When an emotional robot meets real customers

Exploring HRI in a customer relationship setting

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ABSTRACT

Spoon, a robot described by its designers as "social", "emotional", "empathic" and also "sympathic", was put for three months period during last autumn in a telephone and IT shop in the center of Paris with the mission "to help" sales advisors to receive customers and answer their first questions (like orientation in this big two-floor shop, how to meet an advisor etc.). Building on the video-ethnographic study I conducted at this occasion, the paper explores the interactions between the robot and the customers as well as its inscription in the spatial configuration and work activities of this commercial space.

CCS CONCEPTS

• Human-Computer-Interaction • Empirical Studies in HCI •Social Robotics • HRI • Affective Computing •Artificial Intelligence • Social Interaction •Sociology • Ethnomethodology • Cooperation and coordination

KEYWORDS

Social Robotics, Customer Relationship, Emotions, Public Space, Shop Interactions, User's work, Interactional engagement

1 How to describe our relations to conversational robots?

Different incarnations of conversational AI are progressively leaving the research labs and the scientific experimentations to meet real users in a variety of everyday situations: voice assistants embedded in mobile devices for individual use (smartphone, tablet) or in speakers for family uses at home,

written chatbots in customer relationship or social robots giving information in public spaces like museums, railway stations, airports or commercial spaces.

Social robots give rise to probably the most impressive forms of our encounters with AI as they tend to simulate not only cognitive and perceptive human capacities, but more and more social and interactional competences trough talk, but also bodily movements and gaze. In recent years social robotics and affective computing are going further in the movement of "anthropomorphisation" of robots trying to reproduce other humanlike properties like the recognition and the manifestation of emotions [4, 5, 7, 13]. According to this design philosophy, "emotional" robots will be able to conduct more "natural" interactions and will fit better to the assistance settings they are usually addressing (in service relationship, but also in care, therapeutic or educational settings). If some features refer explicitly to human being (voice, talk, emotions), other recall more generally living beings. This is for example the case of movements. In their work on animation and automation, Stacey and Suchman [14] observe that "movement is taken as a sign of life".

Endowing robots with the capacity *to simulate* or to *recall/refer to* [8] human behavior raises the question of their "hybrid" status of machines imitating humans and of the type of relationship and involvement, humans may develop with them. That was largely discussed in scientific literature, but also in the "word of *artifictional intelligence*, available through the newspapers, books and films."[10: p.13]. The difficulty to grasp the very particular ways robots may play roles of social partners are also visible in the variety of terms used to describe their human-like social behavior: for example, they are said simulating, imitating, copying, human competences; recalling/referring to emotions [8]; producing "effects" [1].

Some authors place the question of robots' status on the technological design side [1, 2, 3, 6]. Discussing the question of the phenomenal status of social robots - are they things or agents, what kind of things are they - M. Alac notes that "their digital and physical materiality is orchestrated to produce effects of sociality and agency" [1]. Others place the issue on the users' side: "[...] we are so good at absorbing computers into social life that we all too easily imagine them to be *full participants* – social creatures like us."[10: p.13].

The study presented in this article is a contribution to the investigation of our relationships to social robotics systems in everyday life. Interactions with robots are most often studied in experimental settings drawing on psychological, ergonomics and cognitive sciences analytic frameworks. These analyses focus on the "face-to-face" between the human participant and the technical system and are limited to usability issues. This research misses questions related to the larger social environment which becomes relevant when robots leave labs and are present in real life situations, including other persons and groups different from the individual user, eventually with different participation status [11] regarding the ongoing human-robot interaction, artefacts, objects, surrounding organizational setting, work activities, etc.

Drawing on ethnomethodologically informed video-ethnography of the uses of an "emotional" robot in the public space of a large telephone and IT technology shop in Paris, this article aims to describe the specific forms of HRI in this context, but also to grasp their "inscription" in a larger social situation of "copresence" between the robot, customers and shop professionals.

2 Field study: method, data, research questions and findings

1.1 The setting

The social robot Spoon was installed for three months period last autumn in the world's biggest Orange[1] shop in the center of Paris in order to experiment the potential contribution of social and affective robotics for relations with customers, namely in receiving, informing and helping them in finding their way in the shop. This shop is rather big as it hires a hundred and twenty employees and receives at about a thousand of customers daily on a large surface (2000 m², two floors). In this context, the role of the robot was to help sale advisors in receiving customers through two main use-cases: giving orientation information for the shop and verifying customers' registration (to meet an advisor one has to register first). The third use-case was the guest book: Spoon was able to take pictures and messages from users.

1.2 The social robotics system

The designers of the robot Spoon present it as an "artificial creature", endowed with "human and social competences" and based on "animal communication". The system is composed of a Kuka spindle (its moving body) and of an animated tactile screen (its head) (cf. Fig. 1).

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[1] Orange is the French historic telephone and internet provider.

Fig. 1. Spoon in the Orange shop in Paris (© Velkovska 2018)

Spoon observes its environment through visual sensors and is able to detect human presence nearby and try to engage interaction (saying "Hi there"). Once interaction engaged, Spoon looks at the user and moves his head and body to follow her movements. Spoon is able to multimodal interactional behavior: it speaks, moves, uses facial expressions (smiles, grins, eyelid and eyes movements, gaze), it produces small funny noises and whistles. Users can interact with the system by talk, by the touch screen, or visually (Spoon following user's movement by his head and body movement). Robot's proactive conduct and its multimodal competences give rise to a variety of interactional engagements with users that will be described in this paper.

1.3 The sociological study of HRI in service encounters

The study is composed of two parts. Drawing on sociology of innovation and STS, the first one followed during ten months the innovation project, which brought together different organizational actors and technological designers in order to configure the place and the role of the robot inside the organization of work activities. Drawing on ethnomethodologcial ethnography, the second part investigated the uses of the robot "in the wild" during its three months stay in the shop in the middle of customers and professionals. The data collected are composed of video recordings of HRI in natural situation involving customers and employees, observation ethnographical notes, interviews with customers, advisers and managers, photos.

Based on the second part of the research, this paper explores the consequences of the public availability of a social and "emotional" robot for the customers' and professionals everyday

activities in the shop, and also for customers-professionals interaction. The history of customer relationships is in some sense the history of their progressive technological equipment and transformation trough industrialization (call centers), automation (artificial conversational agents, cf. [16]) and digitalization (online customer communities, digital customers' self-care, cf. [15]). At each step, the technological mediation aims at cost reducing by delegating a part of employees' tasks to other actors (machines or customers). Will the introduction of social robotics constitute continuity or a break regarding to the previous forms of customer relationship automation?

The paper addresses this question through a praxeological approach of activities and interactions with and around the robot. How the public availability of the system is treated by customers and by employees in the shop? How do people engage in interaction with the robot? What is the robot's contribution, if any, to advisors' work? What are the emerging forms of coordination? To explore these questions the paper builds mainly on video-recordings of interactions and focuses on two points:

1). The different forms of interactional engagement with the robot and their consequences on the ecology of the shop; 2) The users' work [17] and attempts to deal with the interactional "oddity" and limits of the robot. The analyses shows a series of noticeable properties of the interactions with the robot: they are often collective and emotionally colored; they configure different groups of participants (interlocutors and public); they may be focused or unfocused interactions [11] building on human-robot copresence; the robot and people interacting with him attract a public of spectators and introduce a particular form of animation in the setting of service encounters. The second line of analyses explores users' work to coordinate with the robot using multimodal behavior and to cope with interactional problems and ambiguities. The results are discussed in the light of the research literature on the coordination, repair and feedback in interactions with conversational agents [9, 12]. On this point Collins [10] suggests that repair practices are good entry to explore the status of conversational machine in the social word: "The test of whether computers are social beings is whether they can repair our failings in the same way as we repair theirs and as we continually do with other human beings – so far they cannont." [10: p. 13].

Building on video data analyses the conclusion will outline the social life of this emotional robot in the midst of customers' and professionals' activities, the forms of interactional engagement and the way the system took place in everyday life of the shop where advisors are dealing with customers' requests, purchases and complaints.

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