

Human robot dialogue in a training setting for elderly people

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Purpose The Northwest of Germany and the northern part of the Netherlands are rural areas affected by urban migration. Young people flee from their hometowns to economically and culturally more interesting cities. The elderly are left behind. Due to the poor infrastructure for example culture centers are often difficult to reach in rural areas. Therefore, the motivation to be physically active decreases (Zahner et al. 2015). It is particularly important for older people to be physically active in order to avoid immobility and the resulting illnesses or injuries (Bischoff 2012). These usually would lead to long-term stays in nursing homes where there is often not enough nursing staff (Neu & Nikolic 2015). In order to avoid this, a training assistant is being developed that help people to stay in their own homes for as long as possible and thus relieve the strain on nursing staff. It consists of the humanoid robot NAO from Softbank Robotics and a self-developed training and communication framework. The training assistant is intended for use at home or in senior groups. It is also important to joyfully mobilize people so that the targeted users are willing to do physical exercises like a game on their own (Fasola & Mataric 2012). To take the concerns of the users into account adequately, the development of user interfaces is a significant task. **Method** Mixed research methods are used. A quantitative survey was chosen as a pretest to gain an impression of how the acceptance of robotics and training assistants could be among older people. The residents of a nursing home (N=17) were interviewed. Partially standardized questions on health, handling technology and robotics provided a good overview. The idea of the training assistant was to have a device, which demonstrates all relevant exercises and to use it in physiotherapeutic treatments especially for older people. In order to verify this concept, the method of focus group research was used. Nurses, physiotherapists and doctors were invited as Focus Group (N = 7). Guideline-based expert interviews were then conducted to provide answers on what the dialogue framework should look like. Physio-therapists and occupational therapists (N=4) were interviewed. **Results & Discussion** Game factors can increase user acceptance and satisfaction and have a highly motivating effect (Moro et al. 2019). According to our survey, the general interest in training with a robot training assistant is high. The best choice for the modality of the interaction system appeared to be language-oriented. The results from the focus group were revealing: the applicability in his current concept for therapeutic purposes is not possible in this way. The therapists work with media and mostly with their hands on people, and the time factor in these professions should not be underestimated. So we came to the conclusion to use the assistant rather preventive. The results of the interviews on the dialogue framework indicate that the dialogue system has to address its user individually.

References

- A. Bischoff, „Richtiges Training bewahrt Senioren vor Stürzen.“, *MMW-Fortschritte der Medizin*, Nr. 3 (154), 2012, p. 33.
- C. Moro, S. Lin, G. Nejat, A. Mihailidis, “Social Robots and Seniors: A Comparative Study in the Influence of Dynamic Social Features on Human-Robot Interaction”, *International Journal of Social Robotics*, 11, Springer, 2019, pp. 5 – 24.
- C. Neu and L. Nikolic, „Versorgung im ländlichen Raum der Zukunft: Chancen und Herausforderungen“, in U. Fachinger and H. Künemund, (ed.), „Gerontologie und ländlicher Raum“, Wiesbaden: Springer Fachmedien, 2015, pp. 185 – 206.
- J. Fasola and M. J. Mataric, “Using socially assistive human–robot interaction to motivate physical exercise for older adults.”, *Proceedings of the IEEE*, 100 (8), 2012, pp. 2512 – 2526.
- L. Zahner, L. Donath, O. Faude, M. Bopp “Strength training in the elderly. Backgrounds, targets and implementation. Krafttraining im Alter. Hintergründe, Ziele und Umsetzung.” *MKG-Chirurg*, 2015, pp. 21-25.

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Figure 1. The Training Assistant with NAO Robot