Understanding Digital Play in Moving Spaces

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ABSTRACT

Digital games have traditionally been confined to predefined play spaces such as arcades and living rooms. Recent advancements in technology have allowed players to play digital games beyond these spaces. However little theoretical knowledge exists that can guide the development of digital play beyond the conventional. I aim to conduct research that comprises of several experimental digital games deployed in unconventional play spaces that will broaden the understanding of where, how and with whom we play. This research may aid researchers and designers interested in digital play, ultimately taking a step towards creating a more playful society that can aid from the many benefits of play.

Categories and Subject Descriptors

H.5.2 [Information Interfaces and Presentation]: User Interfaces.

General Terms

Human Factors, Design, Experimentation

Keywords

Play, unconventionality, moving spaces, pervasive games, game design, experimental games, urban games, street games

1. INTRODUCTION

Play is an inherent aspect of being human and its importance is constantly highlighted in games studies and research [2][8][11][15]. There has been a constant rise of digitally enabled play in the last century in the form of consoles and systems, which act as platforms that afford play. However, digital games have traditionally been confined to arcades and living rooms. Only through the advent of recent technologies such as mobile devices have players had the opportunity to play beyond the traditional play spaces of digital games [16].

Spaces that afford play are seemingly expanding along with our understanding of play in culture [12]. As a result, designers are required to rethink where, how and with whom we play when designing play experiences. The spaces in which we play inform the play experience. I look particularly at moving spaces, spaces that are moving along with the people in it. What fascinates me is the moving aspect, which is unique to the space and has yet to be explored to its full potential as a space for play. Despite players having the capability of playing digital games almost anywhere through the aforementioned technological advancements, little

theoretical knowledge exists that can guide the development of "Digital Play in Moving Spaces" and describe the interrelationship between play, technology, the body and these moving spaces.

2. RELATED WORK

There are a few existing works that take place in unconventional play spaces that inspire and inform my research, in the following section I summarize some of these works.

StreetPong is a digital game that allows two pedestrians at opposite ends of a pedestrian crossing to play a game of Pong by means of a controller that is attached to the walking-sign post while waiting for the traffic light to turn green [4]. StreetPong shows that games in urban environments may have the capacity to engage users of the space in social digital play, and that technology can support this.

Colony, a digital urban art installation, allows passersby to interact with totems by walking through them or using a mobile device to manipulate and play with them [9]. The totems also communicate with one another using light and sound, encouraging users of the space to interact and collaborate. Colony suggests that having an interactive system in an urban environment can draw attention and spark curiosity in passersby through visuals and audio, and can also facilitate social interaction among users.

Lummoblocks is a public installation designed to evoke collective interaction in an urban environment [7]. Passersby are able to engage in a game of Tetris using their bodies to control the game. Two players are required to play the game. One of the players controls the direction of a falling block while the other rotates it. This work shows that collaborative digital games in public spaces can be performative, creating a crowd and engage bystanders.

The London-based public transport game Chromaroma [3] uses passenger's Oyster Cards [19] to track and record their locations and awards points for completing tasks and missions, such as visiting unexplored locations. Players are able to compete with one another on a national leaderboard. The game is accessed through a mobile device and provides visualizations of the passenger's travelling routes. I find this to be an interesting way of engaging passengers on public transport. However, I believe there is a missed opportunity to incorporate both the passengers and the immediate physical space into play, and allow for the passengers to engage in play together to facilitate more engaging commute experiences.

The concept system "Strap Game" [14] aims to augment the public transport space with digital systems. Strap Game involves strapping a small display to the handles that passengers hold onto while travelling, allowing them to play existing games like Tetris through tilting the strap and pressing buttons on the strap [14]. I am inspired by the idea that handles and bars, which are important parts of commuting, can be augmented to support playful interactions. Unfortunately, this system is only a proposed concept

and therefore there are no further insights available on how passengers would engage with such a system.

I feel inspired by these games and systems all of which take place in spaces outside of the conventional. These works inform me of design opportunities for social interactions in public contexts through the engagement of multiple people in these games and systems. This is further supported by the fact that gaming is often as much about social interaction, as it is about interaction with the game content [10].

3. PREVIOUS STUDIES

I previously designed Cart-Load-O-Fun [18], a two-player experimental game designed for public transport (Figure 1). Two players collaborate to control a single character from a top-down third person perspective. One player controls the character's movement on the x-axis while the other player controls the y-axis. This is done by holding onto the bars that have sensors attached to them and applying force by squeezing. Holding on tighter increases the value that correlates to the x and y position of the character in the game. Players must work together to collect gems that randomly appear, while avoiding enemy characters that bounce around the level (Figure 1).
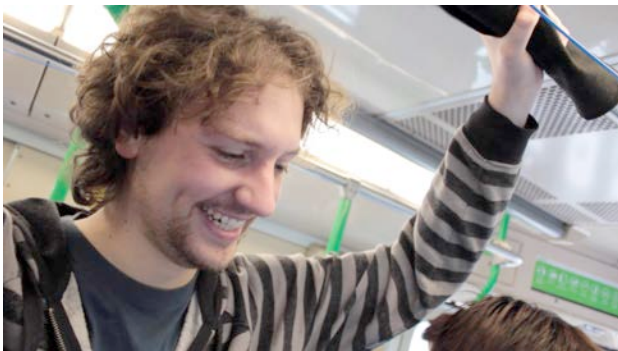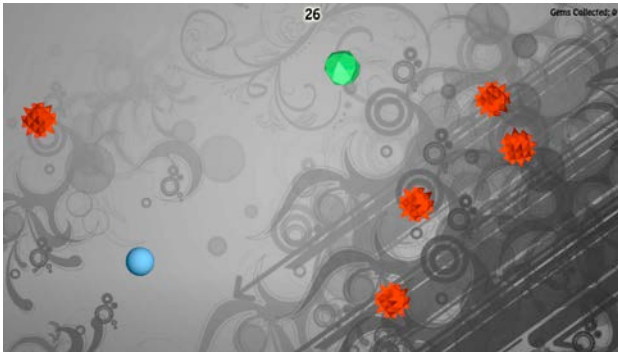

Figure 1. A passenger (bottom) enjoying playing Cart-Load-O-Fun (top) on a tram using sensors attached to the bars.

I conducted a study to understand how passengers play and experience Cart-Load-O-Fun as a means of gaining knowledge in how games for moving spaces should be designed. The findings from the study revealed 3 design dimensions of digital games in moving spaces, and I provided 7 design strategies as guidance for game designers who aim to facilitate play in unconventional spaces such as trams [18]. The game acted as a research vehicle to explore the ways in which digital games that incorporate both the physical and social affordances of the space can enhance the experience of travelling on public transport.

I see this work as a starting point in which we begin a conversation and discussion towards the understanding of

unconventionality in play, looking particularly at where, how and with whom we play, as I believe research in this field can help us broaden our understandings of digital play.

4. PROPOSED RESEARCH

I aim to look particularly at spaces that have yet to be explored to their full potential as spaces for play; I call these spaces "unconventional play spaces" or spaces that afford play but of which play is not the primary purpose. I aim to focus further on "moving spaces", spaces that move along with the people within it.

I see this as one example of an unconventional play space and propose that research in this area will contribute to our understanding of how to design digital play for moving spaces. I aim to do this through a series of exploratory studies that comprise of three experimental digital game prototypes deployed in three moving spaces.

These games will act as research vehicles that aim to support the understanding of where, how and with whom we play by contributing knowledge on digital play in moving spaces. This research may aid researchers and designers interested in digital play, ultimately taking a step towards creating a more playful society that can aid from the many benefits of play.

My aim is to gain an understanding of how unconventional spaces can be used as a space for play and how it can encourage play for both the players and non-players within the space. Therefore, my main research question is:

- "How do we design digital play for moving spaces?"

This is supported by several relevant secondary research questions that contribute to the main research goal:

- How do we define and understand digital play in moving spaces?

- Should play be encouraged in moving spaces, and if so, why and how?

- What role does technology have in evoking play in moving spaces?

- What are the potential challenges faced when designing for moving spaces?

5. PROPOSED METHOD AND RESEARCH TASKS

I aim to use the 'research through design' approach to undertake the proposed research. This will consist of the design of three games that are deployed in three moving spaces. This approach is widely used for research in game design, interaction design and human-computer interaction fields [20][21] as well as in the Exertion Games Lab at RMIT University and in my previous research [6][13][17] as an approach for generating knowledge through the creation of designs and associated explorations. The games will be created using a rapid prototyping process.

I will interview participants who play in these moving spaces using the laddering technique [1], which will take place over multiple rounds of data collection. The qualitative research method 'grounded theory' will be used to analyse the collected data [5]. Common themes, synergies and anomalies will be sought out in the collected data, leading to a conceptual understanding of digital play in moving spaces.

In order to achieve the defined research questions in my PhD, I aim to complete the following tasks:

- Create three game prototypes designed for moving spaces as case studies.
  - o Rapid prototyping will be used for the creation of the games.
- Interview participants who play the games, over multiple rounds of data collection.
  - o Laddering technique will be used for the interview process.
- Analyse the data collected, seeking out common themes while also looking out for synergies and anomalies.
  - o Grounded theory will be used for the method of analysis of the collected data.
- Publish the findings along with guidelines in the form of 'design strategies' that game designers and researchers may also benefit from.
  - o Findings will be published at prestigious conferences in the field of games research and human-computer interaction (e.g. CHI, TEI, DIS, Fun and Games, Foundations of Digital Games, and DiGRA). I aim for one conference paper per moving space explored (three in total).
  - o Dissemination of results to media and game design audience in the form of online articles as well as promotional videos.

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