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The Role of Bots in Video Games

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There are many types of bots that exist, from wiki editing bots, to social media spam bots, to chat bots, and, to video game bots. In this report I will be exploring the varying roles of bots in the world of video gaming, the impact they have, and various implementations.

Now, I'm not going to be looking into offline bot characters/enemies that come built into the game – featured in various multiplayer games such as *Call of Duty*, *Mario Party*, and *League of Legends* – or bots used in video games for research purposes[1] (namely Artificial Intelligence (AI) research[2]). These are the good type of bot - often developed using advanced AI algorithms and neural networks - that allow users to play the game offline, without the required number of players, and giving the choice of difficulty level. Instead, I will be discussing the bad kind of bots that are considered cheating in the majority (if not all) of games they are found in, allowing users to gain an unfair advantage – ranging from in-game currency, rewards, points, and experience, to real-life cold, hard cash. For most of this report I will be focussing on gold-farming bots, however I will start by touching upon the other types of bot used in online gaming, later delving into measures taken to stop and prevent such bots.

To start, a common type of bot found in video games are bots used in First-Person Shooter (FPS) and Multiplayer Online Battle Arena (MOBA) games; namely aimbots and triggerbots[3]. Aimbots are bot programs that automatically lock the players sight (crosshair) onto enemy heads, and triggerbots automatically shooting the player's weapon once it is detected that the sight is over an enemy. Used in online games such as *Overwatch*, *Fortnite*, and *Call of Duty*, although these bots are considered bad (and against the rules of such games), I'd argue that they don't have a huge negative affect on other players, the game community, or the company – with no apparent real-life consequences, such as monetary gain/loss – instead merely unfairly boosting rankings on leaderboards, thus skewing results. Pragmatically, it wouldn't be possible for aimbotters to use this as a way to compete in (or qualify for) eSport tournaments (where monetary gain is a reward), as they take place in-person on checked machines.

Another type of bot is those known as Gambling bots. Although these are typically not classed as 'video games', they are primarily utilised in Gambling and Casino games – such as Poker, Roulette, and Blackjack – as well as the MMO *RuneScape*. These bots utilise gambling website's Application Programming Interfaces (API)[4] and/or AI[5], being programmed to be able to decipher odds and place optimal bets – leaving human players at a disadvantage, especially when actual money is at stake. Fortunately, the majority of gambling bots aren't so accurate, with figures stating in 2011 that 'more than 90% are losing money'[6]. However, these statistics may lower as technology ever-improves, with more bot developers learning how to incorporate neural networks into their software[7].

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[1] https://theconversation.com/beaten-by-bots-training-ai-for-first-person-shooter-games-11176

[2] https://openai.com/five/

[3] https://en.wikipedia.org/wiki/Cheating_in_online_games#Bots_and_software_assistance

[4] https://en.wikipedia.org/wiki/Gambling_bot

[5] https://www.theguardian.com/technology/2009/feb/12/online-poker-bots

[6] https://www.nytimes.com/2011/03/14/science/14poker.html?_r=0

[7] https://web.archive.org/web/20140419162236/http://www.carbonpoker.ag/blog/a-look-at-recent-developments-in-online-gambling-17/

On to the arguably most impactful type of bot: gold farming bots, supplier to video game black markets. I chose gold farming to be the main subject of this report for various reasons, including the widespread availability, ease of access, high impact on players, companies, and communities – not to mention my personal experience with them, having been a member of the *RuneScape* community (a hotspot for gold farmers) for numerous years, giving me a better insight into these type of bots than most.

Gold farming bots, also known as macroers, do what their name describes: they farm gold, in-game currency. Similarly, there exists just farming bots who farm in-game experience. These types of bot are commonly found in Massive Multiplayer Online (MMO) games, such as *World of Warcraft (WoW)*[8], *Diablo*, and most notably, *RuneScape*[9]. But why are these bots so bad, exactly? People who use these bots – be it gold farming companies, or just freelancers – go on to sell the accounts (containing the botted currency and/or experience) for real life money (also known as real world trading); and it's quite a profitable business – approximately worth $500 million in 2008[10], with a reported gold farmer claiming he earned £6,500 a month back in 2013[11]. So profitable, in fact, that prior to bots becoming mainstream (even though they still exist today), sweatshops were formed in countries including China and Romania to manually farm in-game currency and experience for real-life profit[12]. Moral implications of such sweatshops aside, I will only be focussing on the implications of the botting section of the gold-farming industry.

Gold farming companies, mainly Chinese-owned, exist in multitudes. Merely searching in a search engine *'buy gold runescape'* provides endless pages of 'legitimate' gold-selling sites – https authenticated, professional web design, correct grammar, customer support, mobile-optimised, and so on. Prices are decent, too, one website I checked out advertised 1 million gp (gold pieces, in-game currency) for only £1.10 – currency which would take at least a good few hours to earn genuinely in *RuneScape*. Time is money, and so I can somewhat see how this would look lucrative to certain people.

Back to why these bots are bad. The whole premise of them goes against the rules, and spirit, of these games – putting in time and effort to gain reward, not gaining reward by buying it. This puts honest players at an unfair disadvantage – spending more time to get to the same place as someone who botted (or bought a botted account) is at, less in-game money, lower leaderboard rankings, etc. Additionally, botting currency has shown to cause inflation, fluctuations, and crashes within in-game markets – all affecting honest individuals. Too many bots can also drive players away – more bots than players make the game unenjoyable for some – and thus potentially losing companies subscription money. Finally, companies - namely Blizzard (creators of *WoW*), and Jagex (creators of *RuneScape*) - have spent their time and money on hiring employees specifically to target these bots, as well as pursuing legal action.

Anti-cheating specialists are just one of the various employee roles hired to tackle botting in these games. These staff members, with a background in computer security, use various methods to catch and punish offenders – generally with a permanent game ban. Furthermore, in *RuneScape*, this has

[8] http://news.bbc.co.uk/1/hi/technology/6592335.stm

[9] https://en.wikipedia.org/wiki/Video_game_bot

[10] https://www.wired.com/2008/08/study-gold-farm/

[11] https://www.vice.com/en_uk/article/zn5pda/i-make-thousands-of-dollars-a-month-from-playing-computer-games

[12] https://www.theguardian.com/technology/2009/mar/05/virtual-world-china

https://www.theguardian.com/technology/2005/mar/13/games.theobserver

been made into a spectacle, with in-game content 'Botany Bay' [13]turning bot banning into an entertaining activity [14]– displaying the shared sentiment across the community of bots being disliked. This is also shown with the use of in-game reporting, an often-used feature (through first-hand experience) that allows players to report other players they suspect are botting (among other rule-breaking activities) to staff. Generally, it's not hard to distinguish a bot from a normal player – repetitive activities (movement, chat), 'spammy' names (e.g. a long-jumbled string of numbers), and very high experience in a certain skill (but not others). Additional in-game content (in *RuneScape*) as a preventative measure includes 'Random events', which teleports any player at random intervals to a different area, requiring them to solve an easy puzzle in order to leave – thus breaking any bots. Although other steps have been taken to prevent and catch bots[15], such steps are generally kept closely guarded secrets by the companies – as to not give botters a way to evade them (although such software has been under the names of 'ClusterFlutterer'[16], 'Botwatch'[17], and 'Optimus'[18]).

Fortunately, the evolution of modern technology, in combination with the methods previously mentioned, has led to gold-farming bots being less and less prominent within MMOs. In 2018 alone, Jagex banned over 3 million macroing accounts, and recovered 4.5 trillion gp from the in-game economy [19]– with an anti-cheating Jagex employee stating to have banned 28,000 macroing accounts just on the first day of 2019[20]! These statistics alone put into perspective the mass of the gold farming industry.

Despite this, botting has still had a long-term impact on the in-game economy – a point I briefly mentioned earlier. To expand on this, the peak years for botting in *RuneScape* were from around 2007-2013 (6-11 years ago!), yet the economy took a slow time to recover from the damage caused to it by bots. This damage was caused by large influxes of tradeable (sellable) items being sold across the economy by bots, thus driving down the price drastically. Non-cheating players were therefore at an in-game monetary loss, having to sell their hard-earned items for less money than they otherwise would have sold for, if it had not been for bots. On the flip side, rare items acquired by bots have also had their prices driven up, thus leaving only the top 0.1% of non-cheating players able to afford such items. In regard to real-life implications, this can allow gold sellers to raise prices on accounts that are in possession of such items.

As for how gold farming bots are implemented, there's a variety of different techniques that bot software developers use. The most common method is that of auto-clicking, a simple program written using a language such as Python, or JavaScript[21], that enables the user's mouse to click automatically at a set interval. These intervals are usually randomised between a certain number of sections, in an attempt to prevent detection from anti-botting software in the game. Auto-clickers are easily made programs, with little coding knowledge needed – they're often used for purposes other than bots. In the same vein as auto-clickers, Auto Hotkey, an open source language allowing

[13] https://runescape.wiki/w/Botany_Bay

[14] https://www.pcgamer.com/uk/runescape-to-get-a-botmaster-general-and-put-botters-on-trial-in-botany-bay/

[15] https://www.pcgamer.com/runescape-bot-nuking-event-bans-1-5-million-bots-in-one-day/

[16] https://runescape.wiki/w/ClusterFlutterer

[17] https://runescape.wiki/w/Botwatch

[18] https://runescape.wiki/w/Optimus

[19] https://twitter.com/JagexWeath/status/1077613628596072450

[20] https://twitter.com/JagexAcorn/status/1080148495032569858

[21] https://recast.ai/blog/bot-in-video-games/

easy creation of keyboard macros, is also often used. Either of these methods can be used in conjunction with a colour macro – a script that checks the colour of the pixel the mouse is on and performs (or doesn't perform) an action based on that (such as moving the mouse or pressing the spacebar). Advanced techniques using more complex AI algorithms or neural networks seem to be not commonly used, requiring a deeper understanding of coding, in addition to botters potentially seeing creating them as a waste of time due to the time and skill required in comparison, in case companies fight back with a solution against them (thus rendering them useless, needing to be updated).

Commercial botting software websites open access up to those without coding knowledge, making botting easily achievable by your average person – with no specialised software or hardware required. Again, simply searching in a search engine for such websites provide an abundance of botting software websites to choose from – making botting such a hard thing to tackle and takedown. Lastly, as most, if not all, of the software and methods used in video game botting is also used for non-malicious reasons, a myriad of tutorials can be found on social media sites such as YouTube and Reddit to aid people in creating their own programs to bot, e.g. "Write Your Own Super Easy Auto Clicker In Less Than 2 mins" [22](not specific to botting, but can be used for it).

So, what's really going to get botters to stop? Botting software is easily acquired, it provides good and easy money (unfortunately). Ultimately, I'd argue that nothing can stop botters – if they're really motivated to do so, they will (as proven by their continuous existence despite attempts taken to stop them). However, road blocks can be put in their way, such as a point I mentioned earlier – legal action. Botting is illegal (in many countries)[23] if it is used for profit, as it indirectly harms the game, and thus the company (losing them profits). Blizzard have fought this, having opened[24], and consequently won[25], a lawsuit against German cheat company 'Bossland' in 2017[26], resulting in an $8.5 million pay-out. Jagex have also successfully pursued legal action against company 'iBot' in 2012[27], with the court stating the botting company were guilty of 'circumvention of technological protection measures', and computer fraud[28].

To conclude, the role of bots in video games is generally one of negative value. Although botters may see it the other way, earning money for easy work with low risk attached, the majority of people in video game communities are of the same opinion as myself – frustrated at having to put in much more work to get to the same stage as cheaters, albeit feeling good by taking the moral high ground (and not breaking the law!) to support a game you enjoy. As of now, steps are constantly being taken by companies to lessen the impact of bots, however their persistent nature leaves me to question if they'll ever be eradicated.

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[22] https://www.youtube.com/watch?v=DMitFOhzZdY

[23] https://en.wikipedia.org/wiki/Gold_farming#Law,_regulation_and_taxation

[24] https://kotaku.com/blizzard-caught-in-legal-fight-with-game-cheating-compa-1743658806,

https://torrentfreak.com/blizzard-sues-bot-maker-for-copyright-infringement-151111/

[25] http://virtuallyblind.com/2008/02/01/peons4hire-blizzard-injunction/

[26] https://www.eurogamer.net/articles/2017-04-04-blizzard-wins-usd8-5m-lawsuit-against-cheat-makers

[27] http://services.runescape.com/m=news/bot-busting-update-legal-proceedings

[28] http://www.escapistmagazine.com/news/view/115418-Runescape-Bot-Maker-Loses-Big-In-Lawsuit