

# The Confidentiality of Coding Video Games with Cheat Code and Bots for Cheating in a Virtual World

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## Abstract

Video games have been around for several decades and have had many advancements from the original start of video games. Video games started as virtual games that were advertised towards children, and these virtual games created a virtual reality of a variety of genres. These genres included sports games, such as tennis, football, baseball, war games, fantasy, puzzles, etc. The start of these games was derived from a sports genre and now has a popularity in multiplayer-online-shooting games. The purpose of this paper is to investigate different types of tools available for cheating in virtual world making players have undue advantage over other players in a competition. With the advancement in technology, these video games have become more expanded in the development aspects of gaming. Video game developers have created long lines of codes to create a new look of video games. As video games have progressed, the coding, bugs, bots, and errors of video games have changed throughout the years. The coding of video games has branched out from the original video games, which have given many benefits to this virtual world, while simultaneously creating more problems such as bots. Analysis of tools available for cheating in a game has disadvantaged normal gamer in a fair contest.

## Keywords

Video Games, Confidentiality, Virtual World, Cheat Code, Bots, Programming

## 1. Introduction

Video games have a large production team behind each of these games. A very important role of video games comes to be the programmers and development

team for these games. A video game programmer (Gameplay Programmer) is known to write the coding for a specific game, and this code will bring the game to life. [1]. Video game programmers (Computer programmers) write lines of code, and this code is run in order to create a gameplay for users. According to Wonderopolis, “Computer programmers must write millions of lines of computer language instructions—called code—that control all aspects of the game [2].” There are many different languages that these codes can be written in, such as Python, C++, Visual Basic, and Perl [2]. These languages are code languages that are written in editors, such as Notepad++, sublime text, atom, and brackets. The programmers will create lines of codes that are written in a specific language into an editor, and have these codes run until a video game is ready for a user.

The coding of a video is very complex in such a way that every aspect of the game is going to need lines of code. The millions of lines in a video game code include all the different parts of a game. This could be shown just by a character, and how the character looks in appearance, how the character moves throughout the video game, and how the character will advance in levels of this game. All of the possibilities of one single character will have a line of code written for this, and this creates a complex code for all video games [2].

Video games have become complex with the new gaming world, and this has had many benefits in bringing more people into this world. Along with the advancements in these games, there comes issues regarding code, bugs, and errors of these games. The modern video games are known to be open-world-shooting games. These modern video games are currently having many issues with the cheating or cheat codes written in the video games themselves. Cheat codes were not used in original video games as the advancement of these cheat codes have given greater benefits into this modern world of gaming. Cheat codes were made for programmers in order to work with the lines of codes and further the advancement of codes [3]. The development of codes and the future of gaming has changed with these cheat codes and caused many issues regarding gameplay for many video game players. The rest of the paper is arranged as follows: Section 2 highlights previous work done, In Section 3 we present The cheat codes and in Section 4 tools for cheating, Section 5 impact of cheating, and in Section 6 the game bots, in Section 7 we present the future of cheat codes and bots and finally the paper concludes in Section 8. This research will be discussing different cheating tools available in current video games, the difficulties cheating creates for players, and the problems cheating causes in pro league gaming. The modern world of video gaming has become not as enjoyable for everyday players and for pro video game players from the various cheating methods that are available.

## **2. Related Work on Bot User**

There are many ways that bots are used in gaming, and this comes with different advantages in using them. An anonymous Bot User (Bot User One) has discussed the different ways their bots are used and the advantages of having these

bots. Bot User One says that there are many different types of bots, ranging for Webcrawling bots to Discord and Twitch bots. Other types of bots include ones used to hack into DOS based apps and ones that attack texts and emails. The coding of these bots changes when discussing the different variations of bots. Bot User One discusses these changes by saying that these codes change depending on what your bot is needed to do, such as online games. Online game bots are able to gather resources, perform calculations to determine troop amounts, and as well as how many resources are required to run each village, and determining a counterattack if a village becomes under siege. There are many different ways to code artificial intelligence bots, and these variations of code would be dependent on the type of bot to use.

The history of bots has changed with the changes in video games. Bot User One discusses these changes with the different in bots for different games as the bots varying in games. This would be dependent on the different games played. These bots would be used for different resources in the game and the bots are predetermined by sending single scouts to run calculations, and this is done within a bot emulator.

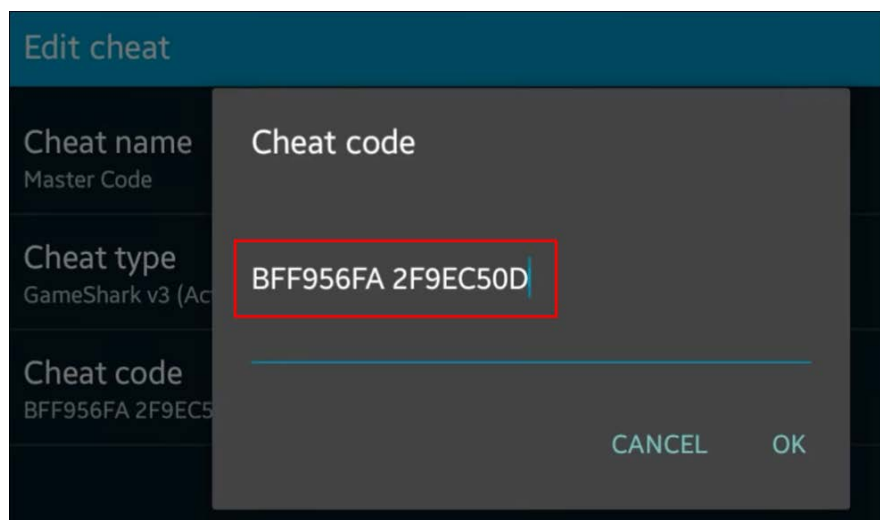
Bot User one discusses how often a recode/remake due to patching of games for their Bots usually is. Microsoft Windows changes firewall settings often and this causes small patch updates, which has a remake or modification to the bot every three to four months. The coding of a bot itself would be used using a bot emulator, and this makes it easier for new modern programming according to Bot User One.

Bot User One discusses the benefits and the selling of bots, where there could be advantages in having these bots or selling these bots for profit. Bot User One discusses that bots would be a great way to maintain gameplay when they are unable to play a game every day or when there needs to be resources in the game constantly and they are unable to reach this level of gameplay in a certain time. The game bot used for Bot User One maintains ten of their accounts and these accounts are ran simultaneously through random VPNs around the world. Bot User One discusses that the bot used for their accounts have been given (not sold) to family members and other players that are in their guild. Although, these bots have been given to other users, bots can be sold for profit, and this would be a way for bot creators to make money off of their gaming. In a study of a computer player giving fun to opponent, it is expected that the form of AI will be expanded. Previous studies are almost occupied by perfect information games, and research is being conducted to strengthen AI. However, this research is targeting imperfect information game [4]. In the AR technology-based game for finding treasures in museums, the goal of the game is to overcome many challenges, collect clues hidden throughout the museum, and finally obtain a “treasure” belonging to the visitors. Before entering the museum, users first download and install a mobile software installation package, then launch the game and scan the given picture next to the collection, and they can see the 3d model corresponding to the collection presented in front of the visitor [5].



granted access to further parts in the game and could not get the edits to be done as quick. Techopedia discusses the original use of cheat codes in a form of development help, where “Cheat codes were initially used as a tool to aid development and testing of the various modules of the game and kept hidden until a user makes the discovery of the cheat code and uses it to gain an advantage [3].” The video game programmers have purposely put these cheat codes in the line of code in order for their own personal advantage for the coding of a game; however, public users of the game are able to find this code and create a personal advantage when playing these games. When playing multiplayer with many online users, the usage of cheat codes can become a heavily unfair advantage for one player versus another player.

There are many different versions of cheat codes, which can be secret textual information, or this could be executable codes with the video game input controllers [3]. Many people see cheat codes as forms of input from a controller, which allows you to have advantages in the game, such as a character level up, adding guns/cars, and/or adding special abilities to your character. In figure one, a setup of video game cheat codes is shown for a new modern game called Grand Theft Auto. These cheat codes are shown as video game controller input, which is a common type of cheat code. The user can use their controller to read the lines of the code to create special advantages in the game. The cheat code shows the input of the controller lines, which could be the up button on the D-pad along with a combination of other buttons such as circle, square, triangle, or the X button. Another popular form of cheat codes is a line of numbers and letters put into an editor cheat code. In the new modern game of Pokémon, a user is able to type in a line of letters and numbers to get special advantages in the game. **Figure 2** below shows the most used Pokémon Emerald cheats. In **Figure 2**, there is a line of code of special numbers and letters to create an advantage to a user playing Pokémon Emerald. Cheat codes are found in many variations for modern



**Figure 2.** The most used pokémon emerald cheats.

video games, and this creates issues when the general public has access to these codes. When there are many users versus another user in a game, then advantages could be made to a user with these codes. As video games become more popular, and users having a career out of these games, then cheat codes could become a bigger issue when versus others. There are many problems when discussing cheat codes, and another issue arises when artificial intelligence is added to video games, known as Game Bots.

#### 4. Cheating Tools

The modern video games have many different cheating tools currently available to use. Specifically discussing popular first-person shooter games, such as Counterstrike: Global Offensive, Halo 3, Battlefield: Bad Company 2, Apex Legends, and Titanfall 2, have many cheating tools actively being used in these games [10]. The cheating tools are used in the software of these video games and allows players to benefit in these games. In a first-person shooting game, there are software cheating tools that allow for wallhacking, aim-botting, and speed hacking. The cheating tool known as wallhacking will allow a player to see through a wall, which allows for a player to see where an enemy player is. The cheating tool known as aim-botting allows for a player to aim assistance and this allows the computer to perfectly align the gun to shoot enemy teams. The third cheating tool, known as speed hacking, allows for a player to have an increased speed during gameplay, which could allow for players to move faster than their enemy teams [11].

A second type of cheating tool is known as hardware cheating, which is not commonly used today due to most games not needing a hardware drive to be inserted into their gaming system. Modern games today are downloaded software, but in the earlier years of video games there were cartridges used to play games. According to Commercial litigation blog, “In the early years of console gaming, players used cheat cartridges to inject cheat codes into games to gain otherwise unobtainable items or advantages. For example, Gameboy cheat cartridges were used for *Pokémon* games to allow players to catch Pokémon, which were unobtainable in the unmodified version of the game [11].” Hardware cheating tools could still be used today, and these would be known as macro buttons being used on a mouse and keyboard, and these macro buttons are used for specialized input commands. These input commands would be similar to software programs, such as increased player speed, would not be obtainable by the skill of a human [11].

Focusing the attention on one first person shooter game, *Apex Legends*, as discussed before, this video game has encountered many cheating reports in its short amount of video game life thus far. *Apex Legends* was first launched February 4th, 2019, and one year later, a report was shown of how many cheating reports had been made within its first-year launch [12]. According to The Gamer, Respawn Entertainment had made a report that *Apex Legends* had 25 million players in the first week of the game’s launch; however, this number had

been decreased by 16,000 due to banning of cheaters in the game. The developers of *Apex Legends* made statements allowing for gameplayers to ban these cheaters and capturing the evidence of cheating to help support the claims [13]. As previously discussed, the capturing of wallhacking, aim-botting, and speed hacking, would give substantial evidence of a cheater in this first-person shooter game. *Apex Legends* has had a cheating problem from the start of its launch and continues to face these same issues today. The cheating from either cheating tool, software, or hardware, makes a difficult time to have fair gameplay for casual players, and makes a bigger concern when pro players have been affected in tournaments.

## 5. Impact of Cheating

The focus of one first-person shooter game will still be discussed, where *Apex Legends* has an ongoing issue with cheating. The impact of this cheating does not only affect the level of casual game players but goes into more professional leagues of gameplaying. *Apex Legends* hosts a professional tournament, “Apex Legends Global Series Pro League”, where professional *Apex Legends* game players can play against other pro players for \$100k in prize money [14]. The fairness of online gaming can be unethical when pro league players have careers from this game, and winning tournament can be tampered with during these games due to cheating. According to the GGRecon article, “Professional Apex Legends Team Claims Squads ‘Cheated’ in 450k ALGS Grand Finals”, there have been reports of entire professional squads cheating in professional league tournaments. The accounts of cheating discussed the cheating tools that had been previously discussed, “third-placed Athaim players believe that opposition players were using aimbot in the ALGS APAC South Grand Finals [15].” The impact of cheating could cause many issues when the professional players that depend on *Apex Legends* gameplay as a career are having tampered games and tournaments from various cheating tools.

## 6. Game Bots

According to Science Direct, “A Game Bot is an automated program that plays the game on behalf of human players. Since they can play without break, game bots can accumulate money and items much faster than normal human players [6].” Game Bots are another form of disadvantages when discussing modern video game multiplayer gaming. There is an unfair advantage when a video game player is versing an artificial intelligence bot. There are many video games, such a new modern video game—Rocket League, that discusses these Game bots as cheating. According to Game spot, “Using bots in online play represents a form of cheating and it violates Rocket League’s terms of use and its code of conduct [7].” Many video games have discussed the use of cheat codes as a form of cheating in the games, and artificial intelligence bots are now being put in the terms of use as a form of cheating as well. Although a user is not directly putting in a code for cheating, there are Game Bots being used for cheating in these

games. According to Techopedia, in gaming, a bot is a character controlled by a computer. In one sense, bots are all the non-player characters (NPCs) in a game, including those that fight alongside as well as against the gamer [3]. There are different variations of Game bots, and the two most common type of game bots are known as static game bots and dynamic game bots [8]. According to Game Designing, static game boots are known for needing assistance for proper use and small agency for their own Movement, and have linear functions, while dynamic game bots can learn levels and complex strategies. The dynamic game bots would be found in more complex game, which would be found in more modern types of games such as Counter Strike [8]. There are many disadvantages to video game players when versing artificial intelligence bots and having cheat codes written in the coding of a game.

## **7. Future of Cheat Codes and Bots**

According to Game Rant, the future of cheat codes is bound to becoming non-existent due to the advancement in gaming. The world of cheat codes is becoming part of the old way of gaming, and the multiplayer games will not have these old forms of cheat codes coded into the lines of these games. Game Rant states, "Cheat codes have largely gone away in the modern gaming landscape. With the advent of online multiplayer, achievements, and trophies, getting an advantage by putting in a code seems unfair [9]." The actual coding of cheat codes could become non exist in a near future for modern video games; however, artificial intelligence bots will still be on the rise in these modern video games. According to Game Singing, "Game bots are present in nearly every multiplayer game, from Halo to MMORPGs. Game bots perform various tasks, everything from acting as the player would or NPCs doing farm work [8]." The future of cheat codes could be coming to a distance end, while the future of artificial intelligence video game bots seems to be on the rise in new modern video games.

## **8. Conclusion**

The coding of video games has become very complex in modern game, but the actual coding for cheats from video game programmers might be coming to an end of an era. While video game programmers will still be needed to code a video game, an artificially intelligent bot could be useful for creating advantages in the games. The artificial intelligence bots could be used in place of cheat codes, creating more advantages for each user. The current modern video games have changed drastically from the beginning of video games and have complex lines of codes to give extra games life. The future of games could be changing, and the artificial intelligent bots could be taking over.

## **Conflicts of Interest**

The authors declare no conflicts of interest regarding the publication of this paper.



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