The usefulness of useless robots

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useless robots?

- Paro, the baby seal
- Kismet (MIT)
- Sociable Trash Box: Michio Okada's weak robots
- …

useless robots?

- an engineering argument:
  - we build robots to help humans, not the opposite
  - these robots are technically very inefficient compared with state-of-the-art competitors (sociable trash box vs. Roomba)
- a philosophical argument:
  - robots belong to the large and old family of animated artefacts (stuffed animals, teddy bears, Tamagotchi…)
  - creating emotional dependency

Yamaha et al., STB: Child-Dependent Sociable Trash Box, *International Journal of Social Robotics,* 2011

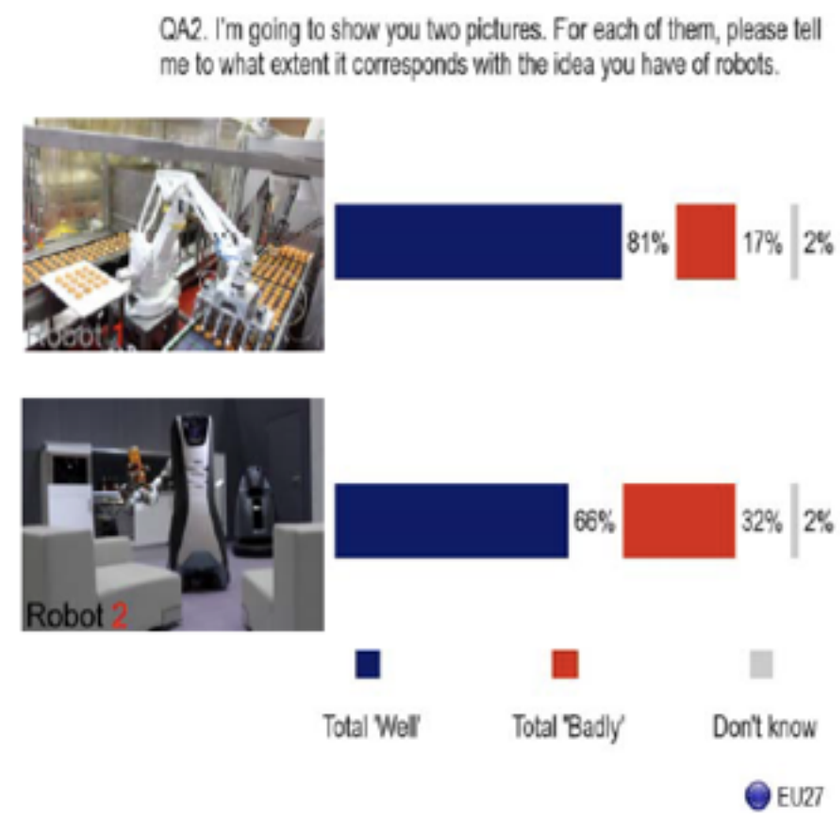
useful vs. useless robots

- A majority of European citizens think that robots should not be used in the "care of children, elderly, and the disabled" and "education."

- Public image of robots: the typical robot is an industrial robot, rather than a domestic, human-like robot.

- A robot is a tool, an instrument designed to perform efficiently a specific task:

  - a robot designed to perform a function that usually human beings cannot do, are reluctant to do, or that robots can perform more efficiently. The robot has one skill, or a predetermined sequence of skills. It cannot do something else, or it has to be rebuilt and reprogrammed => a “technical robot”



Public attitudes toward robots, Special Eurobarometer 382 (p.10)
European Commission, 2012

technical robots vs. social robots

- technical robot: one (a sequence of) function, performance in fulfilling the function defines the artefact
- non-technical robots = social robots?
  - social robots: interaction / presence / elicit empathy
  - technical robots: task-focused / independence / disappear in the background
- two kinds of social robots:
  - robots that are only social. Paro has no capacity of interaction with the world beyond social interaction, it cannot move, it is not able to grasp objects, it cannot do anything practical, its only capable of social communication;
  - robots with some task to perform, but that are also social. The sociable trash box has a definite function—to collect litter—but it is also designed to interact.
- Two different technological paths: Do we want more efficient, autonomous robots, robots that are going to relieve us from many tasks—and in that case robots and their functions will disappear in the background—or do we want robots able to interact, robots integrated in social life—and in that case we have to compose with them and offer them a place in society?

technical robots vs. social robots

- Social robots have a specific utility, e.g., a social utility: for instance, they reduce loneliness or they help people wait in crowded stores…
- *Sociality is a technical feature*, one technical feature among others:
  - Robot 1 is very good to turn screws;
  - Robot 2 is very good to entertain.
- Social robots are a sub-class of technical robots, and communication is their specific technical skill.
- Another option is that all robots are in fact both social and technical, but at different levels.

Living with robots

- Paul Dumouchel & Luisa Damiano
- Research conducted at Ritsumeikan University (Kyoto)
- *Living with Robots*, Harvard University Press, 2017 [from French, 2016]

social mind

Distributed Cognition

- Otto who wants to go to the Art Museum to meet his friend Olga. As Otto has a memory deficit, he uses a notebook to keep track of the address, and then he can read on his notebook the address of the museum and ask the taxi driver: “To the address X, please!” To perform the cognitive task of locating the museum, Otto relies on his notebook, which is a tool, as he would have relied on his own memory if not impaired.

- One can take it as an argument in favor of the extended mind approach, if the tool is seen as part of the cognitive process (the notebook is used as a belief). One can also consider the notebook as a mere tool used by a cognitive system, and in that case one can interpret the thought experiment in the classical, internalist view.

- The social strategy: to ask the taxi driver “To the Art Museum, please!” And then the taxi driver will retrieve the relevant information about the location and the route to the museum. This strategy has some constraints. For instance, Otto and the taxi driver must share a common language, a common set of references, e.g., that there is an Art Museum. Within a definite context, within a shared space of references, “social” resources are generally available to solve cognitive problems. The interaction with the taxi driver corresponds to the resolution of a problem through social resources.

Andy Clark and David Chalmers, The extended mind, *Analysis*, 1998

social robotics

- Social robotics is even more challenging than embodied robotics, because it tackles the most fundamental problem of cognition: the problem of coordination and cognitive coupling—the question of the very emergence of cognitive systems.

- Social robotics does not start with the preconceived idea of an individual cognitive system. It starts with an open system composed of humans and non-humans. The sociable trash box needs the children to collect the litter, and also to decide the nature of the objects lying on the floor. The apparent function of the STB—collecting trash—is fulfilled only when the STB is included in a larger social, human system.

- Being social, being friends, is not a definite function of the system, as is cleaning the floor. It is a condition of possibility of the existence of a system. Paro is a support of social life, as it offers opportunities to interact. It is used in long term care facilities to prevent stress and dementia among the residents. By offering communication, Paro improves well-being.

- This is the bright side of Paro's story, but we still face the challenge of the "common sense" view that says that Paro's benefits might be compensated for in a way or another—less inter-human communication for instance. To go further, we need clinical trials and scientific assessment of their utility. We need a measure of associated costs and benefits, and also a detailed analysis of human-machine interaction. Such analyses and such assessments are going on everywhere.

Soler et al., Social robots in advanced dementia, *Frontiers in Aging Neuroscience*, 2015
Moyle et al.,Use of a Robotic Seal as a Therapeutic Tool to Improve Dementia Symptoms: A Cluster-Randomized Controlled Trial, *JMDA* 2017

social robots as scientific instruments

- A tool designed and used to add knowledge to the world. By contrast with other kinds of tools, defined by their practical use, scientific instruments are mobilized in the quest for knowledge. For instance, they make possible new observations.

- There are at least three advantages of robots compared with other scientific instruments:

  - A robot with a body and a physical presence. This robot is not a virtual agent; it does not appear on a screen. When interacting with human beings, bodily movements, expressions, touch, are part of the interaction. More generally, there are some things that one cannot test with computer simulations only. A time comes when experiments need to enact the real thing, in order to test the interaction of body schema and environmental resources.

  - Production of social behaviors in robots requires a knowledge of the features to be implemented. Building a laughing robot can help us understand the general determinants of social interactions.

  - When using robots, the experimenter can control parameters. For instance: robots designed to interact with autistic children; Paro (what is beneficial in Paro, the social interaction by the mean of cute moves and noises, or the fury thing that we hug? the robot, active or inactive, allows this tactile vs. social comparison).

what kind of instruments?

- But what kind of scientific instruments are social robots?

  - with a social robot, one can investigate sociality, i.e., the nature of social life in general, tackling old questions about collective action;

  - with a social robot, one can investigate the nature of human-robot interaction and question the prospects of a future social life where human beings and artifacts are going to coexist.

robots as instruments: study of the nature of social life

- Epistemological limit
  - When it comes to the study of social life, many options, many instruments, and many methodologies and disciplines are on the table. In this context, it should be demonstrated that robots are a viable option compared to other instruments. There is no need to deny that we can learn something from the existence of social robots, but it is enough to say that the benefits of it might be so marginal that we can do without, especially if the development of robots is painful and time-consuming. Part of the problem is the difficulty to generalize from findings in human-robot interaction to social life in general. The claim that we can study the very nature of social life through robots-as-tools might be overrated, and we would be stuck with the study-of-social-life-with-robots, which is another point.
- Practical limit
  - In order to conduct these experiments with social robots, we introduce robots in social life. When does the assessment of the impact take place? Timing is a typical concern of technology assessment.

robots as instruments: human-robot interaction

- Here, robots have an epistemic privilege, because in this case robots are the only possible instruments.

- The conclusion of Dumouchel & Damanio's *Living with robots* is a plea for a “synthetic ethics” (as we say synthetic biology). Because our social systems are going to be transformed through the introduction of artificial agents, ethics has to be aware of the ongoing reconfigurations of social systems.

- This claim goes against what the authors hold to be the mainstream view in robot ethics: A perspective starting from a definite set of moral values and asking the question—how to integrate robots in this system of values? In the mainstream perspective, the solution is to include robots in our system of norms by imposing constraints on machines so that they conform to predetermined norms. Such a view does not consider the robot as a real social agent, capable of interaction and adjustments. A “synthetic ethics” would acknowledge on the contrary the status of robots as moral entities, that is, as contributors to the social system.

  => study the coevolution of human beings and artificial moral agents

conclusion

- It is one thing to claim that the social system as a whole is going to change and that we need to keep track of these changes;

- it is another to assert that we should use robots as tools to investigate the changes and that experiments with robots are going to help us in this way.

  => In other words, there is a kind of fatalism in saying: Our moral system is going to change and there is nothing we can do about it except the study of how it is changing.

- A possibility is to consider all robots as social and technical at the same time. Sociality and technicality would be two different properties of robots that can be measured in parallel, using different scales. On the sociality scale, the sociable trash box performs well, while it performs poorly on the technical scale. By contrast, Roomba performs well on the technical scale, but poorly on the sociability scale.

  - How much we want robots to be technical and how much social?