Human Robot Interaction and Fiction: A Contradiction

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Abstract. In this position paper a perspective on how movies and science fiction are currently shaping the design of robots is presented. This analysis includes both behaviour and embodiment in robots. We discuss popular movies that involve robots as characters in their storyline, and how people's beliefs and expectations are affected by what they see in robot movies. A mismatch or contradiction emerges in what the robots of today can accomplish and what the movies portray. In order to overcome this mismatch we present design implications that may be of benefit to HRI designers.

Keywords: Fiction robots, Research robots, Commercial robots.

1 Introduction

One of the major aspects of research in Human Robot Interaction (HRI) is to design social robots that look and behave as humans anticipate and desire, ultimately allowing easier and more seamless integration into society. In order to achieve this, researchers in HRI conduct lab-based experiments to determine user needs, expectations and requirements. In our research, we reflect on what we have learned as HRI researchers and robot designers, and look to what we can predict for the future from non-research domains. The primary category employed for this purpose in this paper is robots as seen in science fiction movies. Prior work in HRI has mostly concentrated on reviewing research work or empirical research in the laboratory. However, more often that not, results are presented only with a subset of users and the general public is not fully exposed to or aware of these robots. In addition, real life evaluations for HRI and away from the lab are already occurring [26,30], and in the related domain of Human Computer Interaction (HCI) there is movement to ascertain the future trend of interfaces based on fiction and movies [28,20]. We can also see examples of fictional material being used as a pedagogical instrument in Computer Science Education [11]. Therefore, in order to ascertain the public sentiment and perception of robots it may well be worthwhile to study the more public and accessible media where humans are exposed to robots, such as robots found in movies and fiction. There are several overview articles that base their results and conclusions on research

work in HRI and on what makes effective HRI, however little is determined using robots that humans see in movies. In our opinion this is an under-treated area and therefore the niche of our research.

1.1 Motivation and Related Work

In this position paper we restrict our analysis of non-research domain areas to social robots, namely robots that socially engage with humans and display social characteristics. A more formal definition of social robots can be found in [18]. Other robots, such as industrial robots, do not interact with humans as intensely and are therefore out of the scope of this paper.

As stated, prior HRI research overviews have been based on extrapolations of lab-based results on human-robot behavioural studies and design. In particular, research has minutely discussed what physical features a robot should have based on the robots function [29]. An example which discusses the design of social robots in line with anthropomorphism is outlined in [17]. In addition, several researchers have presented position papers in the field of social robots in specific domains such as education [24]. However, it would be naive to perceive complex concepts such as anthropomorphism from the perspective of research projects only; there are deeper philosophical underlying issues which can be explored from our real life interactions with robots, and not just by experimental user-centred HRI design [27]. These can include robots which humans visualise in various media, such as caricatures, figurines, toys and domestic robots that assist in chores at home. Little is known about how these beliefs and perceptions connect to findings reported in HRI literature. Can we use such beliefs to inform the design of future HRI research? Why is that the Aibo robot which reported such successful sales initially [25] is now almost obsolete? Why is it that other social robots like Nao have limited their sales to the research market? These and similar questions need addressing.

We are not the first to approach the concept of analysing HRI from the perspective of non-research based themes. We find inklings of certain topics such as Culture, Media, Fiction, Religion, and Ethics [8] in HRI literature. However, most of this work is focused on a single theme and does not present a holistic picture in terms of human expectations and preferences. In addition, concrete design implications and linkages to research based results in HRI are not sufficiently dealt with. For instance, the study of Bartneck et. al. on LEGO figurines [10] concludes that facial expressions of such figurines are becoming less happy and examines how this has affected the sale of such figurines. However, in this study the effect of the faces on the users/children themselves is not discussed and neither is any subjective feedback or review evaluated. We can be positive about the transition of beliefs and perceptions about robots that humans have in fiction and in the media. Prior work has suggested [9] and shown [15] that portrayal of robots in the media can both negatively and positively affect human perceptions when they interact with real robots. In order to conduct a deeper analysis on the impact of media on how humans perceive robots we firstly determined the most popular movies emerging from four databases, and used their