Personalizing Robot Avatars - Opening the Discussion

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Figure 1: Workshop participants creating a customized robot avatar from low-fi prototyping materials.

ABSTRACT

In this paper, we discuss on the possibilities of personalizing a robot avatar, which may become a realistic use case with the remote presence technologies become more popular. We present an initial user study, where workshop participants (n=7) present their ideas of outlook characteristics and use cases for a personal robot avatar.

KEYWORDS

robots, design, avatar, robot avatar, personalization

1 INTRODUCTION

Different robots are becoming increasingly common in our everyday life settings. Whereas many domestic and maintenance robots are still quite simple and designed for functional purposes, social robots are an emerging phenomenon. While interacting with robots becomes more commonplace, also use cases for them can be expected to expand. In this paper, we address the topic of robot avatars, especially focusing on the personalization aspects with

them. We consider a robot avatar to be a physical, autonomous or semi-autonomous representation of a person, which has the behaviour of a social robot, and has some characteristics that represent the operator. Here, according to the definition by Bartneck and Forlizzi, a social robot interacts and communicates with humans by following the behavioral norms expected by the people it interacts with [1].

Robots providing remote presence are already a familiar phenomenon both in research and practise. Telepresence robots have already been used for instance in medical domain to extend physician presence [12], education [17], and conference meeting [14] contexts. Telepresence robots are however designed in an impersonal manner, and their outlook remains the same no matter whose virtual presence is occupying the robot. In this paper, we wish to address a more personal representation in remote presence through a robot.

2 AVATARS AS APPROACH FOR SELF-PRESENTATION

2.1 Personalizing Avatars - Prior Art

Using avatars as a representation of oneself is familiar for many from social media applications and video games. Often personalizing an avatar is the required step before entering to use a virtual world application. It has been reported that with virtual world avatars, it is important to provide options and creative freedom

for customizing body parts which are very visible and easily recognizable, e.g. hair [5]. However, the virtual world avatars do not necessarily resemble the user [10], but are rather representations of possible selves. Lin and Wang [10] and Kafai et al. [8] have investigated the motivations for creating avatars in virtual worlds, these spanning from, e.g., seeking aesthetic representations, creating the avatar to resemble self or someone else, and virtual exploration of something otherwise impossible. Neustaedter and Fedorovskaya present Realistics, Ideals, Fantasies, and Roleplayers as four identity types, who have different needs on how much their avatar resembles their real world character's looks [13]. It has been noted that the virtual world avatar representations of possible selves are partly chosen based on the perception of the social context, matching the features with what is relevant in the specific situation [10]. McArthur has pointed out that user experience (UX) oriented research on avatar customization has still been scarce [11].

In practise to date, telepresence robots have been probably the closest counterpart for virtual world avatars in physical world. In addition of investigating their use in different contexts [12, 14, 17], research has addressed the characteristics of a robot avatar. Prior art has studied the robot avatar gestures and their integration to the communication [4], and how well the robot mediates the personality of its operator [3]. Robot avatars are also familiar from the science fiction context. For example, the movie Surrogates (2009) presents a future world, where people interact in the society through a humanoid robot, which they control remotely. So far, the phenomenon of personalizing a robot as an avatar representing oneself has received little attention in research. Yet, there are already examples where clothing on robots has been demonstrated. Prior research has presented providing robots work place uniforms [9], and a fashion show for Pepper robots has been organized [15]. As a physical world phenomenon of possible selves, cosplay should also be mentioned, as in cosplay people create and dress up in costumes resembling a chosen fantastic character [16].

2.2 Initial User Study

To initiate the study on robot avatar design, we integrated the topic into a co-design workshop on social robots. The workshop included start and end questionnaires, and ideation and concept design tasks illustrated in Figure 1. The overall workshop method has been reported in [6]. In this paper, we report the results relating to participants' perceptions on customizing robotic avatars representing themselves, retrieved from the workshop end-questionnaire. The workshop included seven participants (4 men, 2 women, 1 preferred not to answer) with design or HCI background. All participants had some experience from using virtual avatars, either in games (6/7), social media (3/7), or online events or conferences (2/7).

2.3 Desired Features of a Robot Avatar

The workshop end-questionnaire included questions 1) how the participant would personalize the appearance of a robot, if it represented oneself as a robot avatar, and 2) in what kind of situations the participant could imagine to use a robot avatar of oneself.

The participants had versatile opinions on what kind of robot avatar they would prefer for themselves. Some were afraid that the robot avatar could be too realistic (participant #2) and strange: *"I*

think it would be strange to make it similar to me..." (#3), but on the other hand, also preference for as close look-alike as possible was expressed (#7). In addition, a styled or a caricature representation of oneself was desired. *"[I would like it to be] simplified to the most characteristic features, like a caricature. I would not want a digital twin."* (#2). Some (3/7) participants mentioned using clothes, patterned fabrics, or accessories, such as a hat, scarf or wig, to personalize their robot avatar, e.g. *"I would make it to wear jeans and a wig, and a white t-shirt"* (#2). One participant (#5) would have liked the robot avatar to wear a cape, as it was something they wished to wear but currently did not. A cape was also integrated in the physical ideating session, Figure 1. Choosing the color(s) for the robot avatar was mentioned by two participants (#3, #4).

Whereas there was quite a diversity in ideas and preferences how to personalize a robot avatar, the suggested situations for using a robot avatar varied less among participants. Five of the seven responses related to work contexts, typically to remote presence (#2, #4, #6, #7) e.g. at a conference, or *"when I have repetitive or heavy work tasks"* (#3). One participant elaborated, how they could use a robot avatar to reflect their emotions when giving a presentation (for work) (#4). Participant #6 reflected that s/he could use a robot avatar *"if I could not participate in some important work event, or in other occasion, which would not be a very personal event."* One person reported they would use a robot avatar in a *"social VR environment"* (#5).

3 DISCUSSION

The term avatar is today well-known, and many people have come across the avatar concept in movies or with digital games or applications. In the study presented in this paper, our aim was to conduct an initial study of the concept of people customizing their personal robot avatars. Robot avatars represent a social robots case, which breaks the traditional interaction scheme with robots. It addresses scenarios which go beyond using the existing telepresence robots, in a more individual, personalized and autonomous step in their evolution. Hornecker et al. have called for robot's agency as a situated and mutual construction, and that the scenarios should take into account that robots and humans are not independent entities [7]. We see robot avatars pointing exactly to this direction.

Today, customizing virtual avatars is a popular feature in many applications, including social media and video games. However, we can expect that the phenomenon and preferences for customizing avatars changes when bringing the idea of a personal avatar to a physical world. Whereas virtual avatars are often created as possible selves rather than as realistic representation of oneself [8], the preferences with robot avatars is probably towards one's realistic character. With our participants, the ideas of the outlook for a personal robot avatar ranged from look-alikes to caricatures, but also opinions not preferring physical resemblance were risen. Similar ideas as reported with digital avatars using with visible characteristics for personalization [5], e.g. a cap or wig, were verbalized. With virtual world avatars, it has been shown that there exist social pressures to construct an avatar that is refined and sophisticated [13]. This may become a valid point also with robot avatars.

In the participants' answer, many seemed to be positive about participating remotely to work events using a robotic avatar. In the

recent years there has been an increase of virtual and hybrid events due to the COVID-19 pandemic, which undoubtedly has influenced on people's perceptions towards remote technologies in a positive way. The most common use cases people could think of related to remote work. This was probably inspired by the pandemic as well as due to the fact that all participants had already been in worklife.

We believe the topic on characteristics of a robot avatar is an interesting and relevant for future human-robot interaction. There are several fruitful phenomena to study more, including personalization and the social etiquette, where concerns already exist with current remote presence robots [2].

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