

Study explores the potential of using a humanoid robot to entertain the elderly

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An image of Nadine at an elderly care home. Credit: Mishra et al.

Humanoid robots have the potential of assisting humans in a variety of settings, ranging from home environments to malls, schools and healthcare facilities. Some roboticists have been specifically

investigating the potential of social robots as tools to offer care and companionship to the elderly population.

Researchers at Nanyang Technological University have recently carried out a study exploring the potential of a humanoid robot for entertaining residents of an elderly care home. Their paper, pre-published on arXiv, specifically examined the reactions of a group of elderly individuals as they played Bingo with a social robot called Nadine.

"The main goal of our paper was to investigate whether a robot with human appearance and gestures can support the elderly, particularly by entertaining them with games, such as Bingo," Nadia Magnenat Thalmann, one of the researchers who carried out the study, told TechXplore. "We wanted to find out whether these kinds of robots can help to decrease loneliness among the elderly, offering a presence and stimulus by playing games with them at any time of the day."

Nadine, robotic platform used by Magnenat Thalmann and her colleagues, is a [social robot](#) that can communicate with humans in [different languages](#), including English and Chinese. In addition to communicating in human languages, Nadine can tell different users apart by recognizing their faces and can initiate in-depth discussions with them.

"Nadine is also capable of setting up games and leading a game, such as Bingo, by announcing the numbers and revealing who the winner is," Magnenat Thalmann said. "She can play slowly and can also repeat the numbers several times, to ensure that the elderly understand them and have time to examine their cards and check whether they filled a full row or column."



An image of Nadine leading a game of Bingo. Credit: Mishra et al.

To assess the potential of Nadine as a tool to entertain the elderly, the researchers tested it at Bright Hill Evergreen Nursing Home, an elderly care home in Singapore. Their study was carried out on 29 residents of the care home, who were at least 60 years old.

In their experiments, Magnenat Thalmann and her colleagues used cameras to monitor and track the facial expressions and gestures of participants as they played Bingo with Nadine. They specifically assessed their levels of attention, reactivity and joy as they interacted with the robot.

Subsequently, the researchers compared the data they collected with similar data collected as the participants played a game of Bingo led by a single nurse or a group of nurses, without the involvement of Nadine or other social robots. Surprisingly, they found that the residents seemed more attentive and entertained while they played Bingo with the [robot](#) than when they played with nurses.

"Our findings suggest that the elderly participants were significantly happier and more attentive when playing with Nadine," Magnenat Thalmann said. "This means that in the future [humanoid robots](#) could be introduced in elderly care homes to keep the residents company, keep them entertained and play games with them when nurses are otherwise engaged."

The study carried out by this team of researchers could ultimately inspire care homes to purchase and start using social robots, such as Nadine, to entertain their residents. Meanwhile, Magnenat Thalmann and her colleagues plan to continue exploring the potential of social robots as assistants, companions and caretakers.

"We now plan to continue developing social robots, improving their ability to understand situations and act accordingly, with greater awareness of what is going on around them," Magnenat Thalmann said. "In the case of Nadine, for instance, we would like her to be able to move more freely in her surroundings, physically approach users and interact with them directly."

More information: Does elderly enjoy playing Bingo with a robot? A case study with the humanoid robot Nadine. arXiv:2105.01975 [cs.RO]. arxiv.org/abs/2105.01975

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