

I. BÄCK, J. KALLIO, S. PERÄLÄ, K. MÄKELÄ. **An assistive humanoid robot for elderly care.** *Gerontechnology* 2012;11(2):357; doi:10.4017/gt.2012.11.02.624.00 **Purpose** The purpose of our research is to understand the opportunities and limitations of the employment of an assistive robot¹ in elderly care in nursing homes. The research work for the study presented in this paper takes place in three private elderly care institutions in the Finnish county of South-Ostrobothnia. Our goal is to clarify how the robot can be used to assist staff of these institutions in practical tasks, e.g. remote monitoring. **Method** In our research project, we are studying a NAO H25 robot manufactured by Aldebaran Robotics² (Figure 1). NAO is a programmable humanoid robot that is 57cm 'tall'. It is capable of autonomous movement using its electric motors and actuators. It contains a variety of sensors and devices including cameras, microphones, distance sensors, voice synthesizer and speakers. The robot has a wireless local area network (WLAN) connection for communication and information transmission. One of the key application fields of our research is monitoring nursing home residents. We designed a prototype system that utilises the standard telecare system installed in the nursing homes, including alarm buttons and door sensors. The robot is able to receive alarms, and independently navigate to the room or area where the alarm was sent. Once it has entered the room, it can transmit real time images from the room, and also open a voice connection between the resident and the remote caregiver. This way the staff of the monitoring center can establish a real-time voice and video connection to the resident, check his or her condition, and take appropriate actions. **Results & Discussion** We tested and demonstrated this prototype system in the three nursing homes that participate in the project. In the experiments, the robot was able to operate inside the nursing homes, receive alarms, and transmit images and voice over the internet connection. An obvious limitation is the small size of the robot that may cause difficulties in accessing the rooms and avoiding obstacles. Also a relatively short battery-life was identified as a limitation of the prototype system. However, the results show that a commercially available humanoid robot can be used as a tool in remote monitoring. It can cooperate with the existing telecare technology installed in the nursing home, and therefore its deployment is relatively straightforward and does not require investments in additional equipment. It is obvious that the tasks described in this paper could be carried out also by using fixed cameras and telephone systems installed in the rooms of the residents. However, that kind of approach would impinge on the privacy of the residents; one of the key valued factors in the home-like living environments provided by nursing homes.

References

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Affiliation: Tampere University of Technology, Seinäjoki, Finland; E: iivari.back@tut.fi

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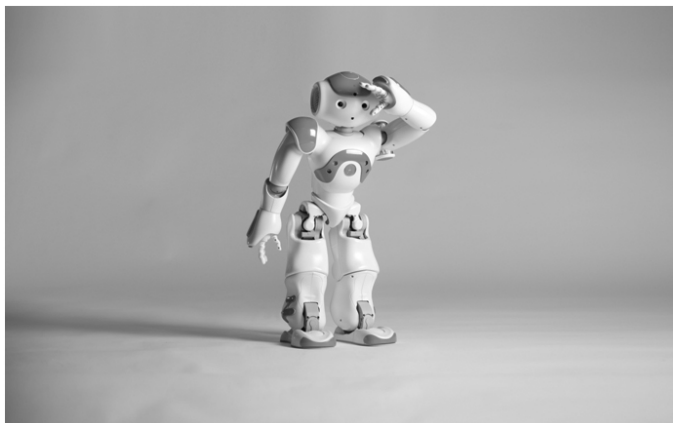


Figure 1. A NAO robot used in our research project