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An Overview of Virtual Reality: Devices, Application, Challenges and Prospects

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ABSTRACT Virtual Reality (VR) technology has been developing rapidly and gaining attention in recent years. According to Fortune, the global VR market size is expected to grow from $25.11 billion in 2023 to $165.91 billion by 2030. Meanwhile, VR devices are flourishing, such as Pico, Oculus Quest, Apple Vision Pro, and so on. VR technology is gradually becoming integrated into people's daily lives, finding applications across various fields, including industrial training, education, healthcare and aerospace. For instance, the integration of VR environments with affective computing facilitates patient rehabilitation through Robot-Assisted Gait Therapy (RAGT). However, the widespread adoption of VR also introduces challenges, like privacy leaks and security vulnerabilities in VR headset applications, indicating the need for stricter regulation of VR apps. In this paper, we present an overview of VR at first. Then the common hardware devices of VR headsets are introduced, followed by a discussion of typical application scenarios and value of VR. Next, we explore the challenges and issues that VR has encountered in recent years. Finally, we examines the prospects for the future development of VR technology.

INDEX TERMS Virtual Reality, Metaverse

I. INTRODUCTION

Virtual reality (VR) is a computer-based technology for simulating the effects (visual, auditory, tactile) of an artificially generated environment on the human senses, giving the user the impression that he is "immersed" in reality [1].

The rest of this paper is organized as follows. Section A introduces the common hardware devices of VR headsets. Section B discusses typical application scenarios and value of VR. Section C explores the challenges and issues that VR has encountered in recent years. Section D examines the prospects for the future development of VR technology and Section E concludes the paper.

II. HARDWARE DEVICES OF VR HEADSETS

III. APPLICATION SCENARIOS AND VALUES OF VR

IV. CHALLENGES AND CRISES FACING VR

V. FUTURE DEVELOPMENT OF VR TECHNOLOGY

VI. CONCLUSION

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