

Google Glass: A New Era for Wearable Technology

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Abstract: *This research study provides a comprehensive analysis of Google Glass, a groundbreaking wearable technology introduced by Google Inc. in 2012. Designed as a head-mounted display integrating augmented reality (AR), Google Glass aims to seamlessly blend digital information with the user's physical environment. The report traces the development of Google Glass from its inception, exploring its technical specifications, features, and functionalities. It delves into various applications across sectors such as healthcare, manufacturing, and education, highlighting its impact and use cases. The report also examines the market reception, including adoption challenges and limitations, such as privacy concerns and technical constraints. Additionally, it provides case studies that illustrate the practical implementation and effectiveness of Google Glass in different contexts. Finally, the report discusses future prospects, including technological advancements and potential innovations in AR and wearable technology. Overall, Google Glass represents a significant step forward in wearable computing, despite facing both market and technical hurdles. The report concludes by reflecting on its current status and future potential in transforming user interaction with digital content.*

Keywords: Google Glass, Variable Computer, Eye Tap, Mixed Reality Experience.

I. INTRODUCTION

1.1 Virtual reality (VR):

Is a simulated experience that employs 3D near-eye displays and pose tracking to give the user an immersive feel of a virtual world. Applications of virtual reality include entertainment (particularly video games), education (such as medical, safety or military training) and business (such as virtual meetings). VR is one of the key technologies in the reality-virtuality continuum. As such, it is different from other digital visualization solutions, such as augmented virtuality and augmented reality.



Figure 1: Virtual Reality

Currently, standard virtual reality systems use either virtual reality headsets or multi-projected environments to generate some realistic images, sounds and other sensations that simulate a user's physical presence in a virtual environment. A person using virtual reality equipment is able to look around the artificial world, move around in it, and interact with virtual features or items. The effect is commonly created by VR headsets consisting of a head-mounted display with a small screen in front of the eyes, but can also be created through specially designed rooms with multiple large screens. Virtual reality typically incorporates auditory and video feedback, but may also allow other types of sensory and force feedback through haptic technology.

1.2 Augmented Reality (AR):

Augmented reality is an interactive experience that combines the real world and computer-generated 3D content. The content can span multiple sensory modalities, including visual, auditory, haptic, somatosensory and olfactory. [1] AR can be defined as a system that incorporates three basic features: a combination of real and virtual worlds, real-time interaction, and accurate 3D registration of virtual and real objects. [2] The overlaid sensory information can be constructive (i.e. additive to the natural environment), or destructive (i.e. masking of the natural environment). [3] As such, it is one of the key technologies in the reality-virtuality continuum. [4]

This experience is seamlessly interwoven with the physical world such that it is perceived as an immersive aspect of the real environment. [3] In this way, augmented reality alters one's ongoing perception of a real-world environment, whereas virtual reality completely replaces the user's real-world environment with a simulated one. [5]



Figure 2: Augmented Reality

1.3. Project Glass:

Google Glass, or simply Glass, is a discontinued brand of smart glasses developed by Google's X Development (formerly Google X), with a mission of producing a ubiquitous computer. Google Glass displays information to the wearer using a head-up display. Wearers communicate with the Internet via natural language voice commands.

Google started selling a prototype of Google Glass to qualified "Glass Explorers" in the US on April 15, 2013, for a limited period for \$1,500, before it became available to the public on May 15, 2014. It has an integrated 5 megapixel still/720p video camera. The headset received a great deal of criticism amid concerns that its use could violate existing privacy laws.

On January 15, 2015, Google announced that it would stop producing the Google Glass prototype. The prototype was succeeded by two Enterprise Editions, whose sales were suspended on March 15, 2023.

Development:

Google Glass was developed by Google X, the facility within Google devoted to technological advancements such as driverless cars.

The Google Glass prototype resembled standard eyeglasses with the lens replaced by a head-up display. In mid-2011, Google engineered a prototype that weighed 8 pounds (3.6 kg); by 2013 they were lighter than the average pair of sunglasses. [1]

A Glass prototype seen at Google I/O in June 2012

The product was publicly announced in April 2012. Sergey Brin wore a prototype of the Glass to an April 5, 2012, Foundation Fighting Blindness event in San

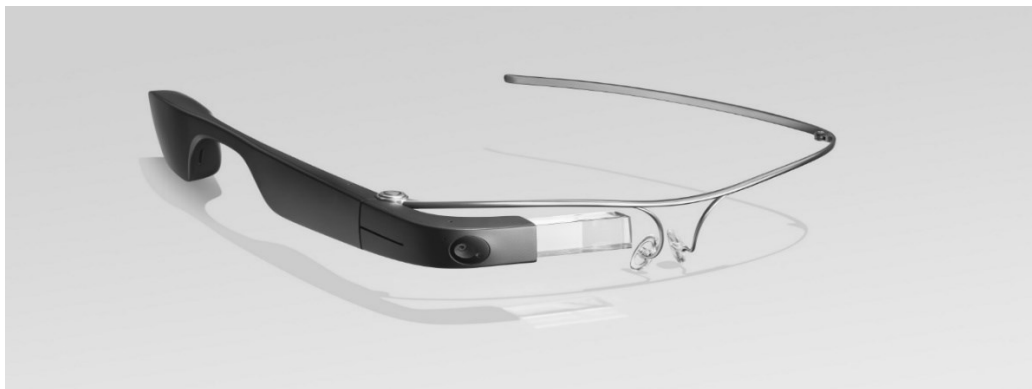


Figure 3: Google Glass

Release Date:

In early 2013, interested potential Glass users were invited to use a Twitter message, with hashtag #IfIHadGlass, to qualify as an early user of the product. The qualifiers, dubbed "Glass Explorers" and numbering 8,000 individuals, were notified in March 2013, and were later invited to pay \$1,500 and visit a Google office in Los Angeles, New York or San Francisco, to pick up their unit following "fitting" and training from Google Glass guides. On May 13, 2014, Google announced a move to a "more open beta", via its Google Plus page.

In February 2015, The New York Times reported that Google Glass was being redesigned by former Apple executive Tony Fadell, and that it would not be released until he deemed it to be "perfect".

In July 2017, it was announced that the second iteration, the Google Glass Enterprise Edition, would be released in the US for companies such as Boeing. Google Glass Enterprise Edition has already been successfully used by Dr. Ned Sahin to help children with autism learn social skills.



In May 2019, Google announced the Google Glass Enterprise Edition 2. Google also announced a partnership with Smith Optics to develop Glass-compatible safety frames

II. SCOPE

2.1 Medical Field:

Doctors can use Google Glass to live stream patient check-ups, which can help them spend more time on consultation and diagnosis. Medical students can also use Google Glass to witness medical examinations and surgeries. On above fig. we can see how Google glass can be use full in medical field we can se by using the google glass there is augmented reality created by glass which is use full or helpful for doctor during operation or surgery.

2.2 Manufacturing and Industries:

Manufacturing: Google Glass can be used to display instructions to workers on assembly lines and other areas where they need help completing orders and assembling part.

2.3 Education and Training:

Google glass is vary use full in education field we know that their many features provide by the Google Glass like take picture, record video or searching, it also proved a immediate translation. Also it can create virtual and augmented reality which can be use full to understand the particular topic properly.

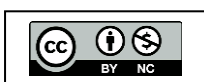
III. LITERATURE REVIEW

Google Glass, developed by Google X, was initially introduced as a wearable augmented reality (AR) device in 2013, aiming to revolutionize how people interact with technology in their daily lives. Although it faced challenges and ultimately did not achieve mainstream consumer adoption, Google Glass and similar wearable technologies continue to shape discussions in both academic and industry sectors. This literature review will explore the evolution, applications, challenges, and future potential of Google Glass, drawing from various academic articles, reports, and studies.

IV. FUNCTIONALITY

4.1 User Interaction:

- **Voice Commands:** The primary mode of interaction is voice control. Users initiate commands with "OK Glass," followed by instructions like "show weather" or "record a video." This hands-free approach allows for seamless integration into daily activities.
- **Touchpad:** The touchpad on the side of the Glass offers an alternative to voice commands. Swiping forwards or backwards navigates through the interface, while tapping selects options or executes commands.
- **Head Movements:** While not a primary interaction method, users can control some aspects of Glass through head movements, such as adjusting the angle of the display.
- **Gesture Recognition:** In addition to the touchpad, Google Glass can recognize certain gestures and movements for controlling features or applications.



V. APPLICATIONS

5.1 Medical Field:

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VI. CONCLUSION

In conclusion, the exploration of Google Glass reveals its transformative potential in various fields, including healthcare, education, and industry. While the device faced challenges such as privacy concerns, user acceptance, and functionality limitations, its innovative features paved the way for advancements in augmented reality and wearable technology. Future iterations of smart glasses could benefit from enhanced design, improved battery life, and better integration with other technologies. As the landscape of wearable devices continues to evolve, Google Glass serves as a pivotal case study, illustrating both the possibilities and challenges of integrating cutting-edge technology into everyday life. Continued research and development in this area will be crucial for realizing the full potential of augmented reality applications.

Google Glass represents a significant milestone in the evolution of wearable technology and augmented reality. Despite facing challenges and limitations, its impact on various industries demonstrates its potential for enhancing productivity and user interaction.

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