A Review on the Google Glass Technology

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Abstract -- Google Glass is a research and development program by Google to develop an increased reality Head-Mounted Display (HMD). The meant purpose of Project Google Glass would be the hands-free displaying of knowledge presently obtainable to most sensible phone users, and allowing interaction with the web via voice commands. Google glasses are essentially wearable computers that may use constant package that powers humanoid sensible phones and tablets. This review paper is giving some basic ideas concerning GOOGLE GLASSES. All options of Smartphone and having internet facilities and adjustable to our eyes As Google glass is incredibly new and up to date technology, this paper can facilitate to understand little concerning the Google glasses. This technology will be discharged in this year. Google Glass is as art movement a convenience we've seen in recent times, a helpful technology for all types of individuals as well as handicapped/disabled.

Keywords -- 4G, Android, Augmented Reality, Eye Tap, Project Glass, Smart Clothing, Smart Grid, Virtual Reality.

I. INTRODUCTION

Google glass is a research and development program by Google to develop an augmented reality head-mounted display (HMD). It is a part of the Google X Lab and the facility within Google devoted to technological advancements such as driverless cars. The Google X Lab works on futuristic technologies. The purpose of Project Glass products is the hands-free displaying of information currently available for most smart phone users, and allowing interaction with the Internet through natural language voice commands. Its functionality and physical appearance has been compared to Steve Mann's Eye Tap, which was also referred to as "Glass". The operating system used in the glass will be Google's Android. On January 15, 2015, Google announced that it would stop producing the Google Glass prototype but remained committed to the development of the product. In their eyes Project Glass was ready to 'graduate' from Google Labs, the experimental phase of the project. Virtual reality applies to computer-simulated environments that can simulate physical presence in places in the real world and in imaginary worlds. Augmented reality is a view of a physical, real-world environment which is live, direct or indirect. It is related to a general concept called mediated reality, which means a view of reality is modified by a computer.

II. TECHNOLOGIES USED

A. Wearable Computing:

Wearable computers, conjointly referred to as body-borne computers are electronic devices that are worn by the bearer underneath. This technology has been developed for general or special purpose information technologies and media development. Wearable computers are useful for applications that require more complex computational support than just hardware coded logics.

B. Ambient Intelligence:

Ambient Intelligence (AmI) creates electronic environments that are sensitive and responsive to the presence of people. Ambient intelligence is a vision on the future of consumer electronics, telecommunications and computing that was originally developed in the late 1990s for the time frame 2010–2020.

C. Smart Clothing:

Smart clothing is the new generation of clothing which is the combination of new fabric technology and digital technology. Due to the absence of the standardization of technology smart
D. Eye Tap Technology:

An Eye tap may be a device that’s worn ahead of the attention that acts as a camera to record the scene offered to the attention also as a show to superpose a computer-generated representational process on the first scene offered to the attention. This structure permits the user's eye to work as each a monitor and a camera because the Eye tap intakes the globe around it and augments the image the user sees permitting it to overlay computer-generated knowledge over prime of the conventional world the user would understand. Eye Tap is a hard technology to categorize under the three main headers for wearable computing (Constancy, Augmentation and Mediation) for while it is in theory a constancy technology in nature it also has the ability to augment and mediate the reality the user perceives.

E. Smart grid:

Smart grid is a modernized electrical grid that uses analogue or digital information and communications technology to gather and act on information, such as information about the behaviours of suppliers and consumers, in an automated fashion to improve the efficiency, reliability, economics, and sustainability of the production and distribution of electricity. Electronic power conditioning and control of the production and distribution of electricity are important aspects of the smart grid.

F. 4G Technology:

4G, short form of fourth generation, is the fourth generation of mobile telecommunications technology, succeeding 3G and preceding 5G. A 4G system, in addition to the usual voice and other services of 3G, provides mobile broadband Internet access, for example to laptops with wireless modems, to smart phones, and to other mobile devices. Potential and current applications include amended mobile web access, IP telephony, gaming services, high-definition mobile TV, video conferencing, 3D television, and cloud computing.

G. Android operating system:

Android is a Linux-based operating system for mobile devices such as smart phones and tablet computers. It is developed by the Open Handset Alliance led by Google. This platform easily provides a range of benefits for mobile application developers. One of which is the easy to handle and easy to implement feature. Thus, the popularity of android devices has gone up significantly. To benefit from this lot of consumers, huge communities of developers write applications including games, social networking, and business modules, for Android smart phones.

Google Play, formerly Android Market, is the online software store developed by Google for Android devices. There were more than 300,000 apps available for Android. The service allows users to browse and download applications developed with the Android SDK and published through Google, as well as music, magazines, books, movies, and television programs. Users can also purchase hardware, such as Chrome books, Google Nexus-branded mobile devices, Chrome casts, and accessories, through Google Play.

Fig 2: Android Using Google glass

H. Bluetooth:

Google Glass can doubtless have network property through Bluetooth. What this suggests is that Google Glasses can eliminate headphones also as earpieces and instead suppose vibrations that are conducted through the ear bones to permit you to listen to music and different audio content. The advantage of exploitation this technology is that not solely are you able to hear music that you simply ar taking part in through this device, however you’ll be able to conjointly hear conversations that are happening beside you.

I. Wi-Fi:

Google Glass also has a property to connect through the Wi-Fi.

III. DESIGN

A. Video Display:
Google Glass has small video display which is used to display hands free information in pop up form.

B. Camera:

It also has the front facing 5 megapixel video camera which helps to take photos and videos in a glimpse.

C. Speaker:

Google glass is designed to be hands free wearable device which can be used to make or receive calls. Therefore, a speaker is designed by the ear for that.

D. Button:

A button is given at one side of the frame which helps the glass to work with the physical touch input.

E. Microphone:

A mike is additionally place in, which will take the voice commands of the user. This mike is additionally used for having telecom communication.

IV. HOW DOES GOOGLE GLASS WORK

If you still think smart phones and tablets are amazing devices that represent a ‘new’ era of personal technology, you’ll be amazed to learn they could already be well on their way to becoming obsolete, just as they had started making the PC obsolete. In a couple of years, your iPhone 5 or Samsung Galaxy S4 could be viewed with condensation by a new generation of users wearing smart glasses, which can do most things a Smartphone can plus a whole lot more.

If this disruptive smart glasses revolution comes to pass, the most popular smart glasses will undoubtedly be Google Glass, because the world’s leading search engine and Smartphone Software Company is already so far ahead in this game that it’s hard to see anyone catching it. Google has already put hundreds of prototype Google Glasses devices in the hands of testers around the world, and other bits and pieces that will make up the Google Glass ecosystem are already out there in some form. For instance, if you want to get a sense of how Google Glasses will work, try using Google Now on the latest Android devices – it’s a voice-controlled search engine that’s aware of your surroundings and tries to figure out what you need before you actually ask for it.

Powered by voice control – so no keyboards – Google Glass overlay the world you see around you with related information beamed onto your retina by a prism that receives from a tiny projector inside the lens. You see both the physical world and all relevant data associated with it, the kind of data that right now – in the relative stone age of PCs, tablets and smart phones – sits on a separate database somewhere, waiting for you to connect the dots.

With Google Glasses, the technology disappears from in front of you and you get data and applications in the context of what you’re doing or what you’re looking at. Want to know the weather right now? You won’t have to find the weather app and click on it to get a report. Weather apps for Google Glass will know when you’re looking up at the clouds and provide you with an instant weather report. If you’re unsure of what’s at a particular street address, look at the premises and Google Glass will tell you who’s inside, and possibly even show you the indoor plans along with a 360° panorama view if it’s a business.

V. WORKING FUNCTION OF GOOGLE GLASS

Google Glass contains the fundamental bits of any computer, including a CPU, sensors such as GPS, speakers, microphone and battery, to which are added a tiny projector and a prism that redirects the light onto your retina. Each component is neatly embedded in the frame. To keep the device as light as possible, most of the processing will actually take place in the cloud (like it does with Apple’s Siri), so a good mobile broadband signal is essential.

![Fig 3: Structure of Glass](image)

In this image below by artist Martin Missfeldt, you can see the projector and prism in the Google Glass working together. In essence, Google Glass is just a tiny projector embedded into a pair of glasses frames with some tiny computing components to drive the package.
VI. WHAT’S IN IT FOR GOOGLE?

Google Glasses are likely to be a revolution for consumers, but what does Google get out of them? The answer is it probably gets far more benefit from Google Glass than you do. Like Facebook, Google is fundamentally an advertising business that helps advertisers better target the customers they want to reach. The reason that Google and Facebook are valued in the billions of dollars is that through their existing products, from search engines and mobile OSes to social networks, they already know a lot about us (our likes and dislikes, friends and spending habits). They know more than any governmental spy agency, let alone traditional competitors such as newspapers and television. But Google Glasses take the accuracy of this targeting to an entirely new level. When you use Google Glass, you make it possible for Google to build an infinitely more detailed profile of you. The search engine giant will not only know what you’ve been searching for, but where you’ve been and even what you’ve been looking at, and lots, lots more. It will be able to provide this to advertisers, regardless of whether you’re an unnamed user in the data. With Google Glass, the era of privacy is not only at an end, it’s about to be nuked. And it’s not just Google going this way. Facebook’s new Home application, which takes over your Android phone, aims to do exactly the same thing: give Facebook advertisers much better targeted customers.

VII. ALTERNATIVES TO GOOGLE GLASS

Google Glass isn’t the only game in town. In fact, Apple and Microsoft are also rumoured to be working on smart glasses and several smaller niche players are already well down the track with more advanced technologies, some of which deliver information directly your eyes.

VIII. VOICE COMMANDS

<table>
<thead>
<tr>
<th>FEATURE</th>
<th>VOICE ACTIVATION TEXT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Record video</td>
<td>&quot;ok, glass, record a video.&quot;</td>
</tr>
<tr>
<td>Take picture</td>
<td>&quot;ok, glass, take a picture&quot;</td>
</tr>
<tr>
<td>Use Google Now</td>
<td>&quot;ok, glass, [question].&quot;</td>
</tr>
<tr>
<td>Start Google+ hangout</td>
<td>&quot;ok, glass, hang out with [person/circle].&quot;</td>
</tr>
<tr>
<td>Search</td>
<td>&quot;ok, glass, google [search query].&quot;</td>
</tr>
<tr>
<td>Search photos</td>
<td>&quot;ok, glass, google photos of [search query].&quot;</td>
</tr>
<tr>
<td>Translate</td>
<td>&quot;ok, glass, say [text] in [language].&quot;</td>
</tr>
<tr>
<td>Give directions</td>
<td>&quot;ok, glass, give directions to [place].&quot;</td>
</tr>
<tr>
<td>Send message</td>
<td>&quot;ok, glass, send a message to [name].&quot;</td>
</tr>
<tr>
<td>Display weather</td>
<td>&quot;ok, glass, how is the weather in [location].&quot;</td>
</tr>
<tr>
<td>Give flight details</td>
<td>&quot;ok, glass, when does flight [flight number] depart from [airport]?&quot;</td>
</tr>
</tbody>
</table>

IX. ANALYSIS OF PROBLEM:

Nowadays, most of people have a Smartphone, a tablet, a laptop, or other device. So it can be said that the web is a powerful tool in society for many uses such as informative, social, as well as entertaining. Therefore, with the introduction of Google Glass, a new idea of internet usage has arrived. While opponents of this revolutionary product are giving reasons such a privacy concerns as well as social faux pass, the truth is that these glasses are quite beneficial to the society in numerous ways, including public safety, social sharing, innovative educational as well as research methodologies, and improved communication.

The public can become an important factor in reducing crimes with the use of Google Glass. Glass is fast and easy because it is hands free. If someone becomes a witness to a crime or is about
to become a victim of a crime, a quick activation of Google Glass can launch the camera and provide assurance that the culprit will be held responsible. Take 26/11 attack, for example. The case of 26/11 would have been solved faster if someone had been wearing Google Glasses. Video would have been captured of the terrorists placing the bomb or implicating themselves in some other way. Thus, the terror of people, afterwards, could have been decreased. Also, it can be a very helpful product for medical students. The senior doctors can wear glass during an operation and the whole procedure can be watched by students outside. This is recently implemented by a Doctor in Chennai. In terms of increased public safety, Google's new product can be a revolutionary savior.

As with any new technology, there are bugs to be worked out and changes to be made. People’s privacy will be an issue, but Google Glass is definitely not dangerous and harmful to society. As a fast speed, forward moving culture, we can get a lot of benefits from such a futuristic product.

X. BENEFITS

A. Record videos, take pictures

Just say the word and Google Glass will take a picture or record a video – you will never have to touch the hardware. The photos and videos will be stored on the 4GB flash memory of the device, and can also be shared on social networking websites or emailed.

B. Show messages

Google Glass will show you text messages as well as emails you receive and allow you to reply to them via voice commands.

C. Find information

If you are in the habit of Googling things a lot, you will find that your task has been made easier by the new Glass. You simply need to ask a question and the device will pull the answer from the internet. For example, you can ask when Taj Mahal was built or to give you a few photographs of the monument and the device will provide appropriate replies on the small screen in front of your eye.

D. Show maps

The widely used Google Maps are integrated into Glass, so that users will be able to chart the course of their journey or look up locations or establishments via voice commands.

E. Live video sharing

Google Glass can show the world what you are seeing – live! If you are attending a family function, your child’s school play or a concert, you can share the feed with your friends and family in real-time and make them a part of the experience.

F. Integrates Google Now

Google Now, the digital voice assistant from the search giant, has been integrated in this device. It will keep track of your daily habits, such as when you leave for office or the route you take. It will give you alternate routes if there is traffic on the way or give you weather updates periodically, among various other functions.

G. Translate

This is a neat feature that may come in handy when you travel abroad. You simply need to ask Google Glass to translate a phrase or sentence from one language to another and it will speak that out.

XI. LIMITATIONS:

*It can be easily broken or damaged. Though Google is trying to make it as modest as possible, it is extremely breakable.
*Glass shows data in front of user’s eyes so it will be a tough experience for him/her because the/she will focus on data and will possibly miss the surroundings.
*Users wearing spectacles won’t be able to wear Glass.
*Privacy of people may be violated with Glass.

XII. CONCLUSION

Google glasses are wearable computers which use the familiar technologies that bring the sophistication and ease of communication and information access even for the physically challenged class of people who cannot use palmtops and mobiles.

XIII. FUTURE SCOPE OF GOOGLE GLASS

With the invention of Google Glass, we have got a futuristic a gadget. Presently it is in limited scope, but Google believes its future is bright and the device itself is “incredibly compelling”. Google is trying their best efforts to pass the Project Glass through the FCC this year. As per reports, Google is trying to get FCC’s approval this year but there are already several hundred glasses made internally for testing.
Fig 5: Communication in Google Glass

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