Editorial Preface

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Welcome to the latest issue of the *International Journal of Mobile Human Computer Interaction* (IJMHCI). As is customary, the articles in this issue cover a broad and interesting spectrum of concerns, all relevant to the mobile HCI community.

The first article in this issue is *The Influence of Menu Structure and Layout on Usability of Smartwatches* by Fan Mo and Jia Zhou. In this, the authors suggest that, although smartphones have an advantage over other wrist-worn technology such as fitness trackers by virtue of their displays, the design of such displays typically (and often inappropriately) adopts smartphone paradigms with the result that the advantages of the smartwatch are eroded. This is reminiscent of original design attempts for mobile devices wherein desktop paradigms were initially transferred to the smaller display sizes without sufficient consideration of the impact of the differences in form factor and use cases. The authors claim that, currently, there is little knowledge about best practice for the adaptation of UI design to smartwatch characteristics. They suggest that menus are widely used in smartwatch UIs to organize and provide access to applications as a consequence of extremely limited screen real estate. They claim there is a lack of studies focusing on the effectiveness of menu structure and layout on smartwatches – a design factor they believe could influence users' performance and satisfaction with smartwatch technology. In an attempt to address this lack of knowledge, the authors first examined the most serious usability problems with existing smartwatch menus before exploring possible solutions and evaluating them in terms of user performance and satisfaction. Existing smartwatch menu structures were found to present confusing information structures and interface content. Of the eight categories of problems the authors identified during their initial usability testing, the predominant was menu disorientation. On this basis, the authors posit that "…the smartwatch still needs to exploit the advantages of its display and explore better adapted design to balance smartwatches' unique characteristics and users' experience with smartphones…". In their subsequent exploration of the influence of menu structure and layout, the authors determined that a tree structure is better than a linear structure for older adults in terms of both satisfaction and performance; such users performed better with a two-branch hierarchical menu than a three-branch structure, but their satisfaction with both did not differ. For younger adults, high visual density within menus delivered higher performance but lower satisfaction than menus with low visual density. Interestingly, given the circular form factor of many smartwatches, menus with round and square patterns did not differ significantly. Further generational divides were apparent in that older adults achieved higher performance and satisfaction levels when using a smartwatch with an overview in contrast to younger adults who found a smartwatch without an overview more satisfying to use. On the basis of their findings, the authors propose some initial design guidelines – tailored to user age – for smartwatch menu structure and layout which they hope will benefit designers in allowing design to more fully exploit the advantages of the smartwatch display.

In *Mobile Phone Usage Patterns, Security Concerns and Security Practices of Digital Generation*, Sonya Zhang and Saree Costa posit that the exponential growth of mobile phone usage and recent advancements in mobile phone technology arrive hand in hand with increasing vulnerability to mobile security threats and attacks ranging from device loss to ever more sophisticated malware.

After reviewing current threats posed by the mobile environment as well as current mobile security practices, the authors report on an investigation of members of the digital generation (or 'digital natives') – in this case 262 college students' – mobile phone usage patterns, security concerns and practices. The authors' intent was to discover changes and new findings since previous similar surveys and to explore relationships between such variables and the personal attributes of the students (including age, gender and technological aptitude). They suggested that if it could be determined that students with different study majors were more or less aware of mobile security concerns, then mobile security training could be customized to degree subject. The authors confirmed that, as any of us who work with students could attest to, today's students are "devoted mobile phone users", utilizing a range of apps for a variety of purposes. The authors found that students "…are generally aware of and concerned about mobile security…", spanning theft, web threat, and malware sources. It was found that today's students exhibit better mobile security awareness and concerns and improved security practice than was reported in previous studies. Despite this, the authors identify room for improvement across a range of factors, including exposure to threat when using public wi-fi hotspots. Interestingly, they identify correlations between personal attributes and mobile phone usage patterns, security concerns and practices. Whilst computer science students, for instance, are (as one might expect) more knowledgeable about security issues and take more precautions in some respects, they also take more risks as a result of their enhanced technology know-how, such as jailbreaking phones. The authors suggest that their up-to-date knowledge about mobile security practices can help determine best practice for awareness training bespoke to individual user types.

The third article – *Reliability and Validity of Low Temporal Resolution Eye Tracking Systems in Cognitive Performance Tasks* by Alexander Sievert, Alexander Witzki, and Marco Michael Nitzschner – asserts that because eye movements are indicative of users' attention, information processing, and cognitive state, eye tracking experiments "…are an important contribution to human computer interaction (HCI) research…" and cite numerous studies which have utilized such measures. They recognize that interaction with mobile technology requires ambulatory assessment of eye movement, placing specific demands on data collection. Although systems such as head-mounted trackers and eye-tracking goggles exist to capture oculomotor activity, the authors note that they are expensive and require specific hard- and software to run, making them inaccessible to many. They further note that the use of such hardware (a) alters users' visual appearance, influencing social interactions, and (b) impedes movement, inconveniencing users and reducing users' field of vision. Consequently, this influence is likely to alter human behavior, both in private and public settings. On this basis, the authors argue that unobtrusive, "…affordable and practical systems are needed, especially for applied research concerning mobile HCI in everyday life…" whilst recognizing that such systems might not be able to deliver the high temporal resolution of more sophisticated eye trackers. The authors argue that, whilst comparisons have been published concerning low and high temporal resolution video-based systems, "…a comparison with further, non-video based, gaze-recording methods has yet to be conducted…" In this article, the authors attempt to address this knowledge gap by presenting a study that compares the reliability and validity of a table-mounted low temporal resolution eye tracking system with an electrooculogram; they claim the research is "…fundamental to the use of video-based low temporal resolution eye trackers in mobile settings…", addressing their reliability and validity independent of context of employment. The authors found that the low temporal resolution eye tracking system produced results of comparable quality to that of the high resolution electrooculogram, suggesting that the former can reliably collect eye tracking data and is thus of value for applied research within the mobile HCI community. The authors posit that this knowledge opens the door to "…use of existing hardware (e.g., the user facing cameras of cell phones, tablets or laptops) in combination with software solutions for mobile data collection…" but recommend further research into and development of specific mobile low temporal resolution solutions.

The final article entitled *Envisioning the Future of Personalization through Personal Informatics: A User Study* is by Federica Cena, Amon Rapp, Silvia Likavec, and Alessandro Marcengo. In this,

the authors note that recent advancements in wearable and mobile technologies has led to a rapid expansion in the amount and type of data that can be gathered about users to build user models, thus changing the overall landscape of user modelling (UM). Consequently, the authors suggest that "…all these changes bring forth new research questions about the kinds of services which could be improved, which of them would be the most useful, the ways of conveying effectively new forms of recommendations, and how users would perceive them." In an attempt to shed some light on this arena, the authors developed a novel personalized system on which basis to then conduct a qualitative user study designed to understand users' needs and expectations surrounding personalization made possible by mobile technologies. The authors' aim was to elicit insight in terms of how to build an "enhanced" user model for the design of personalized services. Their study illustrated that users expect advanced personalization from systems that collect certain information about them, with consequences for all tools that gather personal data, including personal informatics. The authors suggest that "…content personalization could represent a key value for users who are not 'behavior-change oriented…" and thus lack motivation to ordinarily engage in self-tracking. In contrast, experienced "self-trackers" highlight the need for personalized plans to assist them in achieving specific (especially long-term) goals. Not only did the authors' participants highlight the need for recommendations based on the "…entire context that characterizes an individual in a given situation…" but also that the data should be exchangeable amongst systems to support pervasive personalized services. In contrast, however, participants also highlighted privacy and security concerns which have the potential to negatively impact the acceptance of such services. The authors present, on the basis of their findings, recommendations for how to meet users' needs in these regards.

I trust that you find all the articles stimulating and useful – enjoy!

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