Virtual Reality Framework for Smartphone

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Abstract- Running virtual smartphones in the cloud is made possible by the Virtual Smart Phone, a free and open source platform. By using a user's real phone as a terminal for remotely accessing a virtual smartphone running off-the-shelf smartphone app, it helps address many of the issues with secure containers and "bring your own device." The safe operation of these virtual devices in a data centre then offers a secure fortress for accessing private apps and information.

Keywords-Virtual Smart Phone, Virtual Reality.

INTRODUCTION

Smartphones are largely to blame for the fast expanding phenomena known as virtual reality. Smartphones are supplanting dedicated hardware for virtual reality, which was first implemented. We will quickly examine how smartphones can influence the direction of virtual reality in this post. Virtual reality can alter how people live, work, and play using smartphones as a tool. At the moment, virtual reality is all the rage in the world of innovation. A few products, such the Oculus Rift, HTC Vive, and Microsoft Holo lens, have achieved remarkable success and have sold a significant number of their products as of now. There would never be a better moment to create an Android VR application after this feat. Although there are several VR Android applications that are currently available, the proposed application is an exhibition that is focused on showcasing the framework for virtual Smart Phones.

The development of the Virtual Smart Phone has been brought to the fore in the early 2020s despite the fact that extended-reality gaming and social spaces have been around for decades. Technological advancements and societal changes brought on by the COVID-19 pandemic have sparked tens of billions of dollars in new investments and prompted predictions that the Virtual Smart Phone may be "the future of the internet" or "the next internet battleground." The smartphone, namely its screen, has evolved into the portal to the online world. Currently, our efforts are concentrated on developing a framework that enables tracking of your smartphone, tablet, or smart watch in virtual reality so that you may use its functions and actual physical motion to provide input, control, and feedback. Smartphones have a variety of functions that could be beneficial, including touch input, vibration, proximity sensors, and audio output. It is reasonable to assume that as time goes on, smartphones will gain even more features, allowing for more flexible use in VR. The fact that individuals are attached to and familiar with their cell phones is another significant feature that encourages the use of smartphones in virtual reality. Our method presently focuses on smartphones, but in the future, we see possibilities for a wider variety of smart daily objects.

LITERATURE REVIEW

Recent developments in mobile computing hardware and software have made it possible to create mobile virtual environments. This fresh pattern has formed as a result of the fusion of wearable computing, wireless networking, and mobile virtual reality interfaces [1]. This article offers a survey of various mobile technologies that can be used to create virtual reality applications that run on mobile devices.

The use of smartphones is increasing not only globally but also in emerging economies. Virtual reality can be useful in emerging countries in various ways, but education is its main application. In the event that a procedure is captured from the first person perspective, Virtual Smart Phone addresses mirror neurons [2]. People can quickly and accurately learn new movements when watching such film in an immersive virtual reality environment. (Internet) usage is growing. Larger growing economies like

China, Brazil, and Malaysia are responsible for a major portion of this increase (Pew Research Centre, 2016). Virtual reality is becoming more and more accessible thanks to smartphones [3]. It has various advantages, including lower costs, greater mobility, and the capacity to provide additional facilities in developing nations.

Pew Research Centre and Elson University's Imagining the Internet Centre contacted hundreds of technology specialists to get their opinions on extended reality in response to the increased interest and investment in the field. A query requesting predictions regarding the trajectory and impact of the Virtual Smart Phone by 2040 received open-ended replies from 624 technology innovators, developers, business and policy leaders, researchers, and activists. The findings of this informal survey were as follows:

- 54% of the experts surveyed predicted that by 2040, a half billion or more individuals around the world will have access to a considerably more sophisticated, completely immersive, and functional virtual smart phone.
- 46% of respondents said that by 2040, a half billion or more individuals worldwide won't have access to a far more advanced, fully immersive, and functional virtual smart phone.

In an open-ended question that invited their opinions regarding both the positive and negative features of the digital world to come, these experts were asked to elaborate on their multiple-choice responses [4]. These written remarks revealed two main elements. First, a sizable portion of these experts asserted that, rather than the more completely immersive virtual reality worlds many people currently refer to as "the Virtual Smart Phone," the adoption of extended reality in people's daily lives by 2040 will be focused on augmented reality and mixed reality capabilities. Second, they cautioned that both the positive and negative aspects of human nature could be significantly amplified in these new environments [22]. They concerned about the future freedom of humans to go beyond their natural abilities, and they concentrated their worries on how those in charge of these systems would be able to reroute, constrain, or obstruct human agency and stifle people's ability to self-actualize through the exercise of free will. Given that the majority of the components needed to transform your phone into a virtual reality wonderland are already present, the focus on smartphone VR is not entirely unexpected. More importantly, your next smartphone will likely have a better screen and be extremely powerful [5].

DATA SET AND MODEL DISCRIPTION

A free and open source program called Zither Virtual Smart Phone allows users to run virtual handsets in the cloud [6]. By using a user's real phone as a terminal for remotely accessing a virtual smartphone running off-the-shelf smartphone app, it helps address many of the issues with secure containers and "bring your own device." The safe operation of these virtual devices in a data centre then offers a secure fortress for accessing private apps and information [8]. The foundation of the platform is an OS image that we have tailored for use on top of virtualization and cloud platforms like KVM and Open Stack, which is based on the Android Open Source Project [9]. Front-end client software for iOS and Android that can access the virtual device's remote desktop is also offered. SVMP enables users to interact with remote programs intuitively using native mobile inputs like multi-touch, location, and sensors, in contrast to typical remote desktop apps geared for keyboard and mouse interaction. This all functions flawlessly over 4G and 5G cellular networks thanks to technology [10]. On top of current virtualization platforms and public/private clouds like Open Stack, it is intended to be quickly deployed as an application.

ARCHITECTURE

The management of the life cycle of the virtual smartphone devices mainly relies on cloud APIs [12]. This enables us to easily adapt to a wide range of various deployment environments. On a broad scale, it resembles a conventional thin-client system focused on the desktop. It also features components that are similar to voice and video over IP services like XMPP or SIP because we leverage a number of those technologies via WebTV to transmit the video and audio data from the remote desktop [20]. The SVMP Overseer, which manages authentication, database management, and virtual machine deployment, and the client application on users' smartphones or tablets, are the major components.

• The SVMP Server to which the clients connect
• The per-user set of permanent data volumes and the virtual device's "gold image"

• The cloud controller that manages the underlying cloud's API.

USES

There are many potential applications for. We created it and made it available here so that it may serve as the basis for an entirely new class of mobile capabilities [11]. We are forward to learn what creative concepts the community comes up with using these building blocks. Here are a few that came to mind:

- Keep sensitive information off of smartphones that are easily lost or stolen.
- Segment different classes of data and workloads into isolated virtual environments (either business apps on a personal phone or personal apps on a business phone).
- Transferring costly security monitoring and analysis from devices with limited resources.
- Better network and data use visibility.
- Streaming backup and quick reconstitution.
- Application testing, portability, and delivery;

FEATURES

- Client applications for Android and iOS, an AOSP-based virtual smartphone VM, and rich input forwarding.
- Full multi-touch.
- Screen rotation.
- Sensor forwarding.
- GPS position.
- Remote app integration.
- Cross-network intent broadcasting.
- Notification push and transparent "single-app" mode (coming soon) are some of the features offered by this device.

PLATFORM REQUIREMENT

It tested to run on the following platforms.

Client

- Android 4.0+
- iOS 7.1

Server

- Node.js 0.10.2+
- Mongo DB 2.0+

Virtual Device VM

- Linux KVM
- Virtual Box
- VMware ESX, Workstation, Fusion, & Player

Public & Private Clouds

- Open Stack Havana (Essex or newer should work, but not tested recently)
- Amazon EC2.

FUTURE WORK

In recent years, virtual reality (VR) has gained popularity as a technology that enables users to fully immerse themselves in virtual worlds and experiences. The interest in creating virtual reality frameworks expressly for smartphones is expanding as smartphone usage increases. These frameworks allow consumers to use their cell phones to experience VR, making it more widely available and reasonably priced [26]. There are a number of things to take into account while predicting the future of smartphone VR frameworks. First, the VR experience will continue to be improved by advances in smartphone technology. More complicated and lifelike VR experiences will be possible as smartphones grow in power and capability. Developers will now have more opportunities to produce immersive and captivating smartphone VR content. Second, the future of smartphone VR frameworks will be greatly influenced by the affordability of VR headsets for mobile devices. The affordability of VR will rise as more businesses create low-cost, smartphone-compatible VR headsets. since a result, there will be a bigger demand for smartphone VR frameworks since more people will be able to use VR on their smartphones. Thirdly, the future of smartphone VR frameworks will be impacted by the development of new technologies, such as 5G networks. Users will be able to stream high-quality VR material directly to their smartphones thanks to the quicker and more dependable internet connections offered by 5G networks. This will make smartphone VR even more accessible and practical by eliminating the need for substantial downloads and storage space [27]. In conclusion, smartphone VR frameworks appear to have a bright future. Smartphone VR is anticipated to grow in popularity over the next few years thanks to improvements in smartphone technology, the availability of inexpensive VR gear, and the development of new technologies. Developers have a wide range of options, from employing specialized frameworks like Google Cardboard or Samsung Gear VR to more basic frameworks like Unity3D.

CONCLUSION

Understanding the differences between virtual, augmented, and mixed reality, which will form the basis of the move away from conventional screens, is becoming more and more crucial as customers seek out more immersive experiences:

With virtual reality (VR), users are immersed in a wholly digital environment, whereas with augmented reality (AR), digital elements are superimposed over a real-world scene (e.g., Pokémon Go). Mixed reality (MR) combines the two and enables simultaneous interaction with both physical and digital elements.

Our smartphones will soon be replaced by a new mobile computing platform that is already based on the same fundamental technology. Mixed reality has the potential to revolutionize how consumers view content by building on AR/VR technologies. Your next pair of glasses might also serve as a smartphone alternative for your eyes, correcting your eyesight. While some early adopters may not succeed, mixed reality is an incredibly intriguing idea due to the enormous benefits of a computing surface that isn't constrained by a phone or computer screen and that doesn't require typing to input commands.

By the end of this year, a few early MR products for consumers are likely to appear, much like what we saw in the early days of the PC business and later in the mobile sector. Hole Lens is expected to join later this year, and Magic Leap has already started the race. Mixed reality is anticipated to surpass the existing VR/AR markets and assume the lead as the standard computer technology during the next ten to fifteen years. For a smooth and immersive user experience, MR will rely on its hardware platform, fusing powerful voice recognition, virtual assistants, and predictive AI.

The adoption of new mobile computing platforms will ultimately be fuelled by the confluence of these three factors: MR technology, voice-activated virtual assistants, and anticipatory AI. This will allow us to take mobile computing off of our displays and further integrate it into our daily lives.

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