A Study of the Use of a Virtual Agent in an Ambient Intelligence Environment

Germán Montoro[1], Pablo A. Haya[1], Sandra Baldassarri[2],
Eva Cerezo[2], and Francisco José Serón[2]

[1] Computer Science Department - Universidad Autónoma de Madrid
Francisco Tomás y Valiente 11. 28049 Madrid, Spain
`{German.Montoro,Pablo.Haya}@uam.es`
[2] Advanced Computer Graphics Group (GIGA) - University of Zaragoza
Engineering Research Institute of Aragon (I3A), Zaragoza, Spain
`{sandra,ecerezo,seron}@unizar.es`

Abstract. In this paper we present the results in the evaluation of the use of a virtual agent together with a spoken dialogue system in an ambient intelligence environment. To develop the study, 35 different subjects had to perform eight different tasks and fill in a questionnaire with their impressions. From the answers we can conclude that the use of the virtual agent does not provide an improvement in their appreciation of the conversation performance but it offers them a more human-like interaction. Only a minority of users preferred to maintain the conversation without the visual support of the virtual agent.

1 Introduction

In this paper we review a test case study of the use in a real ambient intelligence environment of a virtual agent to assist the spoken interaction. Users had to perform different eight tasks in the environment (such as switch on or off the lights or open the door) with and without the help of the virtual agent. The system was tested with 35 different users. From them, only eight subjects (23%) had previously interacted with an automatic response dialogue system. User's gender was balanced; while 45% of the subjects were women, the other 55% were men. Once users had finished with all the tasks they had to answer a questionnaire to measure their grade of satisfaction with the system.

2 Evaluation of the Use of the Virtual Agent

The questions were related to the employment of the virtual agent in the conversation. Most of the answers did not have a direct relation with the system performance and corresponded to the subjective impressions of the users:

- Almost half of the subjects (46%) felt more comfortable looking at the virtual agent while they interacted with the system. Only 26% of them felt some kind of discomfort and 28% of the subjects did not appreciate any difference. We can

notice that most of the users felt better having the visual support of the virtual agent but also that 1 out of 4 users considered this as a disadvantage.

- Most of the subjects (68%) did not feel disoriented when they did not use the virtual agent for the interaction. Only 11% of them felt lost. Therefore most of the users felt that they could continue with the dialogue in the same conditions even without the presence of the virtual agent.
- The same amount of subjects (37%) considered that the conversation was improved by the use of the virtual agent and that it was not affected. This shows that the employment of a virtual agent did not have a specific effect in the appreciation of the users of the conversation performance.
- Only 26% of subjects answered that looking at the agent did not provide them any stronger feeling of carrying out a conversation with a human being. This points out that the use of the virtual agent can result in a higher degree of naturalness and "humanity" to the interaction with the system.
- And perhaps the most important point was the user preference for the interaction with the environment. Almost half percent of the subjects (48%) preferred to interact with a virtual agent in their conversation with the ambient intelligence environment. Only 14% of them considered that they preferred to carry out the interaction without the support of the virtual agent. Finally, 38% of the subjects did not express any specific preference.

3   Conclusions

With these results we can see that the use of a virtual agent does not provide a strong improvement in the dialogue (as few as 11% of the subjects felt disoriented without it and only 1 out of 3 considered that the performance got better). This means that, for general users, the employment of a virtual agent does not become a required requisite to improve the performance of the interaction in an environment.

Nevertheless, half of the subjects preferred the interaction with the virtual agent to just the oral communication. Besides, most of the subjects answered that the virtual agent conferred more humanity to the interaction and the 46% of them felt more comfortable looking at it.

According to these results we can conclude that since the use of a virtual agent may not provide better results in the interaction, it can have a key role in offering the users a more natural, pleasant and human-like communication with the environment.

Acknowledgments