



“Artificial Intelligence in game asset pipeline”

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Abstract:-

Modern game development requires many assets like 3D models, textures, and animations, which take a lot of time to create manually. Artificial Intelligence (AI) helps automate and improve asset creation, optimization, and management using techniques like machine learning, deep learning, and procedural generation.

Integrated with engines like Unreal Engine, AI speeds up production, reduces costs, and supports creativity, while also having some limitations.

Keywords:-

Artificial Intelligence, Game Asset Pipeline, Unreal Engine, Procedural Generation, Machine Learning, 3D Game Assets, Game Development Automation.

Introduction:-

Modern game development requires many assets like 3D models, textures, animations, and environments, which take a lot of time to create using traditional methods. Artificial Intelligence (AI) helps automate asset creation, improve quality, and reduce development time. Game engines such as Unreal Engine use AI tools to support faster asset production, level design, and optimization. This paper highlights the role of AI in improving the game asset pipeline and shaping the future of game development.

Literature Review:-

Research shows that Artificial Intelligence (AI) helps automate game asset creation through procedural generation, machine learning, and deep learning. AI is used for generating textures, animations, and optimizing 3D models, improving performance and reducing development time. Studies related to Unreal Engine highlight faster production of large game worlds. However, AI still has limitations, so it is mainly used to support artists rather than replace them.

Body paragraph:-

Artificial Intelligence improves every stage of the game asset pipeline, from idea creation to final optimization. AI tools help generate concept art, 3D models, textures, and animations, reducing manual effort and development time. In Unreal Engine, AI supports realistic animations, procedural environments, and automatic asset optimization such as LOD generation and polygon reduction. AI also helps manage assets and detect errors, improving workflow efficiency. Overall, AI acts as a supportive tool that boosts productivity and creativity rather than replacing human artists.

Methodology:-

This study uses a qualitative approach based on reviewing research papers, industry articles, and technical documentation related to AI in game development. Traditional asset pipelines are compared with AI-assisted workflows to understand efficiency improvements. AI techniques such as machine learning, procedural generation, and deep learning are studied with a focus on Unreal Engine tools. Case-based analysis is used to observe how AI improves asset creation, optimization, and performance. The findings highlight the benefits and challenges of using AI in the game asset pipeline.

Conclusion:-

Artificial Intelligence has greatly improved the game asset pipeline by automating tasks like asset creation, animation, and optimization.

When integrated with game engines such as Unreal Engine, AI helps speed up development, improve performance, and enhance visual quality. While AI has some limitations, it works best as a support tool for artists and developers. Overall, AI increases productivity and creativity and will continue to play an important role in the future of game development.