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An assistive system to improve game usability for patients with cognitive disorders.

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Purpose

With the ageing population, Alzheimer's disease and related pathologies are a major public health challenge. In parallel, new technologies of information and communication take an increasingly important role in our daily life and can be a support for both the evaluation and the direct support of users. Serious games¹ are computer applications, whose intention is to combine with consistency, both serious aspects (Serious) as teaching, learning, communication, rehabilitation, with playful aspects from the video game (game). Under the AZ@GAME project² winner AAP e-health #1 of Future Investments, games have been developed with the aim of stimulating cognitive and physical abilities of the patient. One of perceived problems concerns the engagement of patients to understand and to practice these games. Beside of lack of game culture and limited acceptance towards new technologies, memory and cognitive impairments provoke many difficulties of use and influence negatively on their game performance. Thus, engagement of patients decreases progressively and patients cannot benefit all the positives effects of games.

Method

We present an automated support system (*Figure 1*) containing a virtual avatar that can interact and provide help in different appropriate moments thanks to engaging strategies based on patients activities and game states. The system has been tested in three experiments with patients (94 participants including 51% man and 49% woman with an average age of 76 years old) distributed in three cognitive states (Mnesic Complaints, Mild Cognitive Impairment and Alzheimer's disease) who participated in a training session using the game to boost concentration attention. The games were offered with or without the help of the system.

Results & Discussion

The first results³ have remarked that most patients can interact with the avatar and accept its invitation to play games. The second results⁴ have emphasized usability of the system. Patients have better performance when playing with support of the system than when playing alone, especially among Alzheimer's patients. The last results⁵ have confirmed efficiency of the system compared with a therapist. Alzheimer's patient can have similar performance thanks to the system, as compared to playing with a therapist. All of three experiments have been realized in a hospital in a short time. A longitudinal study in other real contexts (e.g. living home) is necessary for analyzing the use of the system with patients in long-term.

References

1. Alvarez J. Du jeu video au serious game [From video game to serious game]. Dissertation. Université Toulouse; 2007
2. www.azagame.fr; retrieved March 7, 2012.
3. Phan Tran MK, Robert P, Bremond F. Comment intéresser les personnes âgées aux Serious Game? [How to interest older adults in the serious game ?]. Journée Annuelle SFTAG 2014, Novembre 2014, Paris ; HAL Id : hal-01092329
4. Phan Tran MK, Robert P, Bremond F. Assistance for Older Adults in Serious Game using an Interactive System. The Games and Learning

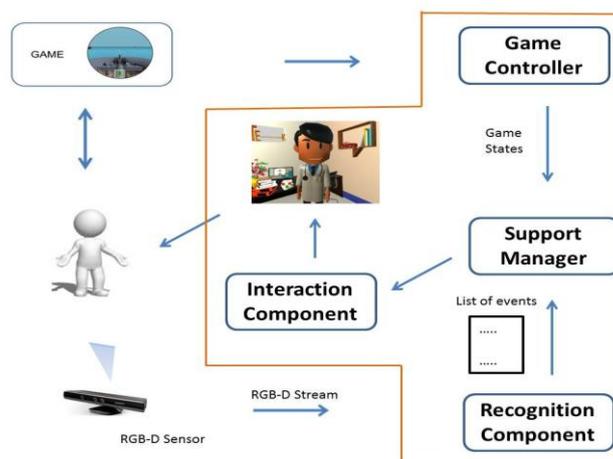


Figure 1 - Support system structure

Alliance Conference (GALA2015), Rome December 2015; doi: 10.1007/978-3-319-40216-1_30

5. Phan Tran MK, Robert P, Bremond F. A virtual agent for enhancing performance of older adults with dementia in Serious Game. The 3rd Workshop Affect, Compagnons Artificiel et Interaction (WACAI 2016), Brest, June 2016; HAL Id: hal-01369878

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