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DETECTING ONLINE GOLD FARMERS USING NETWORK ANALYSIS

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Abstract: **There are many online games having their own ecosystems, where players can purchase in-game assets using game money. Players can obtain game money through active participation or "real money trading" through official channels .Here gold farming group come into picture .Gold farmers, are players who stay online for extremely long hours and farm mobs for the purpose of selling the in-game money they accumulate for real-world money. Also, any farming bots with multiple accounts will reap more benefits for playing the game in this way while the people who play normally suffer. So to avoid this, we are proposing a system which will target to find out such groups and block them.**
Keywords: User behavior analysis, sequence-analysis, MMORPG, Game BOT, GFG.

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I INTRODUCTION

In recent years online games have attracted people's attention. Massively multiplayer online role playing online gaming has millions of players. Players always wants to increase their in-game assets and reputation. . Eager to achieve a high level in a short time, some users employ real money to gain experience or to obtain valuable virtual goods .The game assets and virtual goods are restricted to virtual world , but as games become popular, assets are being traded outside the game world for real money. Gold farmers are professional who play whole day and obtain virtual goods and assets and exchange it for real money. When any two characters exchange items or game money, an in-game trade log is generated. In general, players exchange items for other items or money of an equivalent value. However, in some cases, this exchange occurs even when the values of two items are quite different. For example, a user gives an item to other users as a present. However, GFG members give items or money to the character in a higher position to accumulate game items and money in the GFG. Accordingly, the in equivalent trades between GFGmembers are frequently observed. The free money and items are then sold to buyers who are normal users. Due to these illegal trades, the economic balance of the game collapses because, for example, an abnormal increase in the amount of game money

and virtual goods that causes inflation. And also, players who buy goods with real money quickly achieve a higher level in game. These users do not follow typical steps that causes rapid consumption of the game content, which shortens the lifecycle of the game. The detection framework includes two major components: rule-based detection and GFG expansion using network features of the GFG.

II OBJECTIVES

1. The goal of our investigation is to identify individual bots that compromise part of the trading networks within GFGs.
2. To detect GFG activities and control their underground economy.
3. To distinguish bots from human players using behavioral patterns or their response to interactive tests.

III RELATED WORK

Gold farmer detection methods have evolved over the years, and the literature on the problem can be classified into three generations of related works. The first generation of such methods is signature-based, and utilizes client-side bot detection such as antivirus programs or CAPTCHA-based techniques .However, the first generation of commercial products could be thwarted using techniques learned from reverse engineering. Also, methods using CAPTCHA are known to be user-unfriendly, and contribute to user annoyance. Finally, solving CAPTCHA has generated a

thriving business that uses mechanical Turks utilized by underground players. The second generation of methods focused on data mining techniques, and used server-side bot detection systems, which focused mainly on distinguishing between a bot and a benign player by analyzing server-side log files. Such techniques are widely used commercially and are coupled with logging techniques and various data mining algorithms for highly accurate bot detection. However, making a variant of an existing bot that can generate new behavioral patterns to thwart an existing detection technique is very easy and heavily utilized by gold farmers. Moreover, this method targets gold farmers individually. Companies have less insight of who belongs to the same group, and GFGs fight banning by continuously creating new gold farmers, making current banning efforts ineffective.

The third generation methods are a surgical strike policy. They can detect all industrialized GFGs by group assuming that members in a group have frequent interaction and abnormal patterns.

IV LITERATURE SURVEY

1. Current Analysis and Future Research Agenda on "Gold Farming"

Real-World Production in Developing Countries for the Virtual Economies of Online Games This paper reviews what we know so far about gold farming, seeking to provide the first systematic analysis of the sub-sector. It assembles available data at the sectoral , enterprise and worker level. Five main analytical lenses are then applied. Economic analysis shows how exchange rate variations and scale economies do and do not impact gold farming; and the strong influence of information failure in the purchase of virtual items: known as "real-money trading". Analysis from the perspective of industrial sociology charts the commoditization and globalization of the sub-sector, while value chain models identify resource dependencies and power inequities. Enterprise analysis investigates enterprise entry, existence and progression, and outlines the competitive forces shaping the sub-sector's development; particularly threats. Developmental analysis investigates the impact of this sub-sector in macro and micro terms. Finally, there is a biological analysis of the role played by perceptions and other social forces.

2. Crime Scene Re-investigation:

A Postmortem Analysis of Game Account Stealers' Behaviors

In this paper, we analyzed the action sequences of the account thieves and proposed a model to detect account thieves based on the analysis results. The proposed detection model is useful in detecting the theft of users even if the users do not perform security measures at the user-side. We analyzed transaction networks of the account thieves and analyzed their transaction characteristics and analyzed whether they are related to game bots.

3. Online Games and Security

In this paper introduction to MMORPG security, we focus on bugs involving time and state. We can expect to see more of such bugs. as real-world software evolves to become more like game software.

4. The Ones That Got Away

False Negative Estimation Based Approaches for Gold Farmer Detection In this paper we address this gap in the literature by addressing the problem of false negative estimation for gold farmers in MMOs by employing the capture-recapture technique for false negative estimation and combine it with graph clustering techniques to determine "hidden" gold farmers in social networks of farmers and normal players

5. Multimodal game bot detection using user behavioral characteristics .

The aim of this study is to detect game bots in a massively multiplayer online role playing game (MMORPG). We observed the behavioral characteristics of game bots and found that they execute repetitive tasks associated with gold farming and real money trading. We propose a game bot detection method based on user behavioral characteristics. The method of this paper was applied to real data provided by a major MMORPG company. Detection accuracy rate increased to 96.06 % on the banned account list.

V PROPOSED SYSTEM

A: We write purchase module for any in app purchase game. In purchase module we design game purchase module which contain selling and buying criteria for the particular game.

B: Second task is to create bot which can play game automatically. For this we have to analyze whole software logic of the game. After understanding whole logic or algorithm of the game we are ready to create bot which can play game automatically.

C: Now the main task is to detect bot. we can detect bot by three scenarios which are as follows.

1. Purchase module details
2. Time period
3. Location

If someone does selling only and cannot buy anything in any stage then it is suspicious then we declare that player as a bot and block.

If someone is playing game more than 8 hour or 24 hour then obviously it is suspicious so in this scenario we declare this player as a bot and block.

Last scenario is to find whether there is a group which can play game from different devices but location and IP are

same. Then it will come under suspicious activity and we block that user.

VI ARCHITECTURE

Figure 1 Block Diagram of System

VII ALGORITHM

Algorithm 1

1. Start.
2. Host Web Game on Server.
3. Play Game with 4 user.
4. IF User Playing More Than 8 Hours a Day AND Continuously Loosing Coins
5. THEN Add To Suspicious Table -
6. Reoccurring Behaviour –
7. Ban User From Playing.
8. ELSE Any Location Playing More Than 12 Hours
9. THEN Repeat Steps 5,6,7.
10. Continue
11. END.

Algorithm 2

1. If player is online for 1 hour pop up a notification like you are playing for 1 hour and mark severity level as 1.
 2. After 2 hours of continuous playing send a notification please log out and log in again and mark severity level as 2.
3. If he does log out and log in then remove player from suspicious list of bot players else add him in the suspicious list and mark severity level as 3.
4. Then check for the ip addresses of the players of suspicious list if some are having same IP addresses and severity level as 3 or 2. If true block them.
5. Then check for continuous winning and continuously playing for 8 hours and severity level as 3. If there are any block them.

VIII ADVANTAGES

1. To Save Game money Earns in transactions by the Bot.
2. To stop degradation of game Experience for users.
3. To stop generating Illegal money this can be lead to generate illegal money use in the funding for illegal business.

IX. DISADVANTAGES

Gold farming can affect a game economy by causing inflation. They may degrade the game experience.

X. CONCLUSION

We proposed a framework for detecting GFGs. The framework has the following merits to control GFGs

1. It detects only GFG characters without normal players.
2. It separates each GFG. If a game company quickly realizes that a GFG has become sufficiently big to break the game balance, the game company can take proper actions on time.

REFERENCE

[1] M. A. Ahmad, B. Keegan, J. Srivastava, D. Williams, and N. Contractor, "Mining for gold farmers: Automatic detection of deviant players in MMOGs," in Proc. Int. Conf. Computer Sci. Eng. (CSE), vol. 4.Aug. 2009, pp. 340–345.

[2] E. Castronova, Synthetic Worlds: The Business and Culture of Online Games. Chicago, IL, USA: Univ. of Chicago Press, 2008.

[3] R. Heeks, "Real money from virtual worlds," Sci. Amer., vol. 302, no. 1, pp. 68–73, 2010.

[4] B. Keegan, M. A. Ahmad, D. Williams, J. Srivastava, and N. Contractor, "What can gold farmers teach us about criminal networks?" XRDS, Crossroads, ACM Mag. Students, vol. 17, no. 3, pp. 11–15, 2011.

[5] B. Keegan, M. A. Ahmed, D. Williams, J. Srivastava, and N. Contractor, "Sic transit Gloria mundi virtual?: Promise and peril in the computational social science of clandestine organizing," in Proc. 3rd Int. WebSci. Conf. (WebSci), 2011, Art. no. 24.