
Persuasive End-User Energy Management

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Abstract

This paper describes the objectives and work program of the PEEM (Persuasive End-user Energy Management) project. PEEM is a cooperation of CURE, the ICT&S Center at University of Salzburg and SalzburgAG and will run for two years starting in July 2010.

Keywords

Energy Feedback, Ambient Displays, Persuasion

ACM Classification Keywords

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

PEEM

The objective of the PEEM project is to research and develop new strategies and tools for the home context that provide energy-related feedback to the customer in a persuasive and unobtrusive way. We want to utilize the potential of ambient displays for reducing energy consumption without loss of comfort for the users. Tailored persuasive approaches overcoming limitations of existing solutions will be developed, prototyped and experimentally validated with real user in realistic long-term settings.

Research has shown that detailed feedback on domestic energy consumption can substantially contribute to achieve durable effects on energy savings in private households [1]. However, existing solutions such as regular energy bills or conventional home energy

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3 Examples for ambient energy feedback: Power Aware Cord (top), Energy Orb (middle), Energy AWARE Clock (bottom)

displays provide the feedback untimely or in a way that is difficult to understand. It requires the user to make mental efforts to translate the available information into appropriate actions. Furthermore, the information is not presented in the context where it is needed most i.e. when interacting with the home appliances or environment. Therefore the feedback lacks a direct and tangible link to the consumers' behaviour. Current mechanisms also frequently have shortcomings with regard to long-term effectiveness, as initial results tend to wear off once the novelty effect is over [4].

PEEM therefore aims at improving the communication of energy feedback by seamlessly integrating it in the environment of the user and providing it where and when it is most useful and efficient. Such an integration of feedback could increase the comfort of the users, as no abstract translation and explicit attention towards achieving the goals is needed. Moreover, positive effects on the sustainability of behaviour change are expected.

The main starting point for the study is to explore persuasive technologies to influence behaviour towards optimized end-user energy management. Recent technological progress especially with regard to computational power, connectivity, availability of data and equipment cost allows deploying persuasive technologies in more and more contexts economically. Hence, advanced strategies of persuasion are technically possible. The potential of such approaches have been shown in different contexts (e.g. [2][3]). Within PEEM we aim to systematically explore the possibilities of ambient persuasive home displays for energy savings and develop targeted strategies for achieving energy-savings in the context home. PEEM

will build on knowledge from existing design concepts and approaches, three especially relevant examples are shown on the left.

The developed persuasive ambient displays will be experimentally evaluated in 30 households in and around the city of Salzburg. As we are interested in long-term effects the devices will be in use for 6 months in the households allowing us to differentiate between initial and sustainable effects.

The project will deliver valuable results on different levels. First, new prototypes and tools for providing situated and persuasive energy feedback will be developed. Second, guidelines on how to best implement ambient energy feedback in the home context will be defined and third, an empirical quantification of achievable effect sizes using persuasive ambient displays is determined.

References

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