

42. THE IMPACT OF ARTIFICIAL INTELLIGENCE ON GAME DEVELOPMENT

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Artificial intelligence can have different impacts on the gaming industry. In the future, new technologies created using artificial intelligence will be described, which are likely to have an impact on game development.

Currently, the gaming industry is constantly developing. Artificial intelligence is a fundamental factor that has influenced the revolution in this field. Thanks to AI, the developers of large companies are able to solve more complex or advanced problems, creating various game situations that will bring pleasure to players. The revolutionary progress is evident in gaming content, where AI can play an important role in creating different game worlds that will evolve as they are created. With the help of artificial intelligence, you can create the most unexpected scenarios, which increases replayability. In addition, machine learning and neural networks make it possible to add a huge number of graphic effects that will not harm weak computers.

Initially, artificial intelligence was used to improve NPCs. They make the game world livelier and more realistic. There are many AI algorithms that are used to implement more realistic NPCs. Machine learning can be called the main algorithm through which NPCs can self-learn, adapt to the player's actions and improve their skills [2].

Procedural content generation (PCG) is another major area of AI application in games. PCG is the automatic creation of game content using algorithms. Unlike the traditional approach, where artists and level designers manually create all the components of the game, PCG makes it possible to generate levels, textures, models, music, quests and other elements of the game world using specialised software. PCG simplifies game development by reducing costs and giving designers more time to focus on more creative and important tasks.

The third area of AI applications in game development is graphics. Thanks to the introduction of artificial intelligence in the field of computer graphics, the possibilities of image enhancement in games have significantly expanded. The use of neural networks and modern algorithms allows improving the image quality and detailing, which will make the picture more realistic, ensure smooth movement of game characters and automate the generation of game content – from textures to complex animations. AI is being introduced into the creation of virtual worlds, allowing for more realistic and immersive visual effects.

Thanks to the development of artificial intelligence, new technologies and advancements are emerging in the game development industry. The developers are currently testing in the following areas:

- 1) AI-Powered Narration and Storytelling is used to create a plot and dialogues that change from circumstances and player actions in real time. So, developers can create more personalised stories;
- 2) AI-Driven Virtual Production, AI is used to automate and improve game development, in areas such as animation, character management, visualisation and rendering;
- 3) AI-Enhanced Playtesting is used here to analyse and identify problems with the balance of difficulty levels. AI simulates player behaviour in various situations and identifies problems with game mechanics;
- 4) AI-Based Physics and Simulation helps to create more realistic and complex physical simulations, such as the destruction of buildings, plausible rain, and the behaviour of NPCs [3].

Thus, AI plays an extremely important role in shaping the gaming experience. NPC behaviour is improved, giving characters a more realistic appearance, making them behave more human-like. There is constant improvement and optimisation of game levels and high-quality texture graphics in order to improve performance. Artificial intelligence has revolutionised the gaming industry, transformed the development processes and raised them to unprecedented levels of sophistication. Therefore, the gaming industry will maintain its development, since progress in this area does not stand still [4].

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