
Location-based Mixed Reality Games and Outdoor Play

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DESIGNING FOR OUTDOOR PLAY

Today, screen-based games have become the perhaps most ubiquitous form of play, be it highly competitive or more casually while commuting. Players are focused on their high-resolution screen and are fully immersed in the play experience. But what if there is another form of play *out there*, one that arguably many have seemingly forgotten about? A form, that makes use of the capabilities of the human body and our senses? The analogue counterpart of today's digital world.

This is of course a rhetorical question for a submission to a workshop titled "Designing for Outdoor Play". It is the physical world, the outside world, that competes with our digital gadgets for our time and attention.

My research has been trying to bridge this gap. I am working in the area of location-based, augmented reality, mixed reality and pervasive games. There are many names for games in this area – my focus has been on making games that are technologically *supported* but embrace the exciting opportunities that a more physical play outdoors can provide. The play experiences I am interested in are closer to *Geocaching* [6,7] than *Pokémon Go* [3,8].

In the past, I have worked on designing and developing these games, and lately especially on how to enable *others* to design them (i.e. with authoring tools and ideation cards). I am continuing this research direction and am now especially interested in serious games in this domain.

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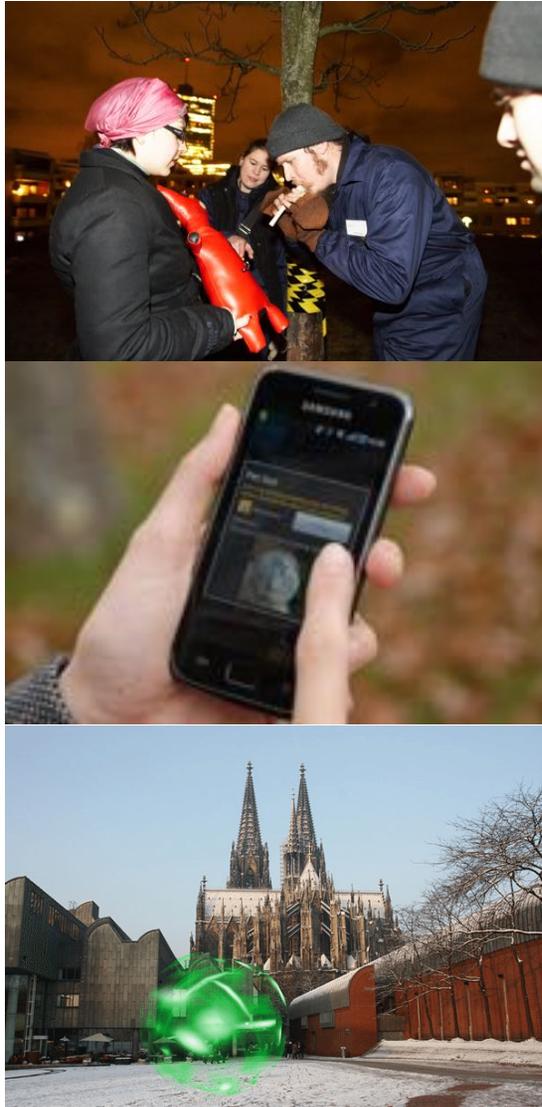


Figure 1: *Interference* (top), *Tidy City* (middle), *TimeWarp* (bottom).

PAST RESEARCH

Game design and development

One of the earliest games I worked on was *Interference* [1,15] where a group of players had to uncover a mystery surrounding the phone networks and among other things had to play a bone flute for a voodoo doll made of red leather (with a phone hidden in the doll registering the right sounds; Figure 1, top). We once staged the game during winter in Stockholm with players that stayed outdoors for several hours while it was dark and snowing. We considered stopping the game, but did not, and afterwards players were extremely enthusiastic about the game experience as the weather conditions supplemented the aesthetics of the game and made it much more immersive.

Another game example is the much less demanding *Tidy City* [12,14]. Here, players have to solve riddles consisting of text and an image that lead them to real world locations (Figure 1, middle). While the gameplay is (intentionally) simplistic, it requires of players to focus on the surrounding environment instead of the phone screen. Collections of these riddles are missions that can be highly thematic, e.g. including non-obvious tourist sites or architecturally interesting roofs of buildings.

Much more reliant on technology was *TimeWarp* [2,9], a two-player game about time-travelling in the old town of Cologne to find escaped robots. While the main game content was only displayed on the mobile device (GPS-based augmented reality), the most engaging moments for the players came when they attempted time-travel and had to physically enter a summoned time portal (Figure 1, bottom). Due to inaccuracies of the GPS this then turned into a game of catch as the always unstable time portal would seemingly evade the players.

All these games have in common that the physical surroundings and the outdoor environment had a huge influence on the player experience – much more so than the underlying technology. Here, my research was revolving around game design best practice in such mixed realities [2,5,11,16].

Authoring and design tools

Another interesting aspect of games such as *Interference* and *Tidy City*, and also in several research projects was the development of authoring tools for such experiences [4,13,15,18]. How can we design tools that enable others to become game creators themselves?

There was one issue that typically arose: While the tools were capable of supporting a variety of games, the users of the tool did not necessarily have the required game design expertise to come up with novel ideas. These experiences ultimately led me to develop a deck of ideation cards explicitly for this context – the *Mixed Reality Game Cards* [17]. The cards were developed iteratively over the course of several workshops with over 200 participants including game students, professional developers, artists, researchers and domain experts (e.g. working for a museum).



Figure 2: Different Mixed Reality Game Cards featuring non-technological elements.

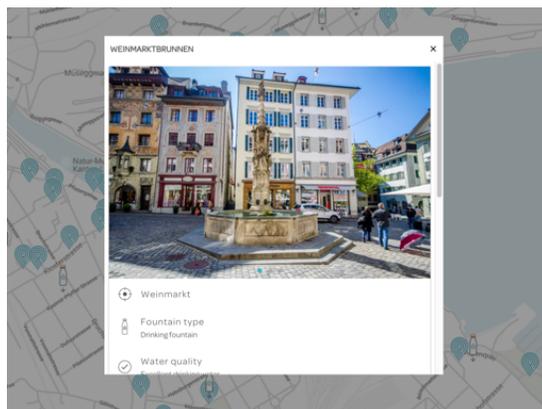


Figure 3: Map of Lucerne showing the wine market fountain of Lucerne.

The cards are divided into Opportunities (the building blocks of an idea), Questions (more general questions about the idea) and Challenges (issues that often arise). These cards help the different involved stakeholders to collaboratively generate and explore game design ideas by providing them brief overviews of the different concepts relevant for these games. As such, the cards are used as a source of knowledge as well as inspiration. One important design goal for the cards was to encourage designers to not only create games that mostly take place on a phone screen, but instead also might include actors, set construction, costumes, or the weather (Figure 2).

FUTURE RESEARCH

Apart from continuing the work on ideation cards for mixed reality game design, I am now looking especially at serious games in this domain. I believe such games are especially suited in cultural or national heritage domains. I am currently working on a project about the many fountains that exist in Lucerne². We are working together with the charity WasserFürWasser (WaterForWater)³ who already have created an interactive map of the city highlighting all fountains and their history⁴ (Figure 3). We now want to see how we can engage tourists as well as citizens with these fountains in the form of a location-based game. Another important aspect will be to emphasize the importance of (clean) water.

In order to come up with initial ideas for the game design, we have used my *Mixed Reality Game Cards*. The cards have proven to be very helpful for this task as they enabled us to actively include two members of the charity without game design experience to meaningfully engage in the process. Their expert knowledge on the fountains, their history, and their locations proved to be extremely valuable.

I believe that such serious location-based games have great potential as they incorporate the physical environment and actually relevant locations full of meaning into the gameplay. Here, outdoor play can outshine other forms of games such as traditional video games or virtual reality games due to the strong connection to the place. The weather, time of day, the smell of a place – all of this can be incorporated into the player experience.

Research questions in this domain revolve around investigating the game mechanics that truly engage players while at the same time not emphasizing technology (the screen). Instead, the focus should lie on the physicality of the world and how to include such types of play.

² <https://www.hslu.ch/en/lucerne-university-of-applied-sciences-and-arts/research/projects/detail/?pid=4101>

³ <https://wfw.ch/en/>

⁴ <https://lucernewater.ch/#/story/start>



Figure 4: Outdoor play at Invisible Playground's You Are Go festival (2011).

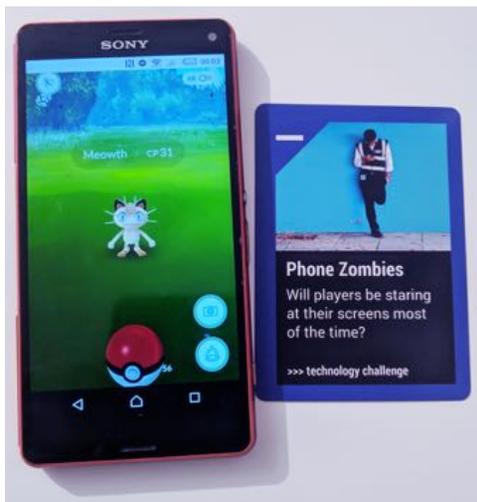


Figure 5: Pokémon Go and a Mixed Reality Game Card inspired by it.

STATEMENT OF INTEREST

While coming from a computer science background, I have always been fascinated by play that just needs a stick, some chalk or a street. Artist groups like *Invisible Playground*⁵ or *Hide&Seek*⁶ are inspiring examples for work in this area (Figure 4). While technology can create some interesting forms of play, these examples show that it is not necessary for creating engaging experiences.

When talking about how technology is being used, however, we can contrast between two approaches. In the case of *Pokémon Go*, the game takes places primarily on the screen. Game elements are placed depending on the real-world locations (e.g. water-type Pokémon are more likely to appear near bodies of water), but other than that the gameplay is so removed from the environment that – to phrase it provocatively – one could arguably play the game on a treadmill without losing much of the play experience. In contrast we have a game like *Geocaching*. Here, the technology is likewise enabling the experience, but apart from that it is delegated to a role in the background. In my work, it is the latter that I strive for, trying to avoid what I call “phone zombies” (Figure 5).

In order to further popularize games that use but not overuse technology, I believe it is crucial to look at fully analogue forms of outdoor play while at the same time considering what new forms of play might be enabled by mindful use of technology. Like mentioned before, this is also an underlying design goal of the *Mixed Reality Game Cards*. Therefore, I will bring along a card deck to the workshop, hoping to gather some feedback and ultimately think about how to apply insights from the workshop when creating new cards.

Overall, I am especially interested in structuring, classifying and analyzing existing and new forms of outdoor play. I am looking forward to meet a diverse group of practitioners and researchers in this field, and to discuss our different perspectives. I am also keen on doing some outdoor play and play design first hand, as I believe that playing together is a great way to build connections – and what better way of doing so in the streets of Glasgow during this workshop!?

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⁵ <http://www.invisibleplayground.com/en/welcome>

⁶ Sadly no longer active; some works listed her by former member: <http://www.hollygramazio.net/city-games/>

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