
Mobile Map Interaction for Local News

Krzysztof Janowicz

Institute for Geoinformatics
Robert Koch Str. 26-28
48149 Münster, Germany
janowicz@uni-muenster.de

Johannes Schöning

Institute for Geoinformatics
Robert Koch Str. 26-28
48149 Münster, Germany
j.schoening@uni-muenster.de

Abstract

From the conceptual perspective, Web 2.0 is about user generated and user centered content. However emerging Web 2.0 news portals, such as [1], ask the users to report about global news and via pre-defined categories. Moreover these portals do not pay attention to the new kind of web-enabled devices (such as smart phones), their abilities and shortcomings. In contrast this paper describes a prototypical news platform focusing on local, i.e. regional news and their ad hoc integration into gesture-based interaction paradigms such as *Timmi* [2, 3], which combines the advantages of large scale and high-resolution public city maps with mobile devices acting as adjustable information displays.

Keywords

Mobile Map Interaction, LBS, Local News, Web 2.0

ACM Classification Keywords

H.5.1 Multimedia Information Systems

Introduction

The benefit of user generated content is its local scope and ad hoc availability. In contrast, when reporting on global news, such as natural hazards (in other parts of the world) or foreign policy, users have to take their information from additional sources such as internet news portals or television. Therefore these kinds of

news items do not benefit from people's local knowledge nor are promptly available. However if users report on events within their spatiotemporal scope, i.e. within a range of minutes up to days, respectively city blocks up to second order political units, their knowledge can be used ad hoc by other people living or acting in the same area (scope). For instance the information that a pop star, called Robby in the following scenario, stays in a certain hotel in the city of Muenster is only meaningful to people in the city and its suburbs and in respect to a time frame of hours or days. Our news platform takes pictures and short messages from mobile phones or written via web browsers by local people (as depicted in Figure 1a, b) and allows them to define a spatiotemporal scope and personalized tags (see also [4]) for their news items. The user generated news can be viewed in two ways, either via a web browser or by combining public maps with mobile phones (see Figure 1c) as described in the following.

Traditional paper-based maps are still superior to their digital counterparts used on mobile devices in several ways. They provide high-resolution, large-scale information without power consumption [2, 3]. On the other hand digital maps provide personalized and dynamic information on request, but suffer from small outer scales and low resolutions. In our previous work *Timmi (Timmi Is Mobile Map Interaction)* we try to combine the advantages of both by using mobile camera devices (such as smart phones ore PDA) as a map-referenced magic lens [5, 6] that displays geo-referenced information (news items in our scenario) on top of the physical map [2, 3, 6] (see Figure 1c) based on the gestures of the user, i.e. the position of the mobile device lens in relation to the public map.

Tourists standing in front of a city map can use their smart phone to mark the region they are staying in and immediately get all news relevant for this area displayed on their phone. In our scenario, visitors waiting for the concert of Robby can be informed that the singer is staying in the hotel nearby the marketplace¹.

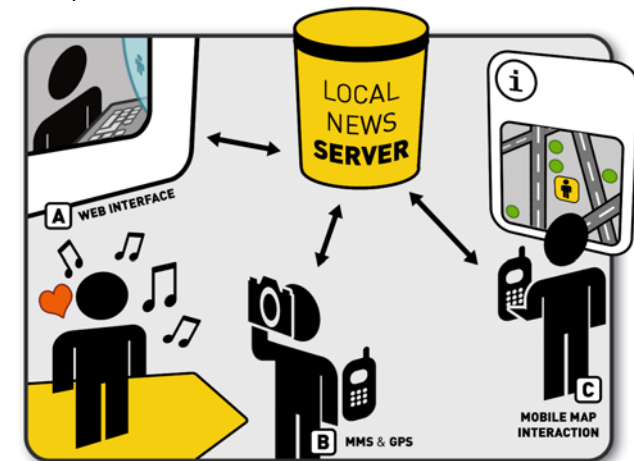


Figure 1: Conceptual design of the local news system.

The following sections describe the local news framework² in more detail and some design decisions taken during its implementation.

¹ Please note that privacy is a critical issue mobile reporters need to be aware of. However, social aspects of mobile technologies are not discussed within this paper.

² Beside the communication via mobile devices, the local news server is also implemented as web application; however this is not discussed here in detail.

Framework and Interaction

Our system distinguishes two kinds of users, readers and mobile reporters. Nevertheless the role of the readers is not restricted to pure consumers as they are invited to comment news items published by the mobile reporters. Moreover it is important to note, that being a mobile reporter is just a role a person takes while submitting a news item. In our vision people create news items ad hoc if they notice some interesting fact in their environment instead of intentionally going out to report about something.

If a user is strolling through the city and by passing a hotel discovers Robby, she can take a picture using her mobile phone and submit it with an additional text message to the local news server. Beside the multimedia content itself, metadata about the spatial and temporal visibility as well as a news category tag should be included. The submitted news item is received by the server and is directly available for all users without any further modification or control through moderators, making our application Wiki-like.

If a tourist, staying in Muenster to visit the concert of Robby, passes a public city map she can point to parts of the map using the camera lens of her mobile phone and get all news items relevant for this area (spatial scope). Via the profile settings in her news application she can also define news categories that she is interested in (thematic scope) and define a time frame (temporal scope) to select recent news only. Using the selected map area the mobile device contacts the server and displays all selected news items on the mobile display, overlaying the map. The background

layer is still the physical map³, which allows the user to move the device over other areas of the map to get additional news.

Next the tourist can move to the hotel to see Robby. If Robby already left the hotel, she can add a comment to the related news item, so that other users immediately notice that this item is outdated.

Implementation

We implement the client of the local news system on a Nokia N70 camera phone using geocoded Visual Codes [7]. We use the geocoded Visual Codes for determining the position of the mobile phone relative to the map and to have an anchor for degeocoding the local news on the map [7]. With the Visual Codes the device computes for each code, found in a particular input image, a bijective mapping between arbitrary points in the code plane and the corresponding points in the image plane. We extend this mapping with a mapping from the code plane in real world coordinates with a simple affine transformation. The parameters for this transformation are stored in the geocoded Visual Codes.

The local news server is implemented as tomcat application server based on the wicket framework [8] with AJAX support. We use AJAX to implement a suggest-interface (also called search-while-you-type interface) that displays tags previously defined by other users in dependence of the letters the user is typing into the system. From the users perspective this helps in overcoming the disadvantages of mobile devices

³ Note that no modifications of the public maps are necessary.

such as small keyboards and displays. In addition, users tend to reuse existing tags (if possible) instead of defining new ones which reduces redundancy.

In our current prototype the positioning data (for the pictures) is taken from the Sony GPS module for digital cameras. To restrict the visibility of a news item we use a Google Maps Mashup integrated into the application server respectively the mobile client.

Conclusion and Further Work

The presented work shows the integration of gesture-based interaction paradigms with web 2.0 styled content creation and the extension of merely thematic classified news to spatiotemporal information objects. However a lot of further (theoretical and practical) work needs to be done.

Up to now it is not possible to modify news items but only to comment them. A really wiki-styled application should not only allow every user to change the information itself but especially also its spatiotemporal scope (e.g. for the case that Robby already left the hotel).

While the user can request news by selecting a certain area of the map via her gestures, this is not possible for thematic and temporal restrictions until now. Instead of a customizable profile, as used so far, additional gestures or context information would be useful. One can imagine a timeline at a corner of the map, but this would change our precondition of using the public maps available in a city. To navigate through thematic classification one could imagine a similarity-aware tag cloud.

Moreover we focused on texts and images as news items; however the idea can be extended to geo-referenced Podcasts.

Acknowledgements

We thank our students of the "Geosoftware 2" course at the Institute for Geoinformatics to build up the local news server and especially also Mohamed Bishr, Martin Espeter and Carsten Keßler.

References

- [1] <http://www.readers-edition.com> (visited: 01/07)
- [2] Schöning, J., Krüger, A., Müller, H. J.: Interaction of mobile devices with maps. In: *Adjunct Proceeding of the Fourth International Conference on Pervasive Computing*, (2006)
- [3] Schöning, J., Heuer, J. T., Müller, H. J., Krüger, A.: The Marauders Lens. In: *Proceedings of the 4th International Conference on GIScience, Extended Abstracts* (2006)
- [4] <http://del.icio.us/> (visited: 01/07)
- [5] Bier, E. A., Stone, M. C., Pier, K., Buxton, W., DeRose, T. D.: Toolglass and magic lenses: The see-through interface. In: *Computer Graphics Annual Conference Series, vol. 27, pp. 73-80* (1993)
- [6] Rukzio, E., Paolucci, M., Finin, T., Wisner, P., Payne, T.: Mobile Interaction with the Real World. In: *Proceedings of 8th International Conference on Human Computer Interaction with Mobile Devices and Services* (2006)
- [7] Rohs, M.: Real-world interaction with camera-phones. In: *2nd Intl. Symposium on Ubiquitous Computing Systems (UCS)* (2004)
- [8] <http://wicket.sourceforge.net/> (visited: 01/07)