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Personal Mirror Assistant for Interactive Uses using Raspberry Pi

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Abstract- In daily life, everyone observes their face in mirror at least once before they move out of the house. The users are associated psychologically with mirror to check our appearance. The personal mirror assistant is one of the applications of raspberry pi. An advanced personal mirror assistant is developed using the raspberry pi and the peripherals like two-way mirror, LED monitor to display the various information, media news, weather forecasting, etc. along with conventional uses. Mirror assistant has embedded display unit fixed, which is a futuristic thing. Raspberry pi is attached to backside of mirror and it is used to control display on mirror. The personal mirror assistant can be programmed for other uses like playing songs and for watching videos, etc. The python is used to program the raspberry pi and connects to a monitor assistant.

Keywords: *two-way mirror, raspberry pi, personal mirror assistant, python, RFID*

1. INTRODUCTION

Digital devices and internet provides the possibility of smartness for various attributes for the home. One of the attribute to improve the facility is assist to the mirror and make it smart. The personal mirror assistant are straight from science fiction. The personal mirror assistant are part of an optimistic vision of the future that imagines a world data everywhere, feeds information required by us at that moment. This idea enables home smarter and saves user time. The innovate idea is to provide the internet facility for this mirror assistant to access data in simple way of interaction.

The personal mirror assistant is constructed using small computing device like raspberry pi which support the processing and web browsing operations, two way glass composed of frame and monitor and effective software like python for driving and supporting various features. In this personal mirror assistant, widgets are made for displaying the present weather condition, time, news headlines, other videos, etc. Using personal mirror assistant, controlling home application becomes easier. One of the conventional example is dressing table with additional facility. This personal mirror assistant would help us in developing smart homes with embedding AI and its applications in shopping malls. The python is used to program the raspberry pi and connects to a monitor.

The paper is organised as follows. The section 1 introduces the personal mirror assistant concepts and reviews literature in section 2. The proposed work and its implementation are described in sections 3 and 4. The result and discussion are explained in section 5. Finally, the conclusion is given in section 6.

2. LITERATURE REVIEW

The digital technology makes everything in our life easier and available in hand using gadgets.

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The next development of personal mirror assistant using smart mirror has been implemented for all applications like industry, home, etc. It gives various data of environmental factors, personal and general, like light, thermal values, news, weather, etc [1 & 2]. The design and development of interactive smart mirror was described for domestic services for simple lifestyle. It is an alternate to the personalized digital device with all digital device peripherals but all the data can be accessed from the frame like glass mirror. The Rosebery pi has been used for processing and python has been used for developing algorithms [3 & 4].

The mirror features can be extended to maintain health via various parameters and techniques. The security aspect has been added using RFID technology for identification and authenticated use for the industries [5]. The "SmiWork" is an interactive smart mirror platform which controls the home appliances with help of mobile application makes very less human intervention. The mobile is paired with the smart mirror for controlling home appliances. The technology named "sonus" is used as medium for the interaction of system and people[6].

The authentication and personalized news feature are provided as advancement. The next level of value added service have been made using speech recognition techniques. Also, face recognition is advanced service which can be implemented. This makes more interaction for home and industrial purpose [7 & 8]. The another smart capability of intelligence has been added for detection, processing the complex operations. Naturally, the security systems are improved for watching all the activities and features of the smart mirror. Various algorithms have been developed using python for accepting commands of various forms and enabling the different format of outputs [9 & 10].

3. PROPOSED WORK

The block diagram of the proposed personal mirror assistant system is shown in figure 1. The brain of the system is Raspberry pi; it's acting like processing unit and also the controller. It receives the information from the internet and display the real time data on the mirror as output via display monitor. The raspberry pi is connected to Wi-Fi to get the real time data. The daily life can be leaded with these mirror assistant for various activities of reading, planning and scheduling, etc. The raspberry pi is connected to display monitor. This monitor is connected to two-way mirror. The mirror in which display the output with the help of back end monitor, the raspberry pi will get the real time data trough internet by connecting to Wi-Fi.

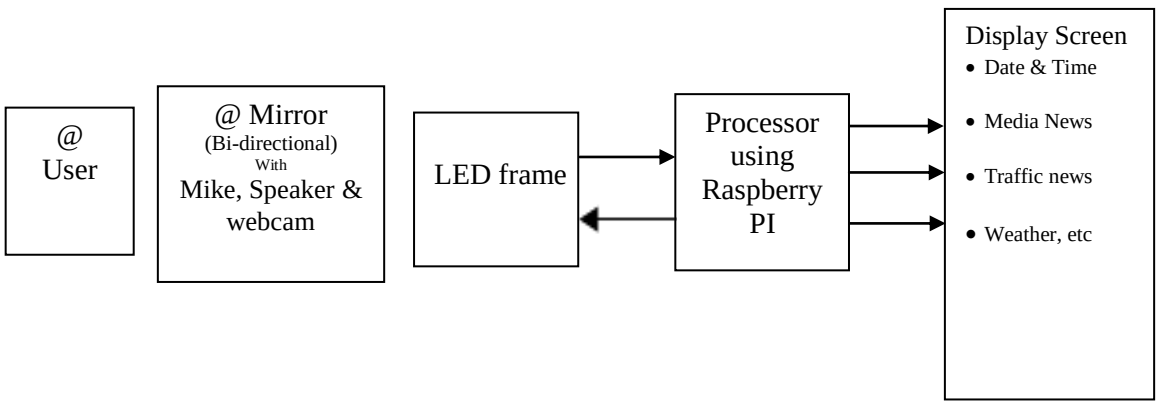

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Figure 1. Proposed System Block Diagram

4. IMPLEMENTATION

The following modules are used to implement the proposed personal mirror assistant system.

Hardware:

Raspberry pi 3 may be a low-cost, credit-card sized, single-board computer and sample assembled board is shown in figure2. The Raspberry pi utilize architecture of an automated RISC machine processor. Moreover, it is mostly utilized by up-to-date smart phones. The system uses quad-core 1.4GHz clock frequency processor with internal 1GB RAM and other units like GPU, serial port UART, LAN ethernet port, etc. The memory card is used for OS and temporary storage purpose.

Figure 2. Raspberry Pi board

This mirror is manufacture using acrylic material and amogh aluminium of required thickness to avoid damage and can be handled roughly. The other factors are transparency, coating, reflection, perception for viewing the mirror accurately at wide angle

An LED monitor which is having minimal power consumption, maximum crispness is used to prevent mirror glow during night time. The user's required information will be displayed on the LED monitor. Finally, all the components are interconnected and verified the operation.

Software:

Raspberry Pi uses Raspbian OS and window platform. Python is used to design the algorithms and software for various functioning. The raspberry pi is configured by downloading the OS imaginary program on the external SD card and connects all the peripherals like microphone, speaker, camera to access and execute commands.

Algorithm:

The algorithm performs the initialization, recognizing the input commands, processing the specified operation and develop the output in the form of understandable format. This involves the necessary programs for accepting the input commands and functions for routine operations and recording purpose. Other programs checks the commands for recognition and then start the relevant application program. Next, the results are displayed in the screen

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display after comparing the various internal data. Sometime, the library files are called for enabling the important operations and data for comparison. The menu and options are developed using the algorithm and software. The algorithm support normal mode, debug mode for testing and developing purpose.

5. RESULTS AND DISCUSSION

The digital mirror assistant displays the data as per commands like temperature, remainder, date and time, etc as shown in figure 3. Also, this can be used as conventional glass mirror if gadgets are not required. The voice command are tested using peripherals by wired mode or wireless mode. The wireless modules are used along with raspberry pi for taking the wireless connectivity and commands.

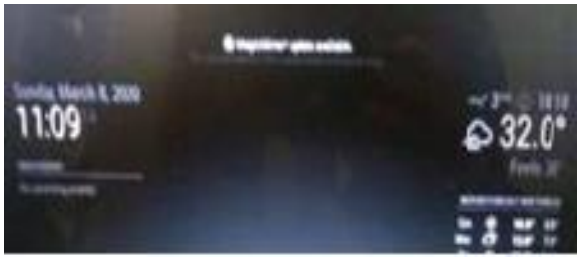

Figure 3. Sample result-output

The implementations of system using raspberry pi, software and peripherals is decided based on the necessary features and any advanced feature like face recognition and RFID security modes. The menu and options have been developed using the algorithm and software. The system support normal mode, debug mode for testing and developing purpose.

6. CONCLUSION

The personal mirror assistant are used to enhance capability of our daily life. This utilize all the technology benefits easily. The design of the personal mirror assistant have been developed as per the requirement of the common man and some advance facilities are accommodated with necessary intelligence for different applications. The menus and options have been provided for remainder, date and time, other environmental factors. The apps were unobtrusively displayed on the screen, which are supported by bidirectional mirror for better utilization. The products were studied for similarities, improvements, and flaws for improving further. The design integrates all the important parts of the personal mirror assistant system. The proposed system satisfies the needs of the users with sufficient features at minimal cost.

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