iBookmark: Locative Texts and Place-based Authoring

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Abstract
With the recent developments in ePaper technology, consumer eBook readers have display qualities and form factors that are approaching that of traditional books. These eBook readers are already replacing paper in some commercial domains, but the potential of eBooks to extend forms of writing and storytelling has not been significantly explored. Using the digital and dynamic characteristics afforded by eBook readers, we are developing iBookmark, a GPS-enabled eBook reader. In iBookmark, writers can create stories that change in response to the location of the eBook itself. By setting context variables based on current and past locations of the eBook reader and using these in the rule-based generation of text and illustrations. We are developing new rhetorical device for writers that extend the expressive range of eBook delivered stories.

Keywords
eBook reader, ePaper, narrative theory, context sensing

ACM Classification Keywords
H5.1. Multimedia Information Systems, H.5.2 User Interfaces: Interaction styles.

Figure 1: The iBookmark eBook reader. A GPS unit is attached to the reader for actual sensing various context variables based on the location of the users. Stories read by users on our modified eBook reader evolve and change every time a user reads at a different location. Here, the title adapts based on the current location. A photograph of the location is used on title page and, a result of the story, an "alien spaceship" is composited in the image.

Motivation

The first eBooks were written for specialist domains and for a small-devoted group of readers, for whom the equivalent paper documentation was prohibitively large. The scope of the subject matter of these e-books included technical manuals for hardware, manufacturing techniques, and other subjects [11]. Current consumer eBook readers, such as Slick (Foxit), Kindle (Amazon), Sony Reader (Sony) and iLiad (iRex Technologies) are allowing publishers to distribute books that are either in the public domain or specifically targeted at the eBook market. Interestingly, as with the Internet-based distribution of popular music, eBooks have the potential to be a disruptive publishing technology, allowing authors to distribute text outside the confines of mainstream publishing and conventional book production.

The reproduction of the form factor of the paper book has been the principal motivating force in the development of eBook readers. However, eBook readers afford the practical delivery of new forms of writing that lie at the intersection of digital technologies and traditional storytelling – so called interactive stories [7]. Our goal is to explore a new form interactive storytelling that is afforded by the book-like nature of eBook readers themselves. These "locative texts" are stories that respond to the place at which a book resides and is read. This work is related to the field of "Alternate Reality Gaming" [5][10], but the gaming component is not the main focus. It could be defined as "Alternate Reality Experience".

As our motivation, we have considered the relationship between a text and the place at which it is read [2][4]. On one hand, the traditional role of storytelling can be thought of as to remove the reader from their time and place and immerse them in them in an alternative world. Alternatively, reading can be cast as a device for causing a user to reflect on their current situation. In contrast to traditional interactive storytelling research [1], we embrace the passive quality of reading (in user interaction terms) and instead our aim is to explore new forms of writing that use an awareness of the "place-of-reading" to adapt texts dynamically.

Locative texts have the potential to adapt according to their locale, either allowing aspects of the real world to leak into the text, or force a juxtaposition of the real and the written (much as the theory of "suspension of disbelief" aids theatre [9]). In practice, we envisage a more subtle and creative space than these extremes suggest. Our first step has been to equip an eBook reader with a GPS/GSM unit for sensing various context variables based on the location of the users.

Figure 2.: The iBookmark system architecture. The eBook reader sends its current location to a server over GPRS to create stories that change in response to various context variables derived from the location.

The iBookmark concept

One advantage of being able to contextually change the story is altering it to represent the opposite of the current context. For example, the weather in the story may be sunny and hot, unlike the stormy conditions where the reader is. This likely aids readers in loosing themselves in the story, enhancing the "suspension of disbelief" of the reader. By altering subtleties in the story, the emotional connection the reader makes as they read will be different depending not just on the reader themselves, but also on their surroundings. This allows for different interpretations by the same reader, not just by different readers.

Various forms of information are used as context variables, including the user's current location, past locations, current time, twitter feed, and Gmail account. From location information, for instance, we can infer a multitude of other information, including current weather conditions, local time of day, place names, photos of surrounding areas and country specific information such as government names. From email data, we can produce character names, combining subtleties from emails with name extensions to produce both standard and fantasy names. Also, writers can create different storylines for different day times. A story read on the weekend would be different from a story read during the week, for instance. Of course, one can think of many different authoring variations using the context variables.

Using Context Variables

The iBookmark framework allows for any pre-published story to be used, by providing a large number of simplified variables, which can be added to each page in the story. These variables are specific location dependent properties abstracted from the location of the iBookmark reader, and can be accessed directly from the page in the story, for example the author could simply ask for a new female character name, or current weather condition. In addition to the author including a context variable in the sentence, a parameter is included that allows the variable to be persistent, so important character names once set will always be the same, whereas place names and weather may change. Along with these helper functions, the author may include their own images overlayed with a location dependent background image, which can be specified by using keywords according to the context of the story.

Story variables can be thought of much like programming language constructs, with local variables represented by a non-persistent story context and global variables representing names and important places. By introducing the element of passing of time (this can be obtained from the GPS timestamps), variables can be changed over time, or according to distinct events such as sunset.

In essence, the process of converting a traditional story for use with the iBookmark is a simple one, consisting of replacing context aware parts of sentences with helper variables defined in the framework. This process can be carried out by either the author or a third party, although it is noted that by allowing the author full reign over the context may result in new types and styles of writing, much more transient and emotional that traditional story building.

Implementation

The system is based on an iLiad eBook reader by iRex Technologies. The reader connects to local wireless networks, using a web browser to render the story contents and allow user navigation through the story. In order to trace the location of the reader, a GPS/GPRS module based on the Telit GM862-GPS chip is attached to the eBook reader. This module posts back its current position to the server at regular intervals over GPRS. The story content is produced and rearranged by a standard Linux-Apache-MySQL-PHP (LAMP) server, which produces the next requested page in the story using a pre-defined templates, filling in appropriate variables with location, time and other context data. Stories are written such that variables that hold importance to the story will not change once set. For our first prototype, we generated a story from a pre-existing electronic story from the web, simply substituting place names, character names and location information. This proved far less interactive for readers than the next version, in which we commissioned a professional writer to create a story that fully utilised all the features of the iBookmark. Knowing what was possible inspired the writer to produce a story in a different manner than he would normally write. We think that this new wave of creativity gives readers a new and enhanced reading experience.

Relevant Existing Work

It is interesting that there are crime book series already on the market that are already adapted to a very small regions (e.g. special crime stories taken place in a special city ("Münster Krimi" [6] or a small region "Sauerland Krimi" [3]). Ongoing work in the field of HCI (Pervasive Gaming, Geocaching and other related disciplines) is focusing on making stories are available on the web that visualize the location of the main character of a book[1] or comedy snippets that are played back as a user drive by a specific location[2]. Tourist information systems, such as Wikear [8], are utilizing context derived from location for a different purpose.

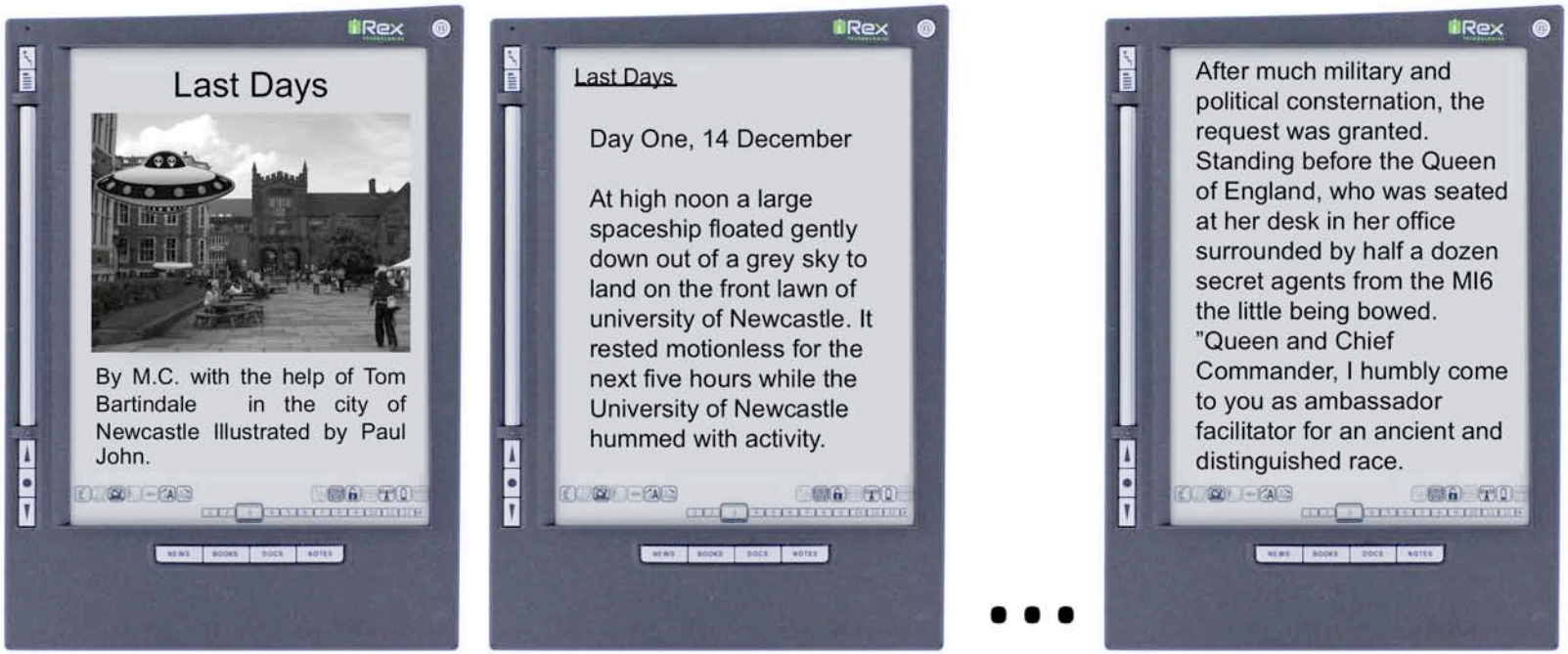
An example story "Last days"

In Figure 3 snippets from a sample story are presented. The story "Last days" (adapted from a pre-existing electronic story from the web called "Second Thoughts") about an alien invasion on the earth. The story on the top of Figure 3 is the story like it would be appear on the user's eBook reader reading the story in Newcastle, UK. The story on the bottom is the same story read by a user in Berlin, Germany. In the story, various forms of information are used as context variables, including the user's current location, current time, and Gmail account. Derived from the actual location information of the reader we infer the current weather conditions, time of day, place names, photos of surrounding areas and country specific information (e.g. the government names and the names of the secret service) to use these variables to adapt the story.

[1] http://www.senghorontherocks.net

[2] http://www.guardian.co.uk/technology/2008/may/03/transport

Story read in Newcastle, UK



Story read in Berlin Germany

Figure 3: Snippets from a sample story "Last days". The story (adapted from a pre-existing electronic story from the web called "Second Thoughts") is about an alien invasion on the earth.

Conclusion and Future Work

We have presented the first combination of an eBook reader with a GPS Device to create stories that change in response to the location of the eBook itself, as well as other context variables. The current prototype is only a first implementation of our ongoing work on this concept. We would like to make the GPS/GPRS more unobtrusive, designing it like a bookmark for the eBook reader. In addition, we are currently building an authoring tool to help professional writers to create locative texts and stories. Finally, we are interested in the users reaction to the strong relationship between a text and the place at which it is read.

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