HAAPIE 2016: 1st International Workshop on Human Aspects in Adaptive and Personalized Interactive Environments

PREFACE

Panagiotis Germanakos
Suite Engineering UX, P&I
SAP SE
Walldorf, Germany, and
Dept. of Computer Science
University of Cyprus
Nicosia, Cyprus
panagiotis.germanakos@sap.com

Marios Belk
Dept. of Computer Science
University of Cyprus
Nicosia, Cyprus
belk@cs.ucy.ac.cy

George Samaras
Dept. of Computer Science
University of Cyprus
Nicosia, Cyprus
cssamara@cs.ucy.ac.cy

Vania Dimitrova
School of Computing
University of Leeds
Leeds, UK
v.g.dimitrova@leeds.ac.uk

ABSTRACT

Nowadays, the profound digital transformation has upgraded the role of the computational system into an intelligent multidimensional communication medium that creates new opportunities, competencies, models and processes. The need for human-centered adaptation and personalization is even more recognizable since it can offer hybrid solutions that could adequately support the rising multi-purpose goals, needs, requirements, activities and interactions of users. HAAPIE workshop embraces the essence of the "human-machine co-existence" and brings together researchers and practitioners from different disciplines to present and discuss a wide spectrum of related challenges, approaches and solutions. In this respect, the first edition of HAAPIE includes 5 papers detailing methods for generating and utilizing user models while users found in different contexts, like museums, executing particular activities, during searching, or found under unpleasant conditions, like stress, and how to utilize contextual information of users, like travelling, for making more tailored recommendations that will enhance their experience. The workshop also includes a panel of three experts from the academia in the area of personalization, user modeling, human factors and Web-based information systems.

1. INTRODUCTION

We are *haapie* to present the proceedings of the HAAPIE 2016 workshop. The 1st International workshop on Human Aspects in Adaptive and Personalized Interactive Environments (HAAPIE[1]), is a half-day workshop held on 16 July 2016 in conjunction with the 24th ACM Conference on User Modeling, Adaptation and Personalization (UMAP 2016), 13-16 July 2016 in Halifax, Nova Scotia, Canada.

The aim of HAAPIE is to bring together researchers and practitioners working in the areas of human aspects in adaptation and personalization. State-of-the-art approaches in adaptation and personalization research consider user models that mostly maintain information regarding the "traditional" user characteristics (i.e., experience, knowledge, interests, context), and related contextual or technology aspects (i.e., displays, connectivity, processing power). While modeling these factors has shown significant improvements and benefits to the end-users in terms of usability and user experience, still the needs of today's epoch signify the further engagement into research that will produce more holistic human-centered practices. Henceforth, the vision of HAAPIE is to bring more inclusively the "human-in-the-loop", considering intrinsic user characteristics and abilities, like perceptual, personality, visual, cognitive and emotional factors as expressed by the theories of individual differences. In addition, recent studies indicate the need of broadening the scope of diversity parameters to include characteristics such as motivation, self-actualization, and socio-cultural differences.

Specifically, the workshop addresses the following objectives:

- to explore state-of-the-art and new implicit and explicit methods and techniques of modeling a broad range of human factors of users and behaviors – both separately and in possible combinations (e.g., cognitive abilities and age; motivation and cultural differences);
- to explore personalization techniques, computational intelligence algorithms, recommendation models, and real-time paradigms that can improve the efficiency and effectiveness of user tasks and interventions;
- to compare challenges and experience in different real world contexts and applications (e.g., decision support, learning, wellbeing, security), where a holistic view on human aspects is needed to provide a positive user experience;

[1] On-line: http://haapie.cs.ucy.ac.cy

- to identify theoretical and computational models for the design, development and evaluation of human aspects in adaptation and personalization.

The added value will be to shape new human-centered adaptive interactive environments and personalized platforms that can contribute towards long-term viable solutions.

This first edition of HAAPIE would not be possible without the involvement and support of various people acting from different positions. At first we would like to thank the organizers of the ACM UMAP 2016 for their support and guidance throughout the whole process, especially: Federica Cena and Jie Zhang (Workshop Chairs), Lora Aroyo and Sidney D'Mello (Program Chairs), and Julita Vassileva and Jamie Blustein. Our sincere appreciations go to the International Program Committee (IPC) for their collaboration, efforts, comments and suggestions:

- Panayiotis Andreou, University of Lancashire Cyprus, Cyprus
- Nikolaos Avouris, University of Patras, Greece
- Maria Bielikova, Slovak University of Technology, Slovakia
- David Chin, University of Hawaii, USA
- Owen Conlan, Trinity College Dublin, Ireland
- Marios Constantinides, University College London, UK
- Dimosthenis Georgiadis, University of Cyprus, Cyprus
- Judy Kay, University of Sydney, Australia
- Stella Kleanthous, University of Cyprus, Cyprus
- Tsvika Kuflik, University of Haifa, Israel
- Lydia Lau, University of Leeds, UK
- Zacharias Lekkas, National and Kapodistrian University of Athens, Greece
- Tobias Ley, Tallinn University, Estonia
- Judith Masthoff, University of Aberdeen, UK
- Alexandra Matz, SAP SE, Germany
- Tanja Mitrovic, University of Canterbury, New Zealand
- Constantinos Mourlas, National and Kapodistrian University of Athens, Greece
- Jahna Otterbacher, Open University of Cyprus, Cyprus
- Efi Papatheocharous, Swedish Institute of Computer Science, Sweden
- Kaska Porayska-Pomsta, University of London , UK
- David Portugal, CITARD Services Ltd., Cyprus
- João Quintas, Instituto Pedro Nunes , Portugal
- Katharina Reinecke, University of Washington, USA
- Maria Roussou, Makebelieve, Greece
- Beth Russell, SAP SE, Germany
- Aimilia Tzanavari, PROTO.IO INC., USA
- Julita Vassileva, University of Saskatchewan, Canada
- Amali Weerasinghe, The University of Adelaide, Australia

Last but not least, we would like to thank the authors who have selected HAAPIE 2016 for sharing their research results and discussing their future plans; the three panelists: David Chin, Geert-Jan Houben, and Julita Vassileva, for the inspiring discussion, ideas, experiences and recommendations; as well as all the participants who attended and made HAAPIE 2016 a successful event.

2. MOTIVATION AND RESEARCH THEMES

Researchers and practitioners of adaptive hypermedia, Web personalization and user modeling, have identified various characteristics of users that present a considerable effect when coupled with the technology, for adapting and personalizing content and functionality of interactive systems within specific domains and contexts of use. As these factors have shown to influence certain research directions and practical domains (e.g., modeling interests in recommender systems, or modeling knowledge in educational hypermedia systems), more intrinsic human traits and abilities (attributes that define each person as an individual, e.g., cognition, emotions, personality) and their respective values may also have an important role in fields, areas and computer-mediated environments that entail human-computer interactions.

Bearing in mind that such human-computer interactions are primarily processed on a cognitive level, e.g., users are required to process and comprehend information, learn, solve problems and take decisions, it is of critical importance to investigate and integrate individual differences in the visual and interaction design and development process of current practices. Whether integrated in the user modeling construction process or intelligently incorporated to generate smart user interfaces, it is expected that the benefits will significantly increase the usability, user experience and quality of systems. Apparently, modeling individual traits and personalizing content and functionality of interactive systems is a challenging endeavor given on the one hand the multi-dimensional and complex nature of human factors and on the other hand the heterogeneous data structures and content meta-characteristics. So far, such individual differences have been widely studied and applied in personalization systems but with mixed yielded outcomes, which could be the result of the endogenous multidisciplinary character of the research works or the nature of the reported studies. Thus, modeling intrinsic human factors and incorporating these in adaptation and personalization systems still remains an open and challenging issue, and further studies and approaches are yet to be found.

In this respect, in HAAPIE 2016 we encouraged original and relevant contributions focusing on experiences and lessons learned from real-life applications, current state-of-the-art methodologies, challenges tackled and solutions adopted, tools and services in the academic, public or private sector, studies, theories, techniques, and evaluation approaches that could support human-centered adaptation and personalization issues in various levels of interactive environments.

The topics of the workshop included (but were not limited to) the following:

- Human-centered Modeling, Adaptation Methods and Techniques
- Influence of Human Factors on Interactive Systems for Personalization
- Usage of Human Factors for Personalization
- Implicit and Explicit Detection of Human Factors for Personalization
- Human-centered Algorithms for Content Recommendation and Delivery
- Novel Human-centered Interaction Concepts and User Interfaces
- Individual Differences (Personality, Cognition, etc.)
- Synergy of Affective and Human Cognitive Factors
- Modeling Groups and Communities of Diverse Users
- Evaluation of Human Aspects in Adaptation and Personalization
- Personalized Access to Services Content
- User Experience
- Cultural Diversity and Adaptation
- Age-specific Personalization and Adaptation
- Adaptation and Personalization for Users with Special Needs
- User Behavior and Behavior Change
- Context Awareness

- Human Aspects in Personalized Internet of Things Applications
- User-centric Cyber-Physical-Social Adaptive Systems
- Human Aspects in Social Adaptive Robots
- Adaptation and Personalization in Usable Privacy and Security
- Privacy Aspects of Modeling Human Factors in Personalization Systems

3. FORMAT AND CONTRIBUTIONS

The workshop focuses both in academia and industry and it is composed of researchers and professionals working in the field of Web Adaptation and Personalization, User Modeling, Human Factors, User Experience, and User-centered Tools and Services. It brings together scientists, students, human factors' professionals, ICT professionals, service providers and developers, product designers, and general users to exchange and share their experiences, new ideas and research results about all aspects (theory, applications and tools) of bringing human factors into the adaptation and personalization process.

HAAPIE 2016 specializes on interdisciplinary sessions as a set of oral presentations, and round-the-table (panel) discussions led by key invited persons related to the main theme of the workshop. The discussions are emphasizing on the practical challenges encountered and solutions adopted on content and services, the personalization of the Web structures and hypermedia applications, as well as techniques that ensure the development of intelligent user interfaces in the best qualitative manner for the user. Accordingly, it consists of technical papers, their commentaries, and a short discussion on the topic of papers. At the end of the day there is a summary of outcomes and goals for the next such event.

This volume contains the peer-reviewed accepted papers among those that have been submitted to HAAPIE this year. Each paper has been reviewed by at least 2 members of the IPC with expertise in the respective area to ensure the necessary quality. More specifically, we received 6 submissions; we accepted 3 long papers, 1 short paper, 1 position paper and rejected one paper. The accepted papers discuss interesting ideas and present insights with respect to human factors, user modeling and recommendations in various contexts and application areas.

Antoniou et al. [1] investigate the use of indirect profiling methods through a visitor quiz. Building on their prior experience of a first study aimed at the design, implementation and user testing of a short quiz version at the Acropolis Museum, a second parallel study was devised. This paper introduces this research, which collected and analyzed data from two environments: the Acropolis Museum and social media (i.e., Facebook), identifying key profiling issues and presenting results and guidelines towards a generalized approach for the profiling needs of cultural institutions.

Najafian et al. [2] devised a novel approach for augmenting user interaction experience on smartphones by exploiting the current context of the end user. For this purpose, they have designed and implemented a context adaptive UI based on an existing mobile application for recommending tourist places. Accordingly, they have conducted a user study and measured the effectiveness of their method in terms of three attributes: task completion time, the user's perceived ease of use and user satisfaction confirming that their approach can enrich user interaction experiences.

Ullah and Liu [3] propose a personalized information retrieval system as an effective method to improve user search experiences during their information seeking process. They suggest an EISE (extended Information goal, Search strategy and Evaluation threshold) model employing a deductive approach based on psychological theories and an existing user model. Ten interactive search logs of users obtained from a real search engine and applied to preliminary validate the proposed user model, showed that the EISE model can identify different types of search users. The preferences of the different user types can be used to inform interactive search system design and development.

Belk et al. [4] present a work in progress that is motivated by existing research that accompanies stress with physical reactions like increased heart rate, blood volume, pupil dilation and skin conductance. This work builds on the premise that measuring such reactions in real-time could implicitly identify stress of older adults at work while interacting with a system. For this purpose, an in-house computer mouse was built with embedded sensors for measuring the users' heart rate, skin conductance, skin temperature, and grip force; and a probabilistic classification algorithm was developed that receives as input these physiological measurements, and accordingly identifies emotional stress events. This work aims to identify when computer users are stressed, and accordingly provide intelligent interventions and personalized solutions to help reduce their frustration and prevent negative health conditions.

Chin [5] discusses the importance of personality and the impact in the adaptation process. Given the imminent limitations of questionnaires for extracting the various personality traits, he pinpoints the need for developing new techniques for inferring personality from other user artifacts as well as methods for more accurate statistical analysis of the data.

4. CONCLUSIONS

HAAPIE is a new workshop whose aim is to bring together experts, researchers, students and practitioners from the related to its research themes areas for sharing ideas and experiences, lessons learned, approaches and results that could substantially contribute to the broader UMAP community. Overarching goal is to bring a people-oriented perspective, to understand the user and exploit the needs, requirements, processes and interaction methods that continuously change in today's intuitive digital ecosystem.

The HAAPIE 2016 volume presents the Supplement Proceedings of the ACM UMAP 2016 through the green open-access CEUR-WS.org. It contains 5 papers which have presented research outcomes, work in progress and position statements on human aspects challenges with respect to user modelling and personalized recommendations in various contexts.

With HAAPIE 2016 as the first workshop we do hope to establish a series of workshops in the coming years that will accompany the current challenges and research directions related to human-aspects in adaptive and personalized interactive environments. Bringing ideas, discussing methods and suggesting solutions that will always keep the user *haapie* in the end.

5. REFERENCES

[1] Antoniou, A., Katifori, A., Rousou, M., Vayanou, M., Karvounis, M. and Pujol-Tost, L. Capturing the Visitor Profile for a Personalized Mobile Museum Experience: An Indirect Approach. In Proceedings of the 1st International Workshop on Human Aspects in Adaptive and Personalized Interactive Environments (HAAPIE 2016), in conjunction with the 24th ACM Conference on User Modeling, Adaptation and Personalization (UMAP 2016).

[2] Najafian, S., Wörndl, W. and Braunhofer, M. Context-aware User Interaction for Mobile Recommender Systems. In Proceedings of the 1st International Workshop on Human

Aspects in Adaptive and Personalized Interactive Environments (HAAPIE 2016), in conjunction with the 24th ACM Conference on User Modeling, Adaptation and Personalization (UMAP 2016).

[3] Ullah, A. and Liu, H. Theory-Based User Modelling for Personalized Information Retrieval. In Proceedings of the 1st International Workshop on Human Aspects in Adaptive and Personalized Interactive Environments (HAAPIE 2016), in conjunction with the 24th ACM Conference on User Modeling, Adaptation and Personalization (UMAP 2016).

[4] Belk, M., Portugal, D., Germanakos, P., Quintas, J., Christodoulou, E. and Samaras, G. A Computer Mouse for Stress Identification of Older Adults at Work. In Proceedings of the 1st International Workshop on Human Aspects in Adaptive and Personalized Interactive Environments (HAAPIE 2016), in conjunction with the 24th ACM Conference on User Modeling, Adaptation and Personalization (UMAP 2016).

[5] Chin, D. Personality Modeling: Potential and Pitfalls. In Proceedings of the 1st International Workshop on Human Aspects in Adaptive and Personalized Interactive Environments (HAAPIE 2016), in conjunction with the 24th ACM Conference on User Modeling, Adaptation and Personalization (UMAP 2016).