Main(s) and Alts: Multiple Character Management in World of Warcraft

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ABSTRACT
Most online games let players create multiple characters, and during avatar creation and gameplay, the relationships between players and their game playing goals are revealed. As multiple characters are developed, player behaviors become more complex. Yet a major characteristic of avatars is that they cannot act at the same time—since gameplay is usually continuous and players alternate between or among avatars, time patterns tend to emerge. For this project we employed a user interface to collect real and continuous data on World of Warcraft players, and developed an algorithm for grouping avatars owned by specific players into sets. We then attempted to identify goals for individual characters, types of set management, and relationships within avatar sets.

Keywords
multiple characters, alternative avatars, online games, avatars, player user interface

INTRODUCTION
Players of massively multiplayer online role playing games (MMORPGs) such as *World of Warcraft* (Blizzard 2004) and *Maple Story* (Wizet 2005) must create avatars that serve as "second selves" for interacting with others in virtual worlds (Kafai et al. 2007) Unlike players in single avatar/single player games, such as *Super Mario Bros* (Nintendo Creative Department 1985) and *Counter Strike* (Valve Corporation 2000), MMORPG players always play with multiple avatars, regardless of whether those avatars are assigned by the game or picked by the player. In single avatar/single player games, discussing avatars and players separately is not appropriate, since avatars and players are considered one and the same.

MMORPGs also have the unique characteristic that players must form groups with good balances of game "professions," since players are highly dependent on each other to

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execute missions. Most MMORPGs allow players to use multiple avatars in single game accounts in order to maximize opportunities for group play; avatars that are not primary are known as *alternative avatars*—usually referred to as *alts*. Individual avatars—created one-by-one based on usage, type, or in-game goal—are associated with different aspects of game playing goals. Some avatars are created for reasons tied to game compensation, or as backups for other avatars. Getting complete pictures of multiple character management requires consideration of primary and alternative avatars—known among players as "main(s) and alts."

Understanding player goals begin with analyses of character management resulting from multiple characters, and is not limited to observations of individual avatars or players. Technically speaking, it is important to know which avatars belong to specific accounts in order to understand how they are used, managed, and utilized, but such data are considered confidential and protected by game companies. Therefore, for this project we designed an algorithm for detecting and classifying alts based on public information that game companies are willing to provide in order to analyze how players use and manage multiple avatars in game worlds.

Single players with multiple avatars represent a common phenomenon in virtual worlds; on average, MMORPG players use 8 avatars, although the average for *WoW* players is 12 (Ducheneaut et al. 2009). We will focus on primary and first alt avatars, since *WoW* players tend to use their "mains" 70.4% of the time, and their "main alts" 21.6% of the time (ibid.). In general, players use 3 or 4 avatars more often than all others. Reasons for creating alts include game design and the potential for social interactions, with some players creating alts to increase the possibility for being invited to join group missions. However, other players use alts for questionable activities such as selling virtual items at inflated prices. Senior players occasionally create new alts to store their accumulated items, since avatars have different sizes of repository space.

Our specific interest is in alts with unique motivation, since they serve as sources of game playing goals. Individual alts can be used to emphasize different characteristics during various game stages—for example, one alt may be used for grouping, but another is preferred for seeking treasure. Today it is rare for experienced players to use only one avatar for an entire game, since players have different cooperative responsibilities that are situation-dependent. Many games allow players to share materials with other avatars so as to form pyramid-like avatar relationships (one exception is *Second Life*). In other situations, game design or rules encourage players to use certain avatars to mail money or distribute materials or information to other avatars that they control (Castronova 2005). In short, the resource management features of games frequently promote the creation of alts and the creative use of mains and alts.

Alts have beginnings and ends. They may be deleted or simply not used, either for utilitarian reasons or for the simple fact that players don't derive fun from them anymore due to game revisions. Some alts have been known to trigger disagreements in certain game societies, therefore players may use them when playing in small groups, but not in large ones. But they still hold on to alts with the knowledge that virtual worlds are constantly evolving. Avatar value is measured according to many factors, including the value of past achievements, the value of social activities with other players, and the degree to which it supports player immersion (Kujanpaa et al. 2007) For this reason,

evaluating multiple avatars requires a refined model and long-term observations, since game playing goals are tied to complex relationships between players and avatars.

STUDY GOALS

We selected *WoW* for our analysis for two reasons: it has a huge database of more than 12 million subscribers, and alts are a very common feature of gameplay. We used a player-designed user interface provided by *WoW* to collect in-game data and to design an algorithm for locating main and alt avatars. We focused on the management of multiple avatars based on our assumption that multiple avatars express distinctions of game playing goals in different situations. In addition, to understand relationships between avatars in an avatar set, we created two categories based on avatar purpose. Using Erving Goffman's (1959) concept of drama theory, we classified avatars in terms of foreground or background avatar. According to Bartle's (2003) player type taxonomy, foreground avatar categories include achiever, killer, and balanced, and background avatar categories include businessman and repository (Table 1).

An avatar set is defined as multiple avatars under the same player account. Once we identified a set, we performed further analysis to determine avatar types in order to figure out player needs and management. Our first focus was on relationships between avatars sets and game playing goals.

Term	Definition
Foreground Avatar	An avatar used by players for social interactions. Since avatars participate in such interactions, they want to be seen and acknowledged.
Achiever	A type of avatar that favors grouping and often appear in dungeons. Executing raids and other missions requires well-trained and well-balanced groups of avatars with appropriate experience levels (see www.wowwiki.com/Instance). Achiever avatars spend more time and investment on item accumulation.
Killer	A bellicose avatar type generally found in arenas and on battlefields. Prior to battles, they often spend their time repairing items and getting supplies; in these situations they are easier to meet one-to-one.
Balanced	A tourist type of avatar that is not location-specific and does not have specific goals. Balanced avatars tend to travel to all parts of virtual worlds to make money, or to simply try new activities.
Background Avatar	A type of avatar used for tasks that support one or more foreground avatars. Background avatar are frequently found in backstage social activities, and do not emphasize interactions with other avatars.
Businessman	A *WoW* avatar that handles business transactions. The main businessman activity is earning gold from selling items. They are often found in home cities that have auction halls, spatial designs, and security features that support in-game commercial activities.
Repository	An avatar in charge of item storage and mailing. They are usually found in cities with banks, and occasionally in towns with mailboxes. They usually go online for very short periods in order to mail items to other avatars; some stay longer in order to clean repositories.

Table 1: Definitions of terms used in this report

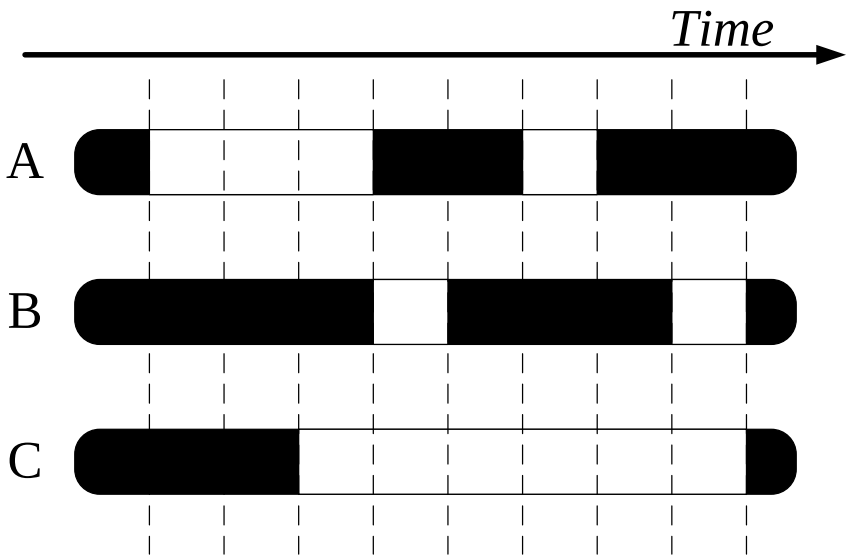

Figure 1: Online sequences of Avatar A, Avatar B, Avatar C
(Light block: online, dark block: offline)

Alt purposes included backups for other avatars, item storage, making money, and tests of new game-playing features, among others. An "avatar type" taxonomy was established to analyze avatar sets and to understand player goals. Our second focus was on avatar set management—there may be many avatars in one account, but the account owner has limited time to use them. The greater the number of avatars owned by a player, the less attention each avatar receives. We made an attempt to determine how avatar priorities are established and enacted.

METHOD

The two main parts of this research were collecting avatar data and finding avatar sets. The goal of avatar data collection is finding online sequences for each avatar, which are in turn used to find avatar sets. We used two Taiwanese *WoW* servers ("Moon of dark shadow" and "Gnomeregan") for collecting data, which were divided between alliance and horde groups (known as "races" in *WoW*). The two servers are typical examples of PvE (Player vs. Environment) and PvP (Player vs. Player) servers, respectively. Data collection intervals ranged from 7 to 15 minutes, depending on the number of players online. By using a player-designed user interface (Ducheneaut et al. 2006), we were able to collect traceable, continuous, and quantifiable data directly from *WoW* games. Search criteria included avatar names, guilds, levels, races, professions, and locations. This data allowed us to know when specific avatars were online, which in turn supported our efforts to follow online sequences.

To distinguish among avatar types, we needed to find double avatar sets prior to locating triple avatar sets that were based on double avatar sets. There were two conditions for checking avatar sets before entering the algorithm core. The first was checking whether avatars were online simultaneously, which would mean that they were not in the same avatar set. In Figure 1, avatars A and C cannot be in the same avatar set because their sequences overlap. The second condition is determining avatar continuity with the online sequence. Most players alternate between their use of mains and alts—that is,

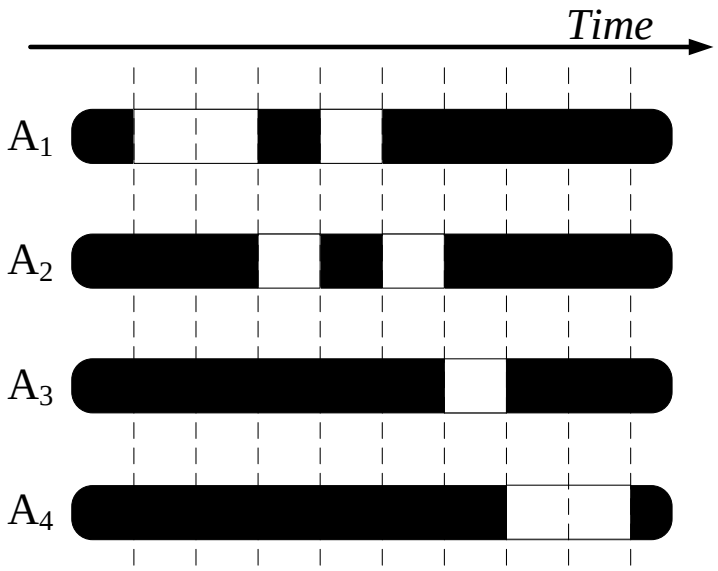

Figure 2: The online sequences of Avatar A_1, Avatar A_2, Avatar A_3, Avatar A_4

Server Type	Race	Sampling Time	Number of Data Records	Number of Avatars	Number of Frequent Online Avatars
PvE	Alliance	13,359	7,647,985	55,089	19,499 (63.92%)
	Horde	8,755	3,104,310	30,448	11,004 (36.08%)
PvP	Alliance	7,561	1,996,556	16,196	6,874 (27.92%)
	Horde	6,878	4,126,659	42,534	17,749 (72.08%)

Table 2: Data summary.

they use multiple avatars in turn instead of sticking with one avatar, since they all have different needs. Switching intervals tend to be short—the shorter the interval, the higher the possibility of two or more avatars belonging to the same avatar set, therefore switching intervals ($\triangle T$) and times can be used to determine avatar sets. In the Figure 2 example, for an account that has four avatars (A_1, A_2, A_3 and A_4), at the fourth time interval one finds three data pairs: $A_1 \rightarrow A_2$ ($\triangle T = 1$), $A_1 \rightarrow A_3$ ($\triangle T = 2$), and $A_1 \rightarrow A_4$ ($\triangle T = 3$), producing three scores.

Once double avatar sets are determined, the next task is to find larger avatar sets. Basically, to find triple avatar sets, one needs to find double avatar set cliques if double avatar sets are expressed as graphs—a clique is a subgraph in which node pairs are connected by edges. This requires re-scanning all avatars to find triple avatar sets based on double avatar set results, since avatar correlations need to be preserved. If avatar A has the double avatar sets AB, AC and AE, we still need to determine whether or not BC, CE and BE are double avatar sets in order to identify triple avatar sets. AB, BC and AC form a clique if BC is a double avatar set, therefore ABC is a triple avatar set.

We collected and organized data between November 2008 and June 2009. In Table 2, "amount of avatars" refers to the number of avatars that went online during the data collection period, and "amount of frequent online avatars" refers to the number of avatars whose online time exceeded 0.5% of the sampling time. Racial percentages were very close to those reported for the entire *WoW* armory; according to armory.wowdb.tw, the percentages of alliance/horde avatars on the "Moon of the shadow" and "Gnomeregan" servers were 70.3/29.7 and 14.1/85.9, respectively.

There are two ways to examine our algorithm results. First, we used 2/3 of the data as input to identify the avatar sets, and then used the rest of the data for verification—that is, to examine whether the alts in the avatar sets were repeatedly online. Under this condition, 88% of the alts in the avatar sets were not online, and 42 real avatar sets were located on the "Moon of the dark shadow" server from different player sources. Among the 33 sets identified by the algorithm, the recall was 78.5%; only one set was found to be a false alarm, meaning that precision was 97%. We also found high correlations among avatar names—for example, "little rain," "shower," "heavy rain," "sunrain," etc. The results indicate that the algorithm was capable of correctly identifying avatar sets.

DISCUSSION

Avatar set results are listed in Table 3. According to the single avatar sets listed in that table, only one avatar had online time that exceeded 1/8 of the sampling time. The Table 3 data also indicate that the game environment affected the scale of player avatar sets, since the number of triple avatar sets on the PvE server far exceeded that on the PvP server. This is likely due to the survival pressure associated with PvP servers, which encourages players to spend more time on social relationships; the result is fewer alts on PvP servers. Furthermore, we did not find significant differences between alliance and horde races.

WoW players must achieve an experience level of 15 in order to join group play, therefore we used that level as a cut-off point: avatars whose levels were 15 or higher were treated as having high-level avatars, and those with levels below 15 were treated as having low-level avatars. As shown in Table 4, if 3 avatars in a set all had levels of 15 or higher,

Server Type	Race	Number of Avatar Sets	Percentage of Single Avatar Sets	Percentage of Double Avatar Sets	Percentage of Triple Avatar Sets
PvE	Alliance	5,386	2.28%	64.76%	32.96%
	Horde	5,423	2.02%	61.28%	36.70%
PvP	Alliance	1,213	19.87%	65.54%	14.59%
	Horde	3,405	7.25%	74.72%	18.03%

Table 3: Avatar set summary.

Set Type	Double Avatar Sets		Triple Avatar Sets	
	Number	Percentage	Number	Percentage
3H	-----	----	1458	82%
2H	3180	91%	276	16%
1H	296	8%	39	2%
0H	12	0.3%	2	0.1%

Table 4: Numbers and percentages of sets containing avatars at different levels.

they were labeled as belonging to a 3-high-level avatar set (3H set); when 2 avatars had levels of 15 or higher, they were labeled as belonging to a 2-high-level avatar set (2H set), and for single avatars at 15 or higher, we labeled them as belonging to a 1-high-level set (1H set). Very few of the avatars we collected data for had levels below 15. This implies that individual players tend to upgrade their avatars within the ranges of their capabilities.

Avatar sets and game playing goals

Data on avatar type can be used to determine game playing goals (Table 5). In terms of foreground avatars, achievers and balanced avatars were the two major types; balanced avatars represent almost one-half, since most players cannot spend long hours in continuous play. According to Ducheneaut et al. (2009), the average age of *WoW* players worldwide is 29.8 years, indicating that most players are of working age. In addition, maintaining several avatars makes instance participation more difficult; some avatars may not show up as expected in specific places because they are involved in many different game activities. (Instances are special *World of Warcraft* areas for group or raid party interaction; see http://www.wowwiki.com/Instance.) Dungeons are the center of major activity in *WoW*, which explains the larger percentages of achiever avatars in Table 5. Achievers tend to form groups and use alts to support attack-oriented missions.

Regarding foreground/background avatars, foreground avatars were dominant in double avatar sets, but when we compared double and triple avatar sets, the number of background avatars increased as the number of members in the avatar set increased (Table 6). One possible reason why avatars in double avatar sets tend to be foreground is that the acts of selling and/or storage are not considered burdens for foreground avatars operated by players. However, as the number of avatar set members increases,

Server Type	Race	Achiever	Killer	Balanced	Businessman	Repository
PvE	Alliance	31%	2%	45%	6%	17%
	Horde	32%	3%	44%	9%	13%
PvP	Alliance	27%	4%	51%	4%	14%
	Horde	35%	5%	46%	6%	8%

Table 5: Avatar type summary.

Avatar Numbers (foreground, background)	Double Avatar Percentage (n = 3,488)	Triple Avatar Percentage (n = 1,775)
(3, 0)	----	39%
(2, 1)	----	32%
(2, 0)	66%	----
(1, 2)	----	22%
(1, 1)	27%	----
(0, 2)	7%	----
(0, 3)	----	8%

Table 6: Summary of avatar types in double and triple avatars sets.

so does the importance of and required time for background avatars. We noticed that some avatar sets consisted of all-background avatars (e.g., 3 businessmen). It is worth mentioning that the primary motivation for some players is not to gain experience, but to make virtual or real money from gameplay.

When Table 6 data are compared with Table 3 data, note the increase in background avatars among high-level avatars, including those at the highest level. A possible explanation is that some players used these background avatars, but stopped for reasons such as being tired of them, not having sufficient time for gameplay, having too many foreground avatars to manage, or wanting to work on characters with special abilities. However, during the upgrading process, certain avatars can have useful abilities in support of foreground avatar activities, but then fade to become background avatars.

Avatar set management

As shown in Table 7, it was very unusual to find the same profession among avatars in the same avatar set. A range of professions can help players form groups for successful raids and other group activities. However, some players still choose the same profession, probably because they loose interest in maintaining background avatars, and then choose professions for purposes of convenience, game management, or fun. Even more rare are avatars with the same profession in the highest-level avatar sets; those players may be interested in experimenting with the same profession in different races due to their different abilities. Other players may perceive the need to add another alt with the same profession and same race for dealing with a range of situations.

In double avatar sets, we found 30% each of "balanced + balanced" and "achiever + balanced" avatars. For the "balanced + balanced" combination, players likely had enough time and resources to manage both avatars, so there was no need to make one a background avatar. On the other hand, achievers often join to participate in instances,

therefore they need repository avatars in home cities to handle logistics. In 1H double avatar sets, "balanced + businessman" was the major type,

Type		Double Avatar Sets		Triple Avatar Sets	
		Number/Amount	%	Number/Amount	%
3H Set	3 in same profession	----	----	2/1,458	0.14
	2 in same profession	----	----	144/1,458	9.88
2H Set	3 in same profession	----	----	4/276	1.45
	2 in same profession	134/3,180	4.21	2/276	3.84
1H Set	3 in same profession	----	----	0/39	0
	2 in same profession	25/296	8.45	7/39	17.95
0H Set	3 in same profession	----	----	0/2	0
	2 in same profession	2/12	16.67	1/2	50

Table 7: Sets and percentages of same-profession avatars in double and triple avatar sets.

suggesting that those players only wanted to upgrade one avatar to participate in game activities, and retain other low-level avatars for background tasks. The reason for the prevalence of the combination of achievers and balanced avatars in triple avatars sets may be that achievers require lots of consumable resources, therefore they need high-level avatars as backups, mostly to enter areas that are forbidden to low-level avatars.

CONCLUSION

MMORPG players create avatars to enter game worlds, and understanding how they manage multiple avatars can help researchers determine how players maintain a sense of fun in a game. Players also create alts for specific purposes, and understanding those reasons can help researchers understand player goals. Players tend to start with foreground avatars, and create background avatars to handle logistics based on specific game situations. Due to real-world time and resource limitations, players may try to manage two foreground avatars, and create one or more alts for background tasks. When the number of avatars in an avatar set increases, players are likely to preserve one or two foreground avatars, and treat all other alts as background ones.

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