Editorial Preface

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Welcome to the latest issue of the *International Journal of Mobile Human Computer Interaction* (IJMHCI). This issue, as is typically the case, covers an interesting range of research topics of relevance to the mobile HCI community. We begin with an article entitled *"Understanding Social Capital on Mobile SNS – An IS Success Model Perspective"* by Zuoning Xu and Tao Zhou. In this, the authors raise and thereafter study the question of how to develop social capital – that is, resources arising from the relationships established by an individual or social unit – within mobile social networking services (SNS). The authors posited that social capital may be essential for mobile SNS providers to retain users and facilitate post-adoption continuance of use – without this, the providers may essentially fail. On this basis, the authors determined that it was important to examine mobile SNS continuance from the perspective of social capital which they argue comprises structural capital, relational capital and cognitive capital. They argued that there is little research examining the determinants of social capital and, as a consequence, the question of how to develop social capital remains unanswered. The authors identified three factors – system quality, information quality, and service quality – derived from the information systems (IS) success model and investigated their specific impact on social capital. They proposed that the quality of mobile SNS platforms which incorporates system quality, information quality and service quality may impact social capital development. Their results highlight that the three technological perceptions (system, information and service quality) do have significant but *different* impacts on social capital building, mapping the technological factors to those factors comprising social capital. The authors present their results as a means of improving general understanding of social capital and as guidelines for service providers to better facilitate users' development of social capital.

In their article entitled *"Multimodal Alarm System for Risk Management in a Clinical Lab,"* Federica Cena, Ilaria Lombardi, Agata Marta Soccini, Federico Sarzotti, Alessandra Re, Marco Trizio, and Margherita Micheletti Cremasco explore effective means to communicate work safety-related risk information to workers without interrupting their main task. They begin by asserting that the efficacy of an alarm (in terms of capturing attention) is dependent on physical salience – the likelihood that the alarm stimulus will attract attention based on its properties regardless of the mental state of the observer. They lament, in particular, the failings of (now perhaps overused

and thus predominant) auditory alarms. The authors argue that alarm systems need to be designed to be customized to a given context of use, systematically integrating them into the work place. To this end, the goal of their work was to design an alarm system that was effective within the specific context of a hospital's toxicology lab where there was significant potential risk to lab operators due to leakage of harmful reagents or overexposure to toxic substances. To achieve their goal, the authors commenced with participatory activity analysis in order to identify risks and discomfort to lab operators under the current working practice. This allowed the authors to develop a detailed and insightful understanding of the specifics of the lab working conditions including, importantly, that there existed no "…customized management of emergency situations with no differentiation of the treatment of different typologies of risks…" From this, they identified three capabilities their novel alarm system would have to support – namely, to catch users' attention without interrupting their main task, to allow workers to distinguish between collective and personal risk without annoying those not personally involved, and to increase risk awareness in workers more generally. They then proposed a novel multimodal alarm system which was integrated into the existing system but offered more advanced features to meet the aforementioned capabilities. The alarm is conveyed to lab operators via vibration of a wearable device (the authors having discounted use of auditory alerts as too intrusive and likely to need to be set very loud to overcome ambient noise); collective alarms also include visual stimuli whereby a light is activated on the wearable whilst environmental lights highlight the source of the danger. A mobile app was developed to report on daily risks, providing more detailed information for subsequent analysis. Three versions of the wearable were developed for comparative evaluation – a wristband, an armband, and a necklace – to test perceived acceptability of the various form factors by lab operators. The authors report on a preliminary, within-subject design pilot study of the system in use in the real-world context for which it was designed. The results of the pilot test suggest the alarm solution was considered discreet and was received positively by lab operators in terms of its capacity to provide clear, unobtrusive and useful risk information about real-time risks, to increase operators' risk awareness, and to provide efficient diagnosis of risks. On the basis of their results, the authors believe the physical salience of the alarm was reached as a result of the use of different sensory channels as well as its fit within the lab operations. Of the three versions, the wristband was most positively received by participants: the authors therefore propose to investigate this more fully with a view to embedding the concept in a smartwatch. They also propose to investigate in more depth the impact of changes in vibrational pulse duration and inter-pulse interval timing on perception of urgency and/or annoyance associated with alarms.

The final article – *"Simple Screen Locking Method Using Randomly Generated Number Grid on Image,"* by Hazleen Aris, Zailani Ibrahim, and Ariff Azman – recognizes the increasing need to protect smartphones from unauthorized access given the ongoing expansion of the personalized services and information accessed and held on such devices. The authors argue that this is typically achieved via screen locking but improvements in screen locking security can, unfortunately, negatively impact

usability and cost. To address these concerns, the authors propose a new screen locking method which is simple (therefore usable), inexpensive, and provides protection from shoulder surfing and smudge attacks. With their simple yet secure (SyS) screen (un) locking method, the authors' aim was to achieve a new screen locking method that achieves the optimum trade-off between security and usability and cost. A randomly generated number grid and an image form the basis of the SyS method. Randomly generated integers populate the grid overlaying the image; to unlock, the user needs to drag a chosen number to a specified point on the image. Both the number and image location are pre-determined at set-up. The authors consider the method simple given it doesn't place high cognitive demand on the user and secure because they claim it can still protect users from shoulder surfing and smudge attacks. It is also cost-effective due to no requirement for additional hardware or complex algorithms. Comparative evaluation of their system on an Android device against common screen locking methods – PIN, password and pattern – showed that it performed best in terms of both usability and security. The authors also claim that it "…performs well theoretically when compared against existing screen locking methods that aim at defending against similar attacks…" The authors do note, however, that SyS was not evaluated with respect to brute force attacks and that future work should consider improvements based on *n* levels of authentication, recognizing the need to carefully consider such enhancements in terms of security and usability. The authors also plan a longer-term evaluation to more aptly consider the memorability of the method.

As always, I trust that you find all the articles thought provoking and useful – enjoy!

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