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Week 5

Towards robotic assistants in nursing homes: Challenges and results

This paper, on a nurse robot whose functions were acting as a non-intrusive reminder service and a guide, raised a number of compelling issues for the design of relational machines. The authors noted that the speed of the robot was critical when guiding elderly people, who exhibit a significant range of motive speeds. While we have been discussing relational machines in terms of forming a cognitive relationship, which is adapting cognitively to their user, this demonstrates that there is also a physical component that must be considered -- where appropriate, a relational machine must be able to make physical accommodations to its user.

Two of the four Nursebot goals are worth mentioning again, as they have particular relevance to relational machines and what we have learned from other areas: the robot must avoid annoying the user, and must avoid making the user overly reliant on the system. These should be considered in the context of the expectations that the user has -- as the machine behaves more like a human assistant, users will expect them to respond to human nuance and social compacts, and when actual behaviors deviates from this there can be problems (e.g. a human nurse would be able to pick up on signals that he or she was being annoying, or that the patient was becoming excessively reliant).

The focus on consideration of uncertainty was also important; as the paper states, the cost of giving the wrong reminder or sending the robot to the wrong place can be large in this type of application. The technique of making POMDPs tractable for large state spaces seemed very useful.

On a practical note, I liked the way in which they started the experimentation with open-ended interaction lasting several days, in which the robot could perform non-critical tasks while acclimating the elder users to its presence. This seems to be a good technique for establishing a sensible baseline, and many other robot-elderly studies we see could probably benefit from it.

Is an Entertainment Robot Useful in the Care of Elderly People With Severe Dementia

This paper (comparing an AIBO to a toy dog in interactions with dementia patients) is an example of the ad hoc nature of many of these types of studies. The study states that its aim is to help patients to remember past happy experiences, but there is no direction of the measures taken towards evaluating this, and there seems to be little about the design in general that takes this into account. There is no attempt to use a gender-balanced subject pool (12 females to 1 male). Activity is classified into categories including "caring", which is not defined or discussed. The OT intervenes freely in a manner that is not experimentally controlled. The toy dog appears more familiar to the patients and

more useful in stimulating their activity. The researchers conclude that both were effective, but it seems to me that the novelty of having something there to play with may have made the most difference, and a longer term study might be more revealing. The researchers also conclude that the patients were remembering past comfortable experiences with a dog when they interacted with the toy dog, but I see little to support this conjecture.

Effects of Robot Assisted Activity to Elderly People who Stay at a Health Service Facility for the Aged

This documents a study that compares interactions with a 'Paro' seal robot to a 'placebo Paro', by elderly people in an eldercare facility. This study has some interesting points - both Paro robots appear to decrease the stress of the patients, though there are still some methodological issues (e.g. the urinalysis component really should have been ignored). Once again there may be a novelty effect, but some of the anecdotes presented are compelling enough - e.g. the elderly man making a song for Paro and singing it - that it may well be worth introducing such robots even for novelty effect. Still, it seems that there is relatively little 'relational' about Paro. In addition, the differences between the two Paros (practical, not in terms of experimental results) seem so small that it is hardly worth making the comparison; the real robot should be developed to have a complexity that is more obvious from its outputs, not just to its designers.