

Pros and Cons of Data Science in Video Games

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DSC500-T302 Introduction to Data Science

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September 18, 2022

Data science is used in a variety of fields from astronomy to economics. One of the familiar uses of data science for me happens in video games. Data science can be used in video games to enhance a professional user's experience and also unintentionally deter a casual user's experience. Using data science, game developers can simulate real-world environments using machine learning, create aesthetic animations, and facilitate skill-based matchmaking. But with all these new features in video games, there comes disadvantages for those who aren't able to spend on a brand-new device.

The pros of data science in video games lead to an enhanced video games experience for a veteran player. Data science can be used to simulate real life within the video game, taking images of the real world, and using machine learning to teach the engine to mimic that realism (Pal, 2020). In addition to the environment, most modern video games have almost infinite possibilities of character customization ranging from the space between eyebrows to the size of feet. Data science is also used to create animations and visual effects that are aesthetic for the user. Each year video game animations are getting cleaner, and along with higher refreshing screens, it's almost as smooth as viewing it in real life. Data science is used to teach opponent AI in games to counter the player's movements and actions. In most RPGs (single player role playing games), the player is asked to choose a level of difficulty ranging from easy to difficult. Each difficulty level determines the hit points of enemies and the pattern of combat the opponents utilize. Skill-based matchmaking (SBMM) is also a feature most first-person shooter (FPS) games advertise. Data science is used to track a player's statistics from match to match and actively compare it to their opponents and consequently place them in higher skilled lobbies. Most players enjoy this as it constantly tests their skill within the game. Finally, during alpha and beta phases of testing for a video game, data science is used to track player preferences and

progress to determine features that should be released (KDNuggets, n.d.). For example, if a certain cosmetic skin bundle is not bought in an FPS game during the beta testing phase, it isn't released along with the full game.

On the contrary data science can deter a casual player's enjoyment of the game. Starting with the problem of SBMM. SBMM doesn't prevent higher level players from creating fresh accounts and playing against players of lower skill, and this process is commonly known as "smurfing". Data science only collects the data over time so there isn't any prevention of creating fresh accounts. In countries like Korea, however, only one account is made per person in a game because they are required to use their social security number to create an account. Secondly, Copious amounts of AI generated landscapes and intensive animations can limit the playerbase of games because people are then required to spend much more money on a device to play it. Although games allow customization of the level of graphics, even most high-end personal computers can not handle the load. Advertisements for games are also created from data analytics from users interacting with ads and leaving a review (Santosh, 2021). These advertisements can get in the way of people looking for other games to play or just affect user interaction in the store. On a more negative note, data science is used to market in-game purchases, making them seem more viable each time you log in. In a mobile gacha game I play called Cookie Kingdom, but more interestingly each time you unlock a unique cookie, the game offers a "one-time" bonus bundle to boost the cookie's stats. Data science is finally used on streaming websites to track viewer engagement with certain video games, categories, and streamers to advertise that game (Medium, n.d.). Some viewers watch streamers strictly because they enjoy the streamer's personality and aren't actually interested in the game. Having advertisements that push that viewer into trying to purchase the game is a bit on the nose.

In conclusion, while data science has its unique applications in data science, there are many tradeoffs experienced between the advancements for veteran players and the distancing from casual players. Making games more visually appealing requires higher-powered devices. Skill-based matchmaking tracks a player's progress but doesn't catch experienced players on new accounts. Data science can also make a casual player's experience terrible considering advertisements around in-game purchases and trying to convince viewers to buy a game they might not be interested in. In this situation, data science is used for strictly business, which is just a small part of all the uses data science has in video games.

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