

Authoring Flexible Story for the Wild

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ABSTRACT

This paper addresses the problem of authoring an environmentally-responsive narrative which is embedded throughout a wild space. Through research at the Media Lab Europe (MLE) we investigate how mobile digital stories may provide a rich experience of a place. An appropriate narrative framework evolved during our development of a prototype navigation and storytelling system. Our audience wanders across a remote outdoor landscape gathering location and weather-based multimedia scenes and screening them on-site with a context-aware handheld computer. Given this scenario we construct and deliver media scenes that aim to *amplify a rich remote setting* rather than compete with it. We seek to provide a *coherent cumulative story experience* that enables character development, narrative climax, and a singular conclusion to everyone regardless of their strategy for navigating the story space. With these goals as a guide we develop a simple, generalizeable framework for use by content creators. We detail our challenges in developing a narrative which fulfills these goals, including a description of the final story framework. We discuss the results of user trials and suggest future application possibilities; the evolution of the framework, in addition to the framework itself, may be instructive to developers of distributed, context-aware digital stories.

Keywords

place-based content, fragmented narrative, plot stages, climax, context-aware, story structure, physical navigation, audience experience, authoring challenges, weather sensing, GPS

1. INTRODUCTION

Stories are a universally compelling way to communicate that 'unexplainable Something' about the life, history, culture of a place. With mobile media-screening devices, a person can receive digital story scenes on-the-spot, outdoors. By interpreting portable environmental sensing technologies like GPS receivers and weather gauges, a collection of digital

scenes can 'know' where and under what conditions a traveling individual is moving, and provide narration that matches real-time situation of the audience. All of this implies that fictional story scenes can be used to encourage and amplify exploration of a landscape. We saw an opportunity for technology to bring story into the wild. This offers an enriched experience of a place for travelers, and offers a new platform for creators to capture and express the essence of a place.



Figure 1. mobile outdoor audience

Creating the technology platform was not the sum of the work. It is not easy to craft a grounded and climaxing narrative across a set of physically distributed fictional scenes, when the scenes change along with a chaotic environment and are navigated in varied, unpredictable orders. Certain features must be built-in to each scene so that it matches audience environment while moving the story onward. Scene delivery must be guided by rules that, based on what audiences have already heard, ensure that following scenes make sense and offer something more than the previous scenes have done.

Virtually distributed story structures for the desktop or TV screen can inform on this type of authoring. Providing the audience with the experience of stepping through distinct geographical spaces, each with sites that offer evolving story content, is a concept embodied in early online exploration narratives such as Cosmic Osmo [2]. In these games the navigable story world was similarly motivated by the desire to enable and encourage an audience to explore a rich landscape, with a vision to put together "something that felt like a real world... with more story and history than would be revealed in the game itself." It is a metaphor arguably taken from the

concept of an analogue wander across a physical landscape—the original 'explorer.'

The mobile story form, then, combines the magical qualities of authored multimedia as found in on-screen navigable stories, and the unpredictable, fully physical and sensory experience afforded by wandering an uncontrolled and rugged 'real' environment. This outdoor, computer-accompanied audience places demands on the author which are non-intuitive compared to stationary audiences consuming screen or print based story. New constraints and creative goals are suggested, such as putting a lens to the cultural, visual or unquantifiable of a physical place, or encouraging physical exploration (which is expensive to audience in terms of energy and time compared to virtual navigation). Add environmental sensors in addition to audience position, as variables in deciding which segment to screen, and complexity increases. Every time an external sensed variable is added to the mix of 'intelligence' that a story scene carries, story threads multiply.

Due to the newness of the medium there is no standard. Everyone starts from scratch with their own vision, which is thrilling. However, this can require authors to each blunder through describing fundamental structures and thus slows the creation of deep content for mobile distributed platforms. We lacked a way to visualize the overall structure which would contain our narrative, and thus lacked an easy entry-point to authoring. In order to overcome this we implemented and evaluated in-field a prototype story and mobile, context-aware platform. In this paper we comment on practical authoring issues that arose during this experience, and we note the characteristics taken on by our context-aware story scenes. We present our ensuing structure for a climaxing story that allows lateral movement.

It is our hope that this documentation of our blundering and ensuing structure can enable groups and authors to focus more on design of deeply place-relevant story content: an emergent medium as rich as in potential as the inventory of artists, culture and history of a place.

1.1 Selkie Narrative: Summary

For our prototype story, which we call the Selkie Narrative, we created two characters based on a well known seal legend [3]. Two first person narrations were scripted into a fragmented fictional story which was represented across an array of places on a small island in West Cork, Ireland. Duplicate scenes were written for each place to allow the story to adapt to different weather conditions. For each audience experience of the story, a fraction of these scenes were experienced aurally on various sites of a remote island in the West of Ireland. Together the scenes moved the audience to an ancient conclusion: the escape of a woman from the house back to the sea.

1.2 Nature Trailer: Parallel Project

The Selkie Narrative was delivered and tested on the Nature Trailer context-aware exploration tool and multimedia delivery platform. Nature Trailer was created in collaboration with Brendan Donovan and Carol Strohecker of the Everyday Learning group at the Media Lab Europe [4]. Its development was interwoven into that of the Selkie Narrative, and so the two projects are closely linked. Nature Trailer used GPS, a dynamic map interface [figure 3] and wireless communication with weather sensing to provide hikers with media points that

provide audiences with a media-rich landscape that changed based on weather, and encouraged exploration. From a story point of view, mobile weather sensing was included to allow our content to reference the real-time aesthetics of the sky-scape above.

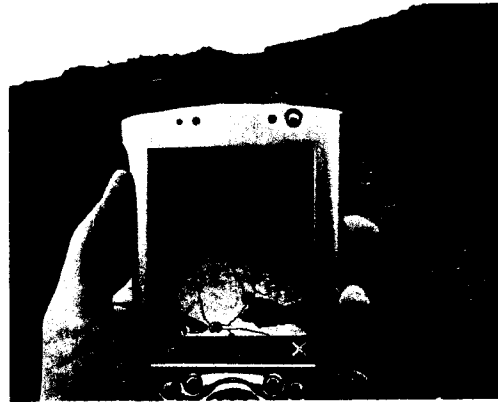


Figure 2. Map interface developed in Everyday Learning

1.3 Related Work

It seems new physically navigable, location aware narrative projects emerge every time we look— all with at least the promise of a platform for creative multimedia content. They span various levels of development, from concept to commercial product, and come from all over: university departments, individual artists, digital art collectives, new media startups, and research and development groups of big companies. We ride with these groups on the back of the same animal in the development of our particular experiment. Some of these take more of a task-oriented game form, like the annual Nokia challenge [5]. Others are informational narratives, such as audio tour cassettes in museums [6] and city tour guide cassettes such as that rented out in Dublin [7]. The Ambient Wood project is related in its use of digital multimedia on a mobile platform which senses the environmental state [8], but has more of an explicit learning bent to its aims.

Different again from game, learning, and tour-guide applications are those more entertainment or arts based: those which have a priority to tell a location-based story which is narrative before it is directly informational or task-oriented. One example is Teri Rueb's distributed poetry installation Trace [9], which uses location-sensing to embed audio media across a hiking trail in the Canadian Rockies. Another, CityPoems [10], distributes location-relevant poetry across locations in London. Andrea Moed's Annotate Space project [11] conceptualizes embedded place-based documentary narrative across NYC, for screening through a handheld device. These are but to name a few; our current culture is clearly thinking to some degree about the design of mobile story.

More related to our aims is Portrait of the Liberties [12], a place-based web of narrative video portraits illustrating an old Dublin community. The above examples have a shared goal with the Selkie Narrative: location-relevant, aesthetic narrative content. The Liberties connects further in its goal of connecting narrative fragments for the audience in order to craft threads of coherence across several scenes. A parent

project conducted a few years earlier at MLE was Hopstory: a location based fictional narrative with threaded parallel plotlines that stepped forward through time to a fixed conclusion [13]. This style, however, did not guarantee coherence, as plot threads might be crossed numerable times, beyond audience control, rendering any one plot thread potentially unresolved. Our challenges begin to emerge.

More parent research of the Selkie narratives is the MViews story platform and accompanying productions [1]. The style of MViews in creating small fictional scenes which are set in the place the audience experiences them, which stand alone, yet which reference a greater plot, influenced the goals of the Selkie narrative. MViews has a branching structure and a stronger goal of plot-advancement; scenes of prototype MViews productions tend to carry plot well forward. The associated MStudio authoring application [14] allows the visualization of potential plot threads, and aids authors in associating scenes with different environmental conditions. This application thus addresses two new challenges in authoring mobile context aware stories. However, the Selkie Narrative approaches audience exploration not as a collection of potential linear branches, but rather a set of evolving but equally weighted locations which contain story. We prioritized the authoring of a traditional story with character development, climax and fixed conclusion, but which preserved lateral freedom of audience movement through space and time.



Figure 3. Still image appears as audio story arrives

2. AUDIENCE CONTEXT: IMPLICATIONS FOR CONTENT

Our audience was encouraged via a map interface with story landmark icons to explore multiple sites on the island of Cape Clear [figure 5], in West Cork, Ireland, in whichever sequence they chose. We suspected that the audience will expect a cumulative reward after being implicitly guided by the presence of icons to visit multiple locations across the landscape. Our field trials verified this, as we will discuss later. This context of an on-foot, outdoor audience in a hill walking scenario, equipped with a particular kind of suggestive, location-based interface, prompted the first design constraints on the style and form of story scenes.

2.1 Audio for Outdoors

The most basic of these was our decision to use audio to narrate the story, rather than audio plus video narration. Video files are bulky in terms of disc space, and we had to carry in all our media on the iPaq. Visibility on the iPaq screen outdoors was poor- only high contrast, large and simple gestural images communicated well over the visual channel of our platform. That said, the most important deciding factor was audience context. A hiker chooses locations which tend to be visually rich and aesthetic. Video had the potential to draw attention away from this setting- we wanted to provide story to enhance the land. Audio-only, in conjunction with context-awareness, allowed the author the chance to write an aural script using the local landscape as visual and aural illustration. Also, by removing a channel, the problem further simplified. (That said, it should be noted that we developed full-video supplements for each scene, for a post-hike linear film which we won't discuss in detail in this paper.)

Each scene would be separated from the previous and next by anywhere from a few minutes- in the case of a change in weather at a given site- to several hours -in the case of walking to another site and breaking in between. Each scene should exalt the unique character of a given place; otherwise why is it embedded there. These characteristics implied that each scene should be a reward in itself: a mini-story which has a roundness, a rise and fall of its own, so that audiences didn't walk away empty or disappointed from any one given site.

2.2 Scripting for Context

We sensed solar radiation, wetness and wind speed to determine whether it was sunny, cloudy, raining or calm. Using GPS, we determined within a few meters what the audience was physically surrounded by in terms of vistas and objects. With use of weather sensors, we imagined that we could have customized narrative scenes for each condition. This could draw audience attention to changes in the sky overhead, as well as giving an author more details about the visual illustration that would go along with the audio delivered to the audience. The narrative challenge then became, how exactly does a fictional story scene go about accomplishing these things?

After creating early scenes, we found it necessary to make the weather connection quite transparent to the audience in order to make the use of environmental sensors worthwhile. During initial content review by audiences in a laboratory setting we found that with too subtle a reference, the connection between changing scenes' content with weather was lost to the audience. In this case it was random and confusing that the scenes for a particular place should change over time. With too direct a reference, we risked losing aesthetic integrity and sounding like a primary school video where the raindrop talks, an aesthetic issue that we faced in earlier research [16].

In the end we wrote character monologues which reference the state of their environment actively in terms of the impact it had on the memory they relay. For example, when the audience is in sun, the seal-woman talks about a day when she took off her fur and sunburned the shape of a shell into her abdomen. The stories similarly address location-awareness, referencing fixed physical landscape features like a signal tower or a rocky beach in terms of how they affected the events in the characters' lives.

3. CRAFTING STORY EXPERIENCE

3.1 Tir Na Nog and Early Experiments

Our story progressed through several phases to get to a final model which accomplished both the incorporation of context information into story, and the insurance of a climaxing and concluding story that allowed audience flexibility of navigational order. The initial approach was to unfold a fictional legend scene by scene in the locations where plot events happened. We chose a legend and a place as a prototype: Valentia Island in County Kerry, the site where, according to legend, the goddess Niamh chose Oisín to elope with to the land of eternal youth, Tir na Nóg [17].

Perhaps the story needn't be time-ordered [18], and events could be sampled in any sequence by the audience. Provided the scenes were individually rich, could any resulting experience of scenes be entertaining? Scripting began, at first using text and video, and quickly came to a halt. It was difficult to construct any one scene without having any knowledge of what scenes, in terms of plot events or character introduction, had been experienced already by the audience. Visualizing the constraints was too complex: in addition the author had in mind the importance of connecting each scene to place and weather.

First attempt was to write a linear story, and then carve it up. This too was insufficient, since story scenes must be quantized by location, and weather conditions and so natural breaks must occur in authoring from the start. The knowledge that plot would be broken apart and randomly sequenced was not easily put to rest. A critical piece of authoring in our circumstances, was drawing on intuition in crafting rises, falls, subtle references to past and future events, and suspense. Without any idea what the audience knew about at any point in a potentially huge bed of content, this task seemed impossible.

The reason was unclear at the time and we set to simplifying the problem of conceptualizing the entire story space. The island we had chosen, we replaced with a smaller space, Cape Clear. The legend about Tir na Nóg we replaced with a simpler story that had a bare, archetypal plot progression (and also was more personally compelling to the authors- a critical aspect in even a prototype story). Perhaps an author with more experience in such stories would not have faced these difficulties; indeed, after our experience we have hindsight ideas for alternate authoring approaches. However, this is exactly the issue: the medium is new so intuition is hard to come by. These early experiments helped us to understand the problems and to develop the important values and principles which we would attempt to satisfy within each scene.

3.2 Selkie Story: Evolving the Structure

According to Irish and Scottish coastal legend, some seals-selkies- can remove their skin and take the form of a human. If a land-man takes the skin of a seal woman, she's obliged to marry him. She may love her human family but when she finds her skin again, she bolts back to the sea.

Tir Na Nóg indicated that in order to author scenes, we needed assurance that at any point our audience would have some

basic understanding of the story premise. In our next structural experiment, we would construct narrative experience by separating out a few critical character states within the plot. We would divide the plot into finite sections based on a reversible, infinite progression: for a given location, weather states ie. windy, raining, sunny, would map to the selkie's changing emotions, which we would make predictably linked to her state in the story world. When agitated, she wants to be on land if in sea, in sea if on land. Wind calm- she's calm: within this category she is domestic if on land, happy in sea if in sea. With such a structure, we no longer need worry about deciding the basic events of a given scene- it would be predetermined. The play could occur in crafting the location- and weather-based associations in scenes.

This plan suggested a granularity of scenes, within which our character lives in a perpetual state of emotional fluctuation. Two sets of story bits emerged: pre-land selkie cases, and post-land cases. As the writing began, scenes emerged more easily. However, in initial evaluations of the content in the lab, there was still a problem of providing narrative progression. The scenes together didn't build towards anything, but seemed more like a set of poems [figure 4]. The character needed to be taken through infinite purgatory into a resolution, thus giving audiences a cumulative story experience which is not flat. We had the concept of stages and context-based fluctuation, but what we needed was a meta-structure which would be embodied as a set of logical rules in a software engine.



Figure 4. Early design of a 'wind' scene

3.3 Improvising Lateral Scenes On-Site

While designing the structure, we also worked on evolving the story characters and plot interpretation. We traveled to sites on Cape Clear and decided that certain events in our version happened at certain places there: a harbor, a path, and so on. We improvised and filmed these scenes about the selkie's life, some which advanced the plot as the legend told, and some which we imagined on the spot to help us understand her as a character: scenes which told of her daily life as a seal-person. This improvisation, or at the very least site visits with story in mind ultimately informed the style of the first person narrations. Improvising on site was imperative in developing events which were shaped realistically by particular landscape and weather features.



Figure 5. Story 'hotspots' on our prototype location [15]

4. RESULTANT STRUCTURE

4.1 Framework

Before immersing the audience in a navigable web of stories, it seemed necessary to provide an introductory scene to set up the story premise and characters, and to indicate to the audience that their handheld computer would be a probe to gather further stories. "Did you ever hear the legend of the seal people?" the fisherman narrates on the ferry-ride to the island, and then, "Through this box of yours, you'll see her life." In examining the navigable scenes that we had improvised, we realized they fell into one of two distinct plot categories: when selkie is a seal-form living in the sea, and when she has been brought onto land to live as a human. This allowed us to divide all our scenes into two time-stages. In between the two stages we composed a transition scene, which was weather independent and carried the audience into the next phase of the characters' lives, as the introduction had done. We embodied this structure as a table [figure 6] and began once again to write scenes, four per location to represent four possible weather states. With this table as a guide, and given our earlier forays, the final script took shape relatively quickly.

Plot Stage	Location	Weather	Scene ID	Scene Description
A	A1	Sunny	A1-S1	...
		Cloudy	A1-C1	...
		Rainy	A1-R1	...
		Foggy	A1-F1	...
	A2	Sunny	A2-S1	...
		Cloudy	A2-C1	...
		Rainy	A2-R1	...
		Foggy	A2-F1	...
	A3	Sunny	A3-S1	...
		Cloudy	A3-C1	...
		Rainy	A3-R1	...
		Foggy	A3-F1	...
B	B1	Sunny	B1-S1	...
		Cloudy	B1-C1	...
		Rainy	B1-R1	...
		Foggy	B1-F1	...

figure 6: table for script structure

4.2 Repeating Themes

Writing according to this structure, we predetermined a few key plot ideas for each of the two plot stages A and B. These were then featured and re-featured across the physically-browseable scenes, ensuring that a random sampling of scenes

would give all audiences an idea of story themes, conflicts, and character personality. For example each scene had to reference either the desire to be on land, her tie to the sea, etc. We used the device of first person audio narration: memories of particular, often minor events in the characters' lives.

From the water, I watched the fisherman pull up to shore and get out of his boat. I peeled off my seal fur and left it out of my reach. My heartbeat flooded my veins.

4.3 Advancing Plot

We established a critical mass in the story engine, estimating that after four scenes viewed from a given plot stage, the audience would be sufficiently invested in the plot and characters to gain access to the transition and 'graduate' to the next stage. This was indicated by the appearance of a 'special' story icon on the prototype interface. However, the audience could if desired, keep probing the first stage until ready to travel to the transition location and advance the plot. After transition, the first phase of story 'disappeared', and a new set of B-stage scenes were scattered across new locations on the map interface. After four of these, the audience could access the conclusion. The transparency of this structure on the interface is still an open design problem; in the field trials, the structural constraints were made verbally clear to the participants ahead of time.

5. TRIAL RESULTS

After recording and encoding the story engine, we engaged eight people from ages eight to around fifty, to try out the story on Cape Clear Island (which is about 3 miles long at furthest opposing points). In almost all cases, the participants sought to advance to the next plot stage as soon as it became available, and wanted to carry through to the conclusion. In most cases, the shortest paths between story locations were sought [location distribution: figure 5]. Some participants spent several hours and browsed the story to the conclusion in one (~ three hour) pass; others spent a day or two and hiked to one place at a time, with long breaks in between. In a free-form discussion directly following the experience, all participants indicated that they were able to invest in the story. They expressed that it was important to experience more than one scene before advancing to the next plot stage, in order to understand and care about what was happening. They expected a climax after a certain period, verifying the desirability for an overall plot-arc in this context. The scenes were sufficient rewards for navigating; in some cases the participants wouldn't have visited sites if story hadn't been embedded. The connection to weather conditions was not strong; however, the trial dates happened to be unfailingly fair!

All participants indicated that hiking in a remote place with a piece of technology which many were unfamiliar with was acceptable, and didn't color the trekking experience negatively. It was commented that the non-invasive nature of the experience was positive given the context- no signposts or embedded technology is attractive in a wild natural space.

Several participants commented that the distributed story gave the strong idea that the fictional character dwelled all over the island, across time. These participants expressed a desire to have access to printed supplements of the fictional story in search of more depth and background both before and after engaging in the mobile experience. Participants also expressed a desire for more deeply place related content, educational

content (two participants were teachers of history and science), a selection of story types akin to TV channels, and a choice to change character perspective for any given location. These desires indicate a few things: there is a hunger for yet more choice and flexibility in content, and the context we chose did engage our trial audience in both the characters and the place.

6. CONCLUSION

We are presenting our methods and resolution, as well as a synopsis of some of the challenges of writing for a system like the one we describe. Our process was influenced by innumerable factors, including the experience and preferences of the researchers, the participants who evaluated, and the layout of our sample landscape. This is not a pure science- it is organic territory for structures to evolve from individuals' and groups' desired story experiences and styles. With our trial story, we chose to address the fundamental structural issues of telling a coherent plot-based story through embedding scenes throughout a landscape, for collection by an audience with a level of navigational freedom. Our aesthetic goals, so to speak, were focused on using fiction to engage an audience in a place, and using a place to engage an audience in fiction.

Residents local to the Cape Clear region all had ideas for storytellers and content that would be more tightly connected to place than our somewhat artificial fictional characters. The fundamental strength of the mobile story medium is its ability to use digital media in combination with context awareness to closely connect story bits to audience. This is particularly compelling in relation to place, which carries emotion and personality that can be lost with advancing generations or hidden from the first-time visitor. Groups concerned with promoting remote places such as the Scottish highlands, for example, envision this framework can preserve the culture and vitality of local islanders who informally tell location-based anecdotes in their communities. Discussions ensued about environmental and natural history curiosities being expressed on such a platform. Other possibilities are the adaptation of local transcribed stories about a place, such as The Man from Cape Clear [19] as Nisi does in her portrait of a Dublin community [20]. The mobile, context-aware story form is immature, and contains rich ground for creators and place-documenters given the technology available. Different sensors than weather can be adapted, such as audience heartbeat, RFID or radiation. The content style has breadth as well: abstract ambient audio landscapes and community-constructed poetry and onwards, can all draw from the strategies we have illustrated.

The framework that resulted from our experiment can enable groups to script, gather, and structure deep place-based content for a similar or further customized mobile audience. It can help such creators to develop intuition about authoring challenges. It can serve as a starting point for dialogue and more rigorous methodologies. Other frameworks for mobile applications that include social dynamics and audience contributions would look different than this, but may be able to draw upon our method.

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