



Generative AI in the Gaming Industry

Tomás Morais

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1. Introduction

In this present report, we will embark on a comprehensive exploration of Generative AI and its profound implications for the Gaming Industry. Generative AI, a cutting-edge technology that enables machines to autonomously produce content such as images, text, and even entire game environments, has emerged as a game-changer in the realm of game development.

However, alongside its benefits, Generative AI also presents a host of ethical considerations that demand careful consideration. Through a consequentialist ethical analysis, we will dissect specific examples of Generative AI in gaming and assess their potential impacts on various people within the industry, which can range from developers right to the users.

By illuminating the interplay between technology, ethics, and industry dynamics, this report aims to provide insights into the ever-growing role of Generative AI in the future of the gaming industry.

2. What is Generative AI?

Generative AI refers to a form of artificial intelligence that prioritizes the creation of original data rather than solely processing and organizing pre-existing data.

At its core, Generative AI utilizes complex machine learning algorithms to analyze and recognize patterns in vast datasets of images, text, audio, or other digital information. By studying these patterns, Generative AI models can generate unique outputs that closely mimic the structure and style of the inputs, but with a high degree of novelty. Those outputs can be:

- **Unique written content**
- **Images**
- **Audio**
- **Videos**
- **Music**

2.1. How can it affect the Games Industry?

With the on-going growth of use and overall evolution of Generative AI, it was inevitable that this use would reach one of the most profitable industries in recent years.

Unlike the examples listed above, Generative AI introduces game-changing applications for game design, development, and player experiences through different ways such as:

- **Procedural Content Generation**
- **Adaptive Game Balancing**
- **Contextual Narrative**
- **Intelligent NPCs**
- **Automated Playtesting**

Rather than following predefined logic, AI introduces new possibilities within games through computational creativity while adapting dynamically to the player. This amplifies engagement, replayability, and innovation for developers.

3. Potential uses of Generative AI

As stated before, Generative AI can have many uses in the Gaming Industry. In this section, we will dive deeper into each of those examples, explaining how they can affect a developer/gamer's experience.

3.1. Procedural Content Generation

As the name implies, Procedural Content Generation is an AI algorithm that autonomously designs vast game worlds, levels, assets etc. unique on every playthrough.

In recent years, more and more games have used this type of generation to mainly create levels and game worlds.

For example, No Man's Sky constructs over 18 quintillion unique planets using Procedural Generation, ensuring no two players ever have the same experience and keeps the game original, even after 1 million plays.

3.1.1. Consequentialist ethical analysis

Procedural Content Generation can bring ultra-realistic experiences to players as each world or level that they play will not be the same as the last 1000 playthroughs.

However, ethical concerns regarding the quality and diversity of these levels/worlds cannot be overlooked.

Without careful regulation, algorithms may show signs of stereotypes, biases, or repetitive patterns, which can be offensive to players. This, in result, can lead to loss of players, which can result in loss of trust and thus affect developers directly, financially and on a personal level.

Developers must ensure that their algorithms promote diversity and avoid harmful representations in order to retain the player base and, hopefully, enlarge it.

3.2. Adaptive Game Balancing

In this example, the AI analyzes player behavior to dynamically adjust difficulty and mechanics to match and, possibly, outplay the player.

In the game "Hello Neighbour" the AI will learn how the player acts and moves around the house and will use countermeasures for those plays on the next playthroughs. For example, if the player breaks through a window in the first playthrough, the AI memorizes this and boards the windows up on the next one.

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3.2.1. Consequentialist ethical analysis

Adaptive Game Balancing can bring quite an exciting experience to players but it can bring some downsides with it.

If the developers make an aggressive AI model where it can outplay the player every time he makes a move, it can be quite frustrating to them, lowering the player base and thus affecting developers with the rapid decline of the player base.

This rapid decline of player base can lead to a loss of trust from potential users due to the bad reputation.

On a more personal level, this can also bring psychological damage to players when the game gets too frustrating.

3.3. Contextual Narrative

In this use, I will use a part of an output generated by AI and will then critically analyze it.

I will use the prompt:

“Can you explain to me what Contextual Narrative is in AI, how it can be used in games and can you also give me examples of games that use this Generative AI?”

3.3.1. Output of the generation

“Contextual narrative in AI refers to the ability of a system to generate or adapt narratives based on the context of the user interaction or the environment within which the narrative unfolds. This involves understanding the current situation, the actions and preferences of the user or player, and dynamically adjusting the narrative accordingly to create a more personalized and immersive experience.”

In games, contextual narrative can be used to create dynamic storytelling experiences where the narrative adapts to the player's choices, actions, and progress in the game. This can lead to more engaging and immersive gameplay, as players feel like their decisions have a meaningful impact on the story and world around them.

One way contextual narrative can be implemented is through generative AI techniques such as natural language processing (NLP) and machine learning. These techniques can analyze the player's actions, dialogue choices, and other contextual information to generate responses and narrative elements that are tailored to the specific situation.

Examples of games that use generative AI for contextual narrative include:

- 1. "The Witcher 3: Wild Hunt" - This action role-playing game features a dynamic narrative system where the player's choices and actions influence the outcome of the story and the relationships with other characters.*
- 2. "Detroit: Become Human" - In this interactive drama game, players make choices that affect the branching narrative and the fate of the characters in a futuristic setting where androids have become sentient.”*

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3.3.2. Analyzing the output

From the simple prompt, ChatGPT was able to give a detailed, well-put and simple explanation and even gave detail on how it could be implemented even though it was never asked in the prompt.

In these types of simple prompts, ChatGPT can excel in creating well structured output since it was asked a simple question and the answer can be factual in terms of describing what was asked. In more complex and variable questions, it can have more difficulty creating a desirable output for the user without much context like code prompts.

3.3.3. Consequentialist ethical analysis

Contextual Narrative can bring more immersive experiences to players due to the huge numbers of possible answers that an NPC can give to the player. But, like all Generative AI, this has its downsides.

Depending on the data models that the Generative AI is trained on, it can give players answers that some might consider offensive or over-reactive. This can lead to mass player loss, which in return leads to loss of trust, which in return directly affects developers, both on financial and, possibly, personal levels.

In order to ensure that players are not affected by Generative AI, developers need to regularly check and regulate the data models that it is being trained on.

3.4. Automated playtesting

Automated playtesting involves using artificial intelligence (AI) and machine learning algorithms to assess and analyze video games systematically.

Traditionally, playtesting has relied heavily on human testers to play through games in order to discover bugs, provide comments on gameplay mechanics, and investigate typical user experience.

While human testers can offer valuable insights, they may be confined in their ability to conduct exhaustive testing because of time constraints, resource limitations (such as hardware and software), and subjective biases.

Automated playtesting aims to overcome those barriers by using AI bots programmed to play through games in a similar way to human players. These AI bots can execute predefined test scripts, simulate diverse in-game situations, and accumulate facts on gameplay metrics consisting of participant actions, interactions, and overall performance.

By exploring different areas of the game, they can spot bugs and glitches that could be unnoticeable for human testers.

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3.4.1. Consequential ethical analysis

A big ethical consideration when considering Automated playtesting revolves around the replacing of jobs inside the gaming industry.

While Automated playtesting can free up human testers to focus on higher-level analyses and creative input, there is a risk that it may displace jobs traditionally held by manual testers. The automation of playtesting processes could lead to unemployment and economic insecurity for individuals in the gaming industry, particularly those with limited access to alternative employment opportunities.

Moreover, the loss of these jobs may disproportionately affect marginalized communities, aggravating existing inequalities.

3.5. Intelligent NPCs

Generative AI can control NPC behavior and dialogues, making them more lifelike, make them have more awareness of the surroundings, and be interactive.

By leveraging sophisticated neural networks and natural language processing, these NPCs show a wide range of emotions, communicate with subtle dialogue, and express unique personalities.

Their adaptive nature allows them to learn from player interactions, evolving their responses over time, creating a sense of continuity and depth within the game world.

By engaging in complex social interactions, dynamically navigating obstacles and/or participating in epic battles, intelligent NPCs enrich the gaming experience by providing challenges and narrative richness.

3.5.1. Consequential ethical analysis

This Generative AI behavior can bring more immersiveness to the gameplay experience but it has its downsides.

Depending on what data models this generative AI is trained on, some of its behavior could be considered offensive to some players. These players could then divert other players from this game based on their opinion, in which it affects the developers directly.

This poses a significant challenge for developers, as they need to balance the benefits of Generative AI with the need to ensure a safe and inclusive gaming environment for everyone. Offending players can result in negative publicity, loss of player trust, and even legal issues, all of which can directly impact the success of the game and the reputation of the development team.

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