

FUTURE SMART GLASS

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ABSTRACT: Google glass is new technology in modern life. This survey reviews current research issues in the area of human-computer interaction for smart glasses. The survey first studies the smart glasses available in the market and afterwards investigates the interaction methods proposed in the wide body of literature. The intercommunication methods can be classified into hand-held, graze, and without feel input. This paper mainly focuses on the touch and touchless input. Touch input can be further divided into on-device and on-body, while touchless input can be classified into hands-free and freehand. We summarize the existing research efforts and trends, in which stroke and touchless input are evaluated by a total of eight interaction goals. Finally, we discuss several key design challenges and the possibility of multi-modal input for smart glasses. It will prove as a useful technology for all kinds of people including handicapped/disabled. This survey mainly focuses on research issues related to interaction methods between smart glasses and human users.

KEYWORDS: Android technologies, Smart Glass interaction, Eye tap, Virtual Reality.

I. INTRODUCTION

The launch of Google Glass in 2014, smart glasses have mainly been designed to support micro-interactions. Augmented reality involves superimposing interactive computer graphics images onto physical objects in the real world. This analysis reviews current research problem created in the area of human-computer interaction for google glasses. The analysis first studies the smart glasses available in the market and afterwards investigates the interaction methods proposed in the wide body of literature. The intercommunication methods can be classified into hand-held, touch, and touchless input. This paper mainly focuses on the touch and touchless input. Touch input can be further divided into on-device and on-body, while touchless input can be classified into hands-free and freehand. We summarize the existing research efforts and trends, in which feel and without touch input are evaluated by a total of eight interaction goals. Finally, we discuss several key design challenges and the possibility of multi-modal input for smart glasses. It is research and developed by google.

Google Glass is the first of its kind in the market. Due to its small form size, only swipe gestures are accessible for the user input and thus the operating system is designed as a series of pixel cards, namely Timeline. Users can swipe over the pixel cards and select the target pixel card. However, this design has potential pitfalls such as limitations in micro-interaction, long search time when pixel card number is large, and so on. However, the default interaction methods available on smart glasses such as touch pad and button inputs are far from satisfactory. The users may find it difficult to consummate their tasks in the interface under the WIMP paradigm by using these default interaction methods, for instance, the long task completion time, high error rate in item selection, and so on. However, there exist no other standard and mature methods for the interaction between smart glasses and human users.

Gestural input refers to the capturing of the body movements of human users that instructs the smart glasses to execute specific commands. The sensors on the additional devices (e.g. wrist band) or embedded sensors in smart glasses can capture the user's gestures such as drawing a stroke, circle, square, or triangle. The captured gestures are then converted into input commands according to the gesture library. For example, the possible input commands can be to select a character on the keyboard in the virtual interface shown on the optical display of smart glasses, choosing an app icon on the main menu of the starting page, as well as moving a 3D object from one location to another in the augmented reality

environment. Google is supportive an ecosystem of developers and designers to build the apps that could make Glass the next iPhone. Glass is part of the evolution from desktop to mobile to wearable technology, including watches, bracelets, and other eyewear.

II. LITERATURE SURVEY

The first and bygone notable example of google glasses can be traced back to the Touring Machine, which was proposed in 1997 by Feiner et al. The Touring Machine is a prototype machine designed for urban exploration. In the demonstration, it is used for the navigation of the campus area. The machine subsists of a vesture see-through display with built-in alignment detector, a stylus and a trackpad on a handheld computer, a GPS receiver, peripherals for the internet connection, and a desktop computer stowed in the backpack of the user. In the campus navigation demonstration, through the see-through display, the user can see information about the surrounding buildings in the campus (for instance, names of buildings and corresponding departments) as well as a number of choices on a virtual menu such as finding the user location, showing the department information, removal of digital overlay, and so on. The users can ingress the digital overlaid menu with the trackpad. Also, the orientation detector guides the users to the orientation of the destination building. The compass system presents a compass pointer on the see-through display. The colour of the points will change from green to red if the user deviates from the target building more than 90 degrees.

Even though the system is cumbersome and heavyweight, in comparison to today's smart glasses, it is a well-defined example of the early development of augmented reality on mobile devices, where the features of Touring Machine are driven by a GPS. This is basically the same as today's GPS-driven mobile applications. Also, it presents a rudimentary approach to the interaction with a digital overlaid menu in augmented reality by using trackpad and stylus.

The Google class consists of the 4 Generations:

a. First Generation Glass

The use of television camera to "analysis of glass" camera is located in eye it effect the few hours display integration in between the eyes.

b. Second Generation Glass

First generation of the glass camera and the display integrated in second generation to define effect of camera and display is feed the drives its ray of light is incident of unaided eyes.

c. Third Generation Glass

In third generation glass includes the control Mechanism of focus in glass consist of clarification of pictures.

d. Fourth Generation Glass

In fourth generation to define looks distance of object is some of the problem can be solve in fourth generation to use the laser light to adjust the camera exactly in eye is also called as glass eye.

The standardization of three phases having smart clothing, android operating system, and road map smart clothing.

Google glass is an optical head mounted display consist of the develop by Google in Google x laboratory in the California to use the android operating system. It captures the pictures, video interface between them in personal contact, map, and personal data. In [1] author has came up with a particular advantage of this technique is that it both communicates the request to the computer and informs the conversational partner as to the wearer's use of the machine. in [2] author has confronted the challenges and conclude that 4th and 5th generation digital eye glass will prove more fruitful than other technologies as the problem of the clarification of pictures in camera, objects out from the range of laser light are also verified. Author has came up with idea of using digital eye with wearable computing which will facilitate author has also mentioned about the issues that can arise due to it. display technology Steve Mann to research the including visual memory.

It defines the two features virtual reality and augmented reality.

VIRTUAL REALITY:

The Virtual reality is defining the presence of state having virtual environment to develop the software user's real thing of real word. It can be communicated with the environment in presence of people into education and training to experienced two senses of sound and vision.

AUGMENTED REALITY:

The augmented reality is define the live things consist of direct or indirect on real world environment. The presence of state is work the technology in the sensory also to sound, video, graphic and internet data of navigation to global positioning of system.

III. TECHNOLOGIES USED

Wearable Computing:

Wearable computers, also known as body-borne computers are miniature electronic devices that are worn by the bearer under, with or on top of clothing. This class of wearable technology has been developed for general or special purpose information technologies and media development. Its provides us consistency by the constant interaction between the computer and user; No need to on or off the devices. It common on mobile computing, Software architecture, wireless network in the interactions.

4G Technologies:

4G is the fourth generation of cell phone mobile communications standards. It is a successor of the third generation (3G) standards. A 4G system provides mobile ultra-broadband Internet access, for example to laptops with USB wireless modems, to smartphones, and to other mobile devices. The 4G technology consist of the fully converged software, software independent, diverse user device, autonomous network and ubiquitous mobile access.

Smart clothing:

Smart clothing is the next generation of apparel. It is a combination of new fabric technology and digital technology, which means that the clothing is made with new signal-transfer fabric technology installed with digital devices. Since this smart clothing is still under development, many problems have occurred due to the absence of the standardization of technology.

Therefore, the efficiency of technology development can be strengthened through industrial standardization. This study consists of three phases. The first phase is selecting standardization factors to propose a standardization road map. The second phase is to research and collect related test evaluation methods of smart clothing.

For this, we selected two categories, which are clothing and electricity/electron properties. The third phase is establishing a standardization road map for smart clothing.

Android OS:

This operating system is based on Linux for cell phone devices such as android, windows phones and tablet computers, developed by Google in conjunction with the Open Handset Alliance. Android is open source and Google releases the code under the Apache License. Software to be freely modified and distributed by device manufacturers, wireless carriers and enthusiast developers allowed by the open source code and latitudinarian license.



Eye Tap:

Eye Tap is a device which made by electronic metal that is scruffy in front of the eye and it acts as a camera to record the scene available to the eye as well as a display to show a computer generated imagery on the original scene available to the eye. For this device, the user's eye operates as both a monitor and a camera. Composition allows the user's eye to operate as both a monitor and a camera as the Eye Tap intakes the world around it and extend the image the user sees allowing it to overlay computer-generated data over top of the normal world the user would ascertain.

Smart grid Technology:

A smart grid is electrical lattice that uses information and communications technology together and act on information, such as information about the behaviours of suppliers and consumers, in a robotic fashion to improve the efficiency, reliability, economics, and sustainability of the production and distribution of electricity.

IV. WORKING OF GOOGLE GLASS

Google glass design is inserted with small chips camera, video display, battery, and speaker. It hand free display works on the android and connects a phone through Wi-Fi and Bluetooth. Small chips cameras are used to capture the images and scenes in front of the eyes. Hand free information is displayed in pop up manner using video display.

Microphone: It is a transducer that converts sound into an electrical signal. The electrical signal can be further processed by speech recognition. The recognized speech is used for input to the smart glasses. All smart glasses have microphones embedded into their circuit board. This implies that today's smart glasses support voice input from users. One of the reasons is that the recent advancements in speech recognition make voice input accurate and responsive.

Global Positioning System (GPS): It is a global navigation satellite system that provides geo-location and time information to a GPS receiver anywhere on the Earth. The GPS enables the smart glasses to support various geo-location based applications. For instance, the smart glasses can tell the users about the current position of the wearer, or driving directions.

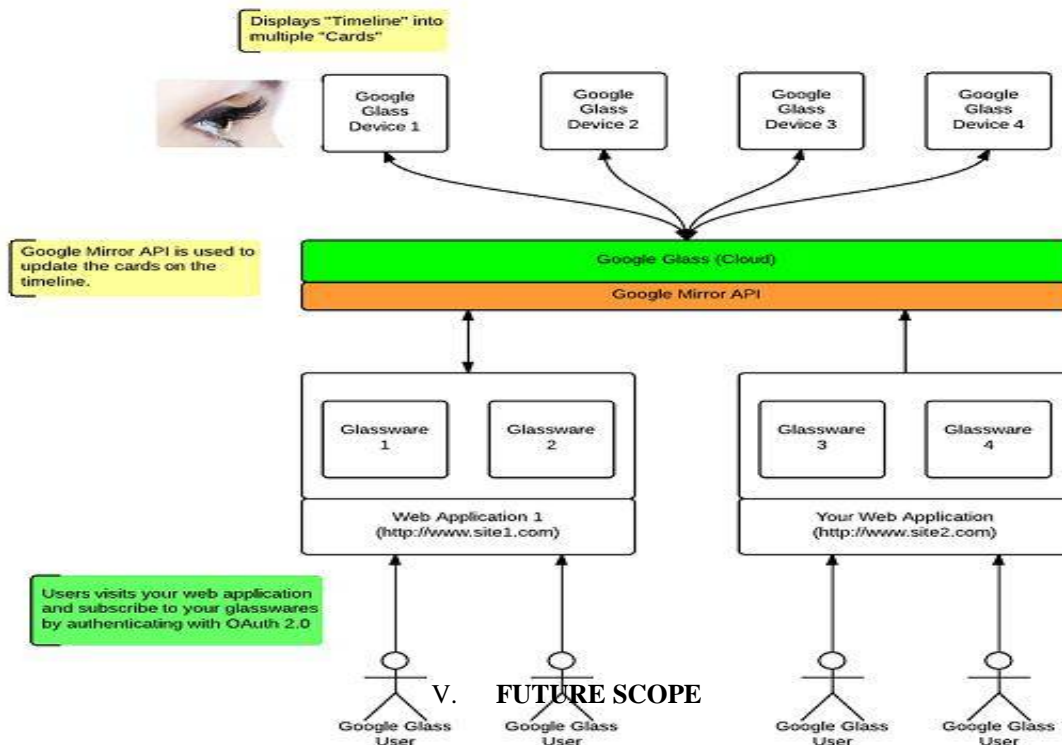
Accelerometer: The sensor is designed for measuring proper acceleration, which is defined as the rate of change of velocity of a body in its own instantaneous rest frame. All smart glasses have accelerometer. Smart glasses can measure the acceleration force along the x, y, and z axis, as well as gravity force. This allows the smart glasses to record the motion input from the wearer, for instance, understanding the status and activities of the wearer like being stationary, walking, running, and so on. In addition, knowing the status and activities of the user can help in designing user input in a more precise and subtle manner. For example, the wearer performs head gestural input to the smart glasses but the accuracy of the gesture recognition can be influenced by the other simultaneous motions, for instance, the walking status of the wearer. Thus, the unwanted motion from walking can be alleviated by the measures taken by the accelerometer.

Light sensor: The sensor is a detector of light or other electromagnetic energy. As for the smartphone, the touchscreen display adjusts its brightness subject to the ambient light. The google glasses that is optical display and adjusts the brightness if the ambient light affects the read-ability of content. Thus, the light sensor provides smart glasses the capability of automatically adjusting the brightness of the display in various light conditions. From the results, only two

of the surveyed smart glasses are not equipped with light sensors. The META is currently designed for Augmented reality in indoor environments. However, Mad Gaze X5 is designed for both indoor and outdoor environments. The lack of a light sensor impacts on the readability of content in outdoor environments.

Tangible interface: This category refers to the use of an external controller, trackpad and button, which allows the wearers to interact with the digital interface of the optical display of smart glasses. The external controller provides a more efficient and easier control than the trackpad and button located on the body of the smart glasses. However, the external controller is cumbersome if the wearer’s hands are occupied and thus it is not convenient for the wearer to perform other tasks simultaneously in augmented reality. The trackpad and button have no issue with the above problem but the operations on the small touch surface of the button and trackpad of the smart glasses causes two major problems. First, muscle fatigue is the main issue as wearers need to raise their hands to touch the button and trackpad. Prolonged use is not favourable for the wearer. Second, the small surface of the button and trackpad requires subtle finger movements and therefore deteriorates the task performance. Nevertheless, the above input methods are commonly used for smart glasses. Out of 12 smart glasses 6 provide buttons and trackpads for manipulating the items and objects on the smart glasses interface, while 3 out of 12 smart glasses have external controllers that enable users to control a cursor on the smart glasses interface. The remaining three google glasses rely on the gestural input supported by various types of cameras. META utilizes an infrared camera to detect hand gestural inputs from the wearers, and Microsoft HoloLens and ODG R9 utilize depth camera to capture hand gestural input. The results show that the hand gestural input is an alternative to the tangible interface, because of its advantages such as intuitiveness and naturalism.

Google glass architecture:



V. FUTURE SCOPE

- Google Glass is as futuristic a gadget we’ve seen in recent times. There are limited in scope now days, but the future, Google believes, is bright and the device itself is “incredibly compelling”.
- Google is trying their hardest to push the Project Glass through the FCC this year. Reports show that Google is trying to get the approval by the FCC this year but there are already several hundred glasses made for testing internally.
- It is personal safety device to use virtual reality and augmented realities are facilitated.

Google is trying their best efforts to pass the Project Glass through the FCC this year. As survey, Google was trying to get FCC's approval last year but there are already several hundred glasses made internally for testing.

VI. CONCLUSION

Although there are many barriers and problems Google still needs to work through before finalizing the consumer version of Glass, the potential benefits make Glass a project worth perusing. It is Lee's expectations "expectation that in three to five years it will actually look unusual and awkward when we view someone holding an object in their hand and looking down at it.

The use of google glass public can reduce the crime and can be identify luggage is safe position.

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