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MAGIC MIRROR WITH GOOGLE HOME USING RASPBERRY PI 3

[1]Aarthi P S, [2]Pradeep R, [3]Srinivasa R , [4]Navya R

[1]Student, [2]Student, [3]Student,[4]Assistant Professor

[1,2,3,4] Electronics and Communication Engineering,

[1,2,3,4]Dayananda Sagar University, Bangalore, India

Abstract *- Not only are intelligent systems employed on phones and computers, but more and more intelligent products are being introduced to the market. There will never be a limit to how smart a device may be made with the right technologies. In this work, we propose a smart mirror based on Raspberry Pi for the Internet of Things at home (IoT). The Raspberry Pi is connected through Wi-Fi, and the API network interface will be used to collect weather forecast information. The display gadget shows the time, date, weather, calendar, and other information. The mirror can be interacted with by the user. Face recognition involves taking a photo of a person's face with a camera and displaying the To-Do list based on it.*

IndexTerms **- Raspberry pi 3, Internet of Things(IOT),Magic mirror;**

I. INTRODUCTION

Everyone in this world requires a comfortable lifestyle. For this reason, modern man has devised a variety of devices. People in today's world need to be linked to one another [6].Many more near-life intelligent items are appearing at the moment, including smart TVs, smart watches, and now its clever mirror. Smart mirrors can be found in 3D somatosensory fitting mirrors and hair salons, although they aren't often used in public spaces. Because of its high price, the imaging effect is poor, and there is a picture delay problem . Our way of life has grown to the point where time management is paramount. Our project will be founded on the premise that because we all stare in the mirror, why can't the mirror become smart [2].

According to the survey, we spend at least 30 minutes after waking up, which includes time for bathing, cosmetics, and dressing, as well as time to glance in the mirror. This concept proposed a kind of intelligent mirror that can be utilised in the house [5] to make full use of this time while also successfully accessing the necessary information of the day.The intelligent mirror operates on the one-way perspective principle, with the actual image being conveyed to our vision in the form of specular reflection. To accomplish the illusion of presenting the pattern on the mirror, the picture displayed behind the mirror can also be transferred to us through the mirror as if it were appearing in the mirror. The image is more smoother and the cost is lower when compared to the method of collecting photographs from the camera employed in the 3D somatosensory fitting mirror.

II. OBJECTIVES

The Raspberry Pi is connected through Wi-Fi, and the API network interface will be used to collect weather forecast information. The display gadget shows the time, date, weather, calendar, and other information. The mirror can be interacted with by the user. Face recognition involves taking a photo of a person's face with a camera and displaying the To-Do list based on it.

III. LITRATURE SURVEY

Projects connected to the smart mirror project have been researched. Here are some smart mirror projects that have been discussed..

Phillip debuted their Mirror TV in 2003, which was constructed on the same concepts as smart mirrors. Their product was a standard television that was mounted behind a two-way mirror, allowing it to function as both a mirror and a television when switched on. They may even make the mirror larger than the television. Phillips gave the example of having youngsters watch cartoons while cleaning their teeth at the same time.

Phillips unveiled their research project MyHeart in 2005, which was based on the idea of an informational mirror. While the original Mirror TV was just a TV with a mirror, the MyHeart project would include a display that would display various medical statistics. However, in order to gather and evaluate data, this idea required onbody electronics. The mirror itself was merely an educational presentation.

In 2011, James Law Cyber tecture released a commercially available smart mirror. This mirror resembles the smart mirrors we are familiar with today. A 32" LCD display is covered by a 37" two-way mirror in this device. Weather predictions, internet streaming, TV, the current time, and numerous widgets can all be displayed on the display. The smart mirror accepts input from a variety of sources, including a remote controller, a smartphone app, and an onscreen virtual keyboard.

Chidambaram Sethukkarasi et al. (2016) developed an intelligent mirror that recognises people based on their faces, recognises emotions, records health factors, and provides clothing advice. Their paper does not delve into depth on any of its topics, instead attempting to bring all of the ideas together under the umbrella of an intelligent mirror. Hi-Mirror, a smart mirror created by New Kinpo Group, was released in 2017. This smart mirror has a camera that monitors your skin's health. The mirror will scan your skin and provide you with a statistic that will tell you where you need to improve. On a daily basis, the mirror logs a user's skin firmness, texture, clarity, brightness, and health using facial recognition.

U. Chaitanya and colleagues created a smart mirror that shows basic information using voice and camera. This system uses voice assistant to activate Google services such as the search engine, alerts, and Google calendar based on the commands given by the user [1]. The attached standard camera serves as a security camera. This system is intended to be used as a hands-free method.

With Raspberry Pi, P. Anand et al. designed a smart mirror that tends to display all of the basic information [2]. The idea is to manage time by using technology to multitask without using phones, tablets, or computers. This was created to improve the interaction between humans and the virtual environment. The information that may be displayed on the mirror is limitless, thus the functionality of our product is highly versatile.

K. Mayuri et al. discussed the design and development of a smart mirror employing artificial intelligence (AI) for commercial applications in various industries as well as for the ambient home environment [3]. This system gathers data from the system and sends it to the Raspberry Pi. This system is a customizable gadget that displays the most popular amenities such as the city's weather, news updates and headlines, as well as time based on the location.

IV. PROBLEM STATEMENT

A smart mirror's purpose is to give users access to all of the information that could influence how they organise their day. A person must always stand in front of the clock for weather and news updates, which takes additional time. Smart mirror was created to address these issues. With the use of face recognition, we may also see the to-do list for certain people.

V. PROPOSED WORK

The goal is to create a Raspberry Pi-based interactive smart mirror prototype. That recognises the user's face and displays his to-do list, news updates, and basic information such as time, weather, and calendar.

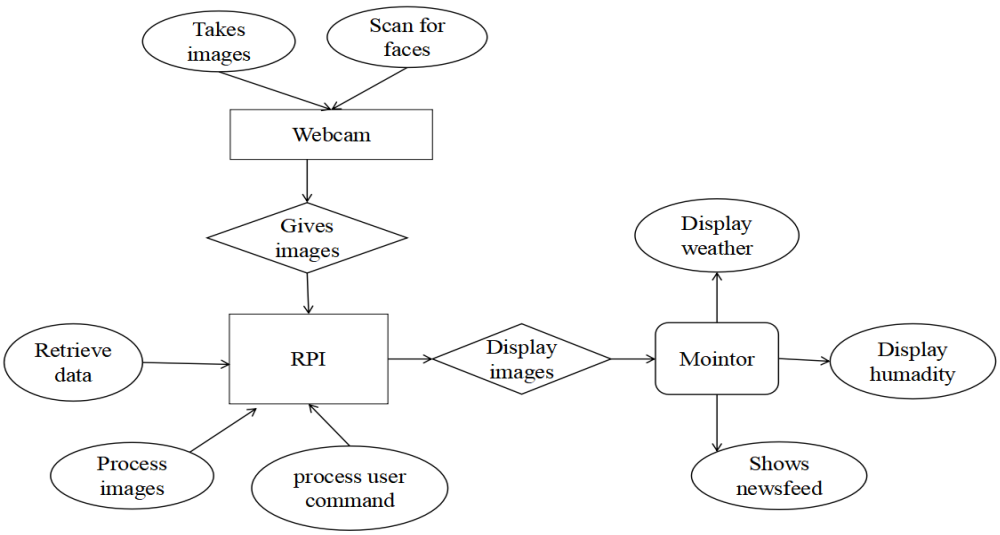

Fig 5: Flow chart

VI. METHOLODY

The following are the objectives:
1. To programme the Raspberry Pi with a weather, calendar, date, and time module.
2. Raspberry Pi for face recognition

6.1 Objective-1

Because automation is the new oil in the IT business, we're attempting to create a prototype for a smart mirror using the Raspberry Pi. A smart mirror is a two-way mirror with 70% reflective and 30% clear surfaces. A LCD display is mounted behind the mirror and is connected to the Raspberry Pi.

Information system algorithm:

Step 1: Turn on the power source.
Step 2: Use the pre-defined URL to retrieve the date, time, and weather information, as well as news from the internet.
Step 3: Use the serial port to send the data to the Raspberry Pi.
Step 4: Use an LCD monitor to project it onto the mirror.
Step 5: When the power supply is no longer in use, turn it off.
Step 6: End.

6.2 Objective-2

The project includes face recognition as an add-on. The system is initially trained by adding image data. The identification is done with Python and the LBPH (Local Binary Pattern Histogram) technique.
Initially, the person's face is photographed by web camera numerous times depending on the user's needs, but roughly 100 images are taken for greater accuracy. Furthermore, each image is separated into n pixels. It is saved in the memory of the Raspberry Pi. When a person stands in front of the mirror, his face is compared to the recorded photographs, and if they match, the user's name saved in memory throughout the training process is shown.

Fig 6.2: Web camera

If the person is registered, it displays To Do material. Otherwise, show nothing.
Face recognition employs the Haar-feature. Similar to Fourier analysis, it is a succession of rescaled square-shaped functions. Edge and line features are the two types of features. Greyscale images with 0-255 shades of black are used.

Face recognition algorithm:

Step 1: Begin.
Step 2: Set up your Raspberry Pi.
Step 3: Obtaining the image from the dataset, which is in grayscale format.
Step 4: Compare the captured image to the live image.
Step 5: If yes, proceed to step 6; otherwise, return to step 3.
Step 6: The alarm is set for three to four minutes, or until the face is recognised.
Step 7: If yes, create a to-do list; otherwise, return to step 6.
Step 8: End.

VII. SOFTWARE AND HARDWARE REQUIREMENTS

7.1 Software:

1. Python 3.7
2. Matplot Libraries
3. Scikit Libraries

4. Tensorflow
5. Opencv

7.2 Hardware:

1. Raspberry pi
2. Pi camera
3. Mirror
4. LCD monitor
5. HDMI cable
6. Power cables

VIII. EXCEPTED RESULT

Fig 8: Magic mirror

IX. OVERVIEW OF PROJECT

Overview Magic mirror system and Flow chart proposed. The goal of this model's design is to develop an interactive interface that can be used in both a household and a commercial setting. Face recognition can be used to access and control a variety of services such as weather, calendar, traffic, news, stock updates, and so on. The Raspberry Pi 3 is connected to a monitor with an HDMI cable, and a webcam is connected through USB. A 5V/2A DC supply is used to power the Raspberry Pi.

X. CONCULSION

Raspberry Pi serves as the host controller for the Smart Mirror. The weather information, clothing index, time, date, and other information are collected by the API interface designated by the extranet, which is connected to the network via WIFI. The appropriate information is displayed on the display at the same time. The technology does face recognition in order to display a specific person's to-do list. Smart mirrors have a compact size, simple operation, low cost, high degree of user-friendliness, personalised user interface, and other benefits, and they also provide news updates to the user. It is appropriate for families and has a wide range of applications.

XI. SCOPE OF THE PROJECT

Nothing is flawless or complete, and there is always room for development in every product. To keep up with modern technology, everything must be updated or improved on a regular basis. Apart from upgrades, there might be a slew of other additions that enhance our smart mirror's functionality and capabilities. This research has a lot of potential in the future, and hopefully it will be of great use in the field of artificial intelligence.The most basic functionality may be smart mirror-based home automation, which would give a natural way of interaction for controlling domestic equipment such as turning on/off lights and fans using simple voice requests. Because we'll be using this mirror in a collegiate setting, basic features like a barcode scanner or a fingerprint sensor can be included to help with chores like college attendance and programme registration. This might include scanning ID cards to register for programmes.

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