SMART REFLECTIVE IOT MIRROR

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Abstract
In moments society, information is available to us at a regard through our phones, our laptops, our desktops, and more. But a redundant position of commerce is needed to pierce the information. As technology grows, technology should grow further and further down from the traditional style of commerce with bias. In the history, information was bear through paper, also through computers, and in moments day and age, through our phones and multiple other mediums. We hope to push the envelope further, into the future. We propose a new simple way of connecting with your morning review.
Keywords*: Internet of Things (IoT)*

I. Introduction

A common approach to erecting a magic glass is to use a pane of two- way glass, a examiner, a frame to hold the glass and examiner, and a web cybersurfer with JavaScript to give the software features and drive the display. The main limitation of this setup is related to the use of a cybersurfer as the displays system of information donation. A cybersurfer creates a sandbox for the law that runs within it, that is, all relations and processes are insulated from other running processes and tackle relations on the computer. likewise, web operations are generally driven through stoner events generated on a web runner(e.g., mouse clicks). This point poses limitations in smart glass operations. First, stoner events can not be generated naturally in a cybersurfer when one interacts with the cybersurfer as one would with a glass. Second, a sandbox limits the use of external tackle to induce events grounded on typical toner- glass commerce. Third, only JavaScript runs natively in a cybersurfed.

II. Literature Review

Lee and Lee (2018) show how IoT smart mirrors can revolutionize healthcare by monitoring vital signs like heart rate and blood pressure. Their study proves the feasibility of real-time health monitoring, allowing for early detection of health issues and personalized interventions.

Kim and Kim (2019) show how IoT smart mirrors improve retail by offering virtual try-on, personalized recommendations, and interactive engagement. Their findings highlight the mirrors' potential to blend online and offline shopping, boosting customer satisfaction and loyalty.

Park et al. (2020) and Michel et al. (2018) study the usability of IoT smart mirrors. Park et al. identify design challenges and stress the importance of user-centered design principles. Michel et al. examine the open-source Magic Mirror project, highlighting its flexibility and collaborative development model, emphasizing the value of open-source platforms in fostering innovation.

III. Existing System And Proposed System

A. Existing System

Current IoT smart mirrors, such as those made by Panasonic and HI Mirror, provide personalized features like recognizing faces and analyzing skin. Innovations like Perseus Smart Mirror make

shopping more interactive with augmented reality, while DIY projects like Maximus Smart Mirror cater to hobbyists. Prototypes from Samsung introduce features like recognizing gestures and controlling smart home devices, showing the wide range of uses for this advancing technology.

B. Proposed system

We can make life easy and comfortable.

We propose to build this smart piece of hardware by keeping in mind all the requirements and drawbacks of existing system. Along with time, date, and weather forecast related information, we also aim at implementing module which can feed news headlines from various sources.

This will display the feeds only when the human face is detected and will turn off the system if no face is detected to save electricity and CPU power.

IV. Working Methodologies

A. Smart Mirror as A Mirror

We can see our view as we can see it in a natural glass while looking and fixing with the help of one-way glass with high attention of aluminum content.Smart Mirror As An Information System

Use Time, Date, rainfall details and news are brought from online using predefined URL. News is brought from websites like CCN, BBC etc. DHT22 digital detector is used to get the

moisture and temperaturedetails.DHT22 is connected to GPIO legs of Raspberry Pi board using minidresses.Smart Mirror As Security System.

When there's nothing in home it can be switched into security system by using VNC bystander to descry mortal presence. When someone enters into room, PIR detector will descry the movement of the person when he passes by the glass and prisoner the image and stores it in the drop box. Also informs the proprietor by streamlining captured image in the Dropbox, by this way smart glass system can also be used as a security system.

V. Design Of Experimentation And Instruction

When devising an experimentation strategy and instructional content for an IoT-driven reflective smart mirror, it's crucial to prioritize simplicity and user-friendliness. This involves meticulously selecting high-quality hardware components, crafting intuitive software for seamless functionality, and seamlessly integrating it with other smart devices. Actively soliciting user feedback is essential for refining both functionality and user interface, while providing comprehensive instructional materials helps users grasp the mirror's features and capabilities. Continuously testing the mirror with real users is imperative for identifying any usability hurdles and implementing necessary enhancements, ultimately ensuring a pleasant and effective smart mirror experience.

A. ***Hardware***

- ***The smart mirror hardware consists of****:*

1) ***16-inch Zebion computer monitor****: Serves as the display component.*

2) ***50x90x0.5cm one-way mirror****: Provides the reflective surface for the mirror effect.*

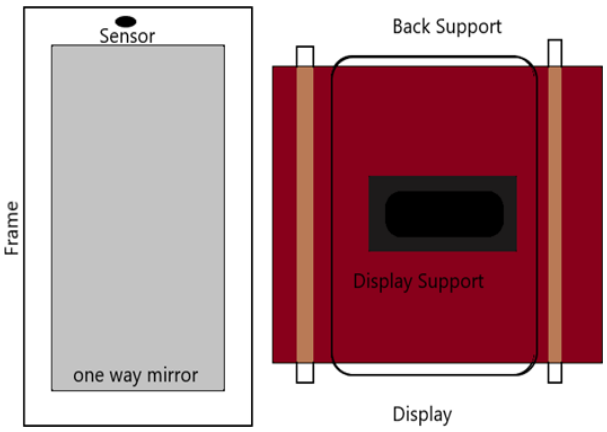
3) ***Raspberry Pi 2****: Acts as the main computing unit for running the smart mirror software.*

4) ***Two USB microphones****:Used for voice input and interaction.*

5) ***Two ultrasonic sensors****: Installed on the frame for detecting presence and movement.*

6) ***Wooden frame****:Supports and encases the components, with detachable sections for easy maintenance and customization.*

The back part of the device holds the display and Raspberry Pi, facilitating wall mounting. The frame attaches to the glass with wooden slats and houses the ultrasonic sensors. This modular design allows for easy replacement of components or the entire frame.For papers with less than six authors: To change the default, adjust the template as follows.



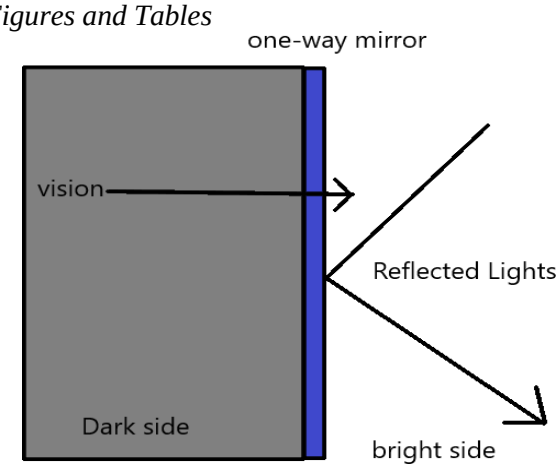
- **Raspberry pi 4B:**

Raspberry Pi 4 Model B, released in 2019, features a powerful quad-core processor, onboard Wi-Fi, Bluetooth, gigabit Ethernet, and USB ports. Initial design flaw resolved in revision 1.2. Popular due to affordability and community support. Requires microSD card for OS installation. Widely used in education, IoT, and commercial projects, empowering innovation with minimal cost.

- ***One-way Mirror***

The crucial component for the smart mirror's futuristic effect is the one-way mirror, which is partially reflective and partially transparent. In this project, it reflects dark or black screen areas while allowing light parts to be seen normally, creating an overlay effect. Sourcing the ideal mirror was challenging, and although the purchased one lacks perfect reflectivity, it serves adequately under suitable conditions, with potential for replacement in the future.

Figures and Tables



- **Display**

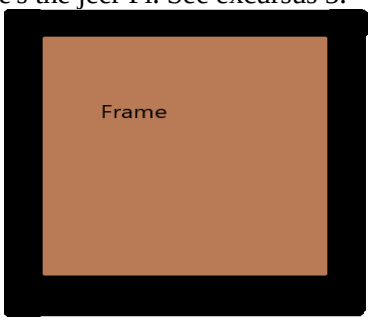
For the display a 16-inch Zebion monitor was bought, which also has built-in speakers and comes with a remote control which is useful to easily turn off the device's screen. The monitor is much smaller than the mirror so a black sticker was used to cover the parts of the glass which are not covered by the display. An HDMI cable was used to connect the display to the Raspberry Pi for video.

- **Microphone**

The smart mirror incorporates two USB microphones for voice recognition purposes. The initial microphone, linked through a USB sound card, detects a clap signal to initiate the system. Subsequently, the second microphone, repurposed from a PS3 Eye camera, exclusively captures voice commands upon activation. This configuration allows for voice interaction with the device, compensating for the Raspberry Pi's absence of a standard microphone input.

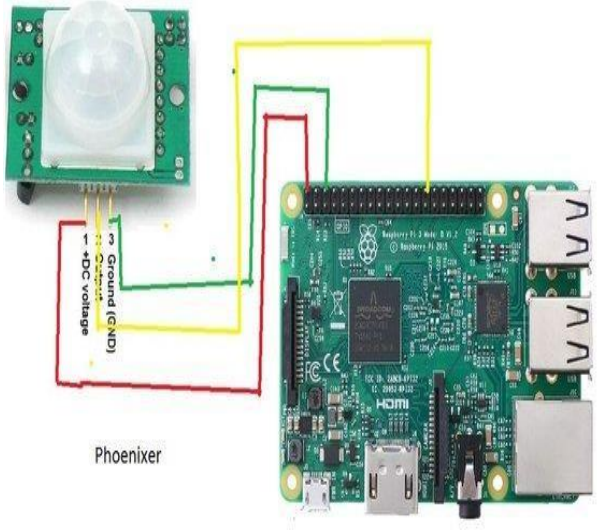
- **Frame And Support**

The frame is made of wood and it provides the support for the glass and all the other factors. It frames the glass and provides a way for hanging the glass on a wall. It has two corridor the front is painted white and has four holes for the ultrasonic detectors. The reverse has two rustic bars on the sides that are used to hang the frontal part. In the centre there's a support for the display and at the bottom there's the jeer Pi. See excursus 5.



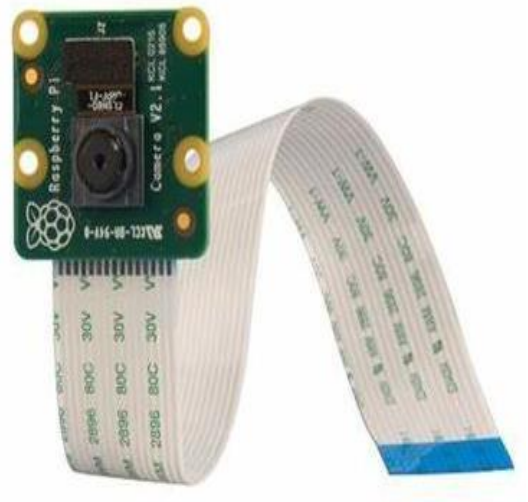
- **Pir Sensor**

The ultrasonic sensors are the second way to interact with the smart mirror. An ultrasonic sensor has two main parts, a speaker and a microphone. It works by sending an ultrasound with the speaker and returning the time it takes to capture the echo with the microphone. With the time it takes and the speed of sound we can then calculate the distance of an object from the sensor.



- **Pi camera**

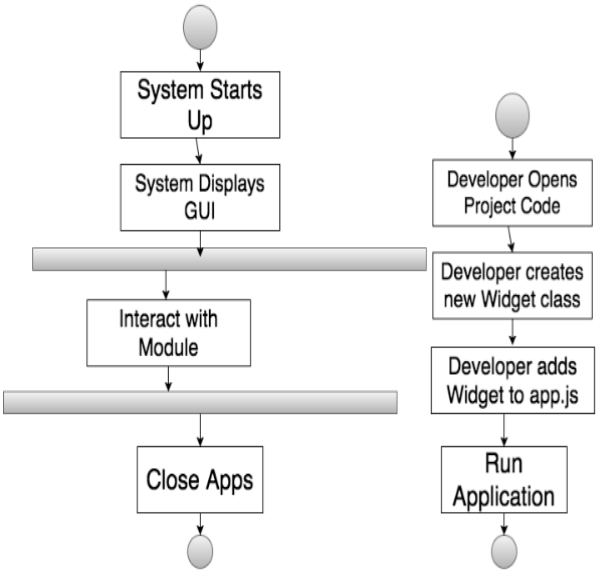
Preface. The Raspberry Pi camera module can be used to take high- description videotape, as well as stills photos. The exercise display is voluntary, but can be used full- screen or directed to a specific blockish area on the display. However, the null Gomorrah element is used to' absorb' the exercise frames, If exercise is impaired. The camera must produce exercise frames indeed if these are not needed for display, as they are used for calculating exposure and white balance settings.



VI. Implemention

- Assuring miners safety in case of mining accidents that occurs due to increase in temperature, blood pressure.
- To provide a proper safety to the workers
- Detection of temperature and pulse rate within mining environment
- Communication establishment between sensors and Micro-controller

VII. Working Flow

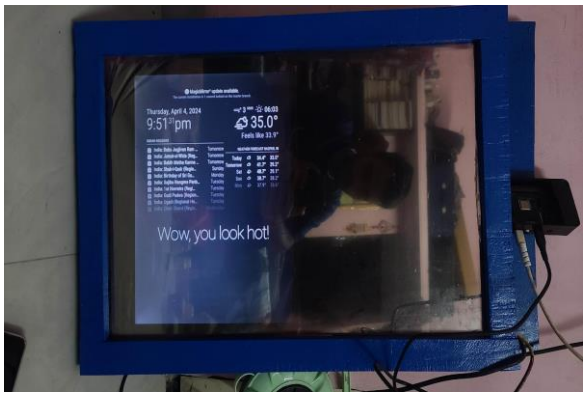


A. User Interaction Process:

- *System Starts Up: Upon powering on, the mirror's operating system initializes.*
- *System Displays GUI: Users interact with the graphical interface, which may include widgets and personalized content.*
- *Interact with Module: Users engage with features like voice commands, hand gestures, or smartphone integration.*
- *Close Apps: Users can exit applications or return to the main interface.*

B. Developer Actions Process:

- *Developer Opens Project Code: Access to the mirror's codebase.*
- *Developer Creates New Widget Class: Designing new software components for the mirror.*
- *Developer Adds Widget to app.js: Integration of newly created widget into the main application file.*
- *Run Application: Testing or execution of modified application on the smart mirror. and the broader IoT landscape.*



VII. Conclusion

The smart reflective IoT mirror revolutionizes traditional mirrors by integrating IoT technology, offering functionalities like weather updates, calendar reminders, and fitness tracking. Its intuitive interface enhances user experience, making daily routines more efficient and enjoyable.

With its sleek design and multifunctionality, the smart reflective IoT mirror redefines the concept of a mirror, blending functionality with modern innovation to create a sophisticated and indispensable household item.

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