

Turn on the lights: investigating the Inspire voice controlled smart home system

Heleen Boland¹, Jettie Hoonhout¹, Claudia van Schijndel¹, Jan Krebber², Sebastian Möller², Rosa Pegam², Martin Rajman³, Mirek Melichar³, Dietmar Schuchardt⁴, Hardy Baesekow⁴, & Paula Smeele⁵

¹Philips Electronics Nederland B.V., Eindhoven, The Netherlands

²Institute of Communication Acoustics (IKA), Ruhr-University Bochum, Germany

³LIA, Ecole Polytechnique Federale de Lausanne (EPFL), Switzerland

⁴ABS Gesellschaft für Automatisierung, Bildverarbeitung und Software mbH, Jena, Germany

⁵TNO Human Factors, Soesterberg, The Netherlands

Abstract

The Inspire project aims to realise an interactive spoken dialogue system for wireless command and control of home appliances. In terms of the user interaction approach adopted, this could be done in basically three ways: via an embodied agent mediating between the user and the devices, via an invisible agent (ghost), which mediates between the user and the devices, or by directly interacting with individual devices. In the test described in this study, human factors aspects of this system, and of the three different interaction metaphors, were investigated. Questions that were addressed included: appreciation of the different metaphors, suitability of voice control for the different devices that were included in the test set-up, and other aspects of the system that are of interest regarding the actual interaction of the users with the systems. Data were collected through observations regarding the participants' opinions on various aspects of the Inspire system. Furthermore, data for various dialogue parameters were collected using a specially developed annotation tool. The main conclusions are that the interaction with the individual devices was preferred most compared to the other interaction approaches; that there was a difference in preference of interaction approaches between older and younger users; and that in developing these types of interaction systems it would probably be more beneficial to focus on the size of the vocabulary and the flexibility rather than 'human-human' like interaction in terms of grammar and social standards.

Introduction

The technological complexity of electronic devices in and around the house, or rather the way to operate these devices, is increasing fast. Nowadays more and more users of such devices, certainly user groups such as elderly and technically non-inclined people, are faced with difficulties even when performing daily tasks. Intelligent user interfaces that can function as 'home assistants' might facilitate these