

SPECIAL SESSION

The Role of Behavior Measurement in Persuasive Settings

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Abstract

The goal of this special session is to investigate the role of sensor and behavior measurement in persuasive systems, in particular systems that are aimed at adherence to exercises and sustainable behavior change of humans, such as virtual coaching and training systems.

Persuasive settings can be characterized as communicative contexts in which it is common ground that one participant intentionally tries to change the behavior of another participant. Persuasive settings are dominant in health, education and commerce: a doctor tries to convince a patient to take the prescribed medication, a packet of cigarettes 'warns' a smoker for the lethal effects of smoking, and a salesperson tries to sell a particular product for a particular price. Persuasion often incorporates elements of resistance and contradiction: resistance, because without support of the persuader the individual will not show the desired change; contradiction, because despite the knowledge that a particular behavior supports an individual's well-being, something withholds the individual to perform the desired behavior in practice. Patients, for instance, may find exercises too strenuous or may simply forget the medication, smokers may lack motivation to quit smoking and the salesman's price may be too high. Persuasion is, therefore, a precarious process where timing, modality and content of messages should be carefully chosen to avoid the individual's withdraw and a premature stop of the communication process.

Currently, an interest emerges in developing automated systems that provide behavior changing support to patients and consumers without human interference. In these systems, methods from so-called persuasive technology are applied to implement effective communication strategies that support self-care, adherence to prescribed exercises and sustainable behavior change. These systems provide for anonymous and frequent monitoring, feedback and counseling that would otherwise be impossible. Modern mobile technology and web applications enable the delivery of advice and interventions in the appropriate form and modality, at the appropriate time, location and device; wearable sensors enable continuous measuring of relevant momentary information. In persuasive settings, tailoring of information plays a central role. Superfluous interruptions, erroneous messages and irrelevant information have to be avoided as much as possible. As a result, these systems should become familiar with a blend of characteristics of the individual and its environment: the current activity, daily behavior, ability to perform an exercise, physical circumstances, and so on. In other words, a prerequisite for the implementation of adequate persuasive strategies is a strong awareness of the characteristics and activities of the individual. Basically, there are two channels that provide the system of this information: a sensory channel that enables automated measuring of behavior, biosignals and environmental data, and a symbolic channel for the exchange of intentionally produced messages such as natural language.

Automated measuring of behavior by sensor information may have some important advantages over symbolic messages. First, data can be collected in a more objective and reliable way than when intentionally entered by human individuals (e.g. stress related or smoking behavior); second, the individuals need not to focus on the measurement process and can, therefore, avoid the tedium of tracking their own performance (e.g. a step-counter) and do not have to worry about the timing of the measurement (e.g. in cases of emergency); third, it enables individuals to become aware of otherwise unobservable behavior (e.g. sleep activity); fourth, frequent feedback of a device often provides motivation to perform the desired activity. As a result, the process may give the persuaded individual, the persuasive system and third parties relevant information for diagnosis, understanding and exercise performance and so substantially improve the quality of the interaction.

This special session is intended to bring together a group of researchers in the field of automated coaching and other behavior changing applications. Questions concentrate on, but will not be restricted to, sensor types and behavioral measurements in well-known persuasive settings, the reliability of behavioral measurement, the influence of the behavioral information on the interaction (in particular the timing, modality and content of messages), and the integration of symbolic input and sensor data. In this session, various persuasive applications will be discussed, ranging from automated sleep therapy to sustainability and activity coaching.

SPECIAL SESSION CONTENTS (sorted by paper ID)

Inter-usability and the Presentation of Multi-modal Feedback for Physical Activity and Diabetic Type II Patients

Randy Klaassen and Rieks op den Akker (University of Twente, The Netherlands)

It's LiFe!: A Monitoring- and Feedback Tool to Stimulate Physical Activity, Embedded in Primary Care

Sanne van der Weegen, Renee Verwey, Marieke Spreeuwenberg, Huibert Tange, Trudy van der Weijden, Luc de Witte (Maastricht University, The Netherlands)

Unobtrusive Sleep Monitoring

Reinder Haakma (Philips Research, The Netherlands) and Robbert-Jan Beun (Utrecht University, The Netherlands)

Unobtrusively Measuring Stress and Workload of Knowledge Workers

Saskia Koldijk, Mark Neerincx and Wessel Kraaij (Radboud University Nijmegen, The Netherlands; TNO, The Netherlands)

A Context-Aware Adaptive Feedback Agent for Activity Monitoring and Coaching

Harm op den Akker, Valerie Jones, Laura Moualed, Hermie Hermens (Cluster Telemedicine, The Netherlands; University of Twente, The Netherlands)