ABSTRACT

Our lifestyle has evolved in such a way that optimizing time is the most important thing. Based on the user studies and prototype implementation, we present the development of a different application that integrate interactive services of information, offered through a user interface on the surface of a mirror. Our work is based on the idea that we all looks at the mirror when we go out, so why wouldn't the mirror become smart. The framework will offer basic services, like the presentation of personalized weather data, time, date and will incorporate some additional functionality, like reminder service by mobile synchronization and through social media. Our framework is based on detecting presence of human using Passive Infrared sensors and Wi-Fi connectivity. Once a person comes in front of the mirror, it displays the information that is being fed from the phone. This data or information includes calendar, time, weather, news feed, notifications and so on. Our framework also discusses about the face recognition and its application in control mechanism in home appliances and opening and closing of shelf. Our framework also introduces speech activated music player, and plays the music when a person gives a command.

Keywords: Smart Mirror, Augmented reality, IOT, Raspberry pi, nugets, wi-fi devices.

1. INTRODUCTION

IOT is network connectivity for physical devices, home automation, city and other things—integrated with different software, detector, actuators that enable these objects to communicate with each other. Applications:
– Smart homes
– Smart city [cisco city]
– Wearables
– Smart farming’s
– Automated car
– Connected health
1.1 SMART MIRROR

A mirror is a signature detail of futuristic movies and advertisements. The smart bathroom mirror is a symbol detail of futuristic movies and Smart mirror is mirror that perform multiple task through connecting to your smart phones or laptops. The smart advertisements. Want some visual shorthand for how far technology has come? Show the person brushing her teeth, while over her reflection are laid on her daily routine, weather report, news headlines, incoming messages, and more.

1.2 VIRTUAL MIRROR

A virtual mirror or smart mirror is a device that displays a user's own reflection on a screen as if that screen were a mirror. Some versions of mirror also feature the augmented reality with addition to the video display, or use an entirely virtual graphical change of the user.

Virtual mirrors are available in the form of mobile phone applications, with some authorized users to modify the appearance of their hairstyle, make-up stuffs or other accessories. This technology is also used in online shopping. Some major retailers use the technology to provide virtual dressing rooms to customers.

1.2 AUGMENTED REALITY

In the below figure, it shows the working principle of smart mirror. It starts from the LCD touch screen of the mirror, mirror is used to provide the interface of the function which connected by the raspberry pi 3. smart mirror cpu is the raspberry pi core system. Camera and micro phone are attached to raspberry pi 3 for the further function of the mirror. By using both the feature of the camera and microphone, mirror is going to detect the future operation to be done. The mirror will shows the weather forecast, news feed, multimedia services. And at last phone is get connected to our smart mirror and provide its user interface with the mirror.

Fig -1: schematic diagram of smart mirror
1.4 Nuget packages

NuGet package is one of a free and open-source package manager, designed for the Microsoft development platform (earlier known as NuPack). Since its introduced in 2010, NuGet package had evolved into a larger ecosystem of tools and services. NuGet are distributed as a Visual Studio extension. Starting with Visual Studio 2012, NuGet package comes preinstalled by default in the device. NuGet is also integrated with Sharp Develop. NuGet can also be used from the command line instructions and automated via scripts instructions. It supports multiple programming languages, including:
- .NET Framework packages
- Native packages are written in C++ with package creation aided by CoApp.

1.5 Model View View Model

It is a software architectural pattern process. It facilitates a separation of development, the GUI (Graphical User Interfaces) — become via a markup language or GUI code — from development of the business logical model or back-end logic model (the data model). The view model of MVVM is a value converter, meaning the view model is responsible for converting (exposing) the input data objects from the view model in such a way that objects are easily managed and represented in the mirror. With this respect, the view model is more model than view, and also handles most if not, all of the view's display the logic behind that. The view model may be implement a average pattern, organizing the access to back-end logic around the set of use cases diagram function for supported by the view.

2. Functional overview

The proposed mirror is being well designed to perform several functionalities that can be shown as follow:
A Mimic natural mirror interface: A touching surface based flat display device like monitor is used for the mirror display. A web cam is used to provide the real-time feeds of what it is located in front of the virtual mirror, thereby just calling the function of a regular simple mirror. The live feeds are not going to store for privacy purpose. It is Distinction among the different individuals, One of the core value of the system is to facilitate customized services based on user credentials scheme. And also recognizing the user is the first step towards providing such type of services. As a face recognition based mechanism or function is used to recognized users and also unlock their personalized profiles of users to provide access to other or otherwise restricted the user, applications, and appliances. If encountered with an unknown user, the mirror will also can be deny access to the personalized services and it will only provide the standard mirror functions.

Figure 3 shows the overall home automation system architecture. The mirror interface described earlier stands as an interface for this system to access various services. The backbone of the system consists of a collection of off-the-shelf personal computers, such as the Mirror CPU, the kitchen CPU, the Authentication CPU, the Multimedia center, and others.
CPU, etc. These computers are loosely meshed into a distributed network. The devices are connected with the CPU depending on their strategic locations in the environment. Although the design incorporates several machines to provide various functionalities, it is possible to cluster the services and use one or two machines for the tasks. Also in the architecture, the messaging bus of the network leverages the latest standardized communication protocols such as web services, thus allowing a heterogeneous operating environment to co-exist within the infrastructure. For example, the kitchen CPU would be able to expose its attached smart appliances via self-hosted web services, while consuming Real Simple Syndication (RSS) feeds streamed from the Internet gateway. The integration performed is seamless.

3. CONCLUSION

The goals of the smart mirror were to focused in reduced the time needed in a user’s daily routine and provide a merger of user and technology that becomes an enhancement. The functionality must meet these descriptions in the design. We have designed a futuristic smart mirror that provides natural interaction between users and the ambient home services. The core of the mirror is based on a home automation system, which we developed to demonstrate the various functionalities provided by the mirror. The mirror display is provided by a touch-based flat monitor, which streams live continuous feeds from a web camera connected to the mirror to mimic a traditional mirror function.

REFERENCES


