Preface to the International Workshop on Personalization in Persuasive Technology: Research Challenges and Opportunities Strategies

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1 Personalization in Persuasive Technology

Persuasive Technology (PT) is a growing area of research which investigates how interactive systems can encourage and support people to change their behavior. Over the past two decades, several persuasive technologies and behavior change support systems aimed at promoting change in different domains, including health, safety and security, environmental sustainability, energy conservation, marketing, and education have been developed. Most of these technologies use the so-called one-size-fits-all approach in their design and evaluation, which has been shown to be far less effective at motivating behavior change. Personalization is essential for maximizing the effectiveness of PT as the most effective persuasive and motivational strategies are likely to depend on user characteristics such as the user's personality, gender, age, culture, affective state, existing attitudes, behaviors, knowledge, and other inclinations [3,7,15,18–23].

The Personalization in Persuasive Technology Workshop connects diverse groups of PT and behavior change researchers and practitioners interested in personalizing and tailoring of persuasive technology to share their experiences, ideas, and discuss key challenges and future research trend for the PPT research area, as highlighted in this editorial.

This volume comprises a total of 16 short and long papers (including two keynote presentations) presented at the International Workshop on Personalization in Persuasive Technology (PPT'16) that took place on April 5th, 2016 in conjunction with the 11th International Conference on Persuasive Technology (PERSUASIVE 2016) at Salzburg, Austria. The PPT 2016 included peer-reviewed long and short papers accepted for oral presentation. The interactive workshop attracted 43 participants from over 10 different countries across the world and provided a forum for researchers and practitioners interested in ways that interactive technologies can be designed to promote desirable behavior change to discuss and outline a roadmap for PPT research with a focus on improving relevance and overall effectiveness of PTs.

The PPT workshop witnessed contributions from multidisciplinary researchers, practitioners, and experts from various disciplines including, Computer Science, Health Science, Information Science, Psychology, Human-Computer Interaction,

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Industrial and Engineering Design, Business, and Marketing. The submissions covered topics on methods, theories, application domains, and systems with the overall aim of advancing research on how to adapt and personalize persuasive systems to increase their efficacy and to promote desirable behavior change, such as improving health [2, 8] and social interaction [4].

2 Personalization methods, theories, and need for personalization

How to achieve personalization in the context of persuasive technology, who to personalize for, and whether there is a need to personalize persuasive are current research questions of interest to the PPT researchers and practitioners. Many submissions to this workshop are targeted at answering these research questions. The papers in this category include:

- "Personalization/computer-tailoring in Persuasive Technology: Tailoring ingredients target psychological processes" [9]. This was presented as an opening keynote by Arie Dijkstra.
- "Adaptivity and Personalization in Persuasive Technologies" [5]. This was delivered as a closing keynote by Kaptein Maurits.
- "Understanding Effective Coaching on Healthy Lifestyle by Combining Theoryand Data-driven Approaches" [25].
- "Persuasion and Culture: Individualism-Collectivism and Susceptibility to Influence Strategies" [17].
- "Missing the Forest for the Trees: Balancing Personalization Costs and Benefits in Persuasive Games" [16].
- "An Empirical Analysis of the Perception of Mobile Website Interfaces and the Influence of Culture" [24].
- "Designing for Different Stages in Behavior Change" [13].

3 Personalized persuasive systems and application domains

The context and domain dependency of various persuasive technology strategies, theories, and techniques is an important research issue for PPT researchers and practitioners. Many submissions to this workshop explored this issue by analyzing, designing, and evaluating PPT targeted at various behavior domains, including Type 2 diabetes self-management [12], rehabilitation [8], marketing [1,11]. Papers in this category include:

- "Personalization of Gait Rehabilitation Games on a Pressure Sensitive Interactive LED Floor" [8].

- "Personalized Persuasive Messaging System for Reducing Patient's Dissatisfaction with Prolonged Waiting Times" [2].
- "Persuasive Recommendations in ubiquitous Environments" [11].
- "Integrating Persuasive Technology to Telemedical Applications for Type 2 Diabetes" [12].
- "Personalized Persuasion for Social Interactions in Nursing Homes" [4].
- "Evaluating Personalization and Persuasion in E-Commerce" [1].
- "Persuasiveness, Personalization & Productive Workplace Practices with IT-Knowledge Artefacts" [10].
- "Personalization of Mobile Health Applications for Remote Health Monitoring" [14].
- "Towards the Design of a Persuasive Technology for Encouraging Collaborative Prototyping" [6].

4 Research Challenges and Opportunities for PPT Researchers

Although the field of PPT is attracting increased research effort, there are important research issues and challenges that need to be addressed. The PPT attendees believe that future research effort should be focused on addressing the following issues:

- Frameworks and models for developing personalized persuasive technology
- Methods and Metrics for evaluating the effectiveness of personalized persuasive technology
- Long-term evaluation and evidence of long-term effect of personalized persuasive technology
- Systematically investigating and highlighting the difference between:
 - Adaptivity and Adoptivity
 - Automatic personalization and controlled personalization
- The relationships between individual characteristics and effectiveness of various persuasive technology features
- How to balance the cost and benefit of personalized persuasive technology (the level of personalization required for a maximum return on investment)
- How to avoid reproducing bias in personalized persuasive technologies
- How to develop ethical and privacy-sensitive personalized persuasive technology
- How and who manages personal profiles in personalized persuasive technology

Addressing these issues is crucial for advancing the field of personalization in persuasive technology.

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