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Robots as Companions: What can we Learn from Servants and Companions in Literature, Theater, and Film?

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Abstract

Many researchers are working on developing robots into adequate partners, be it at the working place, be it at home or in leisure activities, or enabling elder persons to lead a self-determined, independent life. While quite some progress has been made in e.g. speech or emotion understanding, processing and expressing, the relations between humans and robots are usually only short-term. In order to build long-term, i.e. social relations, qualities like empathy, trust building, dependability, non-patronizing, and others will be required. But these are just terms and as such no adequate starting points to "program" these capacities even more how to avoid the problems and pitfalls in interactions between humans and robots.

However, a rich source for doing this is available, unused until now for this purpose: artistic productions, namely literature, theater plays, not to forget operas, and films with their multitude of examples. Poets, writers, dramatists, screen-writers, etc. have studied for centuries the facets of interactions between persons, their dynamics, and the related snags. And since we wish for human-robot relations as master-servant relations - the human obviously being the master - the study of these relations will be prominent. A procedure is proposed, with four consecutive steps, namely Selection, Analysis, Categorization, and Integration.

Only if we succeed in developing robots which are seen as servants we will be successful in supporting and helping humans through robots.

Keywords: robots; companions; servants; literature; theater; film

Many researchers are working on developing robots into adequate partners, be it at the working place, be it at home or in leisure activities, or enabling elder persons to lead a self-determined, independent life.

Experiences have only been collected in short-term interactions with virtual actors or with rather simple artificial animals. Examples of the first group are the estate agent Rea developed by Justine Cassell, the museum guide Max, developed at the University of Bielefeld, the technician giving instructions Steve, developed by Rickel and Johnson, the mission rehearsal exercise by Gratch, Marsella and others, the virtual bartender [1] and many others, some of them with (restricted) language and speech capabilities [2].

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To the second group belong animals like Paro, Reeti, Tofu, and others. Some of these animals have a quite complex underlying structure, e.g. Kismet or Leonardo, developed by Cynthia Breazeal and her group at MIT. While some of these robots have quite expressive "faces" and are able to detect emotions in their human counterparts and can react accordingly, none of them has been used in environments like long-term cooperation in the working place or enabling elder persons to lead an independent life.

Obviously, more is required from robots than identifying emotions or moods in their human partners, processing and expressing them, though this alone is already a real complex task [3–5]. In the project "Social Engagement with Robots and Agents (SERA)" <project-sera.eu> under the guidance of Sabine Payr and supported by the EC, simple robots ("Nabaztags") were placed for about ten days in households and interacted with elder persons. Their main task was to encourage them for daily exercise but other interactions were also possible. As preliminary results, the location in the home influenced the robot's role and the interaction between different humans present, and a diversity of styles of usage could be identified, ranging from simple tool operation to even conversation (a detailed report is forthcoming in a special issue of Applied Artificial Intelligence).

Therefore, for fulfilling in long-term relations the tasks mentioned above, in addition to the already developed interfaces these robots will require more psychological qualities. In this respect empathy, trust building, dependability, non-patronizing, and others are mentioned.

But this is pure terminology and, at best, followed by good definitions. But we know e.g. from children how many years it takes till these capacities develop to such an extent that they are adequate partners. And the way to this result is full of problems and pitfalls. Since this amount of time will not be available and, in addition, it is preferable to avoid unnecessary problems, we have to search for other means.

For these aims, a rich source is available, unused until now for this purpose: artistic productions, namely literature, theater plays, not to forget operas, and films, with their multitude of examples. Poets, writers, dramatists, screen-writers, etc. have studied for centuries the facets of interactions between persons, their dynamics, and their pitfalls. And since we wish for human-robot relations as master-servant relations - the human obviously being the master - the study of these relations will be prominent.

To uncover this wealth of information it is proposed to proceed as follows:

1. Selection. Select the relevant media and choose the most relevant scenes. Examples may range from the story of a servant in Egypt in 2000 B.C. to Greek tragoidia, examples from Commedia dell' arte, Robinson Crusoe and Friday, Don Quixote de la Mancha, plays of William Shakespeare and Gotthold Ephraim Lessing, Johann Nestroy, Don Giovanni and Leporello, to Metropolis or E.T. in films. And many others. The criteria for these selections being scenes with, at best, only the master and the servant present, if possible, with an aside of one or both of the actors what he is thinking (in drama) or, in literature, with a detailed description of his inner processes.
2. Analysis. Analysing the interactions: Who does when what? What is the reaction? How does the sequence of actions and utterances (and deliberations) develop? Where are turning points? Etc. Probably the standard methods of text analysis will not be of great help, as are e.g. "smile-counts" in the analysis of visual interactions.
3. Categorisation. Here special statistical procedures may be helpful. As result, categories could turn up of which psychologists were not aware, e.g. non-obtrusiveness [6].
4. Integration. Integrating the results in existing personality models for humanoid robots [7], or in extensions of them, perhaps as behaviour patterns activated by using a situation-based reasoning method, or in some other ways.

It must be added that these results are quite culture-specific but so are most relations between humans and agents/robots [8]. Selecting works of art from the culture of the target population is therefore required.

Resumé: The master lost his trust in the servant and turned to machines [6]. As these machines became more complex and human-like, people's view of these machines, now robots, mostly turned to the negative side, at least in Western culture [9].

Only if we succeed in developing robots which are seen only as servants by using the examples of really serving servants in art, not to forget the inherent complexities of relations but also not forgetting their humour, we will be successful in supporting and helping humans through robots.

A project along these lines is planned. Cooperating scientists, institutions, and companies are welcome.

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