

Video Games and Virtual Reality

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Purpose To assist elderly people at home, our research group has been developing a system called *Virtual Care Giver (VCG)*¹, which integrates *Virtual Agent (VA)* technology with the Internet and smart home. The VA is an animated human-like chat bot program with speech recognition and synthesis technologies. A user can interact with the VA via voice. Connected to behaviors of the VA, VCG can display supplementary texts, pictures and movies in a Web browser. Using VCG, we have implemented elderly care services, such as daily greeting, routine reminder, and favorite song movie. The principle of VCG is to provide *personalized care*, considering individual situations and circumstances of elderly people. Especially for people with dementia, the philosophy of person-centered care is important. In the current system, however, every conversation of VCG relies on a pre-determined *playscript*, written by a developer. To adapt to individual people with dementia, the developer has to write an enormous number of playscripts to cover all possible situations. The purpose of this research is to explore methods that *dynamically create personalized dialogues* in VCG, especially for individual people with dementia.

Method We implement two methods to achieve the purpose. The first method exploits *life history* and *Linked Open Data (LOD)*. The life history is personal information of a person about how they have been living so far. It includes birthplace, family, school, work, reminiscence, and hobbies. VCG obtains a user's life history by a given assessment sheet, or by directly asking the user. Using the life history, VCG generates questions, and plays favorite songs and movies. According to the response from the user, VCG also tries to expand the conversation by finding associated words from LOD and uses the new words for the next conversation. The second method focuses on the *user's life stage* to use memorable events and fashions in the world within the conversation. From the birth year of a user, VCG estimates years of major life stages of the user, such as graduating school and finding employment. For each year of the life stage, VCG acquires related events and fashions from open data on the Web. Assuming that the events and fashions happened in these years should be memorable for the user, VCG generates explanations and questions about them, and also plays related pictures and movies using cloud services such as YouTube. We implemented the proposed method using LOD of *DBPedia Japanese*² and *LinkData*³, and the events & fashion lookup table of the *KAZOKU-ISAN project*⁴. The method was then integrated with the existing VCG system.

Results & Discussion We conducted an experimental evaluation with actual elderly people. In the experiment, five elderly people in an elderly day service center participated, and each of them talked to VCG through a thirty-minute session. It was shown that personalized dialogues well promoted conversation of the elderly people. Elderly people with light and mild dementia remembered some events that happened in their youth. Especially, the effect of memorable songs was significant. When the songs matched their favorites, the elderly people really enjoyed the session, and appreciated VCG for the conversation.

References

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