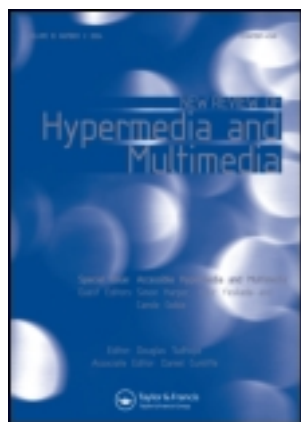


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### Mobile digital interactive storytelling—a winding path

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# Mobile digital interactive storytelling— a winding path

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These places (and, indeed, particular spatial orientations and vistas) are so central to the telling of stories that their names may become proxies for the stories themselves. It is not just that stories are about places, then, but that stories are about being in places. Brewer and Dourish (2008, p. 967)

## Stories in the physical world

The idea of inscribing stories into the physical landscape is one that has been around since long before the recent developments in mobile technology. The myths of the Australian aboriginals tell about how the “Dreamtime” is sung, and by that, sings the very land into existence (Chatwin 1986). In that way the myths are inscribed into each Aboriginal group’s local landscape. Over the centuries, architects have been designing paths through the landscape to guide movement and direction of sight—and game designers do the same in their virtual worlds. The psychogeography movement (DeBord 1955), which aimed to explore the psychological effects of the geographical environment, created numerous forms for playful exploration targeted to reveal and transgress such designed structures. Several modern movements can trace their roots back to this movement, such as the urban exploration movement, which explores the hidden city landscape through accessing underground tunnel systems and rooftops pathways. Independently, skateboarders, Parkour runners and Flash mobs instead focus on exposing and transgressing the ordinary use of public space, through injecting alternative usages of urban space.

Lynch’s (1960) age-old work on the social cityscape was extremely early in describing traveling on a road as a narrative experience. At the center of his works lies the understanding that physical movement creates a sequential experience and as such constructs a basic narrative structure. Early graphical games such as *Myst*<sup>1</sup> offered spatial exploration of a virtual space as the primary form of activity. The free movement in such games already offers a primitive level of interactive storytelling, as the paths chosen will determine how the narrative is formed and to some extent even which plot is told.

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In this special issue of the *New Review of Hypermedia and Multimedia*, we explore the relationship between such locative practices and the idea of space as inherently narrative, and the tradition of interactive storytelling as it has developed for virtual media.

### The origins of interactive storytelling

Although the free movement in space in itself offers some interactivity, the concept of interactive storytelling has its roots in a different design goal. Whereas free movement enables some control over a narrative experience, the core goal of interactive narrative is to let the reader influence the very *plot* of a story.

The first approach worth mentioning is Ted Nelson's (1974) proposal of what is now known as "Hypertext" or "Hypermedia." The exploration of hypertext as a technology as well as an art form emphasizes that the reader's encounters with the text are just as important for the narrative, as are the words and links provided by the author (Landow 1994, Murray 1997, Bernstein 1998). Hypermedia narratives follow common patterns that provide coherence, through tight organization of material on the basis of composition and aggregation. Famous examples are the interactive novels "Afternoon" by Michael Joyce,<sup>2</sup> or "Victory Garden" by Stuart Moulthrop).<sup>3</sup> Early examples of navigation and exploration-based games are based on similar structures; "Colossal Cave"<sup>4</sup> is a well-known example. The fascination and contribution of hypertext still lies in the use of technology to better exploit the dynamics between author, reader and material, where the center of attention lies on the craftsmanship of the author as the architect of the narrative landscape.

An alternative approach was followed in Artificial Intelligence (AI) during the late 1970s and beginning 1980s, in which the basic vision was that the machine should become an active partner in the pleasures of immersion and interaction. Although most AI research was not primarily directed toward storytelling, this strand of work embodied mechanisms to interpret, manipulate or generate textual stories. The main cornerstone was a cognitive view on stories in which schemas are central, each schema describing what a person knows about the world, the objects it contains, and the tasks to be performed (Schank and Abelson 1977). In combination with automated planning, it became possible to establish textual storytelling engines with user adaptability. Traces of this technology could be found in interactive fiction where players use text commands to control characters and influence the environment.

The introduction of audio-visual media in computing in the 1990s facilitated the initiation of realism into digital storytelling: stories could now be told by visual and audible, and not only textual means. The physical world could be simulated on a larger sensory scale, applied to a single medium or between media. The semantic and semiotic possibilities resulted in story environments that informed the theory of digital storytelling with respect to the representation and exploitation of temporal, stylistic and interaction attributes (Nack and Parkes 1997). More importantly, the gained realism also demonstrated how digital storytelling can become a culturally and politically powerful tool,

through incorporating authentic, documentary-like rather than fictional story content (Davenport and Murtaugh 1995, Mateas *et al.* 2000).

Around the same time technological advance allowed computing to leave the realm of research and enter society in large, and thus has drastically changed the audiences' experience request. Enter the graphical computer game, as pioneered primarily by *Doom*.<sup>5</sup> Early graphical games would only allow readers to follow set paths; hence, free movement in a realistic environment became something of a holy grail of game development. Some early graphical games such as *Myst* emphasized exploration of space. However, game designers soon found out that this came at the expense of story control - the free movement in virtual space tended to generate rather random narrative arches. In practice, even the free movement games of the period encouraged, or even forced, players to follow a set path, much like Lynch analyses the road experience. The consequence was that much of the adaptive richness in storytelling from the earlier hypertext experiments was lost—this generation of computer games offer little in terms of adaptive storytelling. More recently, single-player role-playing games like *Mass Effect*<sup>6</sup> and *The Witcher*<sup>7</sup> have combined this tradition of narrative-oriented graphical games with hypermedia storytelling structures, enabling some user adaptation of plot as well as narrative.

The 1990s also gave rise to the idea that the system could be more than a storytelling engine: it could simulate the inhabitants of a story world. *Agents* perform as autonomous entities, which observe and act on an environment (a story world) and aim to achieve their own goals. Computer games of the time were flooded with very stupid agents called “non-player characters,” primarily serving as moving targets for the player's aiming device. Researchers worked at making them smart, supported by learning strategies as well as methods to collect knowledge over time. Dynamic programming, reinforcement learning and combinatorial optimization facilitated digital storytelling to be applied in responsive environments in which the user could engage with characters in a story world and some times also construct the world. The most well-known example is Will Wright's game series *The Sims*,<sup>8</sup> a life-simulation computer game of daily activities in which the player controls one or more virtual persons in a suburban household. Various “sandbox” games, such as *Morrowind*<sup>9</sup> and *Grand Theft Auto*,<sup>10</sup> combine the free exploration of space with agents of limited intelligence, that are influenced by the players' previous actions in the game. Whereas “*The Sims*” is a pure simulation with no deliberate aim to generate interesting stories,<sup>11</sup> and sandbox games tend to incorporate a main story as an optional path for the player to follow, the game prototype *Façade* (Mateas and Stern 2005) aimed to combine the “character in the world” approach with an adaptive narrative arch, through its introduction of a “drama engine.” This allows the player to explore the game freely while the game still controls events to form a dramatic narrative. *Façade* clearly has its roots more in the research tradition of text-oriented storytelling; although it is graphically depicted and supports free movement in space, its story primarily evolves in form of a dialogue. The player types

sentences, as response to the character actions and internal dialogues, and by doing so is able to influence their internal relationships.

### **Interactive storytelling in the physical world**

The rapid adoption of sensor-based smart phones and location technology provided another technological boost in the beginning of the twenty-first century that facilitates the transfer of many of the mentioned storytelling technology solutions to the physical world. But compared to the deliberate design of the very landscape in story-oriented games, the story experience generated from a random stroll in the physical world is likely to be rather chaotic (Lynch 1960), and it is not clear how the methods and tools developed within the area of interactive storytelling will transfer to a physical setting. Due to their roots in static technologies, previously designed algorithms and design solutions are only partially useful to address the challenges of a nomadic, social-networked world. There is an inherent conflict between the emergent narrative structures generated by motion, and providing rich personal adaptation of a story. As discussed earlier, this conflict emerged already for free-movement games, and it is more acute in the physical world, as there are few ways to shortcut travel or control the pace of travel (Montola *et al.* 2009, Chapter 4: Designing Spatial Expansion).

Physical space is also different in that it is inherently social, and shared with players as well as non-players (Huysen 2003, Chapter 5: Designing Social Expansion). This difference is apparent in the recent development of GPS-based locative practices that are *performative* rather than experiential. Social media sites such as Foursquare (<http://foursquare.com/>), Facebook (<http://www.facebook.com>), Twitter (<http://www.twitter.com>), and Flickr (<http://www.flickr.com>) facilitate us to instantly create, consume and manipulate information about people, objects, places, and events in real time. Through these communication acts we contribute to, rather than experience, stories. We leave traces of our emotional or intellectual experience as virtual attachments, shaping the experience fabric of locations (Huysen 2003). The usefulness of such traces is demonstrated by path recommendation systems that exploit geotagged Flickr images to establish the interestingness of locations (El Ali *et al.* 2010, Lu *et al.* 2010), as well as by systems that evaluate the social engagement of Facebook users with respect to news stories (<http://ediscope.labs.yahoo.net/>). In short, we expect to experience the world around us as a continuous, flexible, and networked exchange of ideas that are routed in where we are, who we are, and how these intrinsic facets of our experience are connected to those of others (Nack and Jones 2008).

Sensor-based smart mobile device technology raises many issues related to storytelling. Where will stories come from and who will create them—is there an author and a reader, or are the two roles merged? Do readers follow stories, or create them through active interaction, movement, and participation? Are there several reader roles—for example, what if a bypassing

spectator enters into the story only because he or she caught a glimpse of it in a public setting? What are the particles those stories are made out of? Since stories are staged in the physical world, they are bound to contain some fragments that are actual rather than fictional. Their substance of expression (Chatman 1980) might be produced for unknown purposes and outside of the story context, and yet, they will be used to form fluffs of meaning that swirl around with the drafts of the spectator's movements and disappear with him. Are these stories real or mere fiction, and is this distinction even possible? Will these stories challenge the individual assumptions and perspectives, or will they be personalized to the level where they comfort the spectator/participant with a view on the world she cherishes? Are location-based stories ephemeral rather than persistent—and is that a desirable property?

The article collection presented in this special issue should be read in the light of such questions. They have no generic or “best” answer. Rather, each design solution will navigate its own path toward an answer, avoiding some of the questions and taking a strong stand on others.

In their work on locative storytelling for cultural heritage, *Lombardo and Damiano* take an author-centric view. They use adaptive methods to address issues both of interactivity and movement, so that a story arch can be planned based on what users do as well as to how they move. This story arch is presented through the metaphor of a companion agent, one that retells the story through a “third person” view. This form enables the agent to create a story arch out of even rather disjoint snippets and allows the author to maintain control over the overall plot despite the fact that the participant/listener controls movement and interaction.

*Callaway et al.* rather pick up on the desirability for social and performative interaction. Just as *Lombardo and Damiano*, *Callaway et al.* work in the context of an information-rich task, in their case a museum visit. Through presenting *different* parts of the storyline to different members of a visiting group, they encourage discussion and information sharing within the group. In addition, they address the issue of free movement through the dynamic use of bridging segments that serve to connect pieces of located content to each other, depending on participant movement. This creates an interesting intermediate between a stable and ephemeral story: whereas the plot content is fixed, the discussions between players are ephemeral, shared only within the precise group at that precise visit.

Similar to *Lombardo and Damiano*, *Hansen, Kortbek and Grønbaek* present a system to support authors in creating location-based story structures for outdoor environments. The stories that can be created they describe as mobile urban drama, because the spectator becomes the main character in a play that is presented as a multimedia production on the spectator's mobile phone and in the physical environment. Key elements are the use of plot graphs to represent the narrative flow, a user model that captures the spectator's current knowledge of the story, and an environmental model that describes the physical environment and detail which events occur at which location. *Hansen et al.* recount their experience of using the system to facilitate the

staging of various dramas, ranging from a murder mystery to a structured learning experience.

*Gentès and Jutant* set out to explore the design strategies that location-based storytelling has developed in response to their close relationship with reality. As mentioned previously, these systems always create situations in which actual facts and physical places are an inherent part of the storyline, even when this storyline is fictional. Hence, the storytellers must develop strategies to deal with reality. *Gentès and Jutant* present a semiotic-based design approach, where the split between the signifier and signified plays the central role. As a result, they identify four very different strategies for pervasive game design that greatly impact how stories as well as the participant's involvement are planned.

*Løvlie* provides the analysis of an experiment on locative poetry, where renowned poets contributed text and sounds to enhance the understanding of a location. The aim of the experiment was to determine if these artists would develop a new type of poetry if they understood their work as sculptures of text and sound that, in combination with the audiences' reactions, form a location's memory. The analysis of the works shows that the curated poetry could indeed create experiences that would not have been possible using only paper and pen, but also that the creation and perception of locative literature is not very different in this setting, with experienced poets, compared to a previous experiment with amateurs. In locative literature, the role of location is central, and the medium is as novel to the poets as it is to everyone else.

Throughout this introduction, we have attempted to put research at the side of its concurrent commercial and social practices. We end on a similar note, reflecting on the direction of the current issue that focuses on locative storytelling as an authored rather than a collaborative practice. As mentioned previously, the emergent locative practices tend to be performative and collaborative, but they also tend to create the chaotic narrative experiences that are symptomatic of free movement in physical space. The articles in this issue try to overcome this through structured authoring and user adaptation, and they show what such techniques can add to current locative practices. The goal remains, however, to combine the two approaches.

## Notes

- [1] Developed by Cyan, 1993.
- [2] Developed by Michael Joyce, 1987.
- [3] Developed by Stuart Moulthrop, 1995.
- [4] William Crowther 1975, extended by Don Woods 1977. [http://www.rickadams.org/adventure/e\\_downloads.html](http://www.rickadams.org/adventure/e_downloads.html)
- [5] Developed by id Software, 1993.
- [6] Developed by Bioware, 2007.
- [7] Developed by CD Project Red Studio, 2007.
- [8] Developed by Maxis, 2000–2012.
- [9] Developed by Bethesda Game Studios, 2002.
- [10] Developed by Rockstar Games, 1997–2009.

- [11] The Sims still inspires players to storytelling, often in the form of graphical comic strips, where the graphics are screenshots from the game.

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