Time, Voice, and Joyce

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"He contained Dublin… If Dublin were destroyed, his words could rebuild the houses; if its population were wiped out, his books could repeople it. Joyce was many things, but he was certainly the last forty volumes of *Thom's Directory* thinking aloud." [8, p.15]

"Different trains of thought constantly intercut one another (as they do in real life), often without helpful punctuation, often leaving ideas or even words incomplete…" [14, p.2]

ABSTRACT

We present a design for recapitulating walks through Dublin's City Centre by characters in James Joyce's *Ulysses.* Our computationally supported walkers will avail themselves of a "map with a sense of time" and a system that translates their hand lettering gestures as attributes of colourful typographic forms. Participants will walk around Dublin, read passages from *Ulysses,* and write reflections of their experiences. Their colourfully transformed reflections will blend with others' to create a pluralistic account of today's Dublin, organised according to the sequence of Joyce's descriptions. The experiment will help us to refine initial versions of the two digital systems while suggesting future directions for comparable story systems and techniques such as ad-hoc networking for distributed story making and telling. These developments will serve our larger agenda of exploring individuals' engagements, expressions, and learning with and through such systems.

Categories and Subject Descriptors

H.5.2 [**Information Interfaces and Presentation**]: User Interfaces – *Graphical user interfaces (GUI), Input devices and strategies, Prototyping, Screen design.*

General Terms

Design, Experimentation.

Keywords

Co-constructed narrative, interaction design, participant observation, expressive typography, pen input, time visualisation, decision-making, multimodality.

1 INTRODUCTION

One hundred years ago – on June 16th, 1904 – James Joyce's fictional characters Leopold Bloom and Stephen Dedalus embarked on an odyssey through the streets of Dublin. We are designing a quirky recapitulation inspired by two features of Joyce's descriptions: his focus on the timing of aspects of his characters' walks and his experimentation with multithreaded voices.

Two computational systems in early stages of development are enabling us to recast portions of treks by characters in the "Wandering Rocks" episode of *Ulysses.* One, Amble Time, is a "map with a sense of time." The other, Polymorphic Letters, translates hand lettering to subtly expressive on-screen "voices" rendered typographically and colourfully – and ultimately auditorily – so as to engage multiple sensorial and conceptual involvements, enhancing and potentially boosting reflection and communication.

Figure 1: Screens from Amble Time and Polymorphic Letters

Participants will construct their Dublin walks by choosing interim destinations within an ever-decreasing available time frame. At each location they will read a relevant passage from *Ulysses,* which could influence in some way their experience of the place and reflections that they will later record through Polymorphic Letters. Aspects of their gestures will map to letterforms whose weight, colour and other attributes vary according to hand movements, creating expressions of "voice" that may surprise even the writers themselves. Ultimately the walker/writers will join others who have participated to see how their expressions mesh, forming a collective train of thought reminiscent of the intermingling of voices in *Ulysses.*

Through this experiment we aim to glean feedback that will be useful in the ongoing development of the user interfaces and "constructivity designs" for the two systems. Refinements of the underlying algorithms will likely be useful more generally as we develop further platforms for supporting engagement and learning

with computational stories. Broader goals include focusing explicitly on time as a distinctive component of story structures and exploring ways that location-based information and ad-hoc networking can support long-term constructive participation in interactive story systems.

2   AMBLE TIME AND RELATED WORK

Amble Time is a digital map that provides visualisations of time constraints to help support decisions about where to go in navigating a city on foot [1]. You can select from three different modes of use. These correspond to a bubble indicating everywhere you can walk in some amount of time, everywhere you can walk and still return to the starting point in some amount of time, and everywhere you can walk en route to some final destination within some amount of time. In this final mode, the device can also be used as a travel-sensitive alarm clock, allowing you to put the device away and wander unhindered while it keeps track of your location and alerts you with enough time to walk to your eventual destination on time. Future versions of the system may use the same visualisation for building itineraries including multiple destinations, but the current instantiation is targeted at a more ad-hoc, unplanned, journey through a space. Future users will also have the necessary GPS component fully implemented, whereas in this version we simulate it by hand.
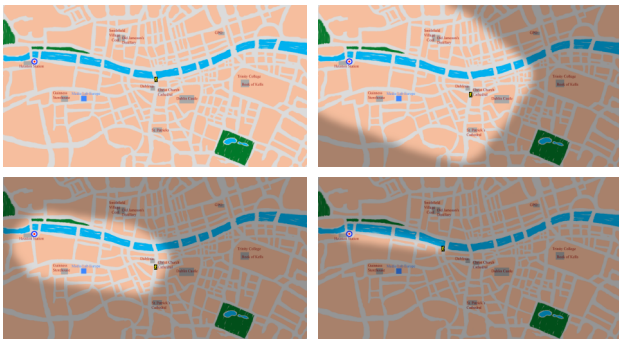

Figure 2: Your average walking speed and given time limits feed computing of the maximum distance you can travel on foot. Based on a weighted topology of the street network, the system paints a bubble around your location delineating everywhere you can reach on foot within the time limit. The bubble diminishes as time ticks by.

Amble Time uses similar techniques for calculating shortest paths through street networks as many other projects and commercial products [5, pp.527-32]; however it differs in that its main purpose is not to show you how to travel from A to B, but to visualize everywhere that you can get to from A under some time constraint. Amble Time focuses on decision-making where time is a consideration. In this way it is comparable to the Fluidtime dynamic scheduling system [11] and to other systems [17, 7] that are attempting to use wireless mobile devices and real-time information to create more flexible and responsive time-based tools.

In Nature Trailer you navigate through a network of narrative elements set in a physical environment [6]. The handheld interface uses GPS to determine your position and trigger audio renditions associated with your current surroundings. Similar to Amble Time, you use a map interface to help in deciding on destinations as you explore the environment. However, Nature Trailer gives glimpses and audio snippets of the destination before you set out.

3   POLYMORPHIC LETTERS AND RELATED WORK

Polymorphic Letters is a multimodal writing system that can support learning through self-expression and communication. The input device is a digital tablet and pen; we are focusing on hand lettering gestures because they can be so personally expressive. Movements, however subtle, may become as important to the communication as the semantic content.

Figure 3: Polymorphic Letters affords a more fluid and personal writing technology. The idiosyncratic attributes of your hand lettering such as size of the letters and pressure of the pen on the tablet are translated into colourful typographic forms. The transformations, visualised by means of a blend, will eventually include a range of imagery and sounds.

To operate the system you write on the tablet and see your letters blend into colourful typographic forms. As you press harder on the pen or slow down your writing, you see the emergent form thicken or blur. Other movements map to their own specific transformations: height and width of the written letters map to size and width of the typographic forms; baseline maps to baseline; spacing between letters to character spacing; spacing between words to word spacing; and spacing between lines to line spacing. We are currently developing the colour output, and later versions of Polymorphic Letters will map the hand lettering attributes to elements of sound and image, resulting in a particular kind of multimodal expression.

The responsiveness of the system matches your gestures closely, giving you a distinct sense of control and encouraging experimentation. We anticipate that writers will learn how to express emotion and tones-of-voice such as loudness and emphasis, enhancing the meaning of a text and ultimately developing their own particular styles of expression – and readers would come to distinguish one person's "voice" from the next.

The main design challenge is in declaring "appropriate" mapping relationships. Gunther Kress [12] and Scott McCloud [15] provide useful frameworks. Kress considers the different characteristics of writing and image as resources for representation and communication. He theorises that if writing and image have distinct affordances then their potentials for representing are specific and partial. This forces us to think carefully about the characteristics of typography, colour, image and sound as they form expressions through Polymorphic Letters.

McCloud articulates categories for combining words and pictures: in word-specific combinations pictures mainly illustrate a textually told sequence; in picture-specific combinations words mainly add a "soundtrack" to a visually told sequence; in duo-specific combinations words and pictures convey essentially the

same message; in additive combinations words elaborate on an image or vice-versa; in parallel combinations words and pictures follow different courses; in montage combinations words are a part of the image; and in interdependent combinations words and pictures combine to communicate an idea that neither could convey alone [15, pp.152-155].

These combinations are helpful in thinking about how inputs to the Polymorphic Letters system can be distributed across the multiple outputs. For example, in the current implementation, type weight and hue are working together, each in its own way reflecting changes in pressure. As you press harder the letterform becomes heavier and appears in an increasingly active or charged hue — more toward the yellow-orange-red end of the spectrum. A larger objective is to develop a scheme for Polymorphic Letters that is comparable to McCloud's, describing the different ways in which typography, colour, image, and sound can be optimally combined.

Comparable works include *La Cantatrice Chauve* (*The Bald Prima Donna*) [9, pp.66-77] and *Brother Blue* [13], which make use of the "personality" of typefaces to convey character's voices. For example, in *La Cantatrice Chauve*, Mr. Smith talks in Plantin Roman and Marie, the maid, in Cheltenham Bold. They "speak" in these distinct typefaces throughout the text and distorting the text communicates their vocal expressions, such as pitch and volume. Prosodic Font [16] is an experiment in designing a font that takes its form from the speaker's voice signals and words. The system aims to represent the emotional state and emphasis of the speaker: in accordance with a voice signal, the letterforms adjust in shape, size, proportions, and weight.

4 WALKS IN AMBLE TIME

The "Wandering Rocks" chapter of *Ulysses* takes place in Dublin between the hours of three and four in the afternoon on the 16th of June 1904. We combed through this chapter of the book and selected short excerpts that refer to or evoke particular locations in the city [4, 8, 10]. We marked these locations on the Amble Time map interface.

As a walker you begin by indicating your location on the map. You then select an estimated walking speed, enter the time limit of one hour – which is the same duration as for the characters in the novel – and indicate a location at which to end your tour, in this case the taxi rank near O'Connell Bridge.

A bubble appears on the map; you decide on a location within the bubble and amble toward it. Upon arrival you read the associated excerpt from *Ulysses*. Then you select a new point within the shrinking bubble and continue the walk until the overall time has elapsed. At the end of the hour we all take a taxi to Media Lab Europe.

5 REFLECTIONS VIA POLYMORPHIC LETTERS

Upon arrival to the Everyday Learning research area you see on the Polymorphic Letters system the same map as used during the walk. You choose a location and add a reflection pertinent to your experience of that location and/or to the relevant reading or any other musing. As the pen hovers over a location marker on the map, the *Ulysses* passage for that location appears. As the pen taps the marker, the system offers a blank Polymorphic Letters surface. As you record a reflection, the system transposes it letter-by-letter. Upon completion, the system saves the entry in association with the particular location and returns you to the map. You can continue to add expressions as desired; there is no required sequence of entry and no requirement to enter for every location. You write each entry on a new opaque layer without having seen the previous contributions. In this way, you and others build a story collectively from individual expressions.

This "constructivity design" reminds us of the collaborative storytelling game Exquisite Corpse[1]. The Surrealists' game involved a piece of paper onto which each member of a group wrote a phrase and then folded the paper to conceal the writing before passing it on to the next person for their contribution. The result is a story of composite parts.

After each walker has stored a set of reflections within the Polymorphic Letters system, all return to Everyday Learning to experience the composite story as a group and in the form of a movie. Playback sequences begin with the map, highlighting a given location and triggering an audio version of the associated *Ulysses* passage. The written reflections stored at that location then play in order of entry, visually moving from one "voice" to another. The map reappears and the sequence repeats for each of the remaining locations, according to their sequence in *Ulysses*.

This use of a spatial interface for textual additions to a composite, emergent narrative is similar to treatments in projects such as Memory Maps [3], City of Memory [2], and Tired of Giving In [18]. Participants create Memory Maps by writing notes on semitransparent bits of vellum and tacking them to specific neighbourhood locations on large street maps. The composites become visually intriguing for the diversity of writing styles and the layered richness that develops as entries become discernible through one another. City of Memory takes this idea into the digital realm. Participants can add stories which, when linked by theme, create new virtual "neighbourhoods of narrative." Tired of Giving In is set in Montgomery, Alabama, where the bus boycott in 1955 sparked the American Civil Rights Movement. Participants in the "unfolding" narrative reflect their perspectives by clicking a panel associated with each scene and typing comments marked as graffiti-style glyphs that others can access.

6 FURTHER WORK

The two systems we are working with are in initial stages of development. Ideally Amble Time would be implemented on a handheld computing device – or something even smaller – rather than a laptop and would be able to manage high-resolution map layers. As it is, we need to work with the larger device and supplement the on-screen map with a more detailed counterpart on paper. Likewise Polymorphic Letters needs significant development; the walks and workshops will address technical needs as well as conceptual matters. Priorities include music design and implementation, and refinement of character recognition.

In preparing for the walks we are tweaking both systems by revising the map and interface control elements appropriately. We will designate roles for researchers assisting the walkers: someone must function as the system's ambulatory pedestal and GPS proxy, and someone must tend to the photo and audio recording.

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[1]See, for example,
  http://www.exquisitecorpse.com/definition.html

We will photograph each walk and, ideally, audio-record each walker's readings of passages from *Ulysses*. Photographs will illustrate our notes on each person's walk, their engagement with the two systems, and the stylistic nature of their transformed hand lettering. These notes will become the basis of case studies of each walker's experience, including their accounts of the usefulness of affordances for dealing with time constraints, their impressions of the composite writing result, and their surmises of any ways in which they used the experiences to reflect on or to change aspects of their identity or thinking.

Researchers at Media Lab Europe and Trinity College, Dublin, are creating a wireless corridor between the two organisations which would support applications such as distributed stories that make use of ad-hoc networking. Part of this corridor runs through the "Wandering Rocks" area; we can envision a version of this project for which recordings of the readings are "planted" in appropriate locations for access and modification via mobile devices.

7 ACKNOWLEDGMENTS

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