

The big urban game, re-play and full city tags

Art game conceptions in activism and performance

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The practice of technological tagging of locations in contemporary urban spaces can be seen in relation to the concept of the ‘Re-Play’ of urban space and urban life using performance practices. The performance of technological play with mobile technologies in everyday life serves as the starting point for a new interpretation of modern cities as a positive utopia. Re-Play is introduced in this paper as an idea of staging knowledge. In my approach to performance, I consider play a method to identify topographies of cultural or historic interest in urban spaces and to frame potential inter-action on such sites. Play consequently enables the extraction of new stories and new knowledge concerning narratives of the urban. The idea of Re-Play draws on the Situationist principle developed in the 1960s (Constant 1972), of a playful and open society living in a ‘New Babylon’ that offers zones of play and relaxation as a basis for creativity and a self-determined life – in relation to and through the constructivist use of technologies.

Contemporary activist play and performative urban games have to deal with a specific precondition: the electronic, electromagnetic and logic topography of the modern city, which is marked through ‘tags’. Tagging can be understood in two ways, first as an expression of an urban sub-culture of graffiti arts and secondly as a technological term to indicate a virtual-reality marker in physical space. My own work as an artist deals with technologies of ubiquitous topographies in the city – in relation to the individual – in order to raise questions around the cultural implications of tagging technologies.

The ambiguity of the term ‘tagging’ best expresses the general parallels between practices of performing data and performing the city. The increasing use of smart phones and the technological possibilities of navigation in urban space

that they present, and electronic and visual urban markers – commonly called ‘tags’ – have become a leitmotif of urban life.

Building on the investigation of technological evidence and its theoretical analysis, the practice of using such technologies to track individuals demonstrates new requirements for political agency through play in electronically networked cities. Games and play dealing with these technologies can be explained theoretically by the concepts of perceived, conceived and lived space – or the ‘spatial trialectics’ – developed by Henri Lefebvre (1991).

THE TRIALECTICS OF URBAN SPACE, AGENCY AND TECHNO-PLAY

The bourgeoisie and the capitalist system thus experience great difficulty in mastering what is at once their product and the tool of their mastery, namely space. They find themselves unable to reduce practice (the practice sensory realm, the body, socio-spatial practice) to their abstract space, and hence new, spatial, contradictions arise and make themselves felt (Lefebvre 1991: 63).

Lefebvre’s theory of ‘trialectics’ of common social spaces can inform contemporary urban play performances in the city. In technologically enhanced kinds of play in urban spaces, topographies can be simultaneously perceived, conceived and lived. As a consequence of the technological information exchanged through contemporary mobile devices, and the personal use of the devices in relation to geographical traces stored via the networks, city spaces are understood by players as a cultural history of changes. In contemporary cities, Lefebvre’s seminal theory about sociality in urban environments is radicalized through the technological condition of ubiquitous computing devices – like mobile phones and tablets. To the same degree as their use has become an everyday reality, they affect the experience of a space gradually perceived through a constant stream of information, they alter conceived space through the images and texts uploaded to particular sites, and they reconfigure lived urbanity experienced through the communication aspects offered by devices as an everyday practice of a playful use of technology.

The question of privacy has become pressing with the continual use of these technologies. A critical view of these practices in modern life must inform and shape the conditions of urban games and performances. Only through the critical potential of arts performances can the technologically lived city be addressed as a space where we express ourselves as self-determined citizens. The ability to build new worlds can be enabled by a slightly modified use of technologies.

With a gentle twist, introduced through playful arts experiments, current devices can become a platform for meaningful physical intervention – in contrast to the perceived urban space being experienced as a predefined space. Technologically defined spaces familiar from online mapping systems such as Google Maps can be experienced as a tool of control by industry, yet this control of personal movement can be re-interpreted as a conceived, deliberated, technically re-written and overwritten space of critical consciousness.

BIG DATA IN THE CITY: AN INVISIBLE PERFORMANCE PLAYGROUND

The necessity for a political awareness about the role of electronic topographies in relation to Big Data and its role in economies, surveillance, and espionage is seminal for our contemporary societies of techno-fetishism. Accordingly, the use of mobile devices in urban gaming can be identified as everyday performance practice that enhances the critical use of technologies in a subliminal way. Virtual and physical tags are increasingly used in a way that was not necessarily foreseen by industry. Geographical caching games tend to make visible the combination of storage of individual data about activities, movement patterns, geographical location and network traces, all of which is invisible with ordinary use of the devices. Through their game mechanic, new hybrid urban games support – intentionally or not – the inherent surveillance capabilities of mobile devices and demonstrate how the industry exploits players.

For example, the commercial urban game, *Ingress. The Game* (2014), builds on user image uploads, texts, and on the human ability to identify sites of relevance in geographical space. It constantly collects all available navigation data and exploits the conceived space as well as the space that is generated by a sites' narratives, which are generated in *Ingress* by the players. After a closer look into its game mechanics, it becomes evident that the long-term aim for its release was a consolidation of the Google Maps system as a high-quality content database of lived urban spaces. The game's aim, evidently, is to collect the performance data of players for the increasing development of quality content for sites on Google Maps. In this sense, the game builds on unpaid user work to generate geographical data. This demonstrates an exploitation of user labor based on the joy of play in the mapping geographical data to a perceived space in the city. *Ingress* unfolds as a hybrid game melding technology and reality in urban space. But an analysis of the macro mechanics of the game makes clear that it not only includes the storage of data traces with the purpose of generating a publicly acces-

sible, collectively built map but also tries to achieve a deeper monetization of play performance through user surveillance. Tourist apps hold the promise of being data mines, especially if the content is user centered and combined with playful narrations, as it is in the case of data generated through Ingress. The micro mechanics of the game focuses on public sights like monuments and sculptures. In the game narrative, such objects of art become play objects, they are defined as star-gates to another reality, because the game reality is only made accessible by the technological definition of such sights as 'natural markers' read through a mobile phone camera in urban space. The functionality and viability of such natural-marker technologies depend on the density and size of the related marker databases, consisting of images of the marker objects. At the end of the day, the technology can only function with the help of smart phones and human labor. In this case, the urban performance of players targets the generation of a new unpaid mapping of cities, which can be used later by Google as an alternative city guide mapped by user movements.

As a side effect of conditioning users to constant use of a device in-game, the game play establishes the use of electronic tablets as a user interface for city walks. This effect stems from an advantageous main feature of computer games, which historically was to establish the use of certain, often user-unfriendly, interfaces. Evidence for this dates back to early graphic computers from the 1960s like the Programmed Data Processor-1 (*PDP-1*), up to the use of laser guns for Spacewar games and the modern use of the mouse and touchscreen in personal computer gaming (Pias 2002).

Thirdly, the *Ingress Online* news channel psychologically motivates a community of worldwide players to upload their video data. This takes advantage of practices established by social networks such as Facebook or video channels like YouTube. The Ingress news channel uses elements of a social network, elements of real-time news channels and, not least, of featuring the new tags at urban sites uploaded by players.

In the example of *Ingress. The Game*, Google targets the establishment of user habits to get them to accept a monopoly of mapping. A side effect of the game is establishing social acceptance of user tracking as an everyday practice and forces users to playfully absorb a parallel view of the world we live in on a smart phone or tablet while moving through the real world. The players act as unpaid agents for Google, exercising play within the city as a playground and becoming notorious tagging masters for commercial purposes.

Summing up the 'Ingress experience', it can be said that contemporary play and performative urban games have to deal with a shared precondition: the electronic, electromagnetic and logical topography of the modern city. Everyday life

and urban games involve technological sensations and fictions. On closer inspection, they also inherently contain the possibility to raise public awareness about the political dimensions of ubiquitous computing technologies. Being part of a preconceived intervention through electronic artifacts enables players to discover the invisible network and surveillance dimension of common objects in urban space. Urban games can support the uncovering of the mystery of the tools in everyday life. The following art piece description opens the black box of our mobile devices in a very distinct way.

WARDIVE: A DATA TRANSPARENCY STREET PERFORMANCE

The urban game *wardive 1.0* created for iPhone & iPod touch was rejected from Apple's *iTunes Store*. The official explanation for the ban by Apple, sent to the artist developers, was that the app should not publicly display names of user's personal hotspots, which the game intentionally does, during a physical city walk. The obvious reason for a 'too dangerous' classification can be identified in the app's potential of showing data insecurity and data transparency to casual gamers.

Figure 1: *wardive*, Augmented Reality Screen



Urban game by andor.ch

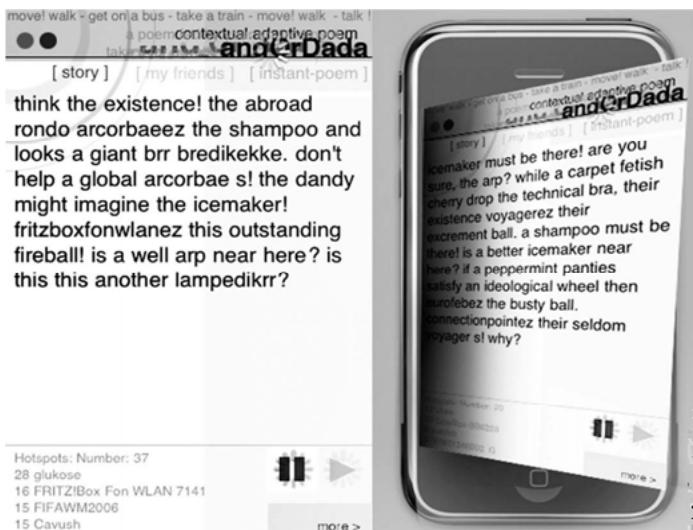
According to the artists' description, *wardive* is an adaptive game with locative levels. It converts WLANwaves into game objects and levels, displays the names of the hotspots in the players' immediate area and turns them into enemies in an urban battlefield scenario. As a consequence, the individual perceived space of electronic access points – and its linkage to individual information – influences the behaviour of players in a city. The walking routes chosen by players are selected according to the expected density of individual WLAN access points. The play experience makes no difference to the technical functionality of such individual access points in urban space, but by indicating them dynamically, the app makes a big difference in how the reality of the electromagnetic topography of the city is brought to the consciousness of the individual player on the street, how it is reflected, and how the individual mobile device in the player's hand is used. The interface instructs the player to 'walk through e-toxic streets', to defeat hotspots and WLANs as private property. This game rules the extent to which invisible urban data is present in a technical sense, and which information is given about the accessibility of individual data streams.

Essentially, *wardive* is informed by strategies of a historic electronic subculture, called 'wardiving'. Hacker activists have been players in urban space for years. They perceived the invisible city of the 'electrosphere' as their environment by scanning it technologically and analysing its value systematically. They were trying to find and indicate insecure electronic access points in the city. Using a 'throw-back' practice of tagging a house in the city with chalk, they opened the hermetic space of limited access and privacy. In a world of data streams that are like new streets of a city, insecure access points mean easier surveillance, and can be indicated by an app instead of chalk on the walls. Tagging symbols in general were inspired by chalk tags used by beggars to mark houses in the 19th century. Learning from practices of rejected groups of society in digital performance practice implies a number of associations. Firstly, it expresses solidarity. Secondly, it compares the data poor and data rich to social hierarchies of earlier times. Thirdly, it builds a bridge between the city-dwelling tramp and urban hacker as independent figures in society.

The game also exemplifies the massive accumulation of data as value: each time you play, *wardive* captures different data and creates a new level. This can be translated into the fact that collecting data about access points and users generates a merit. In that sense, *metro wardive* is not only an adaptive game with locative levels. It also changes according to its real-life location as much as it does according to its virtual data world and mutates the player into a *wardive* activist and critical data performer – who experiences the urban space as his or her perceived, conceived and, most importantly, lived space.

Comparably, a related work entitled ‘sniff_jazzbox’ creates an audible city.¹ It converts the ‘electronic ether’ waves into sound waves. Technically, the mobile app captures the WLANs in the immediate area and produces a stream of WLAN names. This stream of words might be understood as a subconscious expression of the existing communication networks. The game renders private data visible, translates it and makes it audible as a melody of yearning for contact and exchange. In relation to the number and names of access points the game generates an individual soundtrack of the city that indicates different layers of data. Such a multi-layered concept can be perceived as urban performance, which each player enacts in a hybrid state of physical walking through the city and drifting through an audible data world.

Figure 2: Augmented Reality Screen



Urban game by andor.ch

The third work of this urban game series associated with the ‘and/or group’ is of particular interest for theater and performance. The piece *andorDada* is a road poem.² The player, also known as the/a performer, strolls through town while the game renders a poem according to the location. It reads, writes out and interprets

1 Cf. http://www.and-or.ch/sniff_jazzbox_audible_city

2 Cf. <http://www.and-or.ch/andordada>

the subconscious social structure of a town. The result is an endless poem in an emerging digital performance art genre: I would call it ‘adaptive locative Dada’.

Such urban games experiment with the concept of agency through the functioning of a technological system, or in other words, the game mechanics. The power of game mechanics is critically questioned in plays more oriented towards theater performance, such as by *machina eX*³ or *Invisible Playground*. The latter define their games as play in public spaces in order to explore a gray area between game design and participatory art:

“By referencing playful traditions like video games and sports, we connect to something known and remix it to something new and one-of-a-kind. Our games are post-digital. They use technology, but know of the power of bodies in shared spaces and at a specific site. By creating games that make stories and histories of places playable, we aspire to contribute to the development of play as a cultural technique and an art.” (Invisible Playground n.d.)

The contemporary experimental Urban Gaming scene, introduced by Katie Salen (2003) in the Big Urban Game,⁴ builds on the deliberating power of game mechanics. In the act of urban performances in the city, hidden stories are revealed and activated, and potentialities for transformation are explored. Each situation is considered to reveal something unique about urban space, yet with connection points to a bigger narrative. I see such a play setting as a method of immersive research: it requires the full immersion of the researcher in a play situation, which is carefully accompanied by self-observation and context observation. The research gets so close to ‘the subject researched’ that it can then be brought into a critical debate, which stems conceptually from the art movement of *Situationism*. Urban game evidence links to *Situationism* as a source of inspiration for the digital performances in the city in general.

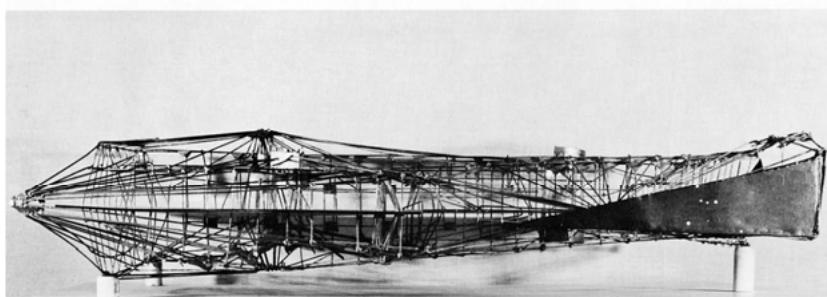
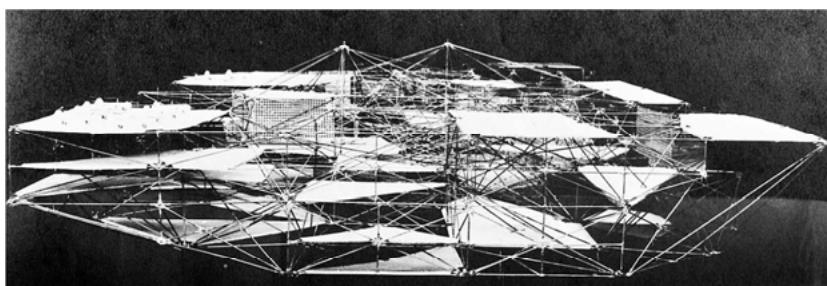
3 Cf. <http://machinaex.de>

4 The Big Urban Game was commissioned by the Design Institute of the University of Minnesota as a part of its Twin Cities Design Celebration with the goal of encouraging the residents of Minneapolis and St. Paul a way to see their surroundings in a whole new way, and to think about the design of urban space.

SITUATIONISM, REPLAYED

The tactical questioning of everyday-life technologies by game mechanics was already expressed in earlier forms of urban games and play, in the Situationist art of the 20th century. In the 1950s, the Situationists understood performance and play as a means of reordering social and economic relations and to evaluate new systems of thought (Debord 1958). Through the means of urban intervention, a political and social utopia was outlined in which new technologies and arts were considered as the main vehicles of the creation of society. Guy Debord (1958) expressed a general interest in play as political practice in his essay, *A Situationist Definition of Play*, in the magazine *L'Internationale situationniste*. Here, play was introduced as a method and vehicle to radically reclaim urban spaces, to appropriate hegemonic power and to overcome social restrictions of love and life in contemporary societies through 'ludic' time and space. This kind of free play time was supposed to be achieved through technology. Further Situationist writing described the city of the future as a site of total interaction enhanced through mechanisation, in which the need to work is replaced with forms of creative play.

Figure 3: *New Babylon*



© Constant Nieuwenhuys, 1958

The idea of a technologically informed city was originally introduced by the Dutch artist and architect Constant Nieuwenhuys (1959). He suggested a technological utopia as playfully experienced, perceived and lived spaces. In regard to the role of technology and mechanization, he also spoke about an emerging new society, the playful Ludic Society. This form of life is based on creativity as a process of public play, enabled by the technology of a machine-like city: a moveable and toy-like gamified city, wherein mechanization would liberate the individual from the domination of time and labor. His fictional model was based on an idea of social design triggered and enhanced by intelligent architecture, where mechanisation offers a positive chance to overcome capitalist demands of work. Social interaction, artistic performance and technology were considered to be the main vehicles for creating an open society. Contemporary activist play systems and performance-based urban games about the electronic, electromagnetic cities seem to increasingly appropriate these ideas of a Ludic Society, based on performances in real space, paired with the subversive use of technological objects of everyday life.

In the magazine *Potlatch* (1959), Constant positioned another related idea of a mechanically liberated *homo ludens* in the new Ludic Society:

“The opposite of utilitarian society is Ludic Society, where the human being, freed by automation from productive work, is at least in a position to develop his creativity. [...] He learns by playing. [...] Such play is possible due to the integral technical control of all those elements, which thus become a conscious creation of the environment.” (Constant 1959: 6)

Today the role of the *homo ludens* is key in order to develop practices of creative resistance against the hegemonic control of communication technologies. Unfortunately, the new *homo ludens* of Big Data society is not liberated by play, but controlled and forced into individual self-exploitation and unpaid labor, disguised as casual gaming. The following section introduces dystopian evidence of how technological framing of the everyday has shaped everyday performance in urban space into such exploitative forms. The examples discussed include the visualization of data traces we leave in public spaces, which serves as a counter strategy to dealing with the omnipresence of data as a marker of individual consumer behavior and/or misbehavior.

URBAN MARKS THAT MAKE A DIFFERENCE

Meta information for digital data is usually called a tag. To tag means to mark a place with an individual sign. Tagging is also used for images on Flickr and other social networks. It can also be understood in the sense of a technological marker suitable for Alternate Reality apps, calling up data and layering it over the image of reality, which is reminiscent of the original meaning of tag used in street cultures. On murals, tags are usually linked to an artist's 'street name' and are an attempt to reclaim an urban site through a personal marker. Such artworks indicate the potential of a particular, often devastated urban location, as public space in order to animate urban life. Nowadays, in networked cultures, the connection of physical commodities to electronic networks is increasingly made possible by ubiquitous computing devices.

Figure 4: RFID world tag, 2006, used in the Plymouth RFID Performance



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In 2006, the Fraunhofer Institute had already defined Radio Frequency Identification (RFID) tags, which are currently used in many mobile phones under the name 'Near Field Communications (NFC)'. It is one of the most influential hybrid technologies to connect materiality and immaterial databases. The technolo-

gy was developed to make the location and history of goods electronically detectable. It functions based on an electric induction principle: a radio wave is sent to a transponder, which consumes the energy of the initial radio wave and sends data back to the sender/receiver unit. When public awareness of this technology first emerged, artist and activist Rob van Kranenburg (2008) critically investigated the digital tagging and tracking of objects. He saw such technologies as enhanced states of public surveillance. The sensual dimensions were the subjects of his inquiry. The worlds of electronically tagged things change the role of the subject/object dualism, highlighting the way electronically marked things influence and shape society.

In modern, RFID-equipped stores, customers are under permanent suspicion. Control of the subject by ubiquitous traceability is established by the networking ability of this technology. Furthermore, the possibilities of drawing conclusions from patterns of movements of both objects and people give another meaning to the idea of 'leaving a mark'. The aim to produce a smart supply chain that thinks, responds and adapts has today become a tool of public control. The alternate realities accessed through these markers usually claim a virtual space for commercial reasons. However, urban games of activists and artists have appeared as a counter-reaction to this trend of digitally supported surveillance in urban space – a subculture of art activism dealing with the subversive use of such technologies as a tool for urban performances is increasingly visible. Only critical practice and discourse achieved through a playful approach to technologies can alter the given conditions of technological objects in public spaces. Through this observation, we can draw the conclusion that only creative play with technologies can change the commercial object into a public object, which redirects suspicions. Most promisingly, performance with electronic toys on the street critically questions technology and power structures.

CRITICAL URBAN TAGGING GAMES

A decade ago I introduced, in reference to Constant's ideas of a deliberating technological space, the label of Ludic Society.⁵ We designed street games that paved the way for a potential everyday-life subversion of electronic tags and geographical positioning systems. The LS games embraced play, technologies, discourse, and live urban plays. With the help of modified interfaces and stage per-

5 Cf. <http://www.ludic-society.net>

formances we tried to educate audiences, as expressed in public workshops we held in relation to each street game.

Figure 5: Plymouth Road Runner Superbird, car used in the Plymouth RFID Performance



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The urban game *RFID Judgement Day for 1st Life Game Figures* performed in Plymouth in 2007 consisted of electronic tagging and an implant session. As ‘spectacle’ in the sense of Situationism, we used a 1970 Plymouth Road Runner Superbird, a sports car, to perform reverse gear races as a game opener on the common English roundabouts. On the original games website, I describe the concept as follows:

This *Tagged City Play for Real Players in Real Cities* uses a Plymouth [car] for the Plymouth Play. A local shop serves as a pit stop/workshop location: Being Tagged! Tagging! To tag the city, real world objects, subjectively chosen things, are tagged with working but useless RFID-Tags, so called ZeroNull Tags. To achieve that, Real Players get a flexible tool-kit suitcase, containing spray cans, stencils and stickers, which are part of each Real Player’s inventory. Each Real Player is personally tagged by a RFID implant, to generate an individual street art graph, displayed over a satellite online map. The goal is to find and overwrite tags with zero information. A specially designed toy gadget sniffs and alters the state of RFID-Tags, the refreshing electronic little tree. Tagging The

City is played in the real cities with RFID over-clocked Plymouth cars, equipped with self-designed and etched electronic *Wunderbaumchens*.

Figure 6: Human Tagging Performance, 2006, Plymouth Art Centre, UK



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A RFID implant session was also performed publicly, as a spectacle. While watching this provocative act of public harm, the audience could perceive the concept of a change of status of the individual by technology being applied to the body in a very direct way. Through their tags, which emitted waves, the players were turned into electronic objects. In the course of the urban game, the players experienced the absurdity of being tagged; of being put on the same level as a semi-synthetic object.⁶ In that sense, the game created public awareness of

6 Ludic workshop, Wednesday 21-24 March 2007, Plymouth Art Centre, UK. Workshop topics were tag teams, game play development, last man standing, tool kit box, being tagged, tagging cities. Workshop exercises: Tag and de-value objects, re-programme tags and toy gadgets, adding the value Zero. Tag the city with stencil graffiti to achieve a Full City Tag (=the complete city is systematically tagged). Fully subjectively and collectively, every player can pass judgement by tagging objects, buildings, vehicles, persons and is judged by wearing a RFID Tag under the skin. Second: scan tags with the *Wunderbäumchens* and change the Internet of things into the value Zero. Third: take souvenir photographs of Plymouth tags and the Plymouth. The Real

hybrid technologies as invaders of privacy; even of the most intimate space of the body. While watching this provocative act of public harm, the audience could perceive the concept of a change of status of the individual by technology, which is applied to the body in a very direct way. It created public awareness of hybrid technologies as invaders of privacy; even of the most intimate space of the body. Accordingly, we gave performance lectures explaining that anonymity no longer exists if the individual is marked under the skin and becomes a permanent emitter of electromagnetic waves. In the map of the piece, each player's number is rendered in an individual graph online. This movement pattern is displayed on an individual map for every player as a layer over Google Maps. All player uploads were layered, and when automatically cycled through, the result was a movie of player movements. The film was shown in the Plymouth Arts Gallery as an online-generated 'performance-map movie'.

Figure 7: we sell play no games! RFID workshop in the Plymouth shopping center, UK



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Play extends the game zone into a situated locative play in a real city. Come and judge with your tag! See: <http://www2.kurator.org/wiki/main/read/workshops>

Figure 8: Plymouth Play, 2007. Online Interface of map of RFID implants



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With the help of combinatory interfaces of serious information, storytelling and, most importantly, play, a seed of doubt is sewn in the enjoyment of technological everyday-life tools. Such critical urban game concepts can be best developed through the observation of players in commercial urban games and the inversion of their introduced logics and game mechanics.

Reviewed from the perspective of agency potentials in play with technologies, the theoretical framework of trialectics can be applied to an analysis of performance works in urban space, which are consequently produced as a reaction to a social history of technological changes. According to this logic, the urban tagging games in this paper are categorized into three distinct types of performance play. They are perceived as applications of concepts of data performance in a perceived agency. This means that the model of agency is demonstrated by the urban game, in order to make agency perceivable to the public. Referring to Lefebvre's concept, conceived conceptual performance made out of urban data appears as conceived agency. The construction of a situation in an urban space – the performance, so to say – is the basis for the conceived space. In the course of the performance and based on the experience from the performance in raising awareness about the wealth of data collected about the individual player, a new form of agency is opened up, one which combines play and activism in one. Lived interventions of principles are finally fully experienced by the players of urban games – a category of lived agency as a strategy against Big Data surveillance through performative digital play.

REFERENCES

Debord, Guy (1958): "Contribution to a Situationist definition of play. Internationale Situationniste #1." (R. Keehan, trans.), In: situationist international online, September, 23, 2015 (<http://www.cddc.vt.edu/sionline/si/play.html>)

Invisible Playground (n.d.): "How we make games". October 15, 2015 (<http://www.invisibleplayground.com/en/category/games>)

Kranenburg, Rob van (2008): The Internet of Things. A Critique of Ambient Technology and the All-Seeing Network of RFID. Amsterdam: Institute of Network Cultures.

Lefebvre, Henri (1991[1974]): The Production of Space (D. Nicholson-Smith, trans.), Oxford: Blackwell.

Muñoz-Cremers, Omar (2007): "Playing the arcades project with the ludic society." Report by Omar Muñoz-Cremers about The Evening of Ludic Society, DEAF07, March 9, 2016 (<http://v2.nl/archive/articles/playing-the-arcades-project-with-the-ludic-society>)

Nieuwenhuys, Constant (1958): Utopia New Babylon, September 12, 2015 (<http://intern.strabrecht.nl/sectie/ckv/10/Architectuur/Babylon/CKV-f0011.htm>)

Nieuwenhuys, Constant (1974): New Babylon. A Nomadic Town, September 12, 2015 (<http://www.notbored.org/new-babylon.html>)

Pias, Claus (2002): Computer Spiel Welten. Berlin: Diaphanes.

Sutton-Smith, Brian (1997): The Ambiguity of Play, Cambridge: Harvard University Press.

Games

"andorDada" (<http://www.and-or.ch/andordada>)

"Ludic Society Tagging game" (<http://ludic-society.net/tagged/>)

"Ingress. The Game" (<https://www.ingress.com>)

"wardive 1.0" (http://www.and-or.ch/wardive_wintermute)

