

Creation of a 'Caricature Robot' for social inclusion

J. SEBASTIAN, Y-L. HSU, J-M. LU. *Creation of a 'Caricature Robot' for social inclusion of older adults*. *Gerontechnology* 2014;13(2):278; doi:10.4017/gt.2014.13.02.383.00 **Purpose**

Communication and social participation for older adults has become an increasingly important need within an aging society. Telepresence Robots carry with them a set of technologies that provide a distinct advantage in helping older adults maintain social inclusion¹. One challenging problem is how to include a robot in the homes of older adults and caregivers, while making it feel like a natural part of their daily life? This paper presents the development of WOBOT, which is a hybrid telepresence and companionship robot that offers interactive communication through video conferencing and tele-operated facial expressions, body motions, and built-in autonomous reactions. WOBOT is simple, non-humanoid robot that emphasizes 'fun' rather than 'functions', hoping to aid our elders in communication, leisure, and companionship.

Method WOBOT is our first design of a series of 'Caricature Robots', which are non-humanoid robots that show humanoid motions in simplified or exaggerated ways. When stationary, WOBOT appears as a photo frame with two hands holding a tablet computer (*Figure 1*). With three degrees of freedom in motion, WOBOT's motion design is based on principles of cartoon character design², used by animators to produce animated films. WOBOT brings some of the features of animated characters into real motions. *Figure 2* shows the information structure of WOBOT. The remote user manipulates WOBOT through the user interface on a smart phone/tablet/PC to show cartoon-like facial expressions and body motions while video conferencing with the local user, the older adult staying with the robot in their home environment. By providing both verbal and nonverbal elements of interpersonal communication, the robot can better serve as the family members' or caregivers' avatar for expressing their care to the older adults at home. WOBOT is not only a communication gate, but also offers a set of autonomous reactions to interact with the older adults like a companion robot. WOBOT is in a "Body and Brain" system structure that enables it to be an open platform. New applications can be added by developing Apps on the tablet (brain), which transmits commands to the robotic platform through Bluetooth to perform requested motions. **Result and Discussion** A lab-based evaluation, in which 16 older adults aged 52 to 80 interacted with a facilitator through WOBOT, showed positive results regarding seniors' acceptance of WOBOT. Older adults' levels of anxiety were low while interacting with WOBOT, based on their heart rate; also, the level of concentration while interacting with WOBOT was high, based on eye tracking records. With the aim of creating robots acceptable to seniors' for use in their homes, and following the Caricature Robot approach to expression and movement design, WOBOT Junior - a smaller version, to be controlled by a smart phone - is currently under development.

References

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Keywords: communication & governance, robot, communication and social participation

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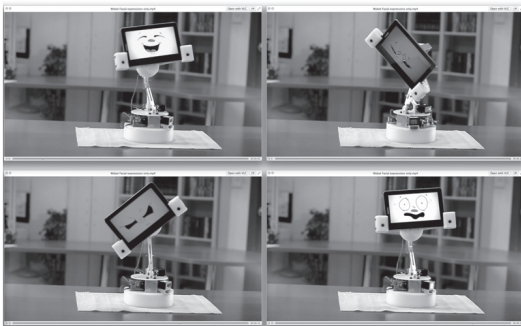


Figure 1. WOBOT prototype

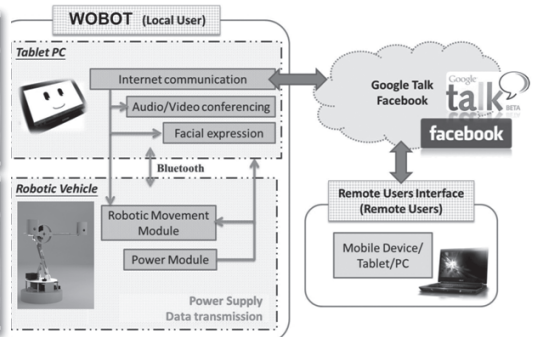


Figure 2. WOBOT system structure