Design for coincidence : Incorporating real world artifacts in location based games

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ABSTRACT
As location based games move players out of the house and onto the streets the experience of game play radically changes. Game designers have the opportunity to incorporate artifacts, elements and events that might naturally occur in the real world into the game play so that a particular place becomes more meaningful.
This paper explores the relevance of place and the idea of "design for coincidence". Design for coincidence is illustrated through case studies and a number of example games that show how this approach has been effective in location based games.

Categories and Subject Descriptors
H.5.2 User Interfaces

General Terms
Design

Keywords
Mediascape, mobile, Experience design, Location based games

1. INTRODUCTION
Location based games are an active area for both research and commercial investment. As GPS becomes a standard feature in most new mobile devices there will be more opportunity to design sophisticated and engaging mobile games that use location as a fundamental part of their game mechanic.

This paper examines how located games can be made more engaging by making use of aspects in the physical environment so that engagement with the surroundings becomes an integral facet of the game. The paper draws on examples from a number of research field trials and the growing body of mediascapes published on the web [15]. Mediascapes are context aware experiences that can be created using the mscape platform [8]. The mscape platform has been designed so that anyone with a PC can easily create mediascape games, tours or walks. The mscape platform consists of the mscape maker, a simple drag and drop editor, the mscape library, for organizing mediascapes and the mscape player which runs on any windows CE based device with GPS. Mediascapes have been made by school groups, environmentalists, artists, media designers, heritage sites, college students and game designers. Anyone who creates a mediascape can share it by uploading it to the mscapers web site. This paper draws together the design lessons learned from analyzing a number of games that have been created and uploaded to this shared repository.

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2. CHARACTERISTICS OF LOCATION BASED GAMES AND RELATED WORK
In a location based game players are typically mobile and move around an outside space. Players use some form of mobile device which will capture information about their current context, including their location, and this is used within the game to deliver a media rich experience that changes depending on their location, game logic and other sensed context. There are three fundamental aspects to consider in the design of a location based game

1. the size and duration of the game
2. the infrastructure available in the game location
3. the role that place has within the game play

2.1 Size and duration of the game
Location based games can differ in size and duration between a short, time constrained game played on foot in a well defined game area to a perpetual game played in short bursts over a long period of time, involving large distance that might combine both driving and walking. For example "Doubloons" [13] is a fifteen minute, single player mediascape game that can be played in any open space. Players first place five islands by walking around their chosen game space and specifying where an island is. Once the islands are placed the game involves revisiting the islands, trading goods and avoiding the pirates who can rob you when you are at sea. It is an example of a portable location based game whereby players define their own game area and the system remembers where elements are that have been laid down in that geography. Play can be anywhere that has enough open space for a player to be able to lay out their islands and can be any time the player chooses. It is similar to the way that spontaneous games of football (soccer) can occur when players mark out goal posts with their clothing.

In contrast Mogi [7] is a subscription based, multi-player, mobile phone and web game in which players collect virtual objects by traveling around Japan. A radar map on the players mobile screen shows the presence of objects and other players situated within a 500 meter radius. Play continues indefinitely and players build up

their reputation, resources and score whilst socialising with other players in the game. The size of the game is city wide (or even country wide) and the duration is ongoing. It is a perpetual game played in the cracks of everyday life.

2.2 Infrastructure

The infrastructure for a location based game comprises

- the device and its capability,
- the availability of networks
- the sensing technologies.

The devices are typically PDAs or mobile phones that have GPS embedded or added on. The screen size of the device can vary and some screens will be touch sensitive whereas others may not be.

The networking capability will also vary depending on the device and the location. Some location based games will rely on connection to a game server to function. These are usually multi-player games. Other games do not require connection to a server because all media is stored locally on the device and the GPS position alone determines if the location should trigger an in game event.

The technologies that are used for location sensing such as GPS, RF, IR or Bluetooth beacons and wireless networking technologies all suffer from problems of uncertainty which raise a number of design challenges for games designers. In mediascape games the availability of GPS is such an important factor that it is exposed to the player as a permanent status icon. It is also a property that the game designer can choose to flag to a player in a more prominent way. Several mediascape games alert the user that GPS has been lost by suspending the game and showing a "Waiting for GPS screen".

The concept of "seamful design" [4] where the infrastructure becomes a central feature of the game, enables designers to address the issues with the infrastructure and consider ways in which state can be reflected within the interface design and become fundamental to game play. Seamful design is one of the research areas that is driving the design of pervasive and Ubicomp games to use features of the infrastructure and an understanding of the technology seams within game play. In Feeding Yoshi [1] players move around to discover virtual creatures called "Yoshis" and feed them fruit. Each Yoshi will have a seed for its favourite fruit and the player needs to take the seed and find the location of a plantation where the fruit can be sown, picked and carried back to the Yoshi. The game uses the detection of secure or insecure wireless access points to present either Yoshis or plantations respectively. As the presence of wireless networks are shaped by existing socio-technical systems, players reported different kinds of places as having different characteristics of game play. Some locations such as industrial and business districts felt uncomfortable because of the presence of surveillance cameras and security guards. Other locations felt dangerous. Unlike the portable mediascape games where players choose their own game play area, in Yoshi the wireless infrastructure coverage determines the game play area and so it is the game designer's knowledge of the infrastructural world which is used to create the seamful game.

2.3 The role of place

Feeding Yoshi underlines how significant the role of place is in the experience of game play. The difference between space and place has been described by Dourish [7] whereby "space" describes geometrical arrangements that might structure, constrain, and enable certain forms of movement and interaction, and "place" denotes the ways in which settings acquire recognizable and persistent social meaning in the course of interaction. And of how the way a virtual game world maps to physical presence in the real world can open up a new spatiality of access, presence and interaction [5].

Figure 1 shows the relevance of place on a spectrum between neutral and high significance. To the neutral, left hand side of this dimension, place is appropriated more for its spatial properties rather than its physical, social and cultural properties. To the highly relevant, right hand side of the dimension, place has a strong association in terms of its significance, meaning and integration within the game.

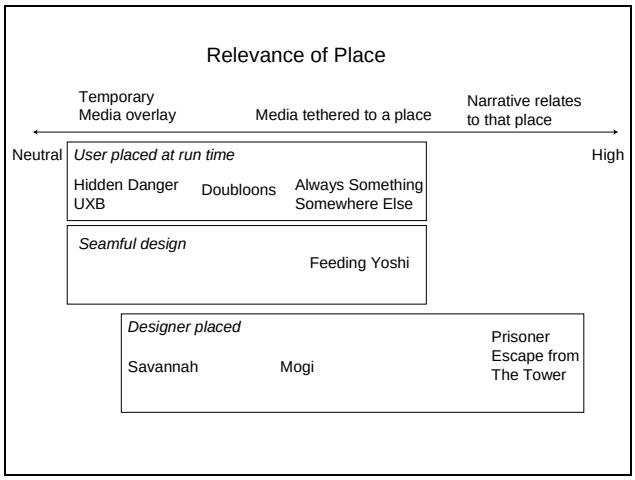

Figure 1. The Relevance of Place Dimension

Location based games are shown on this dimension depending on how the virtual game overlay maps to physical place. There are three classifications of game types

1. User placed at run time: where the user selects and marks out the game area as part of the game,
2. Seamful design: where the games have been designed to use the system infrastructure to determine game play
3. Designer placed: games where the designers choose specific locations because of the properties of the actual place.

Some of the example games in Figure 1 have already been described. We will now briefly describe the remaining games to understand their characteristics and why they are in the position that they are on the Relevance of Place dimension.

Savannah [1, 2] turns a school playing field into a virtual African Savannah by overlaying sounds and images from the real Savannah. Players learn how to act as a successful pack of lions by marking the territory and hunting on virtual prey. In Savannha the place is simply an area of a certain size and shape and any

large rectangular space within a playing field would work. In principle the game can be moved to any place with the right spatial and infrastructural characteristics. A wireless network is needed to handle messages from the devices to the game server. The game could be played on any playing field and at any school that also had the necessary wireless infrastructure. The relative positions of the virtual elements within the physical space of the Savannah are determined by the designer. The game was designed by specifying regions on a map of the area of the right size and shape [6]. Where the game is played does have some relevance in that it was designed for a school environment and the features in the terrain were carefully designed to be appropriate for a real Savannah and to convey habitat, animals and hazards that might be found. Consequently it is been placed slightly more to the right on the place dimension than the Hidden Danger UXB game which does not have any special relation to where it is played it purely uses spatial properties.

Figure 3. Screenshot from Hidden Danger UXB

Hidden Danger UXB [14] is a single player mediascape game that asks the player to mark out a large open space which then becomes a minefield that the players need to sweep in order to detect and diffuse three unexploded bombs. To defuse the mine the player needs to solve a puzzle depending on the type of bomb that they uncover. One of the mini-game puzzles is a word puzzle "WordKey" and the other is a color pattern guessing game "ColorKey". Play is against the clock and if you are not able to defuse the bombs in time the game comes to an explosive end. Like the Savannah game the media is simply overlaid onto the physical space regardless of any landmarks or objects in the space. However unlike Savannah the position of the mines is randomly placed each time a new game starts, there is no specific relevance about the relative position of the mines other than they are not put on top of one another.

The Doubloons trading game that we described earlier is more strongly related to place in that the players choose where their islands should be placed. They will make this choice based on what else might be in the environment, how they might remember the place and how they want the islands to relate to one another. Once the player places an island they are greeted by the local traders. Each time the player returns to an island the trader gives them a new greeting and displays the goods that are available to buy or sell depending on what they have bought on other islands. There are English, French, Spanish, Dutch and American islands. The game relies on you remembering which island has the highest and lowest price for goods and the game strategy is to buy low and sell high. In placing the islands the user is effectively customising and personalising their individual game space.

Figure 2. Greeting from the English islanders in Doubloons

The technique of marking and remembering a place is used even more effectively in a mediascape experience called "Always Something Somewhere Else" [12]. In this narrative led walk the user is asked to find common elements such as a tree, a rock and water and then to mark those spots. The story then unfolds around those locations. The user is asked "Will you remember this place" and as the story and walk progress they are asked to retrace their steps and revisit the places that they marked, whereby the story acknowledges that you have returned and a further chapter is told. The user determines which objects to make significant in their local environment and the narrative makes a close personal connection to that particular landscape, which gives a stronger connection to place. The mechanism for making portable games more relevant to a particular place is described in more detail later in this paper.

In the Mogi game the game designers choose where to place the collectable items for the players. The locations are determined by the game state and the locations and availability of items are continuously created and renewed by the game designers. The players have an interface radar and they can only act on items when they are situated within 300 meters of them. In this instance the virtual items are effectively tethered to physical locations determined by the game designer. In principle the items can be moved to different locations depending on game play. The designers must choose the location according to some knowledge of the general area and the game play. The items must be placed in areas that are accessible to players.

In Feeding Yoshi the digital media items are also tethered to place but are located automatically depending on the wireless infrastructure of the environment.

The game with the strongest association to place is "Prisoner Escape from the Tower" [16]. This game was designed specifically for the Tower of London and relates to the real life escape of some of the prisoners and is based around the places that the prisoners frequented. The game is described in detail later in the paper.

2.4 Emergent behaviour

Seamful design encourages experimentation with how system behavior and system interface might be exposed or used in game design. In addition to system behavior, the observed game play activities and the social rules that emerge through game play can also be fed back into game design. "Design for Emergence" [11] describes how new social norms, behaviours and interaction will arise upon introduction of new technology or in new forms of games. Appropriation of how new technologies are applied and

used is expected but unpredictable; design for emergence encourages research to fold learning from observable emergent behaviours back into the design and the underlying technology systems.

2.5 Creating portable mediascape games

The quality of occupying the same position or area in space is another way of defining coincidence and many portable games can play on the spatial qualities of moving through physical space and triggering virtual media. In Hidden Danger UXB the act of scanning the virtual minefield by walking through the space and listening for the alert that tells you that there is a bomb nearby is a natural act within that game scenario.

In addition to the use of spatial movement it is possible in portable mediascapes to allow the user to customise the game to their particular surroundings. In the mediascape the designer creates a design that is composed of functional elements called regions which get placed by the user at run time. These regions are fully defined on a blank map because the actual locations co-ordinates will not be determined until run time. A screen shot of the Doubloons game in mscape is shown in Figure 9. Each island is defined by a circular region for the island itself, a circular region just larger than the island to denote the beach around the island and a buffer region which the user needs to be clear of when placing the islands. This buffer ensures that the islands cannot be placed too near to each other. When the user is asked to place an island if they are inside any of the other buffer regions then they are told that they are too close to an existing island and they need to walk to another open space. Once the user has placed the island successfully the co-ordinates of the island are set to the current co-ordinates of the GPS reading, which should be where the user is standing.

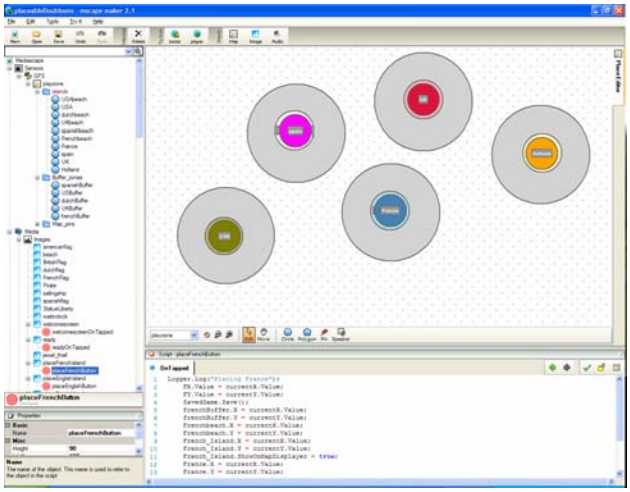

Figure 4. Doubloons design in the mscape maker

This capability allows designers to create games which can be personalized to a players particular location. In order to create a stronger connection to a particular place the design can direct players to find certain elements in their own environment which can be tethered to elements in the game. In Always Something Somewhere Else the designer chose basic natural elements such as trees, water, windows and rock so that the mediascape could be experienced anywhere in the world and still have meaning. The combination of the use of basic elements and the capability within mscape to create user placeable portable games opens up the possibility for a rich vein of games that have global reach but localized personalization.

Having examined the role of infrastructure and place in the design of location based games we will now go on to explore forms of coincidence that can also be used in design.

3. UNDERSTANDING COINCIDENCE

Coincidence is defined as being the noteworthy alignment of two or more events or circumstances without obvious causal connection. When a player experiences such a coincidence it feels “magical” and thus leads to feelings of wonder and excitement. In this section of the paper we examine how game design can draw on understanding and knowledge of the environment to maximize the chance of coincidental magic moments [10].

3.1 Forms of coincidence

We will distinguish between three different forms of coincidence

1. Natural coincidence: where a natural event happens which relates to the game play in some way. For example a gull lands in front of you just at the moment when you are hearing about gulls in the story line.

2. Social coincidence: when you encounter another player or person who shares a game event with you.

3. Feigned coincidence: where actors or props are used within a game environment to appear natural.

We will now examine each of these in detail.

3.2 Natural coincidence

The technique for maximizing the chance of a natural coincidence happening in a game is to develop a detailed understanding of the environment in which the game will take place. If the game takes place in a fixed location then the environmental context can be observed and analysed so that frequent events can be woven into the narrative or the game play. This means that there will be a good chance that some players may experience a magic moment, where a natural event coincides with an event in the virtual world.

Heightening emotional state can also be induced through knowledge of the location and places within it. For example darker corners or less well trodden areas can feel remote and sinister. In contrast light and popular areas can feel safe and social and so game play events and narrative should be placed in areas that are conducive to the kind of behaviour, atmosphere or storyline expected in the game.

The following check list is a useful guide to the kind of things that should be observed and recorded using photographs, video or notes

- the day and time of observation
- the area that is being observed (eg a square, courtyard, street or an area of park)
- the weather and conditions (eg grass wet, trees bare, flowers not in bloom)

- what kind of things are happening (eg games such as football, Frisbee or Petanque, people eating, sitting or just walking through)
- where the things are happening (a sketch of the area with marked areas can be used)
- frequent activities (eg. People cycling through, people walking and listening to music on headphones)
- the kind of things people are wearing or carrying eg. Ruck sacks, hats, briefcases, phones
- animals and what they do (eg squirrels, gulls, dogs)
- where people tend to congregate, chat or sit
- any regular background events (eg train passing, cars hooting, tram ringing)
- the most frequently taken routes or paths

To illustrate further these concepts we will describe the design process for the "Yosemite Walk to the Falls" [19] mediascape experience.

In the Yosemite "Walk to the falls" experience natural co-incidence is used to help determine the choice of content and the placement of media regions. The walk to the falls is a two hour walk with a virtual ranger, with an extra optional game that was designed for young children. GPS is used to trigger media on a handheld device that participants wear in a water proof bag around their necks.

The experience was designed as a collaboration between mscape researchers and the Yosemite Association. A park ranger and media specialist created the content for the mediascape and a designer helped create the resulting mediascape and game.

Figure 5. Winter design and summer experience in Yosemite

To design the experience we walked the location several times to record contextual cues and events. The ranger had extensive knowledge of the area, the habitat, the animals, the plants, the geology and history of the park. The design process was one of choosing the best way to tell the rich stories of the area so that they were relevant, interesting and suitable for the walk. We decided to create the experience to be as if you were walking with a ranger who could give you the insider view of the park. We went on several walks with the ranger noting significant spots and artifacts along the way. The mediascape was designed in the middle of winter but would not be trialled until early summer and so it was important to rely on the ranger's extensive knowledge of how the landscape and population changed over the course of the year to guide the design. For example in winter the waterfalls are incredibly spectacular and forceful but in the middle of a hot summer they can dry up completely. Figure 4 shows the design conditions for the preliminary observation outings in contrast to the actual trial conditions.

We included several of the artifacts that we found in the environment to be a part of the end experience. Associated with each of the wooden bridges that cross the streams we played random bridge facts and jokes so that users would begin to associate bridges with media events. We encouraged people to touch the walls of the canyon at an appropriate point along the walk so that they made a connection with the physical immensity of the rock. And we told people that if they poured water on a stone relief map of the area it would simulate the real flow of the waterfalls. These acts felt like personal discoveries to people and made them feel like "insiders" to the park.

Whilst it is not possible to determine exactly when natural events will occur, especially when animals might appear, we could rely on the ranger's knowledge of the environment to position relevant stories and video sequences in places where there was a high likelihood that you might see the actual animal or at least evidence that the animal had recently been there. For example a short video and some narration about woodpeckers was triggered near a hollowed out tree in which woodpeckers would often nest. Even if you did not see a woodpecker you could see the evidence of the pecked holes all around the tree and the nearby log. In the woods where bears could sometimes be seen, a video of a bear ripping up tree logs to get to the insects inside was shown. This was in a spot where there would be several ripped out logs to be seen, as it was an area that bears would often frequent. In another area of the walk you hear about the scale of the rock face that you see before you and you are told about climbers. The point at which you hear about them is a good vantage point for seeing the expanse of rock face and a popular climbing spot thus maximising the chance that you would also see actual climbers whilst hearing about them.

As part of the walk experience and to add an extra level of interest for younger children we designed a simple collecting game that utilized the trail markers that were situated along the walk.

Figure 6. Trail marker in Yosemite

On most of the trail markers there is a stone relief of animal foot-prints or leaves. When you approached the trail marker the game

would show three possible images and you simply had to pick the image that matched the one on the trail marker that you were standing by. If you picked the right one you would get a bonus video about the related animal or tree. The animals and trees shown in the game could all be found within the vicinity and so in principal it was possible to see the real item not just the video footage. In a five day trial 172 users tried out the walk and most of the users elected to play the game. Family groups that we observed found the game to be entertaining and there would often be a race to see who could be the first to get to the trail marker. However because GPS is an erratic sensor when you reach the trail marker the game trigger would sometimes not fire, or it would trigger on some people's devices but not on others. One family that we observed decided that the way you approached the marker was the secret to getting it to trigger, they devised an elaborate slow and comical walk for approaching trail markers. This actually did improve the chances of success because in some cases GPS takes a while to settle on your position and so the slow movement around the marker increased the chance that a GPS reading would trigger the virtual region that defined the game zone around the trail marker.

3.3 Social coincidence

Maximizing the chances of a social coincidence involves using knowledge of who uses the space, what they frequently do, what they wear, how people move through the space and where they dwell. The layout of the paths, entrances and the general architecture can determine many of these behaviours. This knowledge can then be used within the game design to enhance game play, for example if it is highly likely that you will see a person wearing a tie you can use this within the game in someway perhaps by telling people to hide from anyone wearing a tie.

The "Prisoner Escape from the Tower of London" game is a good example of how social coincidence was used effectively in game play and we will describe the game and the design in more detail to expand this idea. The game was developed as a collaboration between mscape researchers and the Historic Royal Palaces.

Figure 7. Equipment used in Escape from the Tower

In the Tower of London game players help virtual historical figures to escape from the Tower. The escapes are based on actual events and the game leads you to areas of the tower where the prisoners were held or that were used in the escape. Players wear a PDA which has GPS and is connected to an Active RF receiver in a waterproof pouch around their necks shown in Figure 6.

The RF receiver extends the capability of the mediascape so that it can respond both to GPS location events and RF triggered events. It meant that players were able to go inside, where GPS will not work, and an RF transmitter inside the building could trigger the mediascape that the player was in that particular building. It also meant that RF transmitters could be carried by people to trigger spontaneous social events in the game.

There were six main missions in the game. A mission is activated by walking to a particular location, hearing the prisoners plea for help and then choosing to accept the mission. For example in one mission you have to help John Gerard to escape. He is a Jesuit Priest who was imprisoned in the Salt Tower and tortured because of his religious beliefs. To re-enact the escape players must go inside the Salt Tower where an Active RF transmitter triggers John Gerard to plea for help to arrange his escape. If the player accepts the mission they must go out of the tower to bribe a guard to get oranges so that Gerard can write a secret note in invisible orange juice.

The player must then find Gerard's friend who is waiting by the drawbridge and give him the note. All of these events are located outside in the tower grounds and triggered by GPS. When they return to the salt tower they find out how to read the invisible orange juice ink by watching a video of a candle flame lightly burning the underneath of the paper to reveal the secret writing. The player then needs to smuggle Gerard out of the Salt Tower to the Cradle tower where he absails from the roof down to a waiting boat on the river.

Within this mission "social co-incidence" was used to heighten the realism and excitement of the game in a number of ways. When the player needs to find a guard the GPS trigger point was placed in a square where the Yeomen Warders or "Beefeaters" as they are nick named are often found. So whilst the guard that the player encounters is a virtual one there is a strong chance that they may also see a real Beefeater at the same time thus making the interaction seem more relevant. The fact that the Beefeaters constantly patrol the grounds was also used to heighten the excitement. Some Beefeaters were asked to carry an Active RF transmitter, a small battery powered device so that they could easily carry in a coat pocket. Each one sent a unique signal once per second on a frequency of 433MHz. The unique codes could then be detected by a receiver attached to an iPAQ via a serial cable. If the receiver could 'hear' a code then the system knew it was within range of that beacon. The Active RF transmitters and receivers that were used were custom built to our specification by Pyxis Design [17]. Within the game when players were with a prisoner helping them to escape if their receiver detected the presence of a Beefeater a loud "Halt who goes there" message would alert you to the fact that you had been caught helping a

Figure 8. Beefeater holding an RF Transmitter

prisoner to escape and you would be sentenced to 10 years in the tower!

This game feature had many consequences. Players would be constantly on the watch for Beefeaters so that they would not get caught and as far as a player was concerned it did not matter if that Beefeater was actually carrying an active RF transmitter or not, the mere fact that they might be was enough to make players run away and hide whenever they spotted one. As a normal part of their duties the Beefeaters patrol the grounds, help visitors and give talks and so there is a very high chance that you will see one. Their distinctive uniform also makes a dramatic visual impact and the combination of unpredictability and physical presence greatly heightened the excitement in the game. The layout of the tower with its courtyards, walls and battlements also meant that you never knew if a Beefeater was just around the corner. We observed adults screaming and running away from Beefeaters when they spotted them and in some cases the Beefeaters joining in with the game and pretending to give chase.

Figure 9. Players keeping an eye on a Beefeater

Discussion of where other players are and where they might go is another common element of game play which is enhanced through design for social co-incidence. In the Tower game we observed players alerting one another to the location of Beefeaters and discussing their strategies to avoid them or hide from them. The fact that the Beefeaters were not "programmed" or even actively engaged in the game made their encounter spontaneous and non-predictable. The physical layout of the tower with its many walls, courtyards and buildings made encounters even more unpredictable as you might not see someone until you turned the corner. This chance element added greatly to the excitement of the game play.

In most of the missions players needed to avoid being caught by the Beefeaters but in one mission we wanted to reverse this situation and have players seek out Beefeaters. Based on the true story of the escape of Ranulf Flambard, the Bishop of Durham, in 1100, players had to seek out at least two Beefeaters to invite them to a party. Flambard escapes by hosting a lavish party to which he invited all of his guards, gave them a sumptuous banquet and copious amounts of wine and when they were completely drunk and snoring soundly he attached a rope to a column out of the window of the tower and climbed down to some waiting horses ready to gallop away to France. This mission was added so that players could develop a friendly relationship with the Beefeaters as well as having to avoid them in other missions.

3.4 Feigned coincidence

Social coincidence relies on involving people who will already be at the game location to be involved in the game. In some cases the people may not even know that they are in the game and in others, such as the Tower of London, they are aware that they are part of the game but do not need to do anything other than their normal activities to play their role. Feigned coincidence introduces new artifacts, actors or props into the environment so that they are active in the game but play a role. For example The Go Game [18] based in San Francisco are a company who create games that involve teams visiting locations around the city, solving puzzles and doing activities. At some places actors meet up with the players to role play a part in the game. The appearance of the actors and the thrill of not knowing who is in the game and who is not adds to the excitement of the experience.

It is similar to the thrill of Alternate Reality gaming where players absorb themselves into the carefully constructed parallel game world directed by the game designers or "puppet masters" as they are known. Many alternate reality games include "live events" where performers interact with players to observe them, or reward them with another mission or just play out a part of the storyline.

McGonigal argues that the core experiential quality of these forms of real world game play is a change from console or PC games. In online or console based game play there are always optional choices, players decide what paths to take or actions to try. In real world augmented reality games the "puppet master" directs players what to do and there is no choice or free will, you either become an actor in the game or you don't play. "For players, the pleasures and challenges of real-world gaming missions are the pleasures and challenges of dramatic performance" [9]

As part of the "I Love Bees" ARG a series of GPS locations were given to players and a date and time. Players converged on these locations armed with cameras, laptops, mobile phones and any other devices or props that they thought might be useful and waited for something to happen. At the appropriate time a payphone rang and if they answered a question correctly they got a section of their drama. The players then needed to co-ordinate with all of the other players at the other locations to piece together the different elements. The payphone was used as a prop in the game to force the coincidence between a player being at the right place at the right time to receive the phone call.

In the London performance of the game Uncle Roy all around you players are directed from place to place by players online based on the game parameters and overall design. At one stage players are invited into a limousine and taken to the office of the mysterious "Uncle Roy". This elaborate prop is designed to appear as if by coincidence in the game and enhance player's engagement in the game world [3].

4. CONCLUSION

In this paper we have discussed the characteristics of location based games and in particular we have emphasized the role of place. We have distinguished between portable games, where the user places the media at run time, tethered games where the media gets associated with particular artifacts in the game play area and anchored games where the narrative and game play is closely related to a particular place.

Whilst the idea of “design for coincidence” sounds at first like an oxymoron we have shown that it is possible to increase the likelihood of predictable events coinciding with designed events with artful design and knowledge of the environment. We have described techniques for maximizing the chance of natural, social or feigned coincidental magic moments to occur within a game. These techniques rely on observing phenomena in the real world and using events, people or structures that are in the landscape to be incorporated in a meaningful way within the game.

The idea of having the user place objects as part of the game play so that a game can be played anywhere in the world is a powerful mechanism. It means that players can specify how the game media overlays their environment so that it becomes a personalized experience. In addition by using basic elements within the game design a player can find those elements in their own location and tether media to them. These mechanisms allows designers to create rich games that can be played anywhere but still be connected to place.

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