

**THE ROBOT IN THE KITCHEN:
THE CULTURAL POLITICS OF CARE-WORK AND THE DEVELOPMENT OF IN-
HOME ASSISTIVE TECHNOLOGY¹**

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ABSTRACT: *This paper considers two trends at opposite ends of the new economy: low-paid in-home care work, and the development of high-tech “social” robots. At present, the work of caring for the elderly, disabled, and convalescents is done primarily by women (disproportionately women of color) in the space of the home (Pratt, 1999). Meanwhile, in robotics labs at elite research universities and industry think-tanks in the U.S., Europe, and Japan, prototypes are being developed to take over some of this labor. Considered together, these two phenomena raise a number of questions, including: how might ideas about gender and race shape the development of assistive technologies; what does development in this field mean for understandings about technology’s “place” in our lives; and, potentially, even for those who rely on carework for their livelihood? The space of the home carries great cultural and symbolic significance (England, 2000). Allowing robots into this space to help us with our most private tasks would mark an unprecedented level of intimacy in our relationship with technology. While a “nursebot” may be able to measure vital signs, how would the replacement of a human care-giver with an assistive technology alter the relationship between the person being cared-for and the world outside? Drawing on disciplinary frames of Cultural Geography and Science and Technology Studies, this paper explores the social politics, and possible futures, of in-home assistive technology.*

INTRODUCTION

Drawing on fields of Feminist and Cultural Geography as well as Science and Technology Studies, this paper considers the cultural politics of the development of social robots as an assistive technology. “Social” robots are devices that are designed to respond to stimuli and simulate social interaction. Most literature on social robotics falls into one of two categories. The first is written by and for engineers and designers, and is focused on the technical problems of “can we do it” and “how do we do it”. The second is written primarily by cognitive scientists and psychologists, and is principally concerned with the empirical and philosophical likeness between artificial life forms and humans (Fukuda et al., 2001). My concern here is not the technical problem of the lab, or the philosophical question of whether or not social robots really have brains or souls. Rather, it is to consider the social politics of designing robots to do care-work: work

that is highly feminized, racialized and classed, as well as associated with non-public spaces of the home and the nursing-home.

This paper focuses on the emergence of “humanoid” devices designed to help the elderly. As Geographers Brown and Pratt have noted, the work of caring for the elderly and convalescents is done primarily by women (disproportionately women of color), either paid or unpaid, in the space of the home (Brown, 2004; Pratt, 1999). In idealized form, notions of home connote security, refuge and personal freedom across a wide-range of cultures (England, 2000)². In particular, as Brown notes, home can serve as an: “especially dense place of meaning and emotion” in cases where the cared-for is terminally ill and/or has lost autonomy in some way (Brown, 2003: 833). Beyond the powerful feelings and emotions “home” may elicit, this space is also an important, politically salient terrain for the negotiation of material relations of labor, and even identities as citizens (Young, 1997).

As a culture, Americans have grown used to a high degree of engagement with technology in a growing number of aspects of life—from automobiles to cell phones to medicine. As we share our homes with an ever-expanding range of electronic technologies—from televisions to microwave ovens to personal computers, our understandings of these devices and the work that they perform also change (Turkle, 1995). For some, particular devices (cell phones, hearing aids, personal computer) have become indispensable: rather than being viewed as threatening, such devices might seem more like pets or companions. It is within these contexts that this paper asks: what would it mean to have humanoid robots at home, helping our elders—and potentially ourselves—with our most private tasks? I suggest that the development of robotics as a sector has the potential to change our understandings of care-work, as well as the spaces in which it takes place. I approach this topic with an interest in how technology can change work and our ideas about work in racialized and gendered ways; together with the ways in which already racialized and gendered conceptions of work can shape how a given technology develops. Rather than analyzing a process already well underway, this paper draws attention to a phenomenon that is just beginning. As such, it is speculative and problem-posing. Responding to calls within Science and Technology Studies to claim our agency in actively shaping how technology develops (rather than passively reacting to whatever industry happens to produce) (Sclove, 1995; Winner, 1986; Woodhouse et al, 2002), this paper is intended to open discussion on how we might want to guide the field of social robotics as it develops.³

ROBOTIC PROTOTYPES

Eldercare both in the home and in institutional settings represents a large potential market for social robots, and clinical trials are already underway in the United States using interactive robots in elder-care settings to deliver medicine and escort patients to appointments (Taggart, 2003). What might these robots be like? As scholars in feminist Science and Technology Studies have shown, ideas about gender and race can be built in to a technology's very design (Cockburn and Ormrod,

1993; Wajcman, 1991). In what follows I will first provide a context to how ideas about work, interactivity, gender and race are currently being built in to social robots through a consideration of two prototypes developed in the 1990s. I will then consider one model (Asimo), whose potential uses specifically include in-home assistive care. Together, these prototypes suggest a process of exploration in how robots can be designed to suggest gender and/or subservience. While the first two were not designed specifically for in-home care work, they suggest the range of abilities different designers have emphasized as the field of social robotics has developed, and the extent to which that choice structures what kinds of things the end product can do.

The first prototype I wish to discuss is called Grace, and was developed by a consortium of researchers based at Carnegie Mellon University between 1991 and 1992. Grace's design focused on communication skills in the context of a particular social situation (Figure 1). Part of an effort to push the limits of the field of Artificial Intelligence, Grace successfully competed in the 2002 American Association for Artificial Intelligence "Robot Challenge" in Edmonton, Alberta in which robotic entrants had to attend an academic conference and deliver a paper.⁴ Tasks included negotiating the built environment of a conference center, registering, and finding the room in which they were presenting. Grace is six feet tall, and, while not anthropomorphic in design, was designed to be able get around, make (limited) conversation and respond with facial expressions on computer-screen "face". While clearly computer-generated, this visage has red lips, large blue eyes and no facial hair, which, taken together, connotes an other-worldly sort of femininity.

In contrast to the "somewhat mechanical" Grace is the "disturbingly humanoid" Saya (Figure 2), developed by the Intelligent Mechatronics Lab of the Kobayashi Lab at the Science University of Tokyo. In contrast to Grace, Saya is not mobile. Rather, Saya was designed as an experiment to construct a robot in a life-like human form which would interact through facial movements. Saya is outfitted in a vintage nurse's uniform, and created to look Asian. Saya reflects stereotyped femininity in several respects: she is slim, youthful, wears a dress,

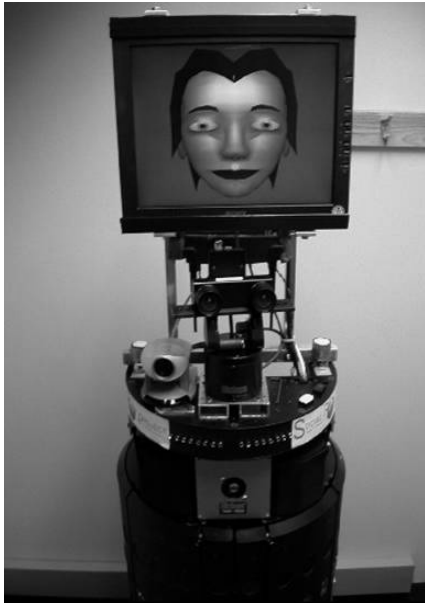


Figure 1: Grace: digital femininity
<http://palantir.swarthmore.edu/GRACE/>,
Photo Credit: Carnegie Mellon University

and is programmed with several engaging expressions.⁵ Although Saya and Grace were not designed as home health aides specifically, they provide a background into some of the ways in which ideas about interactivity, work, gender and race are currently being designed-in to social robots.

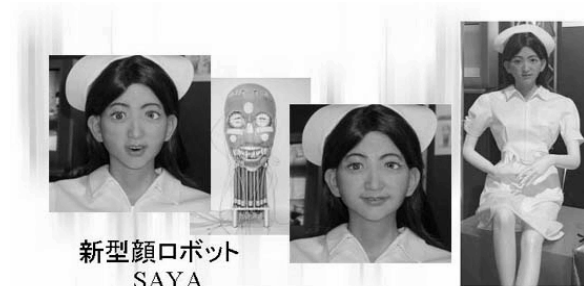


Figure 2: Saya: dialed-up digital femininity or, Blade-runner meets Nurse Betty.
<http://www.androidworld.com/prod04.htm>
Photo Credit: Kobayashi Laboratory, Science University of Tokyo

The third robotic prototype I would like to consider is Asimo, built by Honda over the 1990s and displayed at the 2002 Robodex robotics exhibition in Yokohama, Japan. More or less humanoid in form,

Asimo does not have the same kind of gendered or racialized characteristics as Grace or Saya, possessing instead a black spherical screen where a face would be.⁶ Asimo also is much more mobile than either Saya or Grace. According to Honda, Asimo is endowed with “unprecedented human-like abilities”⁷, it can go up and down stairs, hold things, push things, and balance on a moving see-saw. Unlike Saya and Grace, Asimo is specifically imagined as a potential in-home assistive technology. Building on devices currently being developed to aid the elderly with personal tasks such as washing, (Figure 3), Honda sees a market for a humanoid in-home assistant. Asimo has been specifically designed to navigate a domestic environment, and Honda’s (extensive) website on Asimo notes the device’s ability to negotiate domestic space, illustrated with a graphic showing Asimo in a kitchen.⁸



Figure 3: The ‘human washing machine’ in action *New York Times*, March 5, 2004.
(Photo by Franck Robichon)

If in-home care is Honda’s target market, it is important that Asimo not be perceived as menacing. A marketable in-home robot must not evoke the myriad cultural references to machines

which destroy their creators (Perkowitz, 2004). This is particularly an issue for Asimo; whose broad “shoulders” and “legs” which enable it to walk and balance combine to suggest a helmeted line-backer or perhaps a storm-trooper from *Star Wars*. To counteract these possibly threatening associations, Honda made Asimo small, standing only about three feet tall. Interestingly, one of the biggest differences between Asimo and the prototypes which directly preceded it is its much smaller size.⁹ Thus, while Grace, Saya and Asimo all look different from one another and perform different kinds of functions, each prototype is encoded with a trait associated with subservience in some way: be it through gender or size.

Known primarily for cars, motorcycles and other kinds of motorized vehicles, Honda has sought to create buzz and raise public awareness about its work in robotics through a variety of public relations events. Asimo has been taken on tour in North America and Europe, even shaking hands with German Chancellor Helmut Schroeder.¹⁰ When not engaged in international corporate relations, Asimo has appeared in ads in gadget-friendly North American lifestyle magazines. In an effort to soften the market for such technology—and give Honda a friendly, futuristic face—one such ad shows Asimo at the top of a set of brick steps surrounded by a white middle-class family in front of a well-manicured suburban home (Figure 4). Nestled between the parents and a nearly grown son, and standing above a teen-age girl child and family golden retriever (all smiling), Asimo waves from the middle of the full-page ad. The effect is that of a harmonious suburban inter-species montage from a generation who has grown up with, or grown used to, a high degree of high-technology in their lives and homes.

Depicted at the threshold of the home, the in-home robot is depicted as a non-threatening and in fact welcome addition to the suburban middle-class family. As perhaps as a foreign-exchange student would be, Asimo is with but not of the family. As with an exchange student, the acceptance of this visitor shows the family to be progressive and open-minded to the (technological) Other. More than just a high-tech status symbol, the full-page text on the accompanying page suggests to readers that Asimo will make itself useful, particularly to the elderly. According to Honda:

Asimo has the potential to respond to simple voice commands, recognize faces, carry loads and even push wheeled objects. This means that, one day, Asimo could be quite useful in some very important tasks. *Like assisting the elderly, and even helping with household chores*¹¹ (emphasis added)



Figure 4: Asimo: Robo-hobbit? Eunich-bot? Embracing the (small) technological other. (Advertisement, *Outside Magazine*, October, 2002)

Although the family shown in the picture appears young, able-bodied and healthy, the text suggests that there are other members of the family (perhaps grandma and grandpa) beyond view who do not possess these characteristics, and that it is Asimo’s role to care for them. Thus Asimo is presented as a non-threatening, non-gendered, non-racialised (but yet humanoid) device that might play a role in elder-care (for those who could afford it). Before concluding I will briefly place the development of devices like Asimo within the context of care-work as it is currently constituted in the United States, to get a sense of what kind of

work, and workers, devices like Asimo might one day replace.

CARE-WORK AND ITS POSSIBLE FUTURES

As a society, the United States has both anxiety and non-agreement over who ought to do the work of caring for the elderly and infirm, and where this work ought to take place (Seale, 1998). Should this be the job of family members and take place in the space of the home? Is this better done in the public sphere, as wage-work in nursing homes or other kinds of assistive facilities, or through hybrid types of public and private settings and players? Although much care work occurs privately by family members, as baby boomers age in-home care work is becoming an increasingly important sector of the labor market, creating more and more hybrid spaces in which one person's private home is at the same time another person's workplace.¹²

As feminist scholars of various stripe have noted, understandings of work and care-work are part of, and help reproduce, larger systems of cultural and economic production in which different activities are associated with different spaces, different genders, and are valued differently (Domosh and Seager, 2001; England, 2000; Kobayashi et al., 1994). Within the historic bourgeois ideal, "work" has been associated with the waged-labor of men and located outside the home, while the work of caring for others has fallen into the category of "social reproduction", been labeled women's work and associated with the space of the home. Of course women of all racial backgrounds and social classes in the U.S. now work outside the home (as most women of color and working-class women have always done), and some men are now taking on a fuller role in care-giving. Yet even into the new century we see a continuation of the "masculine work norm" (Bordieu, 2001; Cockburn, 1993; Domosh and Seager, 2001; McDowell, 1997). The masculine work norm is expressed as a tendency to normalize men's activities in the public sphere and define them as work, and devalue activities associated with the space of the home. While the value of care-work is given lip-service, how it is valued in the labor market is another story.

In the year 2000 the Bureau of Labor Statistics reported 710,000 people in the United States working as in-home service providers; 96% of whom were women.¹³ According to the 2000 publication "A Profile of the Working Poor", 20% of those engaged in in-home service occupations are below the poverty line, and 28% (about the twice the national average) are African-American.¹⁴ In-home service providers as a group had the highest rate of poverty of any job category studied.¹⁵ For home health aides, defined within the 2001 National Occupational Employment and Wage Estimates as workers who "provide routine personal health care such as bathing, dressing, or grooming to the elderly, convalescent or disabled persons"¹⁶; the mean hourly wage in 2000 was \$8.90 an hour and \$18,510 a year. In sum, in-home service work as a category is feminized, racialized, and, like all other forms of physical labor traditionally done by women in the home (including house-cleaning, laundering, cooking and caring for children), poorly paid.

In addition, care-work is also a contested terrain from the perspective of labor politics. To take an example from New York State; threats to wages, benefits, and job security are currently points of struggle on the part of SEIU, the state-wide union representing workers in health and human service professions. Threatened by government cut-backs and the expansion of the HMO system, SEIU "aim(s) to be the conscience of the trade at a time of dramatic change".¹⁷ As part of this struggle, SEIU has undertaken a campaign to remind health care customers of the value of the "soft skills" required to make an elderly person feel comfortable, safe and cared-for.¹⁸ The campaign underscored the message that health-care workers minister to patients as people, not just as illnesses, going beyond what science and medicine can provide. Within Geography, Michael Brown has argued that care-giving is a social and even political activity. He notes the important role in-home health aides can play for the terminally ill in the context of hospice-care as a connection to the outside world and civil society, and argues that carework establishes a relational dynamic in which both care-giver and cared-for define their subject positions of gender, class, ability and race through one another (Brown, 2003: 835). Following on this point, the relationship between the professional care-giver and the cared-for is marked

by somewhat complex relations of power. While care-givers may be in position of economic subservience, they often have control over vital and intensely personal aspects of their employers lives—from providing meals to dispensing medicine to changing bedpans.

What does it say about how we view elder-care, and the skills of those who perform it, that robots are being developed to take up some of this work? Such devices might be deployed in conjunction with (and under the supervision of) real-life caregivers, and result in enhanced care. However, given that social robots are already performing unsupervised tasks in clinical trials, is it also possible to imagine that robots may one day constitute an alternative to human in-home aides (and with whom human health professionals would have to compete)? Certainly the replacement of human labor with machine, as well as resistance to this process, is not new; Luddites destroyed the stocking frames they saw as jeopardizing their way of life in early 19th century England, and assembly-line workers challenged decisions calling for their replacement with machines in automobile factories in the U.S. in the 1970s and '80s. What *is* new in this case is the kind of work poised to be replaced: care-work that is highly feminized. While it is one thing to replace a worker at an assembly line in a factory, it is another to replace someone whose job it is to minister to frail human beings. Further, if care-work is relational as Brown suggests, how could a *robotic* care-giver change this relation? More cynically, is it possible that Asimo's developers are betting that an "unmarked" robot, free of gender or race-coded attributes, would present an appealing choice over a human care-giver (who may occupy a very different race/gender/class position) from the person being cared-for? Might this relation be more comfortable socially? Or more purely subservient?

CONCLUSION

Social robots function as a boundary object mediating several thresholds about which we as a society have anxiety: between human and machine, autonomy and dependence, and, in the case of elder-care, between life and death. By analyzing social robotics along side in-home care workers as a labor market I have sought to place this strand of high-tech innovation within a social context. Based on the supposition that ideas about work, gender and other human attributes can be built in to technology at the design phase, I have suggested that the prototypes currently available have been designed so as to suggest subservience (be it by gender or size). On the other hand, actual in-home care work is highly feminized and poorly remunerated. Yet, though low-paid and often without benefits, and under threat from market forces, this job-type nevertheless constitutes an important source of income for low-skilled women.

Finally, for most of us, the prospect of relying on a robot in our home at a vulnerable stage of life to help us with our most private tasks would signal an increase in trust in our relationship with technology. While robots might serve as means by which a mobility-challenged elderly person could feel more autonomous, allowing them to maintain control over what happens in their immediate surroundings, I submit that this intervention could lead to understandings of care and care-work that differ significantly from those currently in place. While this investigation has been both preliminary and problem-posing, I hope to have shown that beyond the myriad *technical* questions social robotics presents, it also raises important *social* questions that warrant further investigation.

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ENDNOTES

¹ This paper was first presented at the Middle States meeting of the Association of American Geographers in 10/2003. The paper came out of discussion with Linnda Caporalet, Audrey Bennett, Ron Eglash, Selma Sabanovic, Ray Fouche and SharraVostral in 2002. I would like to thank them for their thoughts.

² That is the ideal. For some, such as survivors of sexual abuse, home can be a site of pain and/or fear.

³ Winner likens the tendency to deny our agency in shaping how technology develops to sleepwalking.

⁴ <http://palantir.swarthmore.edu/GRACE/>

⁵ For a nuanced analysis of cultural influences in the field of social robotics see Sabanovic, 2004.

⁶ Though beyond the scope of this paper, the decision to make Asimo ungendered would be an interesting question for further investigation.

⁷ Advertisement, American Honda Motor Corporation, 2002 (*Outside Magazine*, October 2002).

⁸ <http://world.honda.com/ASIMO/>

⁹ In addition to trying to make Asimo “less threatening”, this also may suggest a more general privileging of miniaturization as a sign of technological sophistication in the field of electronics.

¹⁰ <http://world.honda.com/ASIMO/>

¹¹ Advertisement, Ibid.

¹² As is also the case with nannying and domestic service.

¹³ Bureau of Labor Statistics, <http://www.bls.gov>. Unfortunately this source does not specify what

proportion of this workforce is Latina or other ethnicities.

¹⁴ *A Profile of the Working Poor, 2000*, Bureau of Labor Statistics, www.bls.gov/cps/cpswp2000.htm

¹⁵ *A Profile of the Working Poor, 2000*, Ibid.

¹⁶ *2001 National Occupational Employment and Wage Estimates*, Bureau of Labor Statistics, http://www.bls.gov/oes/2001/oes_nat.htm

¹⁷ *2001 National Occupational Employment and Wage Estimates*, Ibid.

¹⁸ SEIU direct-mail promotional brochure. SEIU represents 210,000 health service workers in New York State.