The haecceity of assembling by distributing perception

Brian L. Due

Dept. of Nordic Studies and Linguistics
University of Copenhagen
Copenhagen, Denmark
https://orcid.org/0000-0003-3670-9102

This position paper introduces a model for understanding the emerging configurations of humans and robots in interaction. It is based on three elements that together constitute the model: 1) The haecceity of "social facts", 2) the momentary assembling of agents, and 3) the distribution of perception as practical action. Paying attention to these three elements can enable HRI-researchers to gain a more profound understanding of human-robot configurations.

Keywords: *Ethnomethodology, assemblages, HRI, perception*

I. INTRODUCTION

This paper deals with a particular type of robot used in close proximity to humans, either as wearables (e.g. smart glasses), as bodily extensions (e.g. exoskeletons) or as co-bots (e.g. a robot vacuum cleaner, or social robots). They are used within a shared space; they are equipped with sensors and can utilise these sensors not only for processing sense data from the world but also using a sensory system for communication (beeping, blinking, speaking, bumping into, etc.).

Most modern robotic systems have these abilities, which enable them to produce and distribute some kind of perception of the world. People can use them to build new courses of actions. Instead of dyadic relations, interactions becomes co-operative achievements. Thus, what is needed is not just a re-configuration of these kinds of robots as specific types of technical systems, or fixed forms of socio-technical configurations, but rather a unifying conceptual model.

This model should consist of 1) the haecceity, the local and emerging accomplishment, of any "social fact" within a perceptual field, 2) how humans and robots become situated assemblages in that field, and 3) how perception is distributed and becomes a joint co-operative achievement. In what follows I will briefly sketch the theoretical underpinnings of these three elements of a model for studying HRI: *The haecceity of assembling by distributing perception*. But first, an image from the data illustrating the model in action.

Fig. 1. *A visually impaired person (VIP) is navigating using the four-legged robot, Spot, as a kind of "robodog". The robot can make micro-autonomous adjustments, as shown in the image, in which the robot is dragging the user away from an approaching pedestrian. However, its overall pace and direction is operated by a human using a joypad. Accomplishing this manoeuvre right here in space and time is understandable, as it is the haecceity of this particular social fact in this phenomenal field. The VIP, the operator and the robot make up a momentary assemblage that enables mobility and navigation in and through the connecting harness. Perception is distributed among the agents using the VIP's tactile senstations, the robot's visual and distance measuring sensations. and the operator's visual and auditory sensations.*

II. THE HAECCEITY OF HUMAN-ROBOT-INTERACTION

A useful paradigm for studying humans interactions with, and in the context of, technologies is ethnomethodology e.g. [1]–[3], which in its most basic form is concerned with studying the "missing what" (quiddity) and the "just thisness" (haecceity) of what is going on [4], [5]. Whereas mainstream HRI research state particular quantifiable features, the ethnomethodological approach seeks to specify the orderly and interactional organisation that makes up this or that particular feature or sequence. There is, as Garfinkel showed [6], a myriad of seen but unnoticed aspects of a case that are taken for granted by members of society and researchers, but which must be subjected to detailed analysis to exhibit the sense-making practices and actions that make up this or that particular case as an observable and accountable phenomenon [7]. This requires HRI-researchers to study, in detail, the natural organisation of "social facts" from within a particular phenomenal field in which accountability becomes observable [8].

III. ASSEMBLING HUMANS WITH ROBOTS

Ethnomethodology does not prioritise the individual, it focuses on competence as members of a culture [9]. This leads to an agnostic approach to subjectivity and cognition, but a strong focus on observable action [10]. Consequently, agency is not a human trait but an ability that fluctuates within an activity system [11]–[13]. Agency is situated [1], and can be hard to excrete when humans and robots merge into momentary assemblages. Assembling is a concept [14], [15] which does not (as e.g. cyborgs) describe a permanent integration, but rather the process of bringing something together, and possibly disassembling it again, without permanently altering any of the components. The concept of assemblage enables HRI-researchers to establish an understanding of how it may be not just the human, not just the robot or not just any other features in the socio-material setting that has exclusive agency, but rather that it is enacted by a momentarily situated assemblage [16].

IV. DISTRIBUTING PERCEPTION BETWEEN HUMANS AND ROBOTS

Perception is a constant factor in human sociality, and it is based on multisensorial resources [17]. Whereas perception in mainstream natural science research is understood as a neuropsychological relation between sense systems and cognition, and in computer science as a technical relation between hardware and software, a praxeological perspective on perception understands it as a practical achievement [18] which is exhibited as observable action [19], [20], disregarding its specific human or non-human nature [21]. The observability of perception is due to its orderly and semiotic nature, i.e. it is constructed as signs, subjected to the agent's *in situ* orientation. Sensation can be achieved by sense-able agents which have semiotic capacitates to distribute sense information as perception. Any current assemblage can be composed of sense-able agents, wherein perception of the world becomes a concerted, co-operative accomplishment. The concept of distributed perception thus enables HRI-researchers to recognise not just motor functions, manual action, or attitudes, but also perception as distributed from both human and non-human agents.

V. CONCLUSION

In sum, *the haecceity of assembling by distributing perception* is a conceptual approach to the study of human-robot-interaction which is inherently praxeological, and builds on and extends the ethnomethodological framework by incorporating non-human agents. It contributes to, and sets out, a direction for the study of HRI that does not anticipate any specific kind of competence or sensory normality, but rather is indifferent to the type of agent and setting. It seeks to study the missing 'what' of any HRI-settings as naturally organised phenomenal fields where robots, or sensing AI, is operated and operates in close proximity to humans.

The study of HRI from the perspective of *the haecceity of assembling by distributing perception* is not, however, as one might be led to think, simply an idiosyncratic subjectivism. Any local production of a haecceity also exhibits an endogenous orderly organisation that is potentially enacted again and again, but nevertheless never exists without this continued enactment. Any HRI-configuration has its own witnessable details, and because of that its potential "witnessable generality" as well [22, p. 21].

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