Chapter 1
AI and Virtual Reality in the Metaverse: Future Possibilities

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ABSTRACT

This chapter explores the revolutionary intersection of artificial intelligence (AI) and virtual reality (VR) in the emergent paradigm of the Metaverse and emphasizes the degree to which both of these technologies are redefining the future of gaming and immersive entertainment. The chapter takes an introspective look at the eradication of AI needed for dynamic world building, the use of non-player character autonomy, emotionally attuned spaces, and an adaptive narrative system which respond to a real-time user interaction. As such it shows AI's a priori position in the transformation of ever-adapting self-adaptive digital environments where boundaries between human agency and machine autonomy gradually disappear. Critical issues are systematically addressed. Finally, the chapter traces out some ways that futuristic pathways involving decentralized AI governance, cognitive augmentation and inhuman virtual civilizations.

1. INTRODUCTION

The Metaverse has become an environment in which people can interact digitally and be immersed digitally, as well as experience a social presence. Like a virtual playground or entertainment platform, the Metaverse necessitates a total disruption in how humans relate to digital systems; and therefore destroys the traditional

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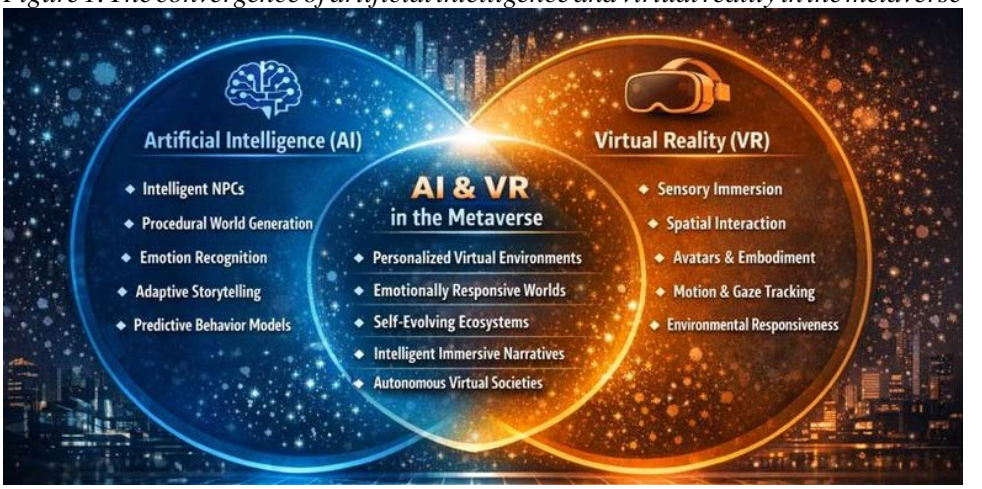
constructs of identity, reality and agency that exist in the physical world. A very important part of this transformation is the convergence of Virtual Reality (VR) and Artificial Intelligence (AI), the interdependence of these technologies will lead to the creation of borderless, interactive, virtual realities (Fan et al. 2024).

The virtual reality experience gives us both the sense and space of a digital world through headsets, motion tracking and haptic feedback that bring user experiences to an elevated level at which a user may have difficulty in distinguishing between a digital world and a real-world experience. Artificial intelligence becomes the smart center of these worlds due to it being able to quickly respond to what the user does and how they can feel; how old the user is; and by its ability to learn and change. Together, artificial intelligence and virtual reality make a fundamental change to the nature of human interaction through the way each traditionally has been used as an enhancement for graphics and/or gameplay (Bhattacharya & Singla, 2024).

This Chapter places Metaverse at the nexus of developing technologies combining those that will be capable of creating dynamic, adaptable and personalized virtual space(s) through the use of artificial intelligence (AI), and Virtual Reality (VR) as a means for experiencing embodiment within virtual social environments. Such technologies will enable the creation of hitherto science fiction (sf) phenomena in the form of AI generated computer automatons or NPCs, self-altering virtual world(s); and environments capable of processing, reflecting and reacting in real time to the emotions of the user.

Figure 1. The convergence of artificial intelligence and virtual reality in the metaverse



The evolution of new and improved decentralized immersive systems – including VRChat, Roblox, Meta's Horizon Worlds and others that are developing similarly –

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