

Human-Robot Relationships: The Future of Full-Functionality

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Abstract

*“A case can be made that there are two constant drivers for technology innovation: war and sex.” In science fiction, it is not a big leap from Robot-as-Servant to Robot-as-Sexual-Partner. While robotic prostitution is not difficult to imagine, even images of robots as surrogate spouses abound. Serenity’s “Mr. Universe” and his robotic girlfriend, the holographic companion in *The 6th Day*, and AI’s sentient robots demonstrate very believable roles for sexualized robots in our future. The technologies are coming together quickly, and these realities are on our horizon. The interesting front of semi-realistic sexualized robots is not just their imminent existence, but the quality and content of our human-robot relationships.*

1. Introduction

Robots are already an integral part of our world. Presently, they are making the leap from industrial installations to personal devices like the Roomba¹, an automated vacuum cleaner. Robotic toys abound, and though not yet common, the robotic personal assistance can be found. Robots that appear and function like people are in development, living their electric lives in research labs and occasionally touring technology expositions, but it will not be long before a substantive, functional android-style robot actually hits the market. Now is a very good time to start thinking about the social function of robots in our society.

Science Fiction has had a considerable impact on technology and innovation. Many imaginary devices and farfetched theories from the genre have now become reality, leading to thoughts that much of the fantasy may actually be reality in our near future. In Science Fiction, it is not a big leap from Robot-as-Servant to Robot-as-Sexual Partner. While robotic prostitution is not difficult to imagine, even images of robots as surrogate spouses abound. *Serenity*’s “Mr. Universe” and his

robotic girlfriend, the holographic companion in *The 6th Day* and AI’s sentient robots demonstrate very believable roles for sexualized robots in our future. How close are we to developing viable robotic partners? What models of physical and emotional companionship are likely to be part of our world?

2. Robotic Roles

Personal robots can be classified into three main categories: tool, service-provider, and companion. We are already familiar with robots as tools. Automated vacuum cleaners, lawnmowers, and simple children’s toys fall into this category. Although in the broadest category of the three, the robots are all characterized by their limited interfaces. Communication is generally one way, with a human directing robot behavior through buttons, a keyboard, remote control, or other mechanical means, and artificial intelligence is generally of limited scope. The Roomba, for instance, ‘knows’ how to both find dirt and avoid stairs, but not how to avoid scaring the family pet. Most people would not consider their

interaction with such a robot to be a 'relationship.'

Service-providers are robots designed for more generalized tasks, preferably with a more 'natural' means of communication such as speech recognition. Although their form follows function and may not be in the android-style, these robots will often have faces or other life-mimicking equipment to aid in communication and make them less intimidating. Although perhaps able to recognize people, receive directions and ask questions, the robot is not actually socially engaging people at more than a superficial level.

Regarding these type of robots, Terrance Fong says

. . . humans and robots must be able to coordinate their actions so they can interact productively with each other. It is not appropriate (or even necessary) to make the robot as socially competent as possible. Rather, it is more important that the robot be compatible with the human's needs, that it matches application requirements, and that it provide the interactional support the human expects.ⁱⁱ

Currently, such robots are functioning as museum tour guides and roboceptionists, and in the future I'm sure we will see them doing everything, from walking dogs and cooking diner to driving busses. One could certainly have a shallow relationship with such a robot, as it could greet you by name on a daily basis and be useful in all sorts of ways, but you would know that it was 'a machine,' un-empathetic and emotionally unaware.

The third type of robot is the companion robot. Fong describes them as ". . . robots that have an intrinsic notion of sociality, that develop social skills and bond with people, and that can show empathy and true understanding."ⁱⁱⁱ Such robots would span several levels of

complexity, from interactive, electronic pets to teachers and playmates. These are the robots where genuine human-robot relationships will be formed, as will be discussed in the remainder of this paper.

3. Sexualized Robots:

All three of the categories above can have sexual purpose. There already are 'tool' robots for personal sexual gratification, and elaboration on this point is surely unnecessary. As for sexualized service and companion robots, the best references come from Science Fiction.

In *The 6th Day*, a character extols the virtues of his 'Virtual Girlfriend.' She is an interactive hologram with an accompanying sensation-producing chair. Her first words onscreen are cooing to her owner: "Hi Sugar. Have you been working out? You look so good! I recorded all your sports programs for you – I thought maybe we could watch them together . . . or [seductively, while slipping dress strap off shoulder] should I just take this off right now?"^{iv} The character believes his virtual girlfriend is better than the real thing, for the convenience of an 'off' switch alone. Superficial pleasantries are exchanged, and with the sensation chair other exchanges are apparently intended as well, but there is no emotional relationship, and conveniently, no emotional commitment.

In the movie *AI*^v we see examples of robotic prostitutes. These are sexual robots intended to be rented out to clients for discrete periods of time. In *AI*, Gigolo Joe, a male robotic prostitute, describes his lot:

We are the guiltless pleasures of the lonely human being. You won't get us pregnant or have us to supper with

Mommy and Daddy. We work under you, we work on you and we work for you. Man made us better at what we do than was ever humanly possible.^{vi}



Social interaction is at a high degree of sophistication, but it appears to be unintentional. These were supposed to be robots with a service to perform, with elaborate processors only to be more 'seductive,' but then those processors evolved to be emotional cognitive, moving them into the third category: companion robots.

David, the main character in *AI*, is also a good example of a companion robot. He was designed as an artificial child for the childless, created specifically to fill an emotional hole. In *Serenity*,^{vii} Mr. Universe is a technological recluse, living alone in the media hub of a galaxy, with a robot wife.



There is even video evidence of their 'marriage,' though ironically it would seem that the robot Lenore is actually substantially inferior to other

robots presented above. Both David and Lenore are intended to stand in for living people, to bond and be bonded with their owners as fully as possible.

4. Advances in Technology Due to Pornography

The dirty little secret of technology is pornography. Pornography generally does not invent technology, but it is the force which takes a novice media, device or system from costly and rare to a marketplace staple. The invention of the printing press increased common literacy and popularized reading; however it was not the Bible, scholarly or legal documents often printed, but two fairly pornographic novels which did the heavy lifting. Peter Johnson quotes one of the two authors boasting of his novel: "more copies of it have been sold by the printers in two months than there will be of the Bible in nine years."^{viii}

Pornography was involved in photography and film from almost the very beginning, and it was pornography which popularized the use of home videotapes. In fact, when the pornography industry chose to produce films on VHS because it could hold more footage than Betamax, the struggle for market dominance was over and Betamax had lost.^{ix}

VoIP technology, Internet Access, eCommerce, CD-ROMs . . . all these owe a substantial part of their success to Pornography. Tom Evslin, retired CEO of a leading VoIP provider, claims:

The high margin and guaranteed demand for porn encourages its production early in the technology adoption cycle. Just when the market of early adopters is depleted, sexual content vastly expands the market for the device.^x

5. Advances in Robotics expected from Pornography

So Porn doesn't so much invent as improve and propagate the new technology into the marketplace. What does this mean for robots? Currently, most service and companion robots are still sitting in research labs, in development. However, there are 'robots' already being produced for sexual purposes, such as Michael Harriman's Andy Dolls. The dolls have heartbeats and breathing patterns that strengthen during sexual use and their body temperatures rise within their lifelike silicone skin.^{xi} These are direct competition for Real Dolls, a company that advertises:

"We offer an extensive list of options, from body type and Face type all the way down to fingernail color. If you've ever dreamed of creating your ideal woman, then you have come to the right place."

These 'dolls' clearly are not robots, but they are the beginning of a movement which should sweep the robotics industry into high gear as soon as more viable technology is available. If the marketing trend of pornography pushing other technologies is duplicated, it would be likely that robots for intimate purposes will be available faster and cheaper than any other purpose, at least initially. Sexualized robots will be in the majority during the industry's initial entry into the market place, making their acquisition and perhaps acceptance that much more likely.

6. Beyond Sex

In *Serenity*, Mr. Universe's chosen isolation and oddities were combined with his love of a barely-

responsive robot to make him seem even more foreign and outcast. However, the conclusion that a relationship with a robot is bizarre is misleading. As a society, we are already pushing companion robots to a great extent.

Furby, as simple as its artificial intelligence components were, filled the niche of an emotive, adaptive, personal companion robot. Beyond simple anthropomorphism, children would describe their Furby as "kind of alive," and would describe its perceived feelings and thoughts in detail.^{xii}

Additional research has shown that adults are also adapting to this concept of 'semi-alive' in relationship to smart machines. After a generation or two of children growing up with intelligent and emotive robots, questions about your relationship with your robot won't seem so bizarre.

Why would we want emotive robots? Studies of long term contact with social robots indicate that adults and children prefer, and will only continue interactions with an emotional robot. Personality quirks and an 'inner life' are key to keeping a human interested in a relationship.^{xiii} In fact, we don't even need a pleasant personality to have an effective relationship with a robot. Several studies have shown that at times, people expect certain behavior like seriousness and authoritativeness, and are more compliant when the robot behaves 'correctly' under the conditions, rather than with one whose personality is set to 'nice' or 'cheerful.'^{xiv}

Studies also show that emotional content in robotic communications increases human comprehension, and behavioral or personality components provide a framework in which we feel more comfortable operating.^{xv} Such interactions more closely mimic social

interactions with which we are familiar. This all implies that if we are going to be interacting with an android-type robot repeatedly in any significant way, personality and emotion will go a long way towards creating an effective dynamic, and an ‘actual relationship.’

7. Human-Robot Relationships Are Good For You.

There is substantial evidence being collected that such companion relationships, even at their present rudimentary level, are actually very good for people. Robotic pets such as AIBO produced similar positive chemical responses in children as actual puppies, albeit to a lesser extent.^{xvi} Purely therapeutic robots are currently in use in hospitals and in elder care, such as Paro,



a large seal with emotive and responsive mechanisms.^{xvii} Paro has been shown to decrease stress levels in elderly patients, similarly to interaction with real animals. It also apparently aided in patient/caregiver communications by providing a common point of positive interactions, and reduced feelings of burnout in the caregivers.

There is even research suggesting that viewing pornography is healthy, which may very well extend to sexual relationships with robots. “. . . several studies have suggested that, far from creating sexist, violent feelings in young men, pornography has a calming,

cathartic effect, easing adolescent cares with a dose of mild erotica.”^{xviii}

8. Two Big Problems

It is easier to become attached to a robotic pet than a robotic person, because a human-pet relationship is well defined and easier to mimic. It is much more difficult to be an authentic person than an authentic dog.

Mashiro Mori contends that the progression from a non-realistic to realistic portrayal of a living thing is non-linear. In particular, there is an “uncanny valley” as similarity becomes almost, but not quite perfect. At this point, the subtle imperfections of the recreation become highly disturbing, or even repulsive.^{xix}

This is why many companion robots that are not animal shapes are stylized as caricatured-humans, or go for a traditional ‘robot style’ of shiny metal. A caricature of a human may work well for a child’s robotic companion, or a household assistance, but it is going to be difficult for a robot with a sexual purpose to be simultaneously a caricature *and* attractive.

The second issue is that while we may become more accepting of robots in society and in our households, even as pets, play companions, teachers and healers, how are we going to look at the ownership of a ‘sexbot?’ For a companion robot to effectively develop a relationship with a human, time and experience are needed, which won’t happen if the robot is locked away in a closet ‘so the neighbors don’t see.’ Perhaps the only viable solution is to make all domestic robots ‘fully functional,’ a new rendition of the ‘plan brown wrapper.’ We can say we are getting Internet for the kids to do homework, and we can say we are getting the robotic household assistant to help with cleaning and to walk the dog,

but underneath it all may be a far stronger motivation.

9. Conclusion

Integration of robots into our daily lives has already begun, and is likely to continue until the lines of human and robot start to blur. In addition, not only will we welcome robots with personality and emotional intelligence, we will actually require those capabilities in any robot designed for personal assistance or companionship.

It is very likely that the pornography industry will drive the robotic market forward for its initial applications, not only beneficially advancing technology, but securing the inevitability of sexualized robots for personal use.

We will have relationships with our robots, though to what degree and how long it will take to be comfortable with them may be measured not in generations, but decades. We will have a future of full-functionality, of genuine relationships with synthetic humans. Rather than unnatural, craving a 'relationship' is simply human nature, and apparently inevitable.

ⁱ iRobot, February 2006. <http://www.irobot.com/>

ⁱⁱ Fong, T. , Nourbakhsh L, Dautenhah, K A survey of socially interactive robots. ***Robotics and Autonomous Systems* 42 (2003):** 143-166

ⁱⁱⁱ *ibid.*

^{iv} *6th Day*. Dir. Roger Spottiswoode, Arnold Schwarzenegger, Michael Rapaport, Tony Goldwyn, Michael Rooker, Sarah Wynter, Wendy Crewson. Sony Pictures, 2000.

^v *A.I. Artificial Intelligence* .Dir. Stephen Spielberg, Haley Joel Osment, Frances O'Connor. Dreamworks Video, 2001.

^{vi} *Ibid.*

^{vii} *Serenity*. Dir Joss Whedon, Nathan Fillion, Gina Torres. Universal Studios Home Entertainment, 2005.

^{viii} Johnson, P., Pornography Drives Technology: Why Not to Censor the Internet. ***Federal Communications Law Journal* [0163-7606] 49 (1996):** 217.

^{ix} *Ibid.*

^x Evslin, T. Pornography Drives Technology. March 11, 2005. http://blog.tomevslin.com/2005/03/pornography_dri.html

^{xi} “Robot Sex Dolls,” Anaova. http://www.ananova.com/news/story/sm_1361247.html

^{xii} Turkle, Sherry. “The Third Culture.” <http://www.fitug.de/debate/0004/msg00330.html>

^{xiii} R. Gockley, *et al.* Designing robots for long-term social interaction. In *Proceedings of IROS 2005*. Edmonton, Alberta, 2005.

^{xiv} Goetz, J. & Kiesler, S. Cooperation with a robotic assistant. *Proceedings of the ACM CHI'2002 Conference on Human Factors in Computing Systems* pp. 578-579. 2002.

^{xv} Fong, T. , Nourbakhsh L, Dautenhah, K A survey of socially interactive robots. ***Robotics and Autonomous Systems* 42 (2003):** 143-166

^{xvi} “Robotic Pets offer health benefits too,” Star Telegram “Robotic Pets offer health benefits too” Sun, Jan. 22, 2006, (SOURCE: *U.S. News and World Report*)

^{xvii} Paro, Mental Commit Robot for Psychological Enrichment.

<http://paro.jp/english/about.html>

^{xviii} Johnson, P., Pornography Drives Technology: Why Not to Censor the Internet.

Federal Communications Law Journal [0163-7606] 49 (1996): 217.

^{xix} Fong, T. , Nourbakhsh L, Dautenhah, K A survey of socially interactive robots.

Robotics and Autonomous Systems **42 (2003)**: 143-166