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User Control Support in Smart Homes

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Abstract

A smart home is a context-aware system that adapts itself autonomously in response to context to satisfy user needs and to improve safety, security, resource use, etc. On the one hand, software autonomy serves the basic purpose of pervasive computing by reducing interaction with the users, easing the use of the system, and reducing the user distraction. On the other hand, it takes control away from the users of the applications, making users feel loss of control over their context-aware applications. The situations including applications may not behave as expected, user preferences may change over time or users may want to add new behaviors, etc, may arise and require smart home users to interact with the applications to control their behavior. This research addresses this issue and proposes an approach, which would provide a wider support of user control by exposing and manipulating (1) application parameters, (2) adaptation logic(s) thus allowing users to add new behaviors. Using this approach a complete system is developed in order to see its effectiveness; furthermore the system is tested on three different context aware applications and a preliminary usability study is done to evaluate the system effectiveness.

Keywords: User control, Context awareness, Smart homes, Adaptation logic modifications, Jess, User Control Manager.

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