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Week 5

A little hindsight pre-comment: These papers were rather painful, with the exception for the Paro paper, especially coming from an interaction and UI background. Not that they aren't good to study (at least for what one should actually do in a research study), but they are painful for the realization of what gets accepted for publication. This will be a long rant, so please bear with me if you will.

Towards robotic assistants in nursing homes: Challenges and results

Localization method: This method is a pretty good method for sonar and laser rangefinders, which produce a bunch of x/y/z points as output. Take a bunch of sensor readings. Now you know where various things are (dots on the surfaces intersecting rays emanating from your own position). But you don't know which dots are connected to which others, or what is what, because you only have dots (plus, the dots are noisy). First, characterize out things that don't look like people (people don't look like planes, for example). Now move a little, and take another scan. Compare with last scan, and see what stayed put given what you know approximately about your own motion. Look for something that's moving like a person. From that, you know where people are. Now lock on to the one that's moving along with you, and because people (or objects) don't disappear into smoke, and you can keep thinking they are there even if you can't see them a while.

As I read this paper, one of the first things that I notice is that this is a paper about designing a robot, and not about designing an interaction experience. In particular, the focus is on what the author feels is the shortcomings of a robotic system, as opposed to the shortcomings of the environment of the user, in this case a declining elder. Even the name is suggestive of this fact, because "Autominder" to me sounds like either a possessed copy of Outlook, or some sort of electronic shepherd (and in fact the design is exactly that, with 2 PC's running the respective apps).

The verbal capabilities of the system are almost nonexistent, and I find this to be a major flaw as well. A primary responsibility of the caregiver on the sort of trips this robot is meant for is to provide human contact and conversation. While human beings will probably have a hard time with this, there is no reason the robot should not at least babble about things. It could, at the least, babble about recent news headlines and then just listen to the elder, which in my opinion would be a great improvement in the interaction quality of the robot. I also found it interesting that the caregivers wanted to have a good head unit (ie, have the thing look anthropomorphic). The authors completely gloss over the physical aesthetics of the device in their work, but I suspect that this was a call for a more humanistic design.

That said, I found the localization method to be fairly interesting, though the explanation of it would be completely impractical to understand. I normally don't write summaries, but I put one here because I would hate to have to parse those paragraphs again, and

someone else might find it useful as well. As again, the design is indicative of the goals, and the system is not designed to know who a person is per se, but to make presumptions about people being in their rooms. This to me is a blatant attempt at putting people into machine boxes. I very much doubt that it would promote the values that last week's papers indicated were important to the elderly, and might well work against those values. The touch screen confirmation of reminders is also troubling to me, because it turns the "reminders" basically into commands (instructions if you want to give benefit of doubt), and I think this will certainly be problematic in cases where the elder has little interest in adopting such technology into their lives to begin with. The excitement that the authors boast about is more than likely excitement about the new-ness of the device more than its actual functionality, and the studies really do not support any such conclusions about real acceptance. That would, as last week's paper pointed out, take a few months to fully manifest.

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

Is the author of this paper in the 10th grade? Where exactly is the animal in this animal-assisted therapy paper? So here we go again... robot vs. toy... round two... FIGHT! (And the toy gets the stuffing beaten out by the \$2000 robot). We have many questions, and very little evidence of answers (or actual evidence).

Jokes aside though, I would be wary of trying to map this study about Japanese elderly to the American elder group. Firstly, the problem is Japan is much worse than it is here, and there is acceptance of the facts. Here, on the other hand, there is neither understanding nor acceptance (though there is a significant quantity of hot air) within the population of baby boomers who will be causing the same problems that Japan is already facing due to the consistently low birth rates since the American baby boomer era.

If that weren't enough, it seems that in a surprise upset, the AIBO actually got the beating this time, because the subjects could not identify it without help, and the interactions were more muted, calling into question whether the authors actually read their own paper on the way to writing their abstract. Additionally, the lack of a real animal control (or even a real stuffed dog control) causes the conclusion to be "the AIBO/toy dog is better", with the "better than what?" question as again going unanswered.

Effects of Robot Assisted Activity to Elderly (...)

After reading these papers, I have come to the conclusion that the choice of the seal is absolutely brilliant! After all, no one expects that you would drag a real seal into the nursing home for a control experiment. And even better, TV has programmed us all with such happy images of what seal cubs should be (puppies with flippers!) that they are just about as good as dogs for the job, without worries of the subject having had bad seal experiences in their childhood. How many of us have gotten growled at by a mean seal anyway? Although I am phrasing this somewhat facetiously, I do believe that the choice of the scope, design, and content of an interaction experience, and especially the choices of prior experience and imagery to use, is an important and difficult task, and that the

authors have indeed made a rather brilliant choice on all accounts, and deserved to be praised for it. The choice of measurement is perhaps a little less so, but one can't complain about accuracy.

I find that it is interesting that the authors chose to attempt to gain commitment from the users to Paro, and moreover, to do so by embodying the same level of intelligence one would find in a real seal. This simplicity, which is a contrast to an AIBO, may be a good thing in terms of being able to communicate the internal state to the users. This clarity of purpose, something that humans generally do not display, but that dogs often do, is generally in opposition to closeness and trust. This suggests that this method of bypassing the issue is probably more valid than attempting to create a device that is meant from the beginning to be anthropomorphized, at least for these specific purposes. In a related note, it seemed that the simple Paro placebo was just about as effective as the real one, and this makes me wonder how much interaction (and the related cost) is actually required for there to be a positive long term effect on highly declined elders. The test results are definitely interesting, and I would be interested in seeing even a sparser testing over a longer period of time (I guess that's Cory's research work?).

Wheesley: A Robotic Wheelchair System: Indoor Navigation and User Interface

I think the #1 problem with a joystick is not that it is a bad control, but that it's not a control with a sufficient number of degrees of freedom. From any point, a human being can move forward or sideways, but a human can also turn. While wheelchairs have this capability, the control is ill suited to actually using it in a fluent manner. This doesn't affect jets and cars, because those systems are designed for motion, while a wheelchair (though it looks like a car) is, or at least should be, designed for use in mixed intervals of motion and stasis. I am also somewhat leery of the idea of a semi-autonomous device controlled by such slow input modalities. In particular, while the chair may avoid someone walking into the path, it might be the case the user wants to stop, and this would require some fast motions on the part of elder that they are likely not capable of. Additionally, the accelerations required to avoid moving targets are really quite severe, and it may be best to stop at all times in these cases.

The sensor map (or the poor excuse for it) is particularly useless, because it requires fine vision and concerted attention to read, and anyone capable of reading the map would certainly be able to see that they're about to run into the side wall. It may very well be one of those cool features in search of a problem to solve. The eye tracker itself makes it even worse, because it doesn't differentiate between gaze direction and view cone direction, and those are distinct things from my own experience with trackers. Since the user is then constrained to certain view directions, the map becomes necessary (because we're now running around with our nose in a notebook), and of course now that it is needed, it is nowhere to be found. Moreover, the directional mappings are completely unnatural, because the user is not looking in the direction that he or she wants to go (up instead of forward), and this is a clear violation of UI basics (akin to clicking left to go right).

Additionally, I would point out that moving a chair backwards is, well, backwards. A human would turn and face the right direction, and so should the chair (especially one that can turn within its radius and is equipped with “advanced AI”). Also, while the authors points out that customizing the interfaces took little time, I would rather they had taken a little more time to think about what they were doing instead of doing what they did. All in all, this is not a case of some complex subtlety, but complete lack of understanding of what an interface requires in itself and of its users. Perhaps these are the dangers one faces when claiming to be a specialist: complete blindness to real life staring on in the eye.