

Game Mechanics of Serious Urban Games

Designing for the Ludic City

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THE PROMISE OF SERIOUS URBAN GAMES

Arguing that both serious and urban games are new game genres would certainly be an exaggeration, since both genres have a design tradition of more than a decade to look back on. Digital urban games experienced a big boost in the Western world in the early 2000s with alternate reality games such as *I love bees* (Szulborski 2005) or with ubiquitous computing technology, e.g. GPS-based geocaching (Dave 2000). Digital serious or learning games date back even further into the last millennium with learning software series such as the German *Addy* brand, or, for an early educational Apple II game, with *Oregon Trail* (1982).

Since then, both urban and serious games have become more elegantly refined and also commercialized in their continuing development. Urban games turned mainstream globally with the advent of *Pokémon Go* in 2016, and also gained momentum on a national level in Switzerland. In 2015 in Zurich, 2,000 players ran through the streets for the game event *Urban Hunt*, a year later there were more than 7,000. Furthermore, the common treasure hunt theme proves to be very low-level entry, and successful in general for group outings, such as business events or touristic formats, and it is also becoming increasingly more widespread – even though (or maybe, because) it might not represent the most innovative game mechanics.

Similarly, the serious games genre has been growing ever since, producing some massively multiplayer showcases such as the participatory science game *Foldit*. In general, the demand for serious games is even greater than for urban games, not only in today's academic game studies conference scene (no conference without serious games track!), but also in the industry and in education: there is, or is a call for, a serious game for every need.

In that way, both genres – serious and urban games – seem promising for correcting societal deficiencies with super-power solutions: urban games shall bring back nature, physical activity and social responsibility to people and help them regain awareness of their every-day (urban) environment. And serious games are a kind of “holy grail”: with serious games, cancer shall be cured, housework will be fun, odd behavior can be corrected. “Gamepocalypse” is what this development is provocatively called by gamification expert Jesse Schell (Schell 2010). In that sense, people attest games a magic power (to save the world, for better or worse) – which, in a way, might be close to the religious power of the “Magic Circle”, a term used by Johan Huizinga to denominate one of the metaphors for the symbolic game space (Huizinga 1949).

Now, what could promise to be more powerful than merging those two genres into a new subgenre? Just a few years ago, in 2013, Ferri and Coppock identified the rise of digital and non-digital “ludic practices in urban spaces” called “serious urban games”: “In that context, a small but promising research area deals with interactions between game design, urban planning and socially relevant issues such as urban rehabilitation, innovation, integration, inclusion and civic engagement.” (Ferri and Coppock 2013: 120). It seems that serious urban games are developing into an area that is relevant for both design and research. Real-world topics from urban spaces are no longer only simulated on the screen (such as urban planning games like *SimCity* or energy-saving games such as the EU Horizon 2020 funded *Domino*), but played out, tested and experienced right on-site, in the city.

There are a few indicators that suggest the potential of this new subgenre. Since the players play outdoors, maybe even at larger events, they are visible: for the researcher and for the developer to gain feedback on the gameplay, but also for bystanders, therefore raise awareness of the game. Having players perform tasks in the city creates the possibility for outsourcing data generation, a task which otherwise might have to be done by researchers. In general, playing games in the city is seen as attractive for non-hardcore, casual players or even people who don’t consider themselves players at all. In Switzerland, where playing games is often regarded as childish or a waste of time – unless you learn something – serious urban games carry the positive attribute of teaching something in an easy and fun way, and help to experience the usual work/life environment as a new, ludic (playful) city.

As promising as this area might be in some ways, it nevertheless presents difficulties for production, since urban and serious game genres are both connected with specific design rules, or even constraints, that differ from “common” digital game design. So what challenges and possibilities lie in the combination

of those constraints? What are the implications for designing serious games for the ludic city? The next chapter will address the challenges of serious urban game development and lay some theoretical foundations, drawing from the MDA framework by Hunicke, LeBlanc and Zubek (2004), and the expanded DDE model by Wolfgang Walk (2015).

This will prepare the ground for the following discussions of several case studies in the field of serious urban games, which were conducted by the Specialization in Game Design of the Zurich University of the Arts (ZHdK) between 2015-2017 (<http://gamedesign.zhdk.ch>). During that phase, very different game/play scenarios were designed in the field of intercultural games: *LucyZH* (short for: Ludic City Zurich) is a multiplayer treasure hunt-style, mobile phone-based urban game that has been played twice a year since 2015 to welcome the new international ZHdK students to the city of Zurich. *Dragon Polo* is a small-scale research-oriented play scenario which was developed and played in Hong Kong in 2016 to observe play in non-game areas such as busy public spaces. *Stair Quest* and *Step Up and Play!* are two different game/play formats resulting from the cooperation of ZHdK with the Hong Kong Polytechnic University in an R&D project on the topic of the stair culture of Hong Kong Island, Central and Western District (see for all mentioned projects: <http://urbangames.zhdk.ch>).

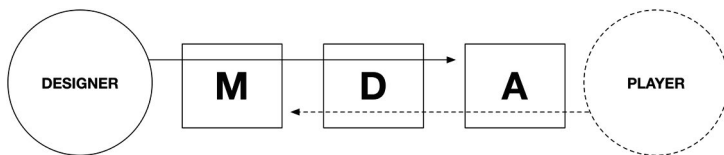
This article will not solely consider a developer's perspective by sharing post-mortem insights, but take the scholarly viewpoint of games studies as well. By analyzing the game mechanics of these different game scenarios and the resulting gameplay, this essay aims to contribute to the research of the motivational design for serious urban games. Motivational design, after all, is about the construction, maintenance and experience of the "Magic Circle": How does a game need to be engineered and envisioned to invite the player to enter, and stay, in this magic circle, and participate in an extraordinary, transformative experience? And which considerations on the level of mechanics and rules (that guard punishment and rewards, affect the possibility range of player's actions) create a well-balanced gameplay?

MDA FRAMEWORK AND BLANK SPACES OF THE GAME DESIGN PROCESS

The formalistic framework called MDA proves to be extremely helpful for understanding the systemic connections between the affordances of the player (playing a game) and the designer (designing a game). MDA stands for Mechanics, Dynamics and Aesthetics.

“Mechanics” is the “material” of the game: the code, the rules, the data structures.¹ “Aesthetics” are the emotional responses evoked in the player that may be the ultimate target of the designer. “Dynamics” describe what happens when the player interacts with the game; it is the “run-time behavior of the mechanics acting on player inputs and each other’s outputs over time.” (Hunicke, LeBlanc and Zubek, 2004). In that sense, it is what we understand as gameplay.

Figure 1: Mechanics, Dynamics and Aesthetics from the perspectives of designer (left) and player (right).



Source: Kocher

This MDA model describes what happens in the interpretational process between any kind of media and the user/viewer/recipient: it is an interactive engagement between a piece of work and a user. The resulting process – above described as dynamics – is what reader’s response theorists call the “true art work” (Iser 1994): it constitutes a different art work in every single reception process, even when the same reader re-reads the same book which (materially) stays exactly the same. The reader still has a (previous) knowledge about the book, has gained new cultural repertoires since the last reading, might be in a different state of mind and receptive frame – thus the whole reading process has a different interpretational and aesthetic effect. Authors are in full control over the books they write (“the mechanics”), and in some way might anticipate what could happen in the “dynamics”, the interactive part, especially when there is a contemporary audience in the same cultural sphere. But in no way do authors have control over the effect on the readers and their interpretations; they represent blank spaces (in German discussed with the theoretical aesthetic model of “Leerstellen”, cf. Iser 1994).

1 Admittedly, on the level of the “mechanics”, there is more than just code and rules: the visuals, the narration, the UI, the worldbuilding – these factors are extensively covered in the further developed DDE model (Walk 2015). For the sake of our argumentation, which focuses on the systemic, mechanical-based approach, we continue discussing the MDA model and refer to DDE where necessary.

In video games, this is even more the case. While a book, or a piece of music or a film, is mostly a linear artwork, video games are in most cases multilinear, and offer numerous ways of interaction and reception. Every time players encounter a rule, engage with a piece of mechanics, initiate an action, interact with a character or another element of narration (all on the level of dynamics in the MDA framework), they literally produce a different piece of “artwork”, a different game. One significant implication of the MDA model for the game designer is the need for (paper) prototyping and playtesting these “dynamics”. It is a reality check to see if the players can actually play the game, if the rules function, e.g. govern the possibility space of the player’s actions the way they should, and which game mechanics are emerging – actually an obvious statement, but nevertheless often neglected due to time and other design constraints.

In short, the MDA model illustrates that on the level of interaction between player and game, there are many blank spaces the designer doesn’t know about at the beginning of the development process. If there are certain aesthetics and experiences of the player that the game wishes to evoke, and if there are circumstantial factors, e.g. of the gameplay scenario, that put constraints on the interaction, designers must try to foresee, and later test, with which mechanics they want to answer these challenges.

DESIGN CONSTRAINTS FOR SERIOUS URBAN GAMES

Designing urban games is very challenging due to specific reasons, and the same applies to designing serious games, but for different reasons. Obviously, those challenges don’t cancel each other out, but generate very specific creative constraints.

To start with, the gameplay situation must be considered. For a serious game, it matters greatly to the design process if the participation of the players will be voluntary or compulsory: is the game activity embedded in a compulsory context, e.g. takes place within a school frame or at any kind of institutional event where the player is more or less forced to participate? Or does it have to compete with other leisure time activities, e.g. with commercially available video games? The specific gameplay situation decides the level of necessary perfection of the game. For a game in a school context it may be fine if the graphics aren’t the best, while the developer will have trouble finding players if the game doesn’t even look good and game participation is voluntary.

Even more important is the role of marketing, especially for serious games taking place during leisure time. If your target community has not heard about

your game, it can be as attractive as can be, but it is unlikely to be played. Again, this is quite an obvious statement, but nevertheless not an easy task (see, for example, Schwab 2016 for an analysis of indie game community identification and engagement processes).

At the mechanical level, considerations regarding the reward/punishment system are different for serious games than for purely entertaining ones; especially if some player tasks are more work than fun, the game must be careful when employing smart punishment in order to keep motivating players (which is not the same as avoiding punishment as a whole!).

Within the range of the (desired) outcomes for the player, or the “aesthetics”, Hunicke, LeBlanc and Zubek (2004) identify a set of emotions, such as sensation, fantasy, or fellowship, amended by Walk (2015), with organoleptic, emotional and intellectual experiences. Since serious games are games with “an additional purpose” and with game mechanics (in comparison to gamification approaches which have no actual game mechanics, Marczewski 2015), there are a range of additional emotions, experiences or reactions in the players to be considered, since the players are supposed to learn something. And, furthermore, that effect is not only intended to take place inside the magic circle, but is meant to expand the magic circle and be transferred outside of it, into the everyday world.

This has, on the one hand, an effect on how to observe, or control (if the desired experience is actually taking place) at or directly after the game event with (participatory) observation, interviews, data interpretation etc. and, in the case of mid- or long-term learning goals, in follow-up studies. On the other hand, designing for game-based learning already requires a set of compromises (How much fun? How much learning?) on the level of mechanics; these usually involve many discussions between designer/programmer and researcher/customer.

Furthermore, a digital game that will be played in a public space is more difficult to test during the design process. Iterative playtesting of the designer and programmer proves to be much more time and effort consuming since, at some point, they must go outside to get the full experience, even though some of the interplay of the mechanics can be simulated in the game engine. The same applies to playtesting a beta version with voluntary testers, which requires considerably more organizing. Also, designing a game for another cultural context (as we did when designing a Hong Kong-based game in Zurich) is obviously problematic, since the first playtesting takes place at home, e.g. in another environment with different conditions to the actual play space. But even for local urban games, it is difficult to estimate and decide the actual number of players for the

specific game event; a decision which will affect the production costs and later the server-related game performance.

In urban games, the city becomes the playground, which has many implications for the designer. For one thing, the designer cannot control the game world: weather conditions (which will probably influence the motivation of the players), day and night (and opening hours of buildings), GPS limitation in closed or dense spaces, removal of buildings or change of their functionality are things to consider, as is playtesting, if possible in every imaginable condition. For example, in direct sunlight it might be impossible to read QR codes on a poster behind shop windows because of the light reflection. Having the city as a playground also has effects on the choice of the game technology. If the designer's aim was to design a purely analog urban game, the problem of game assets would have to be solved: if there is a need to disperse physical objects in the city, the designer might want to hide them (geocaching-style), or attach them solidly to urban infrastructure (treasure hunt-style, such as *FoxTrail*), so they don't get stolen or vandalized, or choose game mechanics that can do without extra assets. From that point of view, it might prove more practical to consider creating a mixed-reality game with mobile phone assistance for the urban space.

Furthermore, the designer must take into account the physical implications that an urban game might have for players and which will affect the gameplay. Players are not represented by digital avatars anymore, but physically walk or run around themselves outside. Player stats such as XP and HP are not virtual but depend on factors that the designer has no control over (physical condition, bodily needs such as food, drinks, toilet). Some players will get tired faster than others and there must be mechanics that make sure both groups of players are still motivated to keep playing.

Also, the usual digital non-player characters (NPCs) are now real human beings. How are they incorporated in the game design? Shall the players interact with them, on a voluntary or compulsory level? Which ethical implications do these decisions have? In this regard, urban games quickly become pervasive games, blurring the boundaries of the magic circle (see also Montola, Stenros and Waern 2009).

We can see that the affordances of both serious and urban games affect all levels of MDA: specific considerations are necessary in the areas of mechanics, dynamics and aesthetics/experience of the player in order to build a good motivational design for the game. At the same time, both genre traits challenge the borders of the magic circle: serious games, because the outcome of the gameplay is not supposed to be purely intrinsic, but must also serve real-world purposes;

urban games, because temporal, spatial and social aspects of the magic circle are not always well defined (Montola 2005).

The following chapter will show how different game/play scenarios have dealt with these constraints and how the resulting motivational design was formed.

MOTIVATIONAL DESIGN

LucyZH

LucyZH is a mixed-reality urban game for international students. As part of the “Welcome Days” at the Zurich University of the Arts (ZHdK), its function is to replace the traditional sightseeing tour. The game was developed in 2015 for the International Office by Master Alumni students and staff of the Game Design Specialization and has been running twice a year ever since.

As for the development of a serious game, the request from the International Office was clear, but left the developers some freedom: international students, who had just arrived in the country a week before the game were supposed to get a sense of the culture of Switzerland and especially of Zurich in a playful way, for the duration of an afternoon. Formal restrictions proved to be more confining: for each of the play events, the actual number of players could range between 30 and 80, and would not be known before the game.

The design process experienced several iterations. Due to financial reasons we tried to consider an analog approach first and pursued a narrative, ARG-style strategy. Groups of players would receive boxes with tokens at the start and would then go on different missions; their paths would intersect and foster interactions between groups, and by following missions (e.g. sending packages by mail, buying clothes in a thrift store) they would partake and immerse themselves in the culture. Unfortunately, the forecast uncertainty about player numbers proved to be too complex a design factor.

The second concept focused on a – still analog – urban quartet-style card game, where cards would either be hidden and were to be found by players, or handed out by helpers who stood at strategic places in the city. Considerations of vandalism and helper logistics lead to the dismissal of the analog approach.

The third and final concept led to a map-based mobile browser game. This allowed us to tweak the code up to the very last minute, which was needed since production time was less than 6 months at that point.

Dividing the players into different groups with just one sim card-carrying iPad per group allowed us to keep the active player numbers (for the system) small, and thus avoid any server performance problems during the game. Keeping the card-based macro mechanics, we introduced competitive game mechanics: players can pick up virtual cards at 100 places in Zurich (which together form 25 quartets, each card representing an interesting location or cultural event, with pictures and informational text). The group who picks up the first card at a place will get the most points from this card, the second group less, and so on. In the end, the group with most points wins. This ensures different dynamics: some groups always find out that they can take the tram, and start “digging their way” through the city from the other side of the map. The players can either be very lucky and pick up the four cards belonging to one full quartet by chance, or they can switch into a more cooperative game mode and start swapping cards with opponent teams.

Playtesting on a larger scale didn’t really happen before the first game event (due to critical time management), apart from the frequent tests among us game designers. In a way, each game run (every half year) has served as playtesting from which we could gain crucial information, allowing us to continuously adapt and refine the game mechanics. An insight we gained from the first game event pointed to the fundamental tension between fun-oriented and purposeful game design. Since players run and aim at catching as many cards as possible, trying to win the game (which was great from a “classical” game design perspective), they would end up not reading the cards and not getting the cultural information (meaning a lack of the desired effect on the player, which was the aim of the serious game). Therefore, as a new menu function we introduced a card archive, where all the cards that the group has picked up were saved. Players could then browse through the archive and read about the places they had visited, a feature that they greatly appreciated (as stated in follow-up interviews).

A group member shared her experiences at the *LucyZH* game event on February 16, 2018: “At the beginning, our experience was all about competition. Getting to the spots first, catching points, achieving a higher ranking. We didn’t take time to read what the places were about. Later, when we got a bit more tired, we took the time to read what was written on the cards and really enjoyed that part, too.” (player, February 2017).

The introduction of the card archive takes into account the need of some players to take more breaks than others, and ensures that they continue to be motivated and engaged, and not feel punished since the game is basically centered around physical activity.

Figure 2/3: LucyZH player race across the city by tram, browsing through the virtual card archive/ LucyZH logo with an intercultural fantasy-animal.



Source: Kocher

Another insight we gained was the fact that the mechanics of urban games had better be kept simple. At first, we were going to implement a complex quartet card system, where each card had different values (how expensive would it be to visit, how well do you have to behave (“Swissness factor”), how many people is the location able to hold, what are the opening hours etc.). If groups would physically meet on the streets, they could exchange cards depending on a value-based “battle of the cards”. Due to lack of production time, we drastically reduced this complexity and left this battle mechanics out (but introduced a simple trading mechanic instead). Keeping in mind that urban players walk and look around the city, orientate themselves on the map, try to collect points, and also chat and get to know each other (all being new at the school), this actually gives them enough to do for 3 hours. After the second game event, we introduced an extra set of 20 cultural quiz question cards that pop up on the screen every 5 minutes. That would add an element of surprise and randomness (ludic factor), while at the same time strengthen the aim of intercultural education (serious game factor).

The end of the *LucyZH* game event is usually marked by a small winning ceremony with prizes and a dinner together (pizza delivery inside the school in February, BBQ in the forest in September). The feedback from the International Office is positive: the participants appreciate the game more than the traditional sightseeing tour, which was non-interactive and didn’t leave any lasting impressions. In comparison to that, the players of the *LucyZH* game stated that they got a well-balanced and fun introduction to the local culture and architecture, which motivated them to visit those places again. Also, by having covered quite a large area of the city, they felt that they learnt to orient themselves along the axes of the city.

It surely helped the whole design process that the requirements of the serious game side (the client) were so open. It was more important to the International Office that the international students had a good time, felt socially welcome and playfully got a sense of the local culture, rather than requiring a solid knowledge of facts.

Having had a limited production budget and time constraints, we kept the user interface and the graphics very simple. Since the game is conducted within the institutional “Welcome Days” frame of the International Office of the Zurich University of the Arts, we didn’t have to worry at all about marketing and competition.

The game works from a purely entertainment-oriented, but also from a serious games perspective, and that is most important. It is definitely expandable: for example, it might be more interesting from a game design perspective to introduce more “play” and more “pervasive game” mechanics, e.g. including the interaction of strangers (locals), to actually have the players experience a more ludic city.

Dragon Polo

Dragon Polo is a small analog research-based play scenario carried out in Hong Kong in July 2016. It was created at the invitation of the Connecting Space – a temporary Hong Kong-based art gallery and intercultural exchange hub of the ZHdK (<http://www.connectingspaces.ch>). At that time, the Connecting Space had a strategic research interest in urbanism and negotiations of public space through a series of art and game/play happenings, and welcomed contributions in the area of design- or art-based research.

The following research questions guided us in forming a game concept: How do the different game cultures, but also the notion of public and private space in each culture, affect the experience and the design of urban games? What insights can we get from experiments that use those spatial and cultural paradigms, and how can urban games contribute to a different understanding of space, for different parties (players, urban designers, decision makers, further target groups)?

From the perspective of a well-functioning motivation design of a game, “external” constraints of *Dragon Polo*, which were prescribed by the research purpose, were fairly small, and the research goal was explorative and open. In that way the set-up was similar to *LucyZH*, whose external constraints were formed by the intercultural learning purpose.

The challenge of the *Dragon Polo* design process was largely the “remote design” aspect; designing a game for an environment so different from the famil-

iar one presented many blank spaces: What tradition do local players of Hong Kong have in terms of urban games? What playgrounds would be suitable for our project? Especially as far as our research quest was concerned – investigating the notion of public space through play – there was definitely a certain uneasiness regarding the challenging local conditions, maybe even unknowingly breaking laws, in a Chinese city.

We took these considerations into account when planning the development process. The preparation and concept phase at home (Zurich) was to be conducted in active exchange with Hong Kong-based collaborators. Then, during the course of two weeks in Hong Kong, we planned to collaboratively design the game together with our co-players in a few workshops and game events (besides individual location scouting and doing local research).

To hint at the research task on a macro game-mechanical as well as narratological/symbolical level, the game was to be called *Dragon Polo*: Hong Kong as a space heavily influenced by China (dragon symbol) and Great Britain (the sport of polo, actually also being played in Hong Kong), yet still emerging as an entity of its own. As for the game mechanics, it was conceived as a polo spin-off where two players would form groups, one pushing the other in a dragon-style decorated shopping cart or a trolley, the other trying to hit the ball with a bat towards a goal. When we communicated this to our Hong Kong collaborators, their feedback was a reality check: none of the street pavements would be even enough, it would be too dangerous also because of the busy streets, and pushing trolleys would not be allowed in pedestrian areas.

We then agreed, and developed the idea in a product design workshop in Hong Kong with about 10 participants, on a simpler, one-player version, where players would each represent a dragon themselves: a creation consisting of a swimming ring with suspenders, with a colorful dragon mask, flying tapes and ribbons attached to it. As for bats, we used plastic brooms, the ball was a large foam ball – therefore we ended up sweeping the streets in a playful way, which definitely added a humorous element to the game, and also clearly marked us players to be part of a game, in a magic circle. This was important, since our activities in the public space were supposed to be a bit disruptive, and we wanted to be clearly recognizable as players.

We tested this project in two game events. As for the choice of the play area, the planned observation and research of public space was supposed to focus on the pervasive expansion of the magic circle in a spatial and social way. We therefore wanted to play at places not meant for play, and wanted to include strangers.

After playtesting first in the backyard of the gallery and refining some of our rules, we took our equipment and set off. We played in the area of Mong Kok on Kowloon, on a Saturday night at 9 pm. It was a very busy pedestrian area, filled with locals and tourists, street vendors and even some street performers – definitely not an area with a lot of play space. In the middle of the streets we set two goals (giant rubber hoops) about 10 meters apart. Our game team consisted of three Europeans (one of them recorded the action in 360° film) and three Chinese people. The three locals were crucial in attracting people and inviting them to play. While many adult pedestrians stopped and took pictures, children were the only ones we could persuade to enter the game with us. Interestingly, the dragon was easily identified by pedestrians (partly due to a reference to traditional Chinese opera, where masquerading as animals is commonly accepted), and they thought it was very funny. When we played, the ball often rolled out of the designated play area, or pedestrians walked through it, but they always kicked it in our direction, thus helping us to uphold the magic circle.

Only a few individuals disrupted our play: an old street artist asked us to stop the game every 5 minutes for his performance, for which he had to take a 30 meter in-run through our game field (he jumped through a hoop on a mattress). This gave the game a very spontaneous and volatile touch. At another point, a group of old men started a heated discussion with our Chinese team members. They didn't understand why we wouldn't want to play in a park, where we had more space, which should therefore be more fun for us.

Figure 4/5: Late night engagement in the magic circle of Dragon Polo, Hong Kong (Mong Kok)/ Dragon Polo logo.



Source: Kocher

We also tried to play the game in Victoria Park on a Sunday afternoon. It was nearly 40°C hot, and – understandably – none of the thousands of foreign nannies and house maids who enjoyed their free day talking with their friends in the shade wanted to join. Again, some Western friends who passed by, and some Chinese children, agreed to play, but we soon had to reduce the game rounds to 2-3 minutes due to the heat. Once, the park police stopped us, because we put our goal hoop in the middle of a path intersection. We repositioned it slightly, and the problem was solved.

These ludic interventions gave us a first insight into the play culture of Hong Kong. *Pokémon Go* had just hit the streets in town two weeks prior to our arrival (summer of 2016), and it was a big hit, groups of teenagers swarming out in the evenings on their hunt. Before that, urban games were not very popular in Hong Kong, and they haven't been since. There are a few small scale serious urban game scenarios which are very local and mostly analog, e.g. to foster social or political engagement in the neighborhood. Commercial treasure hunts (such as *HK Hunter*) do not tend to take off as much as they do in Europe. Public space is basically not perceived as a potential area for play – possibly, this is also due to the fact that in Hong Kong people commute to work, sometimes for hours. They take the subway, are underground. On the ground level, busy, narrow streets with lots of traffic are also not particularly inviting to play.

Nevertheless, our playful activities could persuade some strangers to join our magic circle for some lively play. Many bystanders had fun watching, took pictures and smiled. For the development, and also for the duration of the game events, it was vital to have local friends who knew the environment, knew how to get materials for the game, where to advertise the events and how to communicate with bystanders.

Speaking of the game mechanics and the motivational design, it was interesting how the rule system was negotiated with the co-players as co-designers ahead of the game in the product design workshop where we started to build the dragon and playtested in the backyard. In the actual game event, the rules had to be refined, because the (urban) game environment (busy streets, traffic, hot weather) was, in a way, quite hostile and challenging, and shook the boundaries of the magic circle: we had to fight to keep our playground, we had to ensure that we got enough players and that the players we got did not get heat stroke in the park event. Therefore, we did not really have an elaborated punishment and reward system, since we were happy just to keep playing, and the whole humorous set-up with the dragon costume (which, of course, fell apart in the heated play), provided a lot of enjoyment and reward. In that sense, the game *Dragon Polo* was much more “play” than “game”.

Stair Quest

The next two game projects were also developed by the Specialization in Game Design (ZHdK), over the course of 2017, in the context of a research and development project on the topic of “stair culture”, conducted for the “Hong Kong Stairs Archive” (HKSA).

This game design project was the most demanding in terms of finding an adequate motivational design, since the constraints of the serious game aspects were so ambitious. In response to these research goals, and also to continuously investigate in the ZHdK’s own urban game design quest for innovative game mechanics, we decided to create two projects in this collaboration: the smart phone-based game *Stair Quest* and the analog participatory design festival *Step Up & Play*.

One of the aims of *Stair Quest* was to accompany an exhibition of the HKSA in May 2017 at the Connecting Space gallery in Hong Kong. Titled “Always at the edge of things and between places”, this exhibition displayed a variety of artifacts and provided research insights on the stair culture topic. Besides generating awareness for the exhibition, the game also aimed, from the “serious” game perspective, at inviting users to contribute to the research project with creative player content and with research-related data for the 3000+ stairs on Hong Kong Island (Western and Central District), thus aiding in their protection and renovation and raising awareness about their socio-cultural importance.

While the macro game mechanics would have the players repeatedly visit numerous stairs on Hong Kong island with their smartphones, the micro game mechanics then were to be: adding stair related personal stories, confirming/denying the existence of handrails, counting steps and defining the specific type of the 12 possible stair categories (such as Street Stairs, Pier Stairs, Maintenance Stairs etc.). To add a “fun” factor, we decided to allow the most frequent visitor to a certain stair to propose a name for it. For all of these actions players would get points, allowing them to compare their individual progress with others in the leaderboard.

While these parameters had been set quite easily, the motivational design was still unclear. Stairs are in general a mere passing-by-location, certainly not an exciting place to visit at first-hand, and not a primary play area. For what reasons would the players actually want to do all that “work” we would ask them to do? (see for this also the discussion in Kocher 2017).

To meet these challenges, we brought in a defining mythological narrative that turned the players into “Stair Guardians”. By “reviving” stairs, they would help set free the soul of the long forgotten protective dragon of Hong Kong –

which had died thousands of years ago in an epic fight. Its shattered body had rained down on the city of Hong Kong, and the pieces became stairs over time (also mentioned in the trailer: <https://quest.stairculture.com>).

As a second incentive we brought in a collaborative game mechanic and connected it to the level system: even though we kept the leaderboard and the individual ranking, several players would be needed to interact with the same stair in order to complete it. Also, points (or “Dragon Dust”) had to be accumulated by a number of players in order to progress in the game and to level-up together. The game progression – tying together narrative and game mechanic – was visualized by the image of a Dragon which was assembled as a jigsaw puzzle in 8 levels (8 being a happy number in Chinese culture). We implemented a “News” function as another community-centered tool, where we could add specific requests for the players, e.g. have weekly topics for them to write about, or shout-out the leading player, etc.

Figure 6/7: Guided game tour for Stair Quest/ Stair Quest logo.



Source: Kocher

Technically, building an urban game for the city of Hong Kong posed a number of challenges: we initially wanted to build the game as an app, but the risks involved with the slow release process on app stores as well as most users’ inertia when it comes to downloading yet another app, led us to build this game as a browser application. This in turn brought about rather severe graphical limitations and the complexity inherent in cross-browser development. In retrospect, we question whether it was the right decision to switch from an app- to a browser-centric approach.

Since the game was developed off-site, finding realistic test conditions was another challenge. We first tested in Zurich during the first development phase, then flew to Hong Kong for a first testing at the real location 2 months before the actual game start. Hong Kong, with its many skyscrapers and narrow streets, turned out to severely impact the precision of GPS location services with preci-

sion dropping as low as 300 m. Combined with a high stair density, in the play-tests players could often not determine which stair they were visiting, and sometimes they were adding data to the wrong stair on the screen. Adding stair polygons to show the stair's exact dimensions somewhat eased that issue.

To add to this challenging game developing frame, marketing of the game was definitely underestimated. Traditional exhibition visitors were not that interested in the game, even though we exhibited it there and had an accompanying "Hong Kong Game Talk" evening to talk about urban games and present the project. Unfortunately, there was no specific urban game community to address either, and the game lacked the necessary momentum for the collaborative game mechanics to take off, where the community would work together to save the dragon spirit, and where it would be exciting to fully research each and every stair.

Basically, we tried to make a *Pokémon Go* game for hunting stairs with a ridiculously tight budget and severe time constraints, and didn't quite succeed. Our collaborating partners from HSKA still valued the game application as a research tool and paid extra (after the game event) for us to implement a feature to take and upload pictures. The researchers keep using *Stair Quest* to chart stair data: since they connect pictures to each stair data they register, the researchers can manually verify if it corresponds to the actual physical street, and the imprecise player location doesn't matter that much anymore.

From the game designer's perspective, the combination of the urban and serious games restraints of this project were too complex to solve satisfactorily. Creating a GPS-based game in a city like Hong Kong, where the precise mapping of the virtual objects with physical correspondents was crucial, and asking the players to do tasks that were not all that exciting, without actually having a community we could address, plus trying to solve those challenges with a limited in-house ZHdK budget in a time frame of 6 months, was, in retrospect, a mission impossible.

Step Up and Play

There was also another strategy we pursued for the stair culture research project. With *Step Up and Play!* we created an analog mini-games festival which ran concurrently with the exhibition as a series of events. "Step Up and Play!" celebrated stairs as play-zones in themselves, experimenting with a variety of game genres, also adapting children's games and boardgames to specific staircases.

On a larger scale, the festival project was a cooperative effort between the Zurich University of the Arts (Game Design & Transdisciplinary Studies) and

the Hong Kong Polytechnic University School of Design (Game Design). In the study semester prior to the exhibition, each institution had been conducting game design seminars as part of their masterclass coursework to develop and research the topic of analog game design for stairs. Besides developing a set of innovative and fun mini-games on the topic of stairs, we also carved out a set of design rules. Games for this particular section of urban infrastructure – also in the setting of a festival – posed very specific constraints:

1. Duration of a game round: 5-10 Minutes.
2. For 2-10 players.
3. No hurry, no hurting!
4. Keep rules simple! Instant understanding.
5. Easy to join! Accessible for newcomers.
6. Make use of physicality of stairs in your game mechanics! Give the stair meaning.

The core element of the festival was a game design workshop in the Connecting Space gallery in Hong Kong, where we invited participants to first create, then go out and play games revolving around stairs. We brought along a booklet containing the “Best of Stair Games” that we had created together with the Swiss and Hong Kong Master students, so the workshop participants (who were not game designers per se) could get some inspiration.

Figure 8/9: Randomness of the wind as game mechanic for Step Up & Play/ Step Up & Play Logo.



Source: Kocher

This workshop scenario worked really well and turned out to be a source for great “epistemological fun” – the participants were very motivated, and the dis-

cussion on rules, rewards and punishments was lively; even during gameplay on the stairs we debated and changed rules. We really wanted to understand how the concept of games changes when you play them on stairs (in comparison to, for example, a flat surface in the city, or on a board game). What is the (emotional) effect if the players start playing on top vs. on the bottom of stairs? How can you play a pervasive version of snakes and ladders on the stairs while including strangers? How can we work with music (in the loud street), with dice or with other elements of randomness such as balloons or paper planes carried by the wind?

In regard to the serious game aspects, *Step Up and Play* didn't intend to convey knowledge or have a specific impact on the player. It rather aimed at generating awareness of an area of the city that is usually perceived as non-game space. Due to topology ("Watch your step!"), people walk them carefully and anonymously, often without interaction, oblivious to their playful possibilities. To address this missed opportunity, we offered games as a mode of social practice and a means to engage with stairs. Since stairs are such a "resisting" playground (small area for play, busy, high degree of physical activity needed, risk of hurting yourself) they provided a great ground for experimenting with game mechanics and the borders of the magic circle in social and spatial ways.

AWARENESS GAMES AND A "LUSORY ATTITUDE": SUPPORTING THE MAGIC CIRCLE FOR A LUDIC CITY

Our quest for design insights with relevance to the serious urban game genre concludes with a reflection on what worked well in those projects: Which games had a meaningful motivational design, and which insights did we get into the specific affordances of the magic circle of a serious urban game? And what are the possible implications of serious urban games on larger societal scale?

First of all, designing in/for an intercultural setting in general has been very challenging, on the development level (remote, off-site design) and on the political level as well. Even with the feedback of local experts when communicating during the conceptual phase at the homebase, and the co-development with local participants on-site, the design process within that frame will always be accompanied by a lot of blank spaces, simplification of the unknown, and naivety. In addition to this, there is the ideological aspect of serious games: Which learning content is supposed to be conveyed? How shall culture be represented, which values should be conveyed? Each rule of the game is a statement on how the

world is intended to be perceived, which is, in a serious game, not just the fictional, but the “real” world.

Keeping those ideological implications in mind, experimenting iteratively with game mechanics in a foreign city is also a way of gaining insight into the rule system of that urban infrastructure, and creating your own ludic city. From a methodological viewpoint, the different games we created served really well as an epistemological tool, no matter how “successful” the games turned out to be.

For this purpose, the MDA model helps us to understand the complexity of the game design process. Its dynamics unfold, according to the model, in the actual gameplay situation, out of player interaction with the game system (its mechanics). While game designers can control the rule set of a game, decide on macro and micro game mechanics, determine which skills are needed for which task, how success shall be rewarded and failure shall be punished, they cannot fully control what happens in the interaction with the player, let alone what experiences the player takes home from it – whether these are emotional or intellectual, solely fun-based or learning experiences. In video games in general, but even more so in urban games that want to achieve an additional purpose besides entertainment, there are many blank spaces and many constraints.

Constraints are typical for urban games and concern the physical condition of the player and the physical topology of the playground (e.g. the game world), which constantly threaten the stability of the magic circle. Serious game-related requirements are the above-mentioned ideological and methodological challenges (how to make the player learn something), but also a certain basic incompatibility between designing for entertainment and designing for an extra purpose (*Stair Quest*). In a way, game mechanics of serious urban games also serve to avoid the collapse of the magic circle, and to keep motivating the player to play.

Blank spaces of the interaction between game and player can be filled with interpretation, design decisions and with simulation, but not fully: playtesting is key for experiencing the full potential of the game system’s dynamics. Obviously, that is not an easy task to accomplish when developing an urban game with digital components and possibly many players, especially when they are map-based and refer to the physical environment with mapping precision required (*Stair Quest*). It is much easier when the final play space is at home (*LucyZH*) and the game runs regularly, so iterative adaptations are possible.

Speaking of the desired effect on the player (referring to the MDA model once again: within the range of the “aesthetics”), the player has to accept the rules of the game to enter the magic circle. Bernard Suits calls this a “lusory attitude”. (Suits 2005: 54-55, see also for a discussion of this notion Salen and Zimmerman 2004: 98). To keep up this attitude for serious urban games, the mo-

tivational design has to be crafted either extremely carefully (*LucyZH*), or be flexible and experimental (*Step Up & Play*, *Dragon Polo*).

A decade ago, there was an active and spirited ludic urban game scene, with works of Swiss artists such as “and-or” with their project “wardive 1.o” (among others) and of the Austrian artist Gordan Savičić with “Constraint City”. They created game/play scenarios on the growing density of (closed-circuit) wireless local area networks (see also Stevens 2007 or Flanagan 2007 for an overview).

Today, on a geo-political scale, we need smart urban games more than ever. Cities become denser, more populated each decade, people spend more and more time commuting, the urban environment increasingly becomes functional and over-regulated. At the same time, serious urban game design becomes seemingly less experimental and more mainstream: games have “to work”, they have to solve issues, need to make money. But what is actually needed, are not “serious games”, but “awareness games”, which tease out the pervasive attitude in the (non-)player, bringing in elements of play and subversion, of participation, of community-building, of competition vs. cooperation, of humor to unfold a rich motivational potential. This essay therefore ends with a call for action: let’s put on some luscious, rose-colored glasses, and create more magic circles for the ludic city!

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