

CityFlocks: A Mobile System for Social Navigation in Urban Public Places

Mark Bilandzic

Ludwig-Maximilians-Universität München, Germany

markbilandzic@gmail.com

Marcus Foth

Queensland University of Technology, Australia

m.foth@qut.edu.au

Our physical world has certain characteristics that enable us to observe what other people do, how they behave and where they go. Sometimes, we can see traces on physical objects that provide hints about people's actions in the past. Footprints on the ground left by previous walkers, can show us the right way through a forest, or in a library, for example, books with dog-eared and well thumbed pages might be worthwhile reading as obviously many people did so in the past. The phenomenon of people making decisions about their actions based on what other people have done in the past or what other people have recommended doing, forms part of our everyday social navigation (Dourish & Chalmers, 1994).

In contrary to physical objects, digital information has no such 'visible' interaction history per se. We do not see how many people have listened to an mp3-file or read a webpage. In the digital world people do not leave interaction traces, and as Erickson and Kellogg (2000) conclude, we are 'socially blind'. However, motivated by its high value for navigation in the physical world, people started thinking about social navigation as a general design approach for digital information systems as well. Previous studies have covered design approaches for social navigation in electronic environments in various domains, such as online grocery shopping (Svensson, Höök, & Cöster, 2005) or web browsing (Andreas Dieberger, 1995, 1997; Wexelblat & Maes, 1999) and made suggestions for some key principles, e.g. privacy, trust, personalisation or appropriateness, which should be considered in general when designing for social navigation in digital systems (Forsberg, Höök, & Svensson, 1998). However, it is still unclear what types of social affordances and design principles are significant for different use cases and domains (A. Dieberger, Dourish, Höök, Resnick, & Wexelblat, 2000).

With the rising trend of embedded broadband internet access and GPS navigation, mobile phone users are able to use 'geo-tagging', a technique to mesh up one's current longitude and latitude coordinates with all kinds of multimedia content and information about the locations and places they are navigating (Jaokar & Fish, 2006). We believe that such a digital augmentation of physical spaces with user-generated information opens up possibilities to develop more sophisticated, mobile approaches for social navigation in the physical world.

In this study, we aim to explore appropriate design principles and possibilities provided by mobile technologies to support social navigation in physical environments. Targeting the specific domain of public inner-city places, we have developed a mobile system we call 'CityFlocks', that enables urban residents to leave digital annotations with ratings, recommendations or comments on any place or physical object in the city. Thus, CityFlocks turns residents into in-situ amateur journalists for visitors or other residents who have questions or need navigational aid related to any place in the city. Based on the outcome of previous studies, we implemented CityFlocks using two different design alternatives, one following a direct-, the other an indirect social navigation approach (Andreas Dieberger, 2003; Svensson, 2002). In our case study, the Kelvin Grove Urban Village, an inner-city master-planned community site in Brisbane, Australia, we evaluated how these different design approaches influence the success of participants using a mobile system to socially navigate and find particular places in the Kelvin Grove Urban Village. Based on the results of the field study, we discuss how existing design principles for social navigation can be applied, combined and improved in the context of mobile systems to harness social capital and the collective intelligence of urban residents towards an effective and efficient navigation tool. The outcomes will provide valuable input to the design of future community driven, mobile information systems.

References

- Dieberger, A. (1995). Providing spatial navigation for the World Wide Web. In A. U. Frank & W. Kuhn (Eds.), *Spatial Information Theory, Proceedings of Cosit '95* (pp. 93-106). Semmering, Austria: Springer.
- Dieberger, A. (1997). Supporting Social Navigation on the World-Wide Web. *International Journal of Human-Computer Studies, special issue on innovative applications of the Web*, 46, 805-825.
- Dieberger, A. (2003). Social Connotations of Space in the Design for Virtual Communities and Social Navigation. In K. Höök, D. Benyon & A. J. Munro (Eds.), *Designing information spaces : the social navigation approach* (pp. 293-313). London: Springer.
- Dieberger, A., Dourish, P., Höök, K., Resnick, P., & Wexelblat, A. (2000). Social navigation; techniques for building more usable systems. *Interactions*, 7(6), n/a.
- Dourish, P., & Chalmers, M. (1994). *Running Out of Space: Models of Information Navigation*. Paper presented at the HCI'94.
- Erickson, T., & Kellogg, W. A. (2000). Social Translucence: An Approach to Designing Systems that Support Social Processes. *ACM Transactions on Computer-Human Interaction*, 7(1), 59-83.
- Forsberg, M., Höök, K., & Svensson, M. (1998). *Design Principles for Social Navigation Tools*. Paper presented at the UI4All, Stockholm, Sweden.
- Jaokar, A., & Fish, T. (2006). *Mobile Web 2.0 : the innovator's guide to developing and marketing next generation wireless mobile applications*. London: Futuretext.
- Svensson, M. (2002). *Defining, Designing and Evaluating Social Navigation*. Stockholm University, Stockholm.
- Svensson, M., Höök, K., & Cöster, R. (2005). Designing and Evaluating Kalas: A Social Navigation System for Food Recipes. *Computer-Human Interaction*, 12(3), 374-400.
- Wexelblat, A., & Maes, P. (1999). *Footprints: History-Rich Tools for Information Foraging*. Paper presented at the SIGCHI conference on Human factors in computing systems: the CHI is the limit.

Selected bibliography

- Kranz, M., Holleis, P., Grueber, C., Bilandzic, M., Vetter, J. & Schmidt, A. (2006) The Display Cube as Playful TUI To Support Learning; In Tom Pfeifer et al. (Eds.): *Advances in Pervasive Computing 2006; Adjunct Proceedings of Pervasive 2006, Vol. 207*
- Foth, M. (Ed.) (2008, forthcoming). *Urban Informatics: Community Integration and Implementation*. Hershey, PA: Information Science Reference, Idea Group. Contracted 28 Jan 2007.
- Foth, M., & Sanders, P. (2007, forthcoming). Impacts of Social Interaction on the Architecture of Urban Spaces. In A. Aurigi & F. De Cindio (Eds.), *Augmented Urban Spaces: Articulating the Physical and Electronic City*. Aldershot, UK: Ashgate. Accepted 4 Nov 2006.
- Foth, M., & Hearn, G. (2007, forthcoming). Networked Individualism of Urban Residents: Discovering the Communicative Ecology in Inner-City Apartment Complexes. *Information, Communication & Society*, 10(5). Accepted 23 Aug 2006.
- Foth, M. (2006). Facilitating Social Networking in Inner-City Neighborhoods. *IEEE Computer*, 39(9), 44-50.
- Foth, M., & Adkins, B. (2006). A Research Design to Build Effective Partnerships between City Planners, Developers, Government and Urban Neighbourhood Communities. *Journal of Community Informatics*, 2(2), 116-133.
- Foth, M. (2006). Analyzing the Factors Influencing the Successful Design and Uptake of Interactive Systems to Support Social Networks in Urban Neighborhoods. *International Journal of Technology and Human Interaction*, 2(2), 65-79.

- Gaved, M. B., & Foth, M. (2006, Nov 2-3). More Than Wires, Pipes and Ducts: Some Lessons from Grassroots Initiated Networked Communities and Master-Planned Neighbourhoods. In R. Meersman, Z. Tari, P. Herrero et al. (Eds.), *On the Move to Meaningful Internet Systems 2006: OTM 2006 Workshops* (Lecture Notes in Computer Science No. 4277, pp. 171-180). Heidelberg, Germany: Springer.
- Foth, M. (2006, Jun 12-14). Research to Inform the Design of Social Technology for Master-Planned Communities. In J. Ljungberg & M. Andersson (Eds.), *Proceedings 14th European Conference on Information Systems (ECIS)*. Göteborg, Sweden.
- Hearn, G., & Foth, M. (2005). Action Research in the Design of New Media and ICT Systems. In K. Kwansah-Aidoo (Ed.), *Topical Issues in Communications and Media Research* (pp. 79-94). New York, NY: Nova Science. ISBN 1-59454-279-1.
- Foth, M., & Brereton, M. (2004, Nov 22-24). Enabling local interaction and personalised networking in residential communities through action research and participatory design. In P. Hyland & L. Vrazalic (Eds.), *Proceedings OZCHI 2004*. Wollongong, NSW: University of Wollongong.
- Foth, M. (2004, Jul 27-31). Animating personalised networking in a student apartment complex through participatory design. In A. Bond, A. Clement, F. de Cindio, D. Schuler & P. van den Besselaar (Eds.), *Proceedings Participatory Design Conference (PDC)* (Vol. 2, pp. 175-178). Toronto, Canada.

Biographies

Mark Bilandzic has finished his diploma degree in Media Informatics from the Ludwig-Maximilians-University in Munich, Germany and holds an honours degree in Technology Management from the Technical University in Munich. Working on applied projects as a visiting scholar at the University of California, Berkeley and the Queensland University of Technology in Brisbane, Australia, he has specialised in mobile technologies, web development and human computer interaction. Mr Bilandzic's fields of interest are at the intersection of information technology and sociology. His research studies target the issue how emerging information technology can be leveraged to provide tools for a more efficient information and communication behaviour within communities. Mr Bilandzic has gathered related work experience at the research labs of Infosys Technologies in Bangalore, India, BMW in Munich and Dalmatech, a web development start-up company in Santa Clara, California.

Marcus Foth is a Senior Research Fellow with the Institute for Creative Industries and Innovation at Queensland University of Technology (QUT), Brisbane, Australia, and a 2007 Visiting Fellow at the Oxford Internet Institute, University of Oxford. Dr Foth is also the recipient of an Australian Postdoctoral Fellowship supported under the Australian Research Council's Discovery funding scheme. Employing human-centered and participatory design methods, his research pioneers new development approaches towards interactive social networking systems informed by community, social, and urban studies. Dr Foth has published over thirty articles in journals, edited books, and conference proceedings in the last three years, and is currently editing a book on Urban Informatics to be published by Idea Group Inc. in 2008. He received a PhD in digital media and urban sociology from QUT. He is a member of the Australian Computer Society and the Australian Interactive Media Industry Association. His resume and publications are online at www.vrolik.de