

An Overview on Google Glass

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Abstract:

Google has created a computer equipped with an optical head-mounted display, known as Project Glass. This innovative device presents information in a hands-free format and allows interaction with the internet using natural language voice commands. Glass integrates features of both virtual reality and augmented reality. It incorporates advanced technologies such as 4G connectivity, an Android operating system, eye tap functionality, smart clothing, and wearable computing.

Keywords — 4G technology, Android system, Augmented reality, Eye tap, Virtual reality, Smart grid technology, Wearable computer.

I. INTRODUCTION

Google Glass is described as a program aimed at developing an optical head-mounted device featuring a wearable computer. Announced by Google in April 2012, this innovation leverages head-mounted display technology. The device was developed at Google's X laboratory and became available for purchase in the United States on April 15, 2013, for a limited period. Its functionality and design have drawn comparisons to Steve Mann's EyeTap, which is also referred to as "Glass."

The device operates on Google's Android system and combines two key features: virtual reality and augmented reality.

a) Virtual Reality (VR): VR involves computer-simulated environments that can mimic physical presence in both real-world and imaginary settings. **Augmented Reality (AR):** AR provides a live, direct or indirect view of a physical, real-world environment enhanced by digital overlays.

II. TECHNOLOGIES USED

A. Wearable Computing

Wearable computing refers to electronic devices designed to be worn on, under, or over clothing, often referred to as body-worn computers. This technology is particularly beneficial for applications requiring intensive computations. It significantly reduces the gap between action and intention, as demonstrated by features like Google's predictive search, which suggests options after typing just a few initial letters. Key attributes of wearable computing include consistency and multitasking capabilities.

B. 4G Technology

4G technology represents the fourth generation of mobile communication systems. It delivers ultra-broadband internet access, supporting a range of devices such as laptops, wireless modems, and smartphones. Other phones, voice communication, and 3G services are supported for mobile connectivity. As the successor to third-generation technology, 4G offers a data speed of up to 100 Mbps. It also ensures enhanced data security for mobile devices and computers.

C. Android Operating System

Android is a mobile operating system built on a Linux-based platform and developed by Google. As an open-

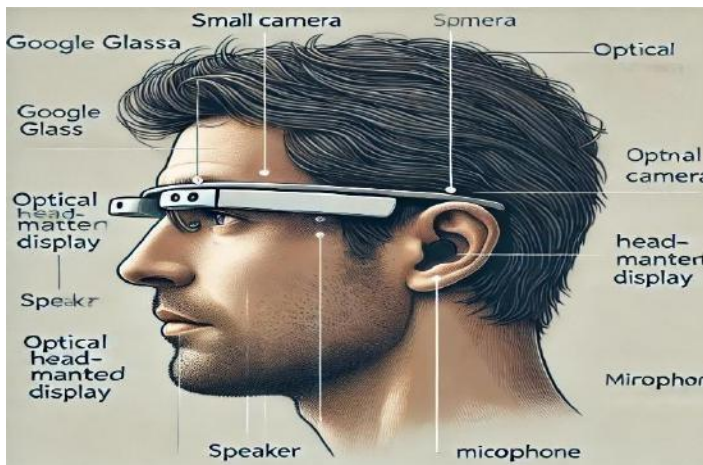
source system, its code is released under the Apache License. Today, most smartphones are designed to run on the Android operating system. Android has undergone multiple version updates, including Astro, Cupcake, Donut, Eclair, Froyo, Gingerbread, Honeycomb, Ice Cream Sandwich, Jellybean, and the latest version, KitKat.

D. EyeTap

EyeTap is a head-mounted display that functions as a camera to record images and scenes viewed by the user. The device reflects the visual scene into a digital camera, captures the image, and transmits it to a computer. Essentially, EyeTap simplifies image and scene capture by using the user's eye as both a monitor and a camera.

E. Smart Grid Technology

A smart grid is an electrical grid that integrates communication technology to collect and act on information, such as the behaviors of suppliers and consumers, in an automated manner. This system enhances the efficiency, reliability, economics, and sustainability of electricity production and distribution.



III. HOW IT WORKS

Google Glass incorporates a compact design featuring small chips, a camera, video display, battery, and speaker. This hands-free display operates on the Android platform and connects to a smartphone via Wi-Fi or Bluetooth. The small chip camera captures images and scenes in the user's line of sight, while the video display presents information in a pop-up format.

- (I) The working process of Google Glass involves the following steps:
- (II) The mini projector within the Glass projects an image.
- (III) The projected image is redirected to the user's eye.
- (IV) Information is displayed within the wearer's field of vision.
- (V) If the user wishes to share data, such as photos or videos of what they see, it can be done using the built-in camera. The device can connect to a smartphone to facilitate data transfer between devices.

Voice Commands

Below is a list of voice commands that can be used to operate Google Glass:

FeatureVoice Activation Command RecordVideo"OK,Glass,recordavideo" Take Picture "OK, Glass, take a picture"

Use Google Now "OK, Glass, [question]" SearchPhoto"OK,Glass,Googlephotoof[query]"Translation "OK, Glass, say[text]
in[language]"

Get Directions"OK, Glass, give directions to [place]"

SendMessages"OK,Glass,sendmessageto[name]""OK, Glass, [send] [name] that [message]"

"OK,Glass,send[message]to [name]"



IV. DESIGN

A. VideoDisplay:

It features a compact video display screen that provides hands-free information in a pop-up format.

B. Camera:

The device is equipped with a front-facing video camera that captures both photos and videos.

C. Speaker:

Google Glass is designed as a hands-free wearable device, capable of making and receiving calls. As a result, a speaker is integrated near the ear.

D. Button:

A single button is located on the side of the frame to allow for physical input and control.

E. Microphone:

A built-in microphone captures the user's voice commands. This microphone also facilitates telecommunication functions.

V. BENEFITS AND LIMITATIONS

Benefits:

Easy to wear and use.

Google Glass is responsive and adapts to the presence of people.

It provides quick access to maps, videos, chats, documents, and more.

A trendy choice for fashion enthusiasts, combining style with innovative technology.

A valuable tool for individuals with disabilities or impairments.

Limitations:

Users who wear spectacles may not be able to use Google Glass.

The privacy of individuals could be compromised with Google Glass.

The data display in front of the user's eyes may make the experience uncomfortable for some users.

VI. APPLICATIONS

A. Make Calls via Glass:

Google Glass allows you to make calls simply by speaking to the device. To call a friend, just say, "OK, Glass, call my friend Karen," and it will initiate the call. It's that simple.

B. Translation Made Easy, Practical, and Fun:

Imagine being able to understand and translate street signs in foreign languages, recognize languages being spoken around you, and retrieve relevant information just by looking at objects with Google Glass. This is the power of Glass, making the world feel smaller and more connected.

C. Capture Photos with "Take Picture":

Google Glass responds to voice commands like "take a picture" and instantly captures a snapshot of whatever you're looking at. The photos are automatically uploaded to your Google+ account in real-time, offering a great way to capture moments.

D. Record Hands-Free with Google Glass:

With Google Glass, you can record hands-free in much the same way as taking snapshots. Simply tell Glass to record what you're doing or looking at. What's even more impressive is the ability to share what you're seeing in real-time via Google Hangouts.

E. Google Glass Can Help You Find Your Way:

If you ever get lost, Google Glass can come to your rescue by providing directions to your destination from wherever you are.

VII. CONCLUSION

Google Glass is a wearable computer that integrates familiar technologies, offering a seamless way to communicate and access information. It proves especially beneficial for individuals with physical disabilities, providing an alternative for those who may struggle with using palmtops and mobile phones.

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