ACCELERATING THE METAVERSE TRANSFORMATION WITH ARTIFICIAL INTELLIGENCE

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The metaverse, a collective virtual shared space encompassing 3D worlds and virtual environments, is rapidly evolving as a new frontier of human interaction and digital experiences. The manual creation of 3D content within the metaverse poses significant challenges in terms of time, cost, and scalability. In this article, an innovative AI-based system is presented, designed to address these challenges and accelerate the transformation of the metaverse.

Research into the current state of the metaverse has highlighted several challenges, particularly concerning the manual labor involved in creating 3D objects and scenes. This manual process not only incurs high costs but also leads to time inefficiencies, making it difficult to meet the growing demand for new 3D content within virtual environments. Studies such as [1] have delved into the complexities of content creation in the metaverse, emphasizing the need for more efficient and cost-effective approaches.

The proposed AI-based system aims to accelerate the creation of 3D worlds within the metaverse by leveraging state-of-the-art AI technologies. The system operates as a pipeline of AI models, including Large Language Models (LLMs), AI CLIP search, 3D object generation models, and 2D textures generation models. This integrated approach streamlines the content creation process and enhances efficiency.

The system begins with the user providing a text prompt describing the desired virtual world. This text prompt serves as the input data that guides the AI models in generating 3D objects, textures, and scenes. The text prompt includes details such as the layout of the virtual environment, specific objects to be included, their coordinates, colors, and any other relevant specifications.

The text prompt is processed by Large Language Models (LLMs) such as GPT-3.5, which have been fine-tuned for understanding and generating natural language descriptions of virtual environments. The LLM interprets the text prompt and generates a list of potential 3D objects, including their attributes (e.g., shape, size, color).

The performance of the AI-based system were evaluated in terms of cost and time efficiency. Comparative analyses are conducted between manual content creation methods and the AI-driven approach. Metrics such as labor hours, operational expenses, and workflow efficiency are measured to assess the system's impact on accelerating 3D content creation and reducing costs within the metaverse ecosystem.

Thus, this research contributes to advancing the field of AI-driven content creation in the metaverse, offering practical solutions to enhance the creation, scalability, and immersive quality of virtual environments.

References

1. Liu G. Fusion of Mixture of Experts and Generative Artificial Intelligence in Mobile Edge Metaverse / G. Liu, H. Du, D. Niyato, J. Kang, Z. Xiong, A. Jamalipour, Sh. Mao, D. I. Kim // Networking and Internet Architecture. – 2024. – Access: https://arxiv.org/pdf/2404.03321