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Persuasive Technology

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ADJUNCT PROCEEDINGS

Center for
Human-Computer Interaction
Department of Computer Sciences

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Preface

Persuasive Technology is a vibrant and highly interdisciplinary research field that focuses on the design, development, and evaluation of interactive technologies with the aim of changing users' attitudes and behaviors. Attitude and behavior change is achieved by means of persuasive strategies, such as social influences embodied in the design of interactive technologies, without any coercion or deception. Persuasive technologies are used to change people's behavior in various domains such as healthcare, sustainability, education, or marketing.

PERSUASIVE, the International Conference on Persuasive Technology, is the leading venue for ground-breaking research and novel designs of persuasive technologies. It is the annual conference to discuss the latest persuasive theories, strategies, applications, and artifacts with academics and practitioners from all over the world. Over the past decade the conference was held at exciting places such as Chicago, Padua, Sydney, Linkping, Columbus, Copenhagen, Claremont, Oulu, Palo Alto, and Eindhoven.

PERSUASIVE 2016 was the 11th edition of the conference and took place in April 2016 in Salzburg, Austria. The conference theme was "Contextual Persuasion: Supporting Life Situations and Challenges by Persuasive Design." With this conference theme, the ubiquity and situatedness of persuasive interactions was emphasized: How are interactions with persuasive technologies influenced and facilitated by spatial, temporal, social, or individual conditions and characteristics? How can we analyze, design, and evaluate for specific contexts or conditions?

This volume collects the accepted poster submissions, demos, workshops, and contributions to the doctoral consortium. It is a companion volume to the conference proceedings that contains long and short papers and which is published by Springer.

We are very grateful for all who contributed to make this conference a success, in particular the authors, chairs, reviewers, and workshop organizers, and hope that you enjoy the submissions presented in the adjunct proceedings.

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Fourth International Workshop on Behavior Change Support Systems (BCSS'16):

Epic for Change, the Pillars for Persuasive Technology for Smart Societies

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1 New Avenues for Research: EPIC for Change

Our everyday life is impossible to imagine without modern technology. Humanizing technology is embedded in our daily environment, measuring our activities 24/7 via smart sensors, activity trackers, and various wearable devices [1,2,3]. Checking health status, tracking and managing our stocks, and controlling the temperature of our house via a mobile app have become a daily routine.

Persuasive technology reveals an interdisciplinary research and education area transcending the traditional use of technology as helpful to merely improve the accessibility, affordability, and efficiency of services within the institutional contexts. Technology has the capacity to create smart (virtual) persuasive environments that provide simultaneously multimodal cues and psycho-physiological feedback for personal change by strengthening emotional, social, and physical presence. Besides, smart environments collect and analyze sensor data by self-tracking behaviors, emotions, and thoughts; presenting a quantified holistic self-concept that will shed new lights on how technology integrates in our lives, and how people engage each other and their environments using unobtrusive and pervasive technologies. An array of persuasive applications has been developed over the past decade with an aim to induce desirable behavior change. A Behavior Change Support System (BCSS) can be defined as "*a socio-technical information system with psychological and behavioral outcomes designed to form, alter or reinforce attitudes, behaviors or an act of complying without using coercion or deception*" [4]. Persuasive applications have shown promising results in motivating and supporting people to change or adopt new behaviors and attitudes, in various domains such as health and wellbeing, sustainable energy, education, and marketing.

During this workshop we would like to set the first stage in defining the pillars for persuasive technology by introducing a new holistic concept: *EPIC for Change*.
EPIC refers here to:

- ***E**ngagement:* Creating experience, flow using persuasive strategies and triggers in development, using positive psychology concepts.

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- ***P**ersonalization:* How to personalize technologies to personalities and to differences in cultures?
- ***I**ntegration:* How to create technologies which are implementable in practice, environments [geo-informatics] and that are adaptable to people [humanizing environments]?
- ***C**onnectivity:* How to develop social networks for self-organizing communities?

Change: Refers to individuals, communities and society, creating smart environments with persuasive technology for solving societal challenges.

1.1 Workshop Topics

Topics for submissions include, but are not limited to:
Design & Development

- Engagement, Personalization, Integration, Connectivity, and Changes in Persuasive Technology.
- Smart communication and information systems.
- Interactive visualizations for personalization and social support.
- High tech, human touch / humanizing technology.
- Persuasive prompts to create engagement and involvement: Virtual environments, ambient visualizations, etc.
- Developing just-in-time persuasive feedback to support activities real-time and offline (e.g., triggers and alerts), using data generated by smart sensors, self-tracking devices, wearable's, etc.
- Connectivity designs for social support, e.g. for lifestyle change & wellbeing.
- Persuasive profiling to personalize interventions.
- Ethical issues of persuasive technology, big data and BCSSs.
- Value proposition design to create BCSSs that have value in practice for all stakeholders, implementation issues.
- Persuasive strategies related to different outcomes (engagement/resilience/attitudes/compliance/behaviors) and levels (individual/community/society) of change.

Evaluation

- Measuring the impact of BCSSs and smart persuasive environments on individuals, community, and society.
- Evaluation methods for measuring various aspects of BCSSs; process and product measurements.
- Advanced big data analytics for measuring and interpreting self-tracking data from wearables, multi- sensor data, etc.
- Adequate design for measuring the effect of persuasive strategies on task adherence during usage and long-term effects (fractional factorial designs).
- Frameworks and methodologies to measure A/B/C-Changes (attitude, behavior or compliance).
- Profiling personalities and matching them with persuasive strategies.
- Multimodal cues and the effects on adherence and outcomes.

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- Advanced analytics to predict adherence, and to identify usage patterns and its effects on adherence.
- Evaluation of persuasiveness of different BCSSs (mobile, ubiquitous, ambient technologies, virtual environments, sensor-based, etc.).
- Design guidelines for practice, based on evaluation studies.

1.2 Important Dates

Submission deadline: February 2, 2016 ➔ Notification to authors: February 26, 2016
Final version due: March 18, 2016 ➔ Workshop date: April 5, 2016

1.3 Organizers

General Co-Chairs: Harri Oinas-Kukkonen, University of Oulu, Finland; and Lisette van Gemert-Pijnen, University of Twente, the Netherlands
Program Chair: Olga Kulyk, University of Twente, the Netherlands
Organizing Chair: Liseth Tjin-Kam-Jet - Siemons, University of Twente, the Netherlands

2 Workshop's Way of Working

This interactive workshop will act as a multidisciplinary forum where researchers, practitioners and experts from a variety of scientific domains (such as information sciences, psychology, human-computer interaction, industrial design and medicine) will: a) present their work, b) discuss and pitch ideas on how to develop a mutual and broader understanding of behavior change models using the BCSSs, and c) set the first stage in defining the pillars for persuasive technology. The results of this workshop are planned to be presented as a vision paper at the Persuasive 2017 conference in Amsterdam, the Netherlands. This edition of the workshop will build upon the insights and research topics of last year's workshop of which the proceedings have been published online and which has led to a special issue on "Persuasive technology for Behaviour Change" in the International Journal of Medical Informatics.

3 Challenges

The use of technologies as persuaders may shed a new light on the interaction process of persuasion, influencing attitudes and behaviors. Yet although human-computer interactions are social in nature and people often see computers as social actors, it remains unknown how these interactions re-shape attitude, beliefs, and emotions; how they change behavior; and what the drawbacks are for persuasion via technologies. Humans re-shape technology, changing their goals during usage, making persuasion not a static ad-hoc event but an ongoing process.

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The capacities of technologies to change behaviors and to continuously monitor the progress and effects of interventions are not yet being used to its full potential. Specific aspects of the intervention contributing to the results and user adherence often remain unknown, known as the 'black box' phenomenon [5].

Validated and suitable evaluation methods are needed, as well as mixed-methods approaches to measure engagement, emotions, and social influence of persuasive technologies in smart environments. BCSSs pose a number of specific challenges as well, such as personal goal-setting, personalized feedback, support for computer-mediated communication, 24/7 availability, feasible business models, as well as suitable methods and processes to develop scalable software platforms and architectures for these systems. Where the focus was on small, exact datasets and causal connections in the past (i.e. knowing "why"); we now focus on gathering or linking large amounts of (noisy) data to demonstrate the presence of (unexpected) correlational connections (i.e. knowing "what") [6]. New technologies allow us to gather larger amounts of data from multiple sources, e.g., multi-sensor data and self-tracking data, that can be used for customization and personalization purposes. Though this opens new exciting frontiers of research, important concerns have been raised as well concerning issues like safety, profiling, purpose limitation, liability, data ownership, and (above all) privacy [6,7,8]. Such issues should be dealt with appropriately, to enhance the public's trust in technological advancements.

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