"Get Off My Lawn!" – Starting to Understand Territoriality in Location Based Mobile Games

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Reference
Papangelis K, Metzger M, Sheng Y, Liang HN, Chamberlain, A. (2017) "Get off my lawn!" - Starting to Understand Territoriality in Location Based Games. In CHI '17, Denver, USA, 2017. Extended Abstracts on Human Factors in Computing Systems (CHI EA '17). ACM, New York, NY, USA. DOI 10.1145/3027063.3053154

Abstract
With the increasing popularity of mobile video games, game designers and developers are starting to integrate geolocation information into such games. Although popular location-based games (LBGs) such as Ingress and Pokémon Go have millions of users, research still needs to be carried out to fully understand the ways in which such games impact upon a player's interaction with other players and their physical surroundings. Consequently, there is limited knowledge on how user behavior can be addressed and drawn upon as a design resource to further engage and motivate players to play. To further understand this, we developed a LBG called CityConqueror and have conducted an in 'the wild' study. This initial study starts to unpack the ways that human territoriality can be expressed in LBGs to facilitate player motivation, engagement and can support the integration of the game in the player's daily life. Based on our findings we propose a series of design implications for LBGs. The primary purpose of this paper is to draw attention to the importance of territoriality and the way that this can be drawn upon as a resource for design.

Author Keywords
Location-based mobile games; locative media; hybrid reality games; playful spaces; image of space; player; mobility; territoriality; game design.

ACM Classification Keywords
H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous; H.1.2 User/Machine Systems: Human Factors; K.8 Personal Computing: Games.

Introduction

With the emergence of social networks and mobile computing, location-based services have grown in popularity. Well known social networks such as Facebook or Twitter have already integrated location-based services such as geotagged content and 'checking-in' to locations, to develop their existing catalog of services. Other social networks are built primarily as location-based system. While these systems combine social networking with location-based services to build location-based social networks, others use location-based services to create LBGs. In 2016 Pokémon Go was launched drawing attention to such games (although earlier incarnations of LBGs can be identified in the literature [5] and [6]). Pokémon Go is a hybrid reality game, which has successfully combined mobile computing with augmented reality. Players see virtual projections of the game's components in their "real" surroundings by using the camera of their mobile device. By making a player's location part of the mechanics of the game, games like Pokémon Go combine the physical "real" world with the digital virtual world of the game, creating a hybrid space; and yet little is known about how people use them and how they influence the nature of a user's interaction with other users and with his/her physical surroundings [1].

De Souza e Silva and Sutko [3] have identified three properties of hybrid reality games that deserve analysis: the connection between play and ordinary life, the relevance of the player community, and surveillance. In this paper, we focus on the role of *human territoriality* in LBGs. Human territoriality is a behavior where one claims space as their own and communicates this claim to others [4]. By focusing on this we address both the connection between play and ordinary life, and the relevance of the community of players as territoriality in both contexts [3].

Related Work

A popular location-based social network is Foursquare. Lindqvist et al. [9] studied how people use the Foursquare check-in system. In interviews and surveys the authors found (among other things) that participants that they would not check-in to locations where they would feel embarrassed; too embarrassed to share with others, or locations that were perceived as boring. While check-ins at restaurants and bars were very common, *"most people do not check-in when seeing a doctor."* Another interesting finding *"was the bimodal distribution of check-ins for home and work."* While most people said they never checked in at home, many people said they did check in 1-2 times a day at various locations to become the mayor of that location and to stop others becoming a mayor. This indicates a notion of territoriality triggered by the competitive gameplay of Foursquare. In our study, we found similar evidence for territoriality. Following a similar approach, Humphreys et al. [8] studied the parochialization of public space. The authors refer to three kinds of urban realms, the public, private and the parochial realm, which have been defined by Lofland [12]. According to Lofland [12] social relations shape urban places. Thus,

CityConqueror

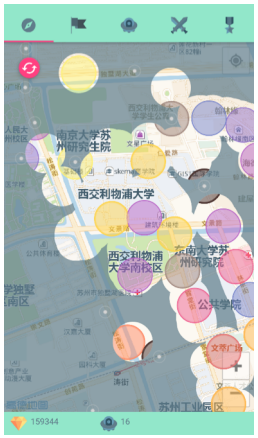

Fig. 3. Territories are plotted on the map.

Fig. 4. A player can conquer a territory in his location

the three kinds of urban realm used are based on three different kinds of relationship and the social links that exist between people. *"Public realms are characterized by people who are relatively unknown to one another, such as city parks, or plazas".* Private realms are those shaped by people with intimate and close relationships to them, *"such as individual apartments".* Parochial realms are forged by groups of people that have parochial relationships embodied as *"a sense of familiarity or commonality".* These parochial relationships can exist either person-to-person or person-to-place. A special person-to-place parochial relationship that finds attention in this paper is the relation to home territories. *"In particular, the home territory is one where people have a sense of connection, intimacy, and control"* [11]. These relationships can be formed with private as well as public spaces so that both private and public spaces can be understood as home territories. Humphreys et al. [8] argued that mobile social networks could serve as a platform where place-based territorial relationships could be negotiated through physical and social interactions with others. Stating, they *"offer more reach and authority in making territoriality legible than a single person could through everyday physical practice in a space".* By identifying the person-to-person and person-to-place parochial relationships formed through the usage of Foursquare, Humphreys et al. [8] argue that, *"Foursquare can facilitate parochialization"*. These relationships were supported by Foursquare's social network and generated a *"sense of familiarity and belonging to people and places within the larger urban environment".* Of particularly relevance to our research are the findings in respect to person-to-place parochialization. The authors found that participants used mayorships in Foursquare to make territorial claims to places and defend their claimed places against competitors, if the competitors *"claim on the place seemed illegitimate"*. Humphreys et al. [8] reason that the ability for users *"to make virtual claims on physical spaces by checking in"* and the way the interface of Foursquare communicates that a competition over territories, *"can invoke territoriality and defense of these places as 'home territories.'"*

CityConqueror

In order to investigate human territoriality in LBGs we have designed and developed a LBG called CityConqueror[1]. CityConqueror was inspired by the board game 'Risk'[2], in which a player conquers countries on a world map, deploys units to defend his countries and attacks countries owned by other players (Fig. 1). In CityConqueror, players can conquer territories in their physical location, deploy units to defend their territories and attack territories of other players that lie in their physical proximity (Fig. 2). When conquering a territory, the player can give it a name that is visible to other players, deploy units to defend the territory and hide a treasure in it. Territories are conquered and plotted on a map of the "real" urban terrain, showing the player's location. The map is covered by the *"Fog of War"* similar to other popular games that deal with territorial conquests. A player can uncover the *Fog of War* to reveal more of the map by physically exploring the urban space. When a player has physically visited a space and thereby uncovered the *Fog of War* overlaying it, they are able to see enemy territories in this area, even after leaving it. To

[1] http://kpapangelis.com/geomoments/

[2] http://www.hasbro.com/en-us/product/risk-game:2C7C6F52-5056-9047-F5DD-EB8AC273BA4C, accessed 12/21/2016.

Fig. 3. Territories in the *Fog of War* are indicated with g*lows*

Fig. 4. To conquer a territory the player must first defeat all enemy territories in the range of the territory (the pink ring in this screenshot)

drive the exploration of the map and thereby the player's actual surroundings, the player can see *glows* (hot-spots) in undiscovered spaces, indicating the location of enemy territories in the *Fog of War* (Fig. 3) Territories generate resources over time which can be collected to buy units to defend their own territories or attack enemy territories (Fig. 4 and Fig. 5). To conquer a new territory, players must first defeat all enemy territories in their range. If a player attacks an enemy territory and wins the fight, they have the chance to find the treasure hidden in the enemy territory. Searching for a treasure is a mini-game within the CityConqueror. The player is given a compass that points in the direction of the treasure, the distance in meters to the treasure from the current location and three minutes' time to find the treasure (Fig.6). To find the treasure the player must move to the pointed location. Furthermore, a player can complete achievements that reward actions related to exploring their surroundings and success in the game such as conquering a certain number of territories, conquering territories with a large distance between them, defending territories or attacking others (Fig. 7 and Fig. 8). The objectives of CityConqueror is to claim as many territories as possible to generate income and consequently to be able to defend territories against attacks from others and attack others to conquer their territories. Thus, the game experience of one player is highly dependent on the actions and interactions of other players. In that way, we have implemented a salient social aspect in the game.

Methodology

After developing and testing of CityConqueror, we conducted a study in which 12 participants were randomly assigned to one of two teams to play CityConqueror over one week. All participants were students of an international university in China aged between 19 and 26 who spent the better part of their daily life in close proximity of the campus (they stayed in their dorms and ate in nearby restaurants). All of the 12 participants were also engaged in the previous game testing process and were familiar with the game. This negated any novelty effects. The teams competed, using a team score mechanism, based on the resources collected and treasures found by the players. CityConqueror was played actively and with a high level of engagement. After the subsequent testing and team play phases, each participant was interviewed to evaluate their experience of the game. The same topics were followed through the course of each interview - these included the importance of using real maps and the role of location-based entertainment in the game, the importance of territories, strategies to claim territories, places that had or gained importance for the player, exploration of new places, mobility, monitoring and anticipation of the behaviour of other users, communication between players, rivalry between players, privacy concerns, and the integration of the gameplay into the daily life of the player. The audio-recorded interviews were transcribed verbatim and analyzed using a grounded theory approach. This approach enabled us to identify theories from unstructured data through data reduction, categorization and aggregation. By identifying important topics discussed in the interviews, grouping statements based on the identified topics and subsequently mapping quotes from participants to statements, we reduced and structured the data to understand the players' experiences.

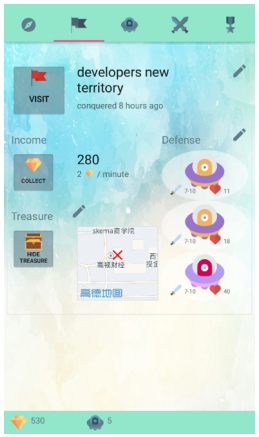

Fig. 5. A territory generates resources

Fig. 6. After winning a fight the player can try to find the treasure by getting to the indicated position within 3 minutes.

Results

To evaluate the game design and to understand how players experience a game that takes place in the "real" urban space, we investigated the use of a "real city map". Nine out of 12 players felt that the employment of the real map and the player's location gave them the feeling of playing in the real world rather than in a fantasy or otherwise restricted game environment. *"It made me feel that the territories I take are real. I had the feeling that the place belongs to me"*. While this quote gives an example of how players felt that they would claim possession of an actual space rather than a virtual territory, one player also stated that he had the feeling of playing with everyone that surrounded him in the real world rather than the limited number of players that were part of the game world: *You play this in a real world. You feel like you are playing with all the people around you"*. The most significant finding regarding human territoriality is that all players had conquered the territory in the place where they lived or tried to defeat other players occupying this place to claim it for themselves. This strategy was applied by all users over all territories and only breached for one purpose, the defense and demonstration of power in the player's 'home territory'. It is to be pointed out that the idea of a 'home territory' is not a fixed concept in CityConqueror. Still, all players used these expressions to describe the territories they conquered in the places where they live. Thus, the idea of a 'home territory' was implemented solely by the players. This makes it all the more interesting to find that all participants expressed the importance to conquer their 'home territory' and to keep control of it even if this would not necessarily give them an advantage in the game.
Eight players deployed their strongest units in their home territory, even if it was never attacked by other players and the risk of being attacked in this place was low because other players were not expected to frequent the area. "*Yes, I deployed the strongest units in my home territory. This is my home and I need to protect my home*" was a comment from a player. One player also said it was a matter of honor to demonstrate his strength in his home territory. These examples show a highly protective behavior concerning the home territory that go beyond the common rational strategy of protecting territories that lie in frequently attacked areas. In one particularly interesting case, a player claimed a territory in a place that they had never visited before and treated it as their home territory. In a similar way, three players claimed possession of public places that were known to be frequented by other players with the intention of demonstrating their strength, power and dominance where the most people can witness it and challenging them to a trial of strength. Instances of *named places* were also evident, places where players took the time to give their territories names for all to see. One player said that "*I named my territories with my name and the number to show others how many territories I have so far*". This leads us to suggest that communication via territory names can be interpreted as an instrument to negotiate legitimacy of claims to places and facilitate territoriality in CityConqueror as discussed by Fazel et al. [13]. The finding that players would conquer and protect the places they live in or even public places and treat them as their home territory are clearly comparable to the findings of Humphreys et al. [8]. They found that the ability of users "*to make virtual claims on physical spaces by checking in can invoke territoriality*" and defense of these places. The example of a player treating a public place as his/her home territory illustrates that the relation to home territories is a person-to-place parochial relationship where "*people have a sense of connection, intimacy and control*", that

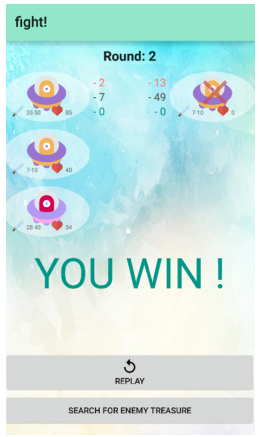

Fig. 7. The result of a fight in CityConqueror

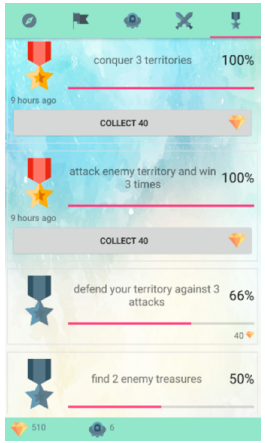

Fig. 8. The player can complete achievements.

can be formed with private or public spaces equally [8] [10] [7]. Further they have argued that mobile social networks can serve as a platform where territorial relationships with places can be negotiated through interactions with others. The findings on how all players expressed territoriality in CityConqueror and the feeling of claiming ownership of real areas and playing with everybody in the urban space, reflect these arguments.

Discussion and Conclusion

Our findings that players prefer to claim real places rather than virtual territories and would rather play in the real world with people around them, show that the layer of virtual game reality that CityConqueror (as a hybrid reality game) implements on to the player's actual reality could be minimal. as opposed to an immersive experience. Accordingly, the player retains the feeling of playing in the real urban space around him. As shown by Saker et al. [14], in relation to Foursquare, and observed in CityConqueror too, the ordinary space and play are not distinct. This contradicts Huizinga's [7] conventional understanding of play being strictly separated from ordinary life and supports the claim that *"boundaries between ordinary space and play are blurred or challenged"* [2]. We have identified expressions of human territoriality and dominance in CityConqueror. All participants conquered or tried to conquer and protect the space that they saw as their home territory even though home territory is not a game concept in CityConqueror. One could argue, that conquering a home territory emerges from playing the game at home and was not necessarily territorial claims. Yet, all of the participants used the expression "*home territory*" or "*home base*" to describe these territories and protected them, if not necessary in the context of the game. Akin to the territoriality found relating to the use of Foursquare [14], this wording and protective behavior indicates that territorial claims can be negotiated not only via location-based social networks but also via location-based mobile multiplayer games. By designing and developing a LBG and in respect to the findings of our study we propose the following design implications for LBGs: 1) The game design should construct a layer of virtual reality on top of the players (real) reality that is light weight and lean, giving the game a 'real feel' and forming the illusion of playing in the 'real world' to support the integration of the game into the player's daily life. 2)The game design should consider the fact that the game can change the player's perception of the urban space. This can in turn, drive player engagement and remind and motivate the player to play. 3) The game design should address human behavior such as territoriality to create an engaging experience and to support the integration of the game into existing habits and behavioral patterns of players in the urban space. As such we draw attention to the importance of incorporating human behavior into the game-play mechanics in respect to the context of person-to-person and person-to-place interaction as part of the design of LBGs. We wish to start a discussion and encourage further research into human territoriality, by investigating other human behavioral patterns and habits and how they might be leveraged in LBGs. Future research will define further design implications in order to assemble a framework to guide and support the design of location-based mobile games to create engaging, player-centered enjoyable experiences.

Acknowledgements

This research was supported through the Xi'an Jiaotong - Liverpool University grant: RDF 15-02-17

References

1. Adriana de Souza e Silva, 2016. Pokémon Go as an HRG: Mobility, sociability and surveillance in hybrid spaces. Mobile Media & Communication (2016): 2050157916676232. [1]
2. De Souza e Silva A and Hjorth L (2009) Playful urban space: a historical approach to mobile games. Simulation & Gaming 40(5): 602–625. [2]
3. De Souza e Silva, A., and Sutko, D. M. (2008). Playing life and living play: how hybrid reality games reframe space, play, and the ordinary. Critical Studies in Media Communication, 25 (5), 447-465 [3]
4. Delaney, D. (2005). Territory: A Short Introduction. Oxford, UK: Blackwell.
5. Drozd, A., Benford, S., Tandavanitj, N., Wright, M. and Chamberlain, A. Hitchers: Designing for Cellular Positioning. *Lecture Notes in Computer Science*, (2006), 279-296.
6. FitzGerald, E., Taylor, C. and Craven, M. To the Castle! A comparison of two audio guides to enable public discovery of historical events. *Personal and Ubiquitous Computing 17*, 4 (2012), 749-760.
7. Huizinga JH (1992 [1938]) Homo Ludens: A Study of the Play-Element in Culture. Boston. Beacon Press.
8. Humphreys, L. and Liao, T. 2013. Foursquare and the parochialization of public space. First Monday, 18(11).
9. Janne Lindqvist, et al. 2011. I'm the Mayor of My House: Examining Why People Use foursquare – a Social-Driven Location Sharing Application. Proceedings of the SIGCHI conference on human factors in computing systems. ACM, 2011.
10. Joanna Brewer and Paul Dourish, 2008. Storied spaces: Cultural accounts of mobility, technology, and environmental knowing. International Journal of Human-Computer Studies 66(12): 963-976.
11. Jordan Frith, 2012. Location–based social networks and mobility patterns: An empirical examination of how Foursquare use affects where people go. Pan American Mobilities Network (Raleigh, N.C.).
12. Lyn H. Lofland, 1998. *The public realm: Exploring the city's quintessential social territory*. Transaction Publishers.
13. Maryam Fazel, Lakshmi Priya Rajendran, 2015. Image of place as a byproduct of medium: Understanding media and place through case study of Foursquare. City, Culture and Society 6.1 (2015): 19-33.
14. Michael Saker, Leighton Evans, 2016. Everyday life and locative play: an exploration of Foursquare and playful engagements with space and place. Media, Culture & Society 2016, Vol. 38(8) 1169 –1183.