illustrates the simplified architecture of such a system:

1) *Features of Existing Voice Assistant:* We should think about how voice associates are essentially orchestrated on a case of "Alice" from the organization Yandex. "Alice" is a clever right hand for cell phones and PCs, which permits to settle normal errands of clients, for example, looking data on the Internet, discovering places on the guide, steering courses, announcing climate forecast. In this case, "Alice" can bolster the discussion, engage the client, and so on. To do this, "Alice" utilizes the cloud assets of the organization Yandex, to which it alludes by means of the API through the Internet. The plan of work is exhibited in the Figure 3.

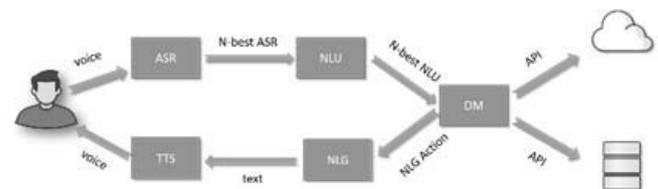


Figure 3: Plan of work

One of the imperative parts of the voice right hand from the perspective of the utilitarian is the discourse supervisor. There are straightforward contents that can be promptly removed from the NLU demonstrate and replicated by means of NLG. What's more, more intricate situations, which depend on the idea of shape.

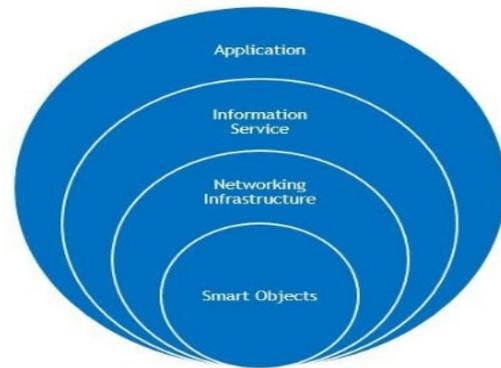
The primary issues experienced by engineers of such frameworks are issues of characterization of situations, confinement of semantic items, upkeep of the unique circumstance, issues of circles and coreference.

1) *Disadvantages in Current Voice Assistants:*

Despite the fact that such colleagues have existed for a significant amount of time, they have yet to be generally

scattered, because of the presence of a few limitations and territories where they can't be connected. The fundamental weaknesses include: center around answers for normal issues, reliance on the Internet and cloud benefits, the multifaceted nature or as a rule the failure to coordinate with outsider administrations, the frailty of individual information. In any case, their inadequacies and confinements don't permit to apply them in regions where reliance on different system foundation is unsatisfactory, for instance, in drug or in the security circle, and also in barely centered zones where utilization of general standards can't tackle existing issues.

Figure 4: IoT layered architecture



D. Smart Home Environment

Having numerous utilizations of mechanization that can be controlled by voice, a large number of them accessible to us every day, among these are: the voice dialing framework present in numerous cell phones, candy machines, lighting control, any control of components that are utilized by individuals with any incapacity either visual or engine normal case of this we have particular scanners or sensors. The client collaborates with the framework through voice by saying one of the catchphrases, the framework perceives this watchword and expects the computerization arrange that you ought to pursue.

The client is in charge of giving the home computerization directions are the equivalent as the ones received by the framework when acknowledgment was effective the framework inside plays out the request shown by inward programming and sends the data required by the client.

E. Smart Home Security

With the IoT layered architecture comprising of four noteworthy layers. They are Application Layer, Information Service Layer, Networking Infrastructure Layer and Smart Object Layer. The Smart Object Layer for the most part comprise of sensors for data acquisition and actuators for information organization. It is the base layer of IoT Layered Architecture, as appeared in the Figure 4.

In the Smart Object Layer the sensors communicate with continuous parameter and empowers information accumulation which are to be utilized by the upper layers. The figure represents the IoT Layered Architecture. Decisions regarding the sensors and actuators in an IoT based framework configuration makes them Smart Objects in this environment. The Networking foundation Layer goes about as an extension between Smart Object and Information Service Layer. For the information transmission between the entryway chime and the Raspberry Pi, Webcam goes about as an irregular hub. The APIs of webcam are introduced with the end goal to take an image of the outsider setting off the caution.



Figure 5: Interactions with "things"

F. System for Fire Hazard

The system proposed can also act as a fire hazard detection and prevention unit using IoT standard methodology. Smoke can be detected using again a smoke sensor. The sensors

connected to the raspberry Pi will via Internet through which it communicate hazard status to the nearest fire-fighting organizations.

The framework proposed can likewise go about as a fire peril detecting framework with IoT institutionalized plan methods. The smoke location sensor is utilized to distinguish the smoke. The sensors associated with the raspberry Pi will by means of Internet through which it convey risk status to the closest putting out fires associations.

1) *WORKING OF A SMOKE DETECTOR* Ionization chamber smoke locator depend on radiation to "ionize" the air inside the chamber.

- A radioactive source "rots," or sheds particles and photons from insecure iotas.
- The particles cooperate with impartial air atoms moving through the chamber.
- The particles expel electrons from air atoms, making positive particles.
- The free electrons connect to other impartial particles, getting to be negative particles.
- Two terminals, or charged plates, pull in the particles, making a little however consistent current.
- Any smoke entering the chamber would intrude on the current and trigger the alert.

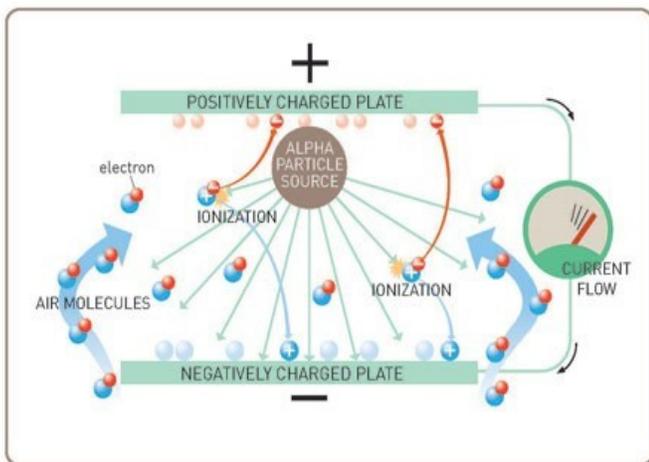


Figure 6: Working of smoke detector

### G. Hand Gestures

In human association, motioning is regarded a characteristic and constituent some portion of correspondence. Hand signals are second in significance just to outward appearance. In human-machine interfaces, alongside voice acknowledgment, signal based cooperation has winding up progressively

imperative. Such cooperation covers an expansive scope of modalities from the basic exchanging on of a hand drier by vicinity detecting, to high accuracy three-dimensional following for a full-body gaming encounter. For some applications the innovation that is utilized is dictated by the level of data that is required from the gesture. This can go from a straightforward substitution for the capacity of a noncontact on/off change, to a strategy for choosing from dropdown menus, or onto a profoundly advanced framework that remembers one of numerous conceivable human motions. In this paper the gadget is quickly depicted be that as it may, the essential spotlight is on an assessment of the pragmatic discovery of human hand motions as opposed to the physical detail and test seat execution of the sensor.

### IV. CONCLUSION

As a decision the application is another innovation for a smart life. This paper demonstrates many use regarding internet of things to help in ease of day to day life. We have designed a futuristic mirror that provides interaction between users and the ambient home services, protection and security, hazard detection.

This work could be improved further and upgraded to be inclusive of multiple other features and applications to an endless bound of imagination.

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