Friends by Design

A Design Philosophy for Personal Robotics Technology

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Abstract Small robotic appliances are beginning the process of home automation. Following the lead of the affective computing movement begun by Professor Rosalind Picard in 1995 at the MIT Media lab, roboticists have also begun pursuing affective robotics, robotics that uses simulated emotions and other human expressions and body language to help the machine better interact with its users. Here I will trace the evolution of this design philosophy and present arguments that critique and expand this design philosophy using concepts gleaned from the phenomenology of artifacts as described in the literature of the philosophy of technology.

1 Introduction

1.1 The Novel Design Issues in Personal Robotics

Robots are no longer limited to pure imagination, cyberspace, or the factory floor. Robots are finding a niche right in our homes. This requires that the machines be designed with a plastic ability to adapt to the differing lifestyles of all their potential users. The roboticist Cynthia Breazeal has coined the term *sociable robots* to describe robots with this ability.

> …a sociable robot is able to communicate and interact with us, understand and even relate to us, in a personal way. It is a robot that is socially intelligent in a human-like way. We interact with it as if it were a person, and ultimately as a friend (Breazeal, 2002, 2).

This conception of robotics directly challenges the more traditional paradigm of industrial robotics and the idea that robots are meant to do their work in isolation from human agents. In order to achieve this vision, robotics designers will need to pay more attention to human values such as the beliefs and desires peculiar to the human society that these machines are built to enter and interact with. Whereas

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workers were either replaced or had to learn to adjust to the robots that entered the factory floor, just the opposite is necessary for personal robotics to succeed.

There is, however, an alternative tradition in robotics that more readily embraces the vision of sociable robotics, which we will explore in this chapter, and that is found mostly in the consumer and service robots coming out of Asia. These robots are more playfully designed and data seems to suggest that Asian consumers are more prepared to accept these machines as a fellow agent, pet, friend, or even surrogate family member.

Certainly, this technology is not without serious ethical concerns. We need to ask the difficult questions such as: When it is correct to replace human agency with artificial agency? Will these machines serve to enhance human culture or serve to isolate us further from each other? How will we program these machines to interact with us as friends?

1.2 Robots in the Home

In 2003 a small dustpan sized robot entered the homes of many consumers (Maney, 2003). This robot, called the *Roomba*, promises to be the harbinger of a new age in personal robotics. Roboticists are now designing robots to work with people in the home and this is presenting them with many new challenges. If personal robotics is to succeed, then these machines must fit into the human lifeworld, which necessitates that an understanding of human sociality should become central to the design process of these machines.

Previous robotics technology has not been designed with much regard for seamlessly fitting into the human lifeworld. Since 1961, and the first application of industrial robotics at General Motors in New Jersey, commercial robotics technology has mainly consisted of large dehumanizing machines chiefly confined to the factory floor. Little effort was made when constructing these machines to get them to fit unobtrusively into the social fabric of those who used the machines. Robotics technology and automation has been criticized for its negative impact on the lives of factory workers; this technology made their jobs less skilled or made workers outright redundant (Garson, 1988). These machines are typically fenced off from human workers and are often very dangerous to be near while they are in operation.

The need to place a larger emphasis on designing personal robots to fit into the lives and social networks of their users is a very new problem for roboticists, since the typical design strategy in industrial robotics is to alter the lives and social networks of the user to fit the needs of the machine. In this chapter I will critique some of the most important work that has been done in social robotics. In addition to this I also want to question why we feel we need to have robotic servants. It is not clear that an automated workspace has made the lives of workers better and it is equally unclear whether automating our living space will make our home lives better. Towards the end I will also focus on the work of roboticists that resist the pedestrian notion of robots as domestic servants and see them instead as a chance for us to design new friends and companions.