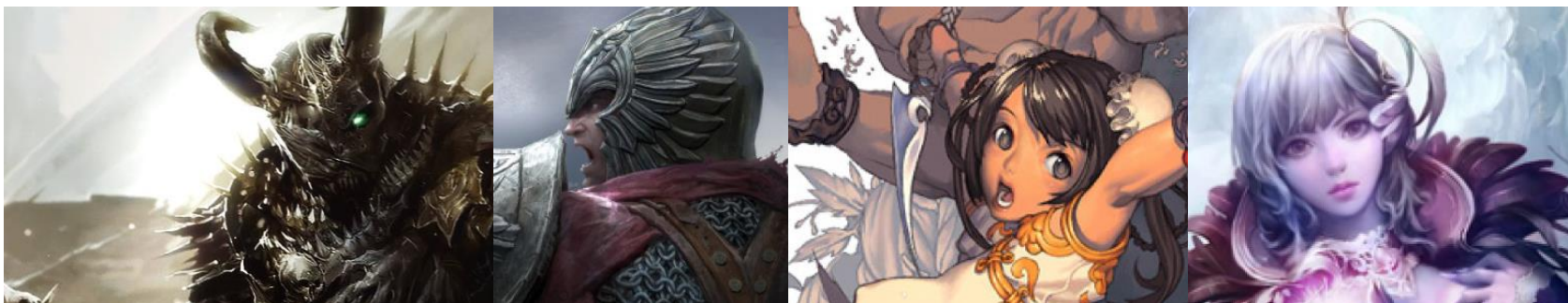


빅콘테스트 대회 설명

게임 유저 이탈 예측



2018. 7.17. 엔씨소프트

NCSOFT

Copyright © NCSOFT Corporation. All Rights Reserved



2018 빅콘테스트
2018 BIG CONTEST

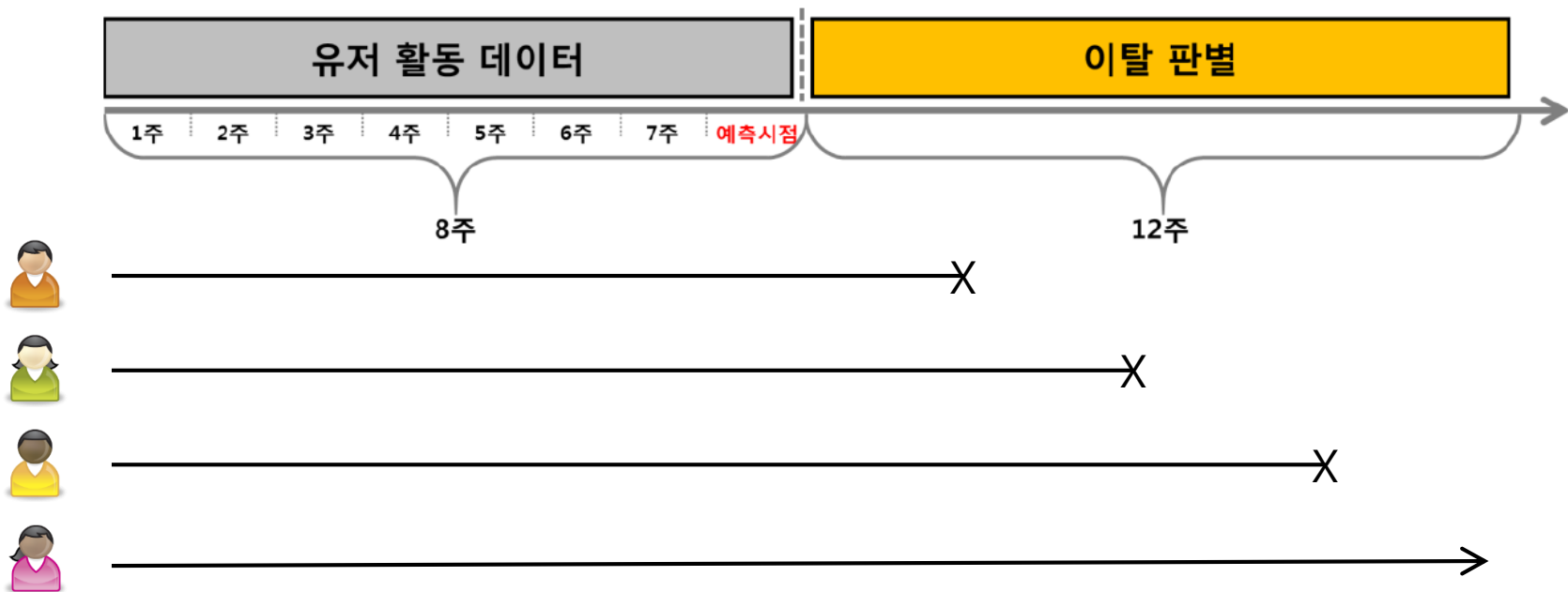
개요

개요

대회 문제 소개

➤ 주제

- ✓ 유저들의 게임 활동 정보를 이용하여 향후 게임 서비스에서 **이탈하는 시점 예측**하기



개요

이탈 예측

- 고객 관계 관리 (Customer Relation Management, CRM) 분야에서 중요하게 다루는 문제
- 비용 효율적
 - ✓ 신규 고객 유입을 위해 필요한 비용 > 기존 고객 유지에 필요한 비용
- 정확한 예측이 근본적으로 어려움
 - ✓ 저마다 다른 욕구 및 선호도
 - ✓ 데이터에서 확인 불가능한 외적인 문제로 인한 이탈
 - ✓ 빠른 변화
 - ✓ 이탈에 대한 기준 모호

개요

분석 대상

➤ Blade & Soul

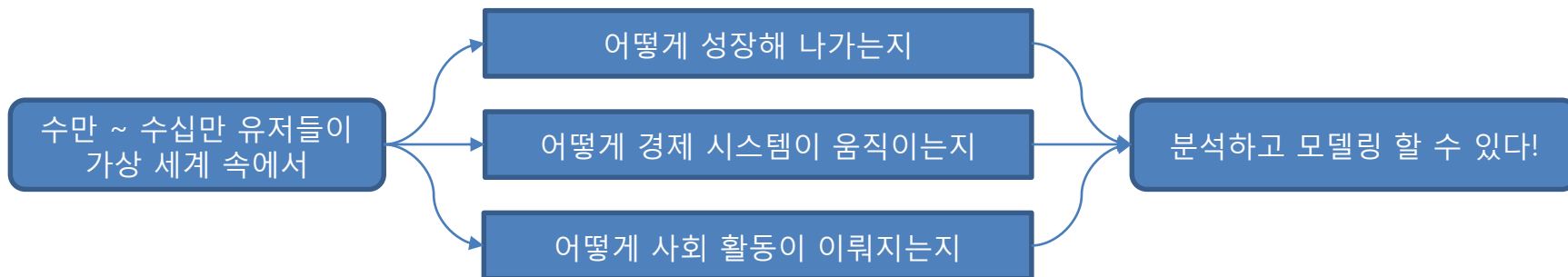
- ✓ 2012년 6월 부터 엔씨소프트에서 서비스 중인 무협 MMORPG
- ✓ <http://bns.plaync.com/>



개요

데이터 분석 측면에서 게임이 갖는 매력

- 현실과 매우 유사한 가상 세계
 - ✓ 성장 활동: 미션과 퀘스트
 - ✓ 경제 활동: 사냥, 채집, 제작, 거래
 - ✓ 사회 활동: 친구, 파티, 문파, 전투, 채팅
- 현실에서 접하기 힘든 고품질 데이터
 - ✓ 누가, 언제, 어디서, 무엇을 어떻게 하고 있는지 모두 관찰



개요

게임을 이용한 다양한 사회 과학 연구 사례 (1/4)

- World of Warcraft – 오염된 피 사건
 - ✓ 치명적인 전염병의 전파 경로 연구에 활용



THE LANCET Infectious Diseases

Volume 7, Issue 9, September 2007, Pages 625-629



Personal View

The untapped potential of virtual game worlds to shed light on real world epidemics

Eric T Lofgren BA^a, Prof Nina H Fefferman PhD^{a, b, c, d, e}

Show more

[https://doi.org/10.1016/S1473-3099\(07\)70212-8](https://doi.org/10.1016/S1473-3099(07)70212-8)

[Get rights and content](#)

Summary

Simulation models are of increasing importance within the field of applied epidemiology. However, very little can be done to validate such models or to tailor their use to incorporate important human behaviours. In a recent incident in the virtual world of online gaming, the accidental inclusion of a disease-like phenomenon provided an excellent example of the potential of such systems to alleviate these modelling constraints. We discuss this incident and how appropriate exploitation of these gaming systems could greatly advance the capabilities of applied simulation modelling in [infectious disease](#) research.

개요

게임을 이용한 다양한 사회 과학 연구 사례 (2/4)

➤ EverQuest 2 – 게임 캐릭터 간의 재화 거래 데이터

- ✓ 악성 유저 간의 소셜 관계와 마약 조직의 유사점을 네트워크 관점에서 분석



Dark Gold: Statistical Properties of Clandestine Networks in Massively Multiplayer Online Games

Brian Keegan
School of Communication
Northwestern University
Evanston, IL 60201 USA
bkeegan@northwestern.edu

Muhammad Aurangzeb Ahmed
Dept. of Computer Science and Engineering
University of Minnesota
Minneapolis, Minnesota 55455 USA
mahmad4cs.umn.edu

Dmitri Williams
Annenberg School of Communication
University of Southern California
Los Angeles, CA 90089
dmitri.williams@usc.edu

Jaideep Srivastava
Dept. of Computer Science & Eng.
University of Minnesota
Minneapolis, Minnesota 55455 USA
srivastaj@cs.umn.edu

Noshir Contractor
School of Communication
Northwestern University
Evanston, IL 60201 USA
noshir@northwestern.edu

Abstract—Gold farming is a set of illicit practices for gathering and distributing virtual goods in online games for real money. Using anonymized data from a popular online game to construct networks of characters involved in gold farming, we examine the trade networks of gold farmers, their trading affiliates, and uninvolved characters at large. Our analysis of these complex networks' connectivity, assortativity, and attack tolerance demonstrate farmers exhibit distinctive behavioral signatures which are marked by brokering affiliates. Our findings are compared against a real world drug trafficking network and suggest similarities in both organizations' network structures reflect similar effects of secrecy, resilience, and efficiency.

Keywords – dark networks, network analysis, online games, MMOG, MMOGP, EverQuest 2, gold farming, real money trade, cybercrime, distance, scale-free, assortativity, attack tolerance

I. INTRODUCTION

Networks have assumed increasing importance as a both a theoretical and methodological approach toward understanding organizational structure and behavior [1, 2]. In particular, network analysis methods are potentially powerful tools to understand how actors in "dark" networks, such as drug traffickers and terrorist cells, coordinate their activities and adapt their structure to achieve their mission while avoiding detection and maintaining resilience [3, 4]. In practice, the hidden nature of the relationships in dark networks necessarily implies that collecting and analyzing complete or even representative data on these networks is very difficult.

However, the explosion of behavioral data available in online databases has opened up new avenues of social research [5]. One such source are massively multiplayer online games

(MMOGs), large-scale social environments in which players of varying levels of expertise join cooperative teams to accomplish complex tasks [6, 7]. To the extent that individuals in online virtual worlds engage in similar psychological, social, and economic behavior as they do in the "real" world, virtual world research can potentially be mapped backwards and employed to understand real world phenomena [8]. Moreover, because the organizations that operate MMOGs maintain archival databases of all player actions and attributes, it is possible to analyze comprehensive cross-sectional and longitudinal behavioral data on a scale that would be unethical, impracticable, or impossible to do in the real world.

Using a combination of comprehensive, unobtrusively obtained data and methods in network analysis and data mining, we examine the coordination structures and dynamics of a dark network of one particular type of deviant activity in an MMOG. These "gold farming" networks operate under similar constraints as other criminal organizations, and so we argue that the structure and dynamics of these organizations can be used to characterize and understand deviant and criminal activity in other domains. We discuss our results and suggest implications for future work in organizational behavior, computational criminology, and intelligence.

II. GOLD FARMING

A. Background

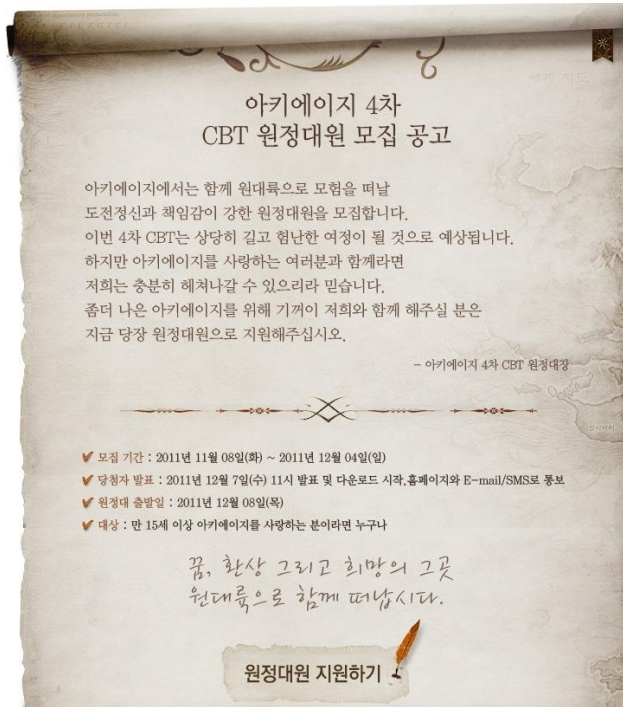
Massively-multiplayer online games such as *World of Warcraft*, *EverQuest II*, and *Lord of the Rings Online* are examples of fantasy-based game worlds in which millions of players interact in a persistent virtual environment. While playing alone or with other players, they accumulate experience, armor, spells, and weapons to improve their power during encounters with non-player characters (NPCs) and player-

The research reported herein was supported by the National Science Foundation via award number IIS-0729503, the Army Research Institute via award number

개요

게임을 이용한 다양한 사회 과학 연구 사례 (3/4)

- 아키에이지 - 베타 서비스 종료를 앞둔 유저들의 활동 데이터
 - ✓ 종말이 다가오면 인간은 어떻게 행동하는가?



I Would Not Plant Apple Trees if the World Will Be Wiped: Analyzing Hundreds of Millions of Behavioral Records of Players During an MMORPG Beta Test

Ah Reum Kang¹, Jeremy Blackburn¹, Haewoon Kwak¹, Huy Kang Kim¹
¹University at Buffalo ¹Telefonica Research
¹Qatar Computing Research Institute, Hamad Bin Khalifa University ¹Korea University
 ahreumka@buffalo.edu, jeremyb@acm.org, cenda@korea.ac.kr

ABSTRACT

In this work, we use player behavior during the closed beta test of the MMORPG ArcheAge as a proxy for an extreme situation: at the end of the closed beta test, all user data is deleted, and thus, the outcome (or penalty) of players' in-game behaviors in the last few days loses its meaning. We analyzed 270 million records of player behavior in the 4th closed beta test of ArcheAge. Our findings show that there are no apparent pandemic behavior changes, but some outliers were more likely to exhibit anti-social behavior (e.g., player killing). We also found that contrary to the reassuring adage that "Even if I knew the world would go to pieces tomorrow, I would still plant my apple tree," players abandoned character progression, showing a drastic decrease in quest completion, leveling, and ability changes at the end of the beta test.

Keywords

Massively multiplayer online role playing game (MMORPG); Online games; ArcheAge; Closed beta test (CBT)

1. INTRODUCTION

One problem that philosophers have struggled with over the centuries is how humans will behave in a disastrous "end times" scenario. For example, how does an individual behave if his/her behavior will have no lasting outcomes or penalties? Do we continue to follow the compass that has led us through life or do we abandon our morals, ideals, and social norms in the face of oblivion? In this paper, we examine such a scenario through the lens of a massively multiplayer online role playing game (MMORPG).

In contrast to typical studies on running MMORPGs, our dataset is from the Closed Beta Test (CBT) of ArcheAge, developed and serviced by XI Games in Korea. The CBT is populated with a limited number of testers, and more importantly, at the end of the CBT the server is wiped: all characters are deleted, progression is lost, virtual property is deleted, etc. The mapping principle [19] states that the behavior of players in online games is not very far from the behavior that humans exhibit in the real world. Thus, while not a perfect mapping, we believe that the end of the CBT is a rel-

atively good approximation of an "end times" scenario, and thus the present work is not only useful for the understanding of players' behavior but can also begin to shed light on human behavior in general under such conditions.

From the "living laboratory" of the CBT, we first formulate the research problem. Our aim is to characterize the activity patterns of players over time with respect to a salient event. A salient event is defined as an event that takes place in time and space which has impact on social units which can respond to the event. The closing of the CBT can be considered a salient event for the entire population of players.

In this work, we investigate how player behavior changes during the course of the CBT. We examine player behavior from two different levels, system-wide and individual-level, which have different granularity. We do this to avoid an ecological fallacy [6], which is when statistical inferences about individuals are deduced from those about groups that they belong to. Via a two-level analysis, we find no apparent pandemic (system-wide) behavior changes, although some outliers resorted to anti-social behavior, such as murder (player killing, or "PK"). That said, we surprisingly find that chat content exhibits a slightly positive trend as the CBT draws to a close. Overall, players increase social interaction with others: they exchange more in-game messages (mails) and create more parties to enjoy group-play or complete high-level quests.

Additionally, we focus on whether individuals' behavioral changes are due to the CBT ending by comparing behavior to that of typical chatters. We find significant differences between players that voluntarily leave the game (chatters) and those who stay until the end of the CBT. In particular, we find that chatters were more likely to exhibit anti-social behavior (e.g., PK). It seems that chatters lose their their sense of responsibility and attachment to the game. In contrast, those who stay until the end might have some loyalty to the game and thus continue to behave within accepted social norms.

Using network analysis, we focus on an associations between a wide range of individual player behaviors. We examine patterns of in-game actions, looking for changes in the frequency as the CBT ends, find that contrary to the reassuring adage "Even if I knew the world would go to pieces tomorrow, I would still plant my apple tree" (i.e., I would still continue to better myself and the world), players abandoned character progression, showing a drastic decrease in quest completion, leveling, and ability changes. This finding itself is interesting and indicates why the quote resonates, and at the same time, it sheds light on game design implications for CBTs with respect to player reactions to the inevitable end of the beta test.

The contributions on this paper have been made by the authors.

©2017 International World Wide Web Conference Committee (IW3C2), published under Creative Commons CC BY 4.0 license.
 WWW '17 Companion, April 3–7, 2017, Perth, Australia.
 ACM 978-1-4503-4913-7/17/04.
 http://dx.doi.org/10.1145/3038912.3038914

개요

게임을 이용한 다양한 사회 과학 연구 사례 (4/4)

- 아이온 - 유저 간의 사회 관계 및 관련 활동 데이터
 - ✓ 사람들의 악행은 어떻게 전파되는가?
 - ✓ 조직은 어떤 식으로 성장하고 쇠퇴하는가?



Unveiling Group Characteristics in Online Social Games: A Socio-Economic Analysis

Taejoong Chung
Seoul National University
tchung@mmlab.snu.ac.kr

Jinyoung Han
Seoul National University
lyhan@mmlab.snu.ac.kr

Huy Kang Kim
Korea University
cens@korea.ac.kr

Daemin Choi
Seoul National University
dchoi@mmlab.snu.ac.kr

Yonghee Choi
Seoul National University
ychoi@snu.ac.kr

ABSTRACT

Understanding the group characteristics in MMORPGs is important to user behavior studies since people tend to gather together and form groups to do their activities. In this paper, we analyze the group activities of users in Aion, one of the largest MMORPGs, based on the records of the activities of 94,497 users. In particular, we focus on (1) how social interactions within a group differ from the one across groups, (2) what makes a group form, maintain, or fall, (3) how group members join and leave a group, and (4) what makes a group end. We first find the structural patterns of social interactions within a group are more likely to be close-knit and reciprocate than the ones across groups. We also observe that members in a strong group (i.e., the number of members increased on more occasions, and communicate with more closely within the group than the ones in other groups). Our analysis further reveals that if a group is not cohesive, its activity communication, or not evenly communicating among members, members of the group tend to leave.

Categories and Subject Descriptors

H.1 [Computer Applications]: Social and behavioral sciences; H.3 [Online Information Services]: Web-based services

Keywords

MMORPG; Online Social Game; Group Characteristics; Group Activity; Social Interactions; Socio-Economic Analysis

1. INTRODUCTION

It is reported that tens of millions worldwide enjoy massively multiplayer online Role-Playing Games (MMORPGs) as of 2013. As MMORPGs typically offers diverse social virtual environments where they can engage in various real-world like interactions including combat, trading, and communication with others. Given the complexity, variety, and longevity of the virtual worlds, user experiences in MMORPGs are expected to be close to real life ones.

The realistic virtual environments of MMORPGs opens up new opportunities for research that is traditionally complex human behavior. That is, a game space on an MMORPG is deemed as a large

scale virtual laboratory for observing the socio-economic behaviors of human. The foundation of real behavior analysis (sociology or psychology) has been changed by the proliferation of online services including online social networks (SNS) and MMORPGs [7, 7]. Since MMORPGs provide real life like environments where users can experience various social interactions like communication, operations, economic activities, and so on, they has been an interesting medium to study human activities in popular MMORPGs [7, 7, 7]. For example, [7, 7] investigated various kinds of social interactions (e.g., friendship, communication, trade) among users in MMORPGs.

Although the above studies on MMORPGs reveal valuable insights into the social interactions among users, most of these studies paid little attention to the social interactions in a group (or a community), rendering the following research question: *How groups are structured in games? How a user interacts with another in a group? What are the differences among groups in terms of diversity of social interactions or economic activities? How groups evolve and why? Why people leave a group? What makes a group rise and fall?* We argue that understanding the dynamics of group-based activities in MMORPGs is important to human behavior studies since people tend to gather together and form groups due to their inherent needs both online and offline.

Aion is an MMORPG run by NCSoft, which is a leading online game service provider. With the collaboration with NCSoft, we work to address the above questions comprehensively, which have not been thoroughly investigated so far. In this study, we analyze the massive datasets of its game user activities collected from ten servers. Some limitations of our study are as follows: MMORPGs with over 1.4 million subscribers from more than forty countries as of early 2013 [7]. Our work is based on the real time datasets, collected for three months from December 21, 2010 to March 21, 2011, which consists of all the activities of 94,497 users (i.e., one of 44 Aion servers) that their communication, economic interactions, group behaviors, when log size is around 918 GB.

To our knowledge, this measurement-based, data-driven, and video-based on the screen massive social interactions in Aion (Whisper lists, private messages). Feasibility requires (1) adding a user to the buddy list of a player, Trade, Shop, Match, Group chat, and Party invitation. In Aion, a user can join a guild¹ if they members an invitation of a current member of the group. Also, the candidates from one group to another. By being a member of a group, the user can check the status of other members, who are among the member of the group, and can communicate with all of the other members simultaneously by using Group chat. To understand the implications of the above social activities in a group, we focus on, (1) how

¹We use a guild and a group interchangeably.

The Contagion of Malicious Behaviors in Online Games

Jiyoung Woo
Korea University
5-Ga Anam-Dong, Seongbuk-Gu
Seoul, 136-701, Republic of Korea
+82-2-3200-4898
jiwoo@korea.ac.kr

Ah Reum Kang
Korea University
5-Ga Anam-Dong, Seongbuk-Gu
Seoul, 136-701, Republic of Korea
+82-2-3200-4898
arm@korea.ac.kr

Huy Kang Kim*
Korea University
5-Ga Anam-Dong, Seongbuk-Gu
Seoul, 136-701, Republic of Korea
+82-2-3200-4898
cens@korea.ac.kr

ABSTRACT

The online environments where individual users are more likely to display malicious behavior after receiving social reinforcement from friends in their online social networks. We analyze the dynamics of game bot diffusion on the basis of real data supplied by a major massively multiplayer online role-playing game company. We find that the social reinforcement, activated by the loss of bot status, one bot friend, affects the likelihood of game bot adoption and the commitment to bots in large-scale

social interaction, diffusion model, online game, game bot

Categories and Subject Descriptors

H.1 [Computer Applications]: Social and Behavioral Sciences - Psychology, Security

General Terms

Measurement, Security

Keywords

social interaction, diffusion model, online game, game bot

1. INTRODUCTION

In massively multiplayer online role-playing game (MMORPG), players engage in a variety of interactions with other players and form online social networks. A complete digital record of players' activities in MMORPGs provides a promising opportunity to study the dynamics of human behavior. As online social networks have begun to play an important role in shaping behaviors, the analysis of human interaction in the context of online social networks has become a viable research topic. Extreme exposure behaviors were also explored in diffusion models [1]. The use of digital evidence and detailed logs have proven to have a significant effect on the contagion process between people. The popularity of online social networks has inspired researchers to study the diffusion of some behaviors. Centis [2] conducted an experiment to trace health behaviors diffusion in online communities. Eaves et al. [3] studied the adoption of the specific function in Twitter. MMORPGs are also an interesting arena to observe how behaviors spread, a subject that has not yet been deeply explored. In this article, we aim to analyze the dynamics of the diffusion based on real data of users' MMORPGs and to test whether individual adoption is more likely when users receive reinforcement from multiple friends in their social networks. We focus on malicious behaviors.

Diffusions to make digital or hard copies of part or all of this work for personal or classroom use is granted by the publisher, provided that the copier pay directly to the ACM for copying fee. For all other uses, permission should be sought from ACM. Copyright is held by the ACM Press, Inc. 2014. ACM 978-1-4503-2666-1/14/000000...\$15.00.

especially the use of game bots that do change nonreciprocally online players' content. Understanding malicious behavior dynamics will enable us to build effective countermeasures.

2. RESULTS

We used the dataset between December 21, 2010, and March 21, 2011 from AION, a prominent MMORPG developed by NCSoft. In Aion, like other MMORPGs, there are various networks depending on interaction types such as communication through text, email, in-game trade, party chat, joining guilds, and building friendship [4]. Here, we specifically focus on friendship networks formed by individual social users. We analyzed the gold farming workshops because gold farmers do not form friendship with others, nor members in the same guild. Generally, only human and nonhuman who trade items develop friendship networks. In Table 1, we present characteristics of the friendship networks of Aion and AionAge (until Jan 13). AionAge is a recently launched MMORPG developed by NCSOFT, and its social network is still in an initial stage before the appearance of the game bot. Compared to well-known social networks [5], Aion users were more friends and were 1/8th less tied not to form reciprocal networks.

Table 1. Summary of the basic network characteristics.

	Nodes, n	Links, e	Avg. degree	Clustering coefficient
Aion	18,761	80,058	4.2	0.973
AionAge	11,433	33,724	2.9	0.976
Facebook	65,730	1,670,900	25.7	0.321
Flacka	2,302,824	22,838,276	20.9	0.118

In January 14, the adoption rates of the bots of characters newly created by the bot detection code, usually new adopters, were total active characters was 0.0406318333. Of 19,153 characters, 10,598 characters formed a friendship network and 128 characters were reported to be new adopters. We consider the characters who did not have bot usage records during December 21, 2010 and January 13, 2011 as new adopters. On the network formed before January 13, the adoption rates reached 10.91% and the recovery of the adoption rates became saturated after 60 days. This implies that the game company needs to restrict users from using bots from the beginning stage of the game to prevent contagion of bots. For the initial bot of contagion, we calculated the bot adoption rates, which was 1/8 when the user was reported and 3/10 when the user was not reported. We measured the social reinforcement effect on bot adoption in terms of various metrics:

* Accumulated signals from friends, bot, cover

문제 설명

문제 설명

데이터

➤ 데이터 규모

- ✓ 학습 데이터: (계정 아이디 기준) 10만 명의 게임 활동 데이터
 - 파일명 형식: train_XXXX.csv
- ✓ 평가 데이터: (계정 아이디 기준) 4만 명의 게임 활동 데이터
 - 파일명 형식: test_XXXX.csv

➤ 레이블 및 이탈 기준

- ✓ 이탈 기준: 4주 이상 게임 미접속
- ✓ 제공 데이터 시점 이후 12주 동안의 접속이력으로 판단
- ✓ 레이블: 총 4개 클래스로 구분
 - **Week**: 1주 이내 이탈
 - **Month**: 2~4주 이내 이탈
 - **2Month**: 5~8주 이내 이탈
 - **Retained**: 잔존

문제 설명

데이터

➤ 데이터 종류

- ✓ 주요 활동 정보: 게임 내에서 수행하는 주요 활동량을 유저별로 1주일 단위로 집계
 - ✓ 결제 정보: 사용자가 게임 활동을 위해 결제한 정보를 1주일 단위로 집계
 - ✓ 사회 관계 정보: 유저 간에 상호 작용 및 사회 관계에 대한 정보
- ※ 사회 관계 정보에는 이탈 예측 대상자가 아닌 유저들도 포함되어 있음**

➤ 제공 파일 종류

- ✓ train_label.csv: 학습 데이터의 레이블 정보
- ✓ train_activity.csv, test_activity.csv: 유저의 인게임 활동 정보를 일주일 단위로 집계한 정보
- ✓ train_payment.csv, test_payment.csv: 유저별 주간 결제 금액을 집계한 파일
- ✓ train_party.csv, test_party.csv: 유저간 파티 구성 관계를 집계한 파일
- ✓ train_guild.csv, test_guild.csv: 문파별 문파원 목록을 집계한 파일
- ✓ train_trade.csv, test_trade.csv: 유저간 1:1 거래 내역을 집계한 파일

문제 설명

데이터 - 활동 정보

➤ 파일명: train/test_activity.csv

➤ 스키마

wk	활동 주 (1~8)	cnt.enter.raid	레이드 참여 횟수
acc_id	계정 아이디	cnt.enter.raid.light	라이트 레이드 참여 횟수
cnt_dt	해당 주에 한번 이상 접속한 일수	cnt.enter.bam	밤의 바람 평야 입장 횟수
play.time	플레이 시간 (단위: 초)	cnt.clear.inzone.solo	솔로 인던 완료 횟수
npc.exp	NPC 사냥 일반 경험치	cnt.clear.inzone.light	라이트 인던 완료 횟수
npc.hongmun	NPC 사냥 홍문 경험치	cnt.clear.inzone.skilled	숙련 인던 완료 횟수
quest.exp	퀘스트 일반 경험치	cnt.clear.inzone.normal	라이트/숙련 인던 완료 횟수
quest.hongmun	퀘스트 홍문 경험치	cnt.clear.raid	레이드 완료 횟수
item.hongmun	아이템 홍문 경험치	cnt.clear.raid.light	라이트 레이드 완료 횟수
game.combat.time	전투 시간 (단위: 초)	cnt.clear.bam	밤의 바람 평야 완료 횟수
get.money	재화 획득량	normal.chat	일반 채팅 횟수
duel.cnt	결투 참여횟수	whisper.chat	귓속말 채팅 횟수
duel.win	결투 승리 횟수	district.chat	지역 채팅 횟수
partybattle.cnt	전장 참여 횟수	party.chat	파티 채팅 횟수
partybattle.win	전장 승리 횟수	guild.chat	문파 채팅 횟수
cnt.enter.inzone.solo	솔로 인던 입장 횟수	factions.chat	세력 채팅 횟수
cnt.enter.inzone.light	라이트 인던 입장 횟수	cnt.use.buffitem	버프 아이템 사용 횟수
cnt.enter.inzone.skilled	숙련 인던 입장 횟수	gathering.cnt	채집 횟수
cnt.enter.inzone.normal	라이트/숙련 인던 입장 횟수	making.cnt	제작 횟수

문제 설명

데이터 - 결제 정보

- 파일명: train/test_payment.csv
- 스키마

payment_week	결제 주 (1~8)
acc_id	결제 유저 아이디
payment_amount	해당 주 총 결제액

문제 설명

데이터 - 파티

- 파일명: train/test_party.csv
- 스키마

party_start_week	파티 생성 주 (1~8)
party_start_day	파티 생성 일 (1~7)
party_start_time	파티 생성 시간 (00:00:00 ~ 23:59:59)
party_end_week	파티 종료 주 (1~8)
party_end_day	파티 종료 일 (1~7)
party_end_time	파티 종료 시간 (00:00:00 ~ 23:59:59)
party_members_acc_id	파티 구성원 아이디 리스트 파티 참여했던 모든 구성원들의 아이디 기록

문제 설명

데이터 - 문파

- 파일명: train/test_guild.csv
- 스키마

guild_id	문파 고유 아이디
guild_member_acc_id	문파원 아이디 리스트

- 문파 정보는 주어진 데이터 기간에서 가장 최신 현황 정보만 제공됨
 - ✓ 즉, 중간에 신규 가입하거나 탈퇴, 다른 문파로의 이전 정보는 제공되지 않음

문제 설명

데이터 - 거래

- 파일명: train/test_trade.csv
- 스키마

trade_week	거래 발생 주차 (1 ~ 8)
trade_day	거래 발생 일 (1 ~7)
trade_time	거래 발생 시간 (00:00:00 ~ 23:59:59)
source_acc_id	주는 계정 아이디
target_acc_id	받는 계정 아이디
item_type	아이템 종류 <ul style="list-style-type: none">• money: 금• grocery: 잡화• weapon: 무기• costume: 옷• gem: 보석• accessory: 액세서리
item_amount	거래된 아이템 수량

문제 설명

데이터 보안

- 개인 정보 보호를 위해 데이터 전처리 후 제공됨
 - ✓ 모든 계정 아이디는 해싱을 통해 마스킹 처리
 - ✓ 모든 통계량은 표준화 (standardization) 를 통해 실제값을 알 수 없게 변환
 - $x_{new} = \frac{x_{old} - \mu_x}{\sigma_x}$, (μ_x : mean of x , σ_x : standard deviation of x)

문제 설명

평가 방법 (1/3)

➤ 예측 성능 + 서류 심사

➤ 예측 성능: F1 score

✓ 각 클래스별 precision과 recall을 계산한 후 전체에 대한 조화 평균 계산

$$✓ F1 = \frac{8}{\left(\frac{1}{Week_{PR}} + \frac{1}{Week_{RC}} + \frac{1}{Month_{PR}} + \frac{1}{Month_{RC}} + \frac{1}{2Month_{PR}} + \frac{1}{2Month_{RC}} + \frac{1}{Retaind_{PR}} + \frac{1}{Retained_{RC}}\right)}$$

➤ 서류 평가

✓ 데이터 전처리 및 학습 알고리즘에 대한 설명

✓ 모델 해석 및 이탈 원인 분석 (논리적인 접근, 적절한 시각화)

문제 설명

평가 방법 (2/3)

➤ 자율 평가 기능

- ✓ 최종 결과 제출에 앞서 평가 데이터에 대한 예측 성능 확인 및 벤치마킹을 위한 Leader board 제공
- ✓ 어뷰징 방지를 위해 중간 평가는 **전체 평가 데이터의 20%만을 측정**한 결과 제공
- ✓ 점수 해킹 및 과도한 트래픽 부하를 막기 위해 지원자 별 **1일 5회로 횟수 제한**

Data Rule Leader Board **Submit**

File Upload

You have 20 submissions remaining today. This resets 00:00 UTC

Test

Drop files here or click to upload.

Submit



Data Rule **Leader Board** Submit

Your Rank : 3

Your Last 5 Submission

Date	Filename	Score
Fri, 25 May 2018 07:56:55 GMT	submit.csv	1.07125
Wed, 23 May 2018 08:46:34 GMT	submit.csv	1.07125

Leader Board

Rank	ID	Date	Score
1	test_id****	Wed, 20 Jun 2018 10:25:21 GMT	0.999091
2	park.su****	Thu, 14 Jun 2018 22:19:43 GMT	1.04426
3	gimmesj****	Fri, 25 May 2018 07:56:55 GMT	1.07125
4	whitein***	Fri, 01 Jun 2018 07:36:09 GMT	1.25176

Previous 1 Next

문제 설명

평가 방법 (3/3)

➤ 자율 평가 및 최종 평가 파일 스키마

acc_id	유저 아이디
label	예측된 유저의 라벨

- ✓ 컬럼명 및 순서가 상기 스키마와 다를 경우 오류 발생
- ✓ **예측 대상: test_activity.csv에 있는 계정 4만개**

➤ 최종 평가

- ✓ 최종 예측 성능은 마지막에 제출한 예측 결과를 기준으로, 평가데이터 전체 대상 성능 측정하여 평가
- ✓ 예측 성능 상위 30개 팀에 대하여 서류 심사 진행
 - 참가 인원 및 순위에 따라 서류 심사 대상자 수는 변경 가능
- ✓ 최종 후보 10개팀 선별하여 발표 심사 진행

문제 설명

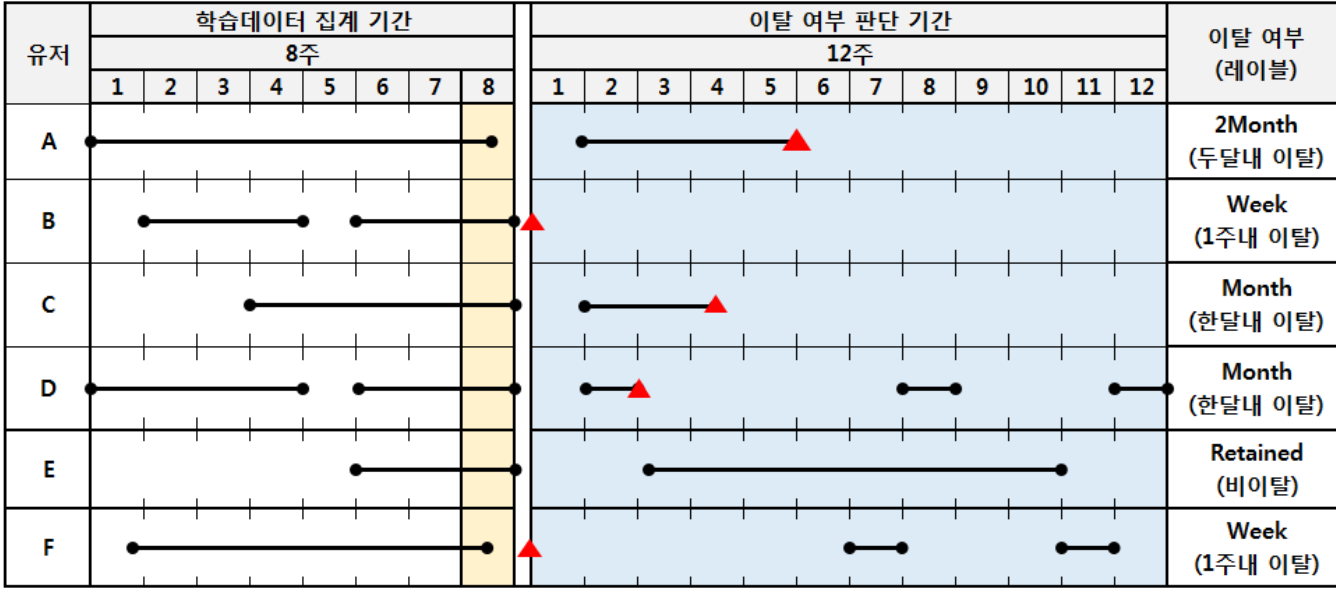
수상자 혜택

- 입상자는 Data Analysis&Programming 직무 채용 시 서류 전형 및 과제 테스트 우대
- 우수 발표자에게 별도의 회사 세미나 및 면담 기회 제공

Q&A

Appendix

레이블 부여 예시



범례	
●-----●	유저 접속
■	이탈 예측 시점
■	이탈 판단 기간
▲	이탈 발생 시점

- 유저 A** 5주차 접속 이후 4주 이상 연속 미접속 발생. 이탈 발생 시점 (5주차)이 4주차 이후, 8주차 이전에 발생하였기에 "2Month" (두달내 이탈) 레이블 부여
- 유저 B** 판단기간의 1주차부터 4주 연속 미접속 발생. 1주차에 이탈 발생하였기에 "Week" (1주내 이탈) 레이블 부여
- 유저 C** 4주차의 접속 이후, 4주 이상 연속 미접속 발생. 4주차에 이탈 발생함에 따라, "Month" (한달내 이탈) 레이블 부여
- 유저 D** 8,12 주차에 접속하였지만, 2주차 이후 4주 이상 연속 미접속 발생, 이에 따라 이탈 판단. 또한, 연속 미접속 발생 시점이 2주차이기 때문에, "Month" (한달내 이탈) 레이블 부여
- 유저 E** 판단기간 내, 4주 이상 연속 미접속 발생하지 않음 → "Retained" (비이탈) 레이블 부여
- 유저 F** 유저D와 마찬가지로, 판단기간 후반 (7,11주차)에 접속을 하였으나, 예측시점 직후 4주 연속 미접속 발생. 이탈 시점이 1주차이므로, "Week" (1주내 이탈) 레이블 부여