Introduction to the special issue on persuasive technologies

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Most of the research conducted on persuasive technologies (or persuasive interactive systems) is based on Fogg' work (Fogg, 1999, 2003; Fogg, Cuellar & Danielson, 2009; Fogg & Eckles, 2007). According to Fogg, persuasion through information and communication technologies takes place at two levels: micro and macro. At the micro level, technologies may not have a persuasive outcome as the overall goal, but they may incorporate elements of influence. Micro persuasion can be incorporated into dialogue boxes, visual elements, interactive sequences which can lead to better performances or behaviour changes. This is the case with *Word* spelling and grammar checker, which helps you identify your spelling and grammar errors, and provides you with propositions. For Fogg, a system that reminds you to do something, which allows you to visualize your activity or encourages or praises you is a micro persuasive technology because it changes the way you think and the way you behave. On the other hand, the main goals of Web sites such as *Amazon.com* or *ebay.com* are to persuade users to buy. These sites are examples of macro persuasion. But commerce is not the one and only issue of the macro persuasive technologies. Every aspect of the daily life is concerned (education, energy conservation, sport activities, food, ecological driving, sustainability, smoking cessation, etc.).

Scientific publications on persuasive technologies are numerous. An international conference (Persuasive Technology) has even been dedicated to this specific topic for more than 10 years. But in spite of this scientific profusion and the creativity of the computer scientists and developers, many critics have been addressed to these technologies. Critics concern for instance the persuasive mechanisms currently implemented in these technologies as well as the methodologies used to evaluate (or not) their impact on users' attitudes and behaviours.

Under the aegis of AFIHM and the GDR I3, a working group (PISTIL: Persuasive Interaction for SusTainabILity, http://pistil.imag.fr/) was created in 2011 with the following goals: (1) identify in the French speaking scientific community the researchers interested in the issues of sustainability in human-computer interactions and more specifically by the persuasive technologies, (2) to elaborate a state of the art in the field and (3) to propose a research agenda for the years to come.

This special issue of the *Journal d'Interaction Personne-Système*, is the result of the meetings and the work carried out

since the beginning of the working group. This special issue is made up of 8 papers from French speaking researchers.

The first article (Fointiat & Barbier) presents a synthesis on the knowledge that has been accumulated over time in social psychology on the mechanisms of persuasion and on the relation between attitudes and behaviour. This paper reminds us of the definitions of these terms and presents the theories of behaviour change. This paper should allow researchers in the field to better explain the mechanisms implemented in their technologies and to better evaluate the impact they have.

The second paper (Foulonneau, Calvary & Villain) moves on the design of persuasive technologies. After presenting additional information on the theoretical foundations of behaviour, attitudes and their relations, on cognitive dissonance, on skills and motivations and information processing, the authors present models of human behaviours that are applied to persuasive technologies. Then, persuasive "principles" are proposed and described. These principles are illustrated with the help of design examples. A persuasive design method is also described. The authors end the paper with existing persuasive system architectures and examples.

Four papers are dedicated to a topical application domain, the energy consumption. The first paper from Cano, Laurillau and Calvary is a critical state of the art on persuasive technologies assumed to reduce energy consumption. The authors also rely on persuasive technologies that have been developed in sport and health. From this state of the art, the authors propose a classification organized into six dimensional design space. In particular, the concept of persuasion function is identified and defined, and six persuasion functions are identified. This classification space opens new research perspectives. The other three papers on energy consumption are from Senach and Negri. In their first paper, these authors combine the pleasure to play with persuasive technologies and they provide us with a ludo-persuasive toolbox for the design and evaluation of this type of systems. This proposition comes with two other studies. In the second one, Senach and Negri integrate ludo-persuasive principles that can be useful when designing such systems and these principles are then applied in a case study of energy consumption reduction.

In an evaluation approach of interactive systems with inspection methods, Brangier, Desmarais, Nemery and Prom Tep propose a grid that integrates motivational and persuasive dimensions to more traditional utility and usability dimensions. Following this proposition, Brangier, Nemery and Schmitt have conducted a study on the application of this grid for the identification of persuasive elements in user interfaces.

In this special issue, the reader will find a review of the psychological concepts used in the field of persuasive technologies, information on the software architectures of some current persuasive technologies, an overview of some application domain and many methodological perspectives for the design

and evaluation of persuasive technologies.

Édité par Pr. J.M.C. Bastien (Université de Lorraine) & Pr. G. Calvary (Univ. Grenoble Alpes)

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REMERCIEMENTS

BIOGRAPHIE

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est professeur d'ergonomie cognitive à l'Université de Lorraine et Directeur du laboratoire PErSEUs (Psychologie Ergonomique et Sociale pour l'Expérience Utilisateurs, EA 7312). Ses travaux portent principalement sur les méthodes d'enregistrement et d'analyse des comportements des utilisateurs de systèmes d'information et de communication et sur les méthodes d'évaluation ergonomique de ces systèmes.

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est professeur en Informatique à l'Institut polytechnique de Grenoble. Ses travaux portent sur la plasticité des Interfaces Homme-Machine (IHM). Son but est de fournir des modèles, méthodes et outils pour soutenir le développement d'IHM plastiques. L'approche qu'elle a le plus explorée est l'Ingénierie Dirigée par les Modèles. Elle défend l'unification des phases de conception, d'exécution et d'évaluation autour des notions de modèles et de transformations de modèles. Elle explore aujourd'hui la plasticité comme levier de persuasion technologique.