

EDITORIAL PREFACE

Special Themed Issue of Best Papers from Selected MobileHCI'2014 Workshops (Toronto, Canada, 2014)

Jo Lumsden, Aston University, Birmingham, UK

INTRODUCTION

Welcome to the latest issue of the *International Journal of Mobile Human Computer Interaction* (IJMHCI). In what has now become an annual showcase, this issue highlights the best papers from a selection of the workshops run during the 16th International Conference on Human-Computer Interaction (MobileHCI'2014) in Toronto, Canada. The organizers of each of the MobileHCI'2014 workshops were invited to nominate their best paper for inclusion in this themed issue. Five of the workshops nominated a best paper (in one case, two best papers) and I am delighted to be able to present to you extended versions of these articles. In addition, the organizers of one of the workshops have also contributed an extended workshop commentary which introduces their workshop and associated insights in more depth. As is always the case with the MobileHCI workshops, the

workshops covered an interesting spectrum, as is outlined below.

WORKSHOP ON DESIGNING THE FUTURE OF MOBILE HEALTHCARE SUPPORT

- **Organisers:** Bhuvaneswari Arunachalan (OCAD University, Toronto, Canada), Sara Diamond (CIV-DDD, OCAD University, Toronto, Canada) and Derek Reilly (Dalhousie University, Halifax, Canada);
- **Best Paper:** *Exploring Privacy Notification and Control Mechanisms for Proximity-Aware Tablets* by Huiyuan Zhou (Computer Science, Dalhousie University, Halifax, Canada), Vinicius Ferreira (Computer Science, Federal University of São Carlos, São Paulo, Brazil), Thamara Silva Alves (Computer Science, Federal

University of São Carlos, São Paulo, Brazil), Bonnie Mackay (Computer Science, Dalhousie University, Halifax, Canada), Kirstie Hawkey (Computer Science, Dalhousie University, Halifax, Canada), and Derek Reilly (Computer Science, Dalhousie University, Halifax, Canada).

“This workshop aimed to discuss and develop ideas on how healthcare services, mobile technologies, and visual analytics techniques can be leveraged and contribute to new ways of mobile healthcare supportive system designs. Designing contemporary mobile support systems for healthcare support requires a clear understanding of information requirements, behaviors and basic needs of users. Design must take into account the challenges of human-device interactions in the healthcare environment, the extension of the care environment beyond the institutional setting and the engagement of patients, facility residents and families in an extended circle of care, and issues of formal and informal data sharing and privacy. This workshop brought together researchers from a wide array of disciplines who have experience with studies of technology in healthcare contexts, clinical communication trials, and designing mobile technologies. During this workshop, we moved discussion of mobile supportive system methodology beyond use as a tool to collect large amounts of data, and established techniques and emerging practices for the ways in which mobile HCI and visual analytics research can be used to inform future healthcare system design.

Our participatory design activities included concept ideation, collaborative prototyping, card sorting, and scenario and concept testing – all aimed at fostering the evolution of relevant concepts and the development of prototypes. The workshop had four main components: (1) *Horizon Scan*: this introductory section contextualized designing healthcare support systems for mobile platforms in terms of developments in mobile technologies and data visualization and trends in demographics and the culture of healthcare. It included a horizon scan of real

world applications in the health care field; (2) *Pecha Kucha Presentations*: consisting of 20 slides shown for 20 seconds each, workshop participants each presented their own work and position on the workshop topic – Pecha Kucha style; (3) *Participatory Design Challenges*: working in groups, participants applied hands-on research methods to design problems related to mobile applications in healthcare. Methods used included persona and scenario development, body storming, paper-prototyping and ideation methods such as card sorting, game generators and design fiction; and (4) *Reflection and Wrap-Up*: participants were invited to reflect on the workshop methods and outcomes in relation to the work originally presented in the earlier Horizon Scan and Pecha Kucha parts of the workshop, and to discuss possible next steps.

Our selected best paper discusses the challenge of aggregating, carrying, and sharing medical documents in public areas while trying to protect potentially sensitive data. The paper focuses on ways to support privacy that are appropriate for using tablets in dynamic, mobile workflow of healthcare professionals. In this paper, the authors have explored how spatial information can be utilized to support both individual and collaborative work in a natural way while respecting data privacy. The initial design of a proof-of-concept tablet interface, as well as a two-phase study design to evaluate the interface, was presented to better understand how to design proximity-aware privacy enhancement tools. The research work presented in this paper is very well presented in relevance to need of this work.” [Overview and Best Paper Introduction by Bhuvanewari Arunachalan, OCAD University, Toronto, Canada].

ENHANCING SELF-REFLECTION WITH WEARABLE SENSORS

- **Organisers:** Genovefa Kefalidou (The University of Nottingham, UK), Anya Skatova, (The University of Nottingham,

UK), Michael Brown (The University of Nottingham, UK), Victoria Shipp (The University of Nottingham, UK), James Pinchin (The University of Nottingham, UK), Paul Kelly (University of Oxford, UK), Alan Dix (University of Birmingham, UK), and Xu Sun (The University of Nottingham, Ningbo, China);

- **Best Paper:** *BioCrystal: An Ambient Tool for Emotion and Communication* by Asta Roseway (Microsoft Research, Redmond, USA), Yuliya Lutchyn (Microsoft Research, Redmond, USA), Paul Johns (Microsoft Research, Redmond, USA), Elizabeth Mynatt (Georgia Institute of Technology, Atlanta, USA), Mary Czerwinski (Microsoft Research, Redmond, USA).

“Ubiquitous technology has changed the way humans view and interact with their social and physical environment. The introduction of new sensors – embedded or even worn- in the surroundings or on people have transformed the way that actions are taken and the way feelings are felt. Sharing information amongst people and between people and devices has been playing a pivotal role in the HCI realm and HCI communities have been researching opportunities and challenges that arise from these new models of computer and sensory-mediated communications. The “*Enhancing self-reflection with Wearable Sensors*” workshop aimed to bring forward and discuss the potential synergies and challenges of self-reflecting (e.g. through mobile diaries) and sensors usage. Such synergies not only provide new opportunities for understanding human behavior but also provide new insights for advanced data collection methodologies. For example, wearable sensors offer physiological data collection on-the-go (some may even call it ‘objective’ data) while self-reflection methods such as diaries offer more psychologically-oriented (or even ‘subjective’) data. Considering synthesizing such methodologies may provide innovative opportunities for

collecting and understanding data and experiences from numerous viewpoints.

Our workshop attracted both industry-based, research and academic-based individuals with <http://datawear.wp.horizon.ac.uk/wild> with unique and invaluable contributions from ‘walking’ projects such as Alan Dix’s project (Alan Walks Wales - <http://alandix.com/alanwalkswales/>) and Mads Bødker’s project that incorporates ethnographic research and social theory providing new means for embodied participation using mobile technology (<http://research.cbs.dk/en/publications/uuid%28a3c3c235-6463-4a74-9c8f-d99c4d-fe573f%29.html>).

We discussed different contexts in which such methodological synergies could be applied (e.g., management, cultural sites (e.g. Genovefa Kefalidou’s project on Crowdsourcing our Cultural Heritage - <http://www.hrionline.ac.uk/openbook/chapter/dhc2012-kefalidou>), at home and the workplace (e.g., Vicky Shipp’s and Anya Skatova’s research on eating habits and work breaks <http://datawear.wp.horizon.ac.uk/>) and discussed the value and challenges of tracking mechanisms (e.g., James Pinchin’s and Michael Brown’s work on GPS tracking within hospitals <http://www.horizon.ac.uk/Current-Projects/wayward>). Our workshop provided exciting hands-on experience with position tracking equipment, mobile diary software application, wearable sensors (e.g., Jawbone activity sensors), wearable cameras (Autographer and Narrative Clip), and Lego-like programmable hardware technology (e.g., littleBits (littlebits.cc/)) – brought to the workshop by Mads Bødker.

There was a lot of discussion around collaborative self-reflection and sensing for understanding each others’ emotions and needs either in their workplace or at their home. Our selected best paper presented by Mary Czerwinski showed an excellent case where technology has been developed for identifying and displaying mood change patterns amongst employees within a firm enhancing self-reflection, personal and communal awareness (Paper title: “*BioCrystal:*

An Ambient Tool for Emotion and Communication”). The technology employed within this piece of research includes wearable sensors that capture physiological data and display them in real time through LED lights that change color based on the identified mood. The researchers accompanied the physiological measures with self-reports of mood and stress levels. This paper presents an excellent demonstration and insight of how human behavior can be altered via mediated sensory and display technology as results suggest that participants engaged in both self-reflection mechanisms and strategic mood management.

Our workshop highlighted many exciting possibilities for future research, collaborations and embracing the synergies between wearable sensors, sensory data, research methodology and the augmented life.” [Overview and Best Paper Introduction by Genovefa Kefalidou, The University of Nottingham, UK, Vicky Shipp, The University of Nottingham, UK, and James Pinchin, The University of Nottingham, UK].

PEOPLE, PLACES AND THINGS: A MOBILE LOCATIVE MAPPING WORKSHOP

- **Organisers:** Martha Ladly (OCAD University, Canada), Bryn Ludlow (OCAD University, Canada), and Guillermina Buzio (OCAD University, Canada);
- **Best Papers:** *Face-to-Face Matters: Inspirations from the Human Library* by Corey Jackson (Syracuse University, USA), Yun Huang (Syracuse University, USA) and Abby S Kasowitz-Scheer (Syracuse University, USA); and *Which Way is Up? How Locative Media May Enhance Sense of Place* by Glen Farrelly (University of Toronto, Toronto, Canada).

“On a beautiful October day, at a gathering playfully entitled “*People, Places & Things*”, a group of researchers and artists met in an urban park in Toronto. Our workshop focused on

narration and place making, using storytelling as our methodology and mobile technologies as our tools. We were interested in the diverse ways that participants might use their mobile devices for documenting and narrating stories in an urban setting, and how they might map those interactions and annotate them in Google Earth. We chose the setting of Grange Park adjacent to OCAD University and the new Frank Gehry wing of The Art Gallery of Ontario, a community park in the grounds of The Grange, one of Toronto’s oldest and most historic houses.

The premise for our workshop was that mobile storytelling allows for the collective process of sharing and co-constructing stories and documentation. Mobile narratives in the park ranged from a serendipitous discovery of the past, to playful forms of inhabiting and sharing physical and virtual space. As we anticipated, our workshops participants were drawn to different areas and activities in Grange Park, using it as playground which they documented with their mobile phones—from discovering the historical heritage of its buildings and the site of a haunting in the churchyard of the Church of St. George the Martyr, to documenting the animals and birds and dog interactions in the park, to engaging in conversations with local residents, and staging an encounter with park denizens and a life-sized puppet sculpture. After a couple of hours of discovery we took our documentation back to the lab to layer it into Google Earth using the Outreach Open Data Kit. Participants found different ways to visualize their documentation, from photos and videos layered into a Google Earth, to polygon images created and laid on nearby buildings, to a social media map and a GPS triggered podcast.

Workshop participants submitted two outstanding papers, which enhanced our learning. “*Which Way is Up? How Locative Media May Enhance Sense of Place*” by author Glen Farrelly (University of Toronto) gives a very inclusive history and literature review, providing a rich series of case studies from which we learned more about mobile media practices. In his own research study, Farrelly investigates how

individuals use these qualities of locative media to interact with place, and to create meaning, and he then goes on to show how this impacts individuals' sense of place.

Corey Jackson, Yun Huang and Abby S. Kasowitz-Scheer (Syracuse University) submitted a provocative paper entitled "*Face to Face Matters: Inspirations from the Human Library*." Their paper is based on observations that while the overwhelming majority of mobile applications are designed to facilitate digitally mediated relationships between previously known parties (e.g., Facebook, Twitter), systems focused on initiating in person communication are much less common. In response to this perceived gap, they devised a mobile application to mediate meetups, taking inspiration from a Human Library event where participants came together to share stories with previously unknown individuals. We enjoyed this scenario, as it mirrored some of the questions and goals of the workshop, which we fulfilled by creating and documenting live interactions with participants and the local community (both two and four-legged) within the environs of Grange Park." [Overview and Best Paper Introduction by Martha Ladly, OCAD University, Canada, Bryn Ludlow, OCAD University, Canada, and Guillermina Buzio, OCAD University, Canada].

SOCIO-TECHNICAL PRACTICES AND WORK-HOME BOUNDARIES

- **Organisers:** Anna Cox (University College London, UK), Jon Bird (City University, London, UK), Natasha Mauthner (University of Aberdeen, Aberdeen, UK), Susan Dray (Dray & Associates Inc., California, USA), Anicia Peters (Iowa State University, Iowa, USA), and Emily Collins (University College London, London, UK);
- **Best Paper:** *Out of work, out of mind? Smartphone use and work-life boundaries* by Emily I M Collins (University College London Interaction Centre, London, UK),

Anna L Cox (University College London Interaction Centre, London, UK) and Ruby Wootton (University College London Interaction Centre, London, UK).

"Advances in mobile and CSCW technologies have facilitated flexible working practices that give many people more choice about where and when they work. These technologies can help people manage their family and work responsibilities, as well as provide opportunities to recover, reflect on habits and provide flexible working. However, they can also bring these different aspects of their lives into conflict. The dual use of devices for business and leisure has the potential to bring work into the home, and the resulting 'always-online' culture can undermine work-home boundaries.

Our workshop not only involved HCI practitioners (ranging from interaction scientists to CSCW specialists) but also sociologists who adopt a broader and often critical perspective on the role of work and technology in people's lives. From a socio-technical perspective, boundaries and norms are empirically investigated in order to explore how technology, work and family are made in everyday practices. Technology is understood less in terms of how it threatens or enhances work and home life but rather in terms of how it helps make 'work' and 'home' in specific ways. The nature, meaning and effects of technology are understood as being achieved through the specific uses and purposes to which it is put.

The main goal of the workshop was to consider how this perspective could inform new ways of thinking about technology design by highlighting the ways in which technologies are bound with particular values and practices. It also explored methodological approaches to studying the interactions between mobile technologies and work-home boundaries, how they are constructed by everyday socio-technical practices and problematized how work-home boundaries have been conceptualized. Importantly, a further goal of the workshop was to

generate ‘actionable’ knowledge that will not only provide HCI researchers with insights into work-life boundaries but enable them to implement design solutions. Therefore, the workshop also critically considered the various relationships between technology and work-home boundary management, and considered how the socio-technical perspective can inform technology design.

The paper “*Out of work, out of mind? Smartphone use and work-life boundaries*” has been nominated as the best paper from the Socio-Technical Systems and Work-Home Boundaries workshop. The authors are based at the UCL Interaction Centre, London, UK, and conducted the work as part of “Digital Epiphanies”, an interdisciplinary project exploring the double edged impact of technology on work life balance.

The paper reports on the results of an online survey exploring smartphone use for work e-mail and its relationship with coping and overload, extending previous work on accessing work e-mail outside of office ours. It was selected due to the prevalent nature of accessing work e-mail on smartphones, and for the potential for the work to influence future investigations into the nature and outcomes of this practice in relation to work-home boundaries.” [Overview and Best Paper Introduction by Emily Collins, University College London, London, UK].

RE-IMAGINING COMMONLY USED MOBILE INTERFACES FOR OLDER ADULTS

- **Best Paper:** *Participatory Design: How to Engage Older Adults in Participatory Design Activities* by Lilit Hakobyan (Aston University, Birmingham, UK), Jo Lumsden (Aston University, Birmingham, UK), and Dympna O’Sullivan (City University London, London, UK).

“Many countries have an increasingly ageing population. In recent years, mobile technologies have had a massive impact on social and working life. As the older adult population rises, many people will want to continue professional, social and lifestyle usage of mobiles into their 70s and beyond. Mobile devices support community involvement and personal independence, but the ageing process can interfere considerably with their usage, e.g. through changes in vision, attention, and motor control. This workshop brought together researchers who are re-imagining mobile interfaces so that they are more suited for use by older adults. The workshop featured a keynote address from Jutta Treviranus director of the Inclusive Design Research Centre at OCAD University in Toronto. Accepted papers reflected the diversity of research in this area. The workshop consisted of research presentations from authors of the seven reviewed papers together with group activities on adapting user interfaces and a lab visit to OCAD. Several of the accepted papers focused on the deployment and context of mobile applications for older adults and the remainder on user-centred design with older adults - it is from this latter group that our best paper is drawn.

Our best paper, authored by Lilit Hakobyan, Jo Lumsden and Dympna O’Sullivan, was selected based on overwhelmingly positive reviewer comments. The paper argues that supporting technology for healthcare at home cannot be efficient and effective without employing participatory approaches for the informed and effective design and development of such technologies. The authors outline recommendations for engaging in participatory design

- **Organisers:** Emma Nicol (University of Strathclyde, Glasgow, UK), Marilyn Mcgee-Lennon (University of Strathclyde, Glasgow, UK), Mark Dunlop (University of Strathclyde, Glasgow, UK), Lynne Baillie (Glasgow Caledonian University, Glasgow, UK), Lilit Hakobyan (Aston University, Birmingham, UK), and Katie Siek (Indiana University Bloomington, Indiana, USA);

with older adults with impairments based on their practical experience of conducting studies with participants with age-related macular degeneration (AMD).” [Overview and Best Paper Introduction by Emma Nicol, University of Strathclyde, Glasgow, UK].

CONCLUSION

This issue closes with an organizers’ extended commentary on the Enhancing Self-Reflection with Wearable Sensors Workshop, the aim of which is to provide more insight into the

exciting area of wearable sensors and self-reflection tools.

As always, the varied and interesting papers included in this themed issue of the IJMHCI collectively represent a wide cross section of the facets comprising the Mobile HCI discipline and I sincerely hope that you enjoy reading the broad spectrum of articles!

*Jo Lumsden
Editor-in-Chief
IJMHCI*