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(Un-)Biasing the Morphologies of Affect for HRI Purposes †

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Abstract: One fundamental aspect of Human-Robot Interactions is the role of the morphologies of both humans and machines. Basically, humans are naturalistically oriented towards the social interaction with other humans. Taking into account that fact that human morphologies run a social role, and that affection or emotion are fundamental aspects of the eco-cognitive and social processes, this talk tries to relate some classic and current challenges related to HRI: moral bias, emotional role into HRI, and dynamical morphologies in transhumanist scenarios.

Keywords: affect; emotion; HRI; morphology; bias; cognition; synthetic emotions

1. Introduction: From Bodies to (Artificial) Bodies

One fundamental aspect of Human-Robot Interactions is the role of the morphologies of both humans and machines. Basically, humans are naturalistically oriented towards the social interaction with other humans, as wrote Aristotle in his classic Politics: "Man is by nature a social animal; an individual who is unsocial naturally and not accidentally is either beneath our notice or more than human. Society is something that precedes the individual. Anyone who either cannot lead the common life or is so self-sufficient as not to need to, and therefore does not partake of society, is either a beast or a god". Considering it as the long result of an evolutionary process, we can find the several cognitive mechanisms make possible these processes [1–4]. Some of them, like constantly face-looking patterns allow some biased, like pareidolia or the faces convey primal information for our social life, which make possible to see faces into toasts, rocks or forests [5,6].

The constant analysis of morphological aspects is related to mating [7,8], fly-or-fight responses [9], social coordination [10] or emotional interaction [11]. This affects primarily the visual [12] and metacognitive processes related to it [13], but must be understood as multidimensional processes which involves several senses. Finally, there is also the influence of cultural values into basic informational sensory processes, as shows the cultural psychologist [14].

Taking into account that fact that human morphologies run a social role, and that affection or emotion are fundamental aspects of the eco-cognitive and social processes, I want to remark some important aspects fundamental to be taken into account during the design of good HRI systems and environments.

2. Moral Morphologies as Social Prejudices or Cognitive Bias?

Although 19th Century psychomorphologists or physiognomists like Cesare Lombroso were wrong about the causal relationship between face shape and (usually wrong) moral behaviour, the truth is that human beings tend to correlate some morphologies with moral and/or emotional content [15,16]. Here, bad guys are usually dark, angry, with some deformity or extreme trait (big nose, big ears, small head, ...), weird cinematic body movement, …like we can find in most of

popular cinema and Walt Disney's villains characters [17]. Obviously there are not only biologically determined aspects related to this process, but the role of cultural values must not be undervalued:

Beyond the debates between continuous and categorical models of human caption of emotions, the outstanding fact is that morphology affects how we define the emotional output or even main character of an agent [18]. Therefore, the morphology of the robot is one among a long list of emotional affordances I've described elsewhere in previous research [19], but at the same time the morphology has an outstanding role because determines a long set of related characteristics of the agent.

3. Emotional Morphologies for HRI

According to the previous data it is obvious that besides of considering the functional design of a robot, several socio-cognitive aspects related to their morphology must be taken into account: gender [20], related language semantics [21], social context [22,23], body gestures/cinematic [24], among a long list. It is very important for example, that most of previous studies have been related to visual and linguistic HRI interactions, while others extremely important, like touch or olfactory have been almost neglected, basically due to the high complexity of these processes. These aspects are not only basic for a more deep relationship between humans and robots in classic domains (service, military, industrial, care), but also for new ones (like the taboo one of sexual robotics [25], surely one the niches with great expected revenues and implementation according current data on sexual surfing and related interests through the Web and Social Networks). As a conclusion of this section, I must to affirm that the study of the emotional affective aspects embedded into robot morphologies arises as a multidisciplinary research as well as a multidimensional process that goes beyond the basic description of size, shape, color or texture, requiring more variables: temperature, cinematic speed, temporal flow and adjustment to a naturalistic emotional gestures dynamics, among other ones.

4. The Challenge of Dynamically Augmented Morphologies: Transhumanism or Adaptable Robotics

There is a final idea to be discussed here: human agents are starting to modify severely their cognitive and bodily limits (up to date just as a repairing/prosthetic process or as fashionable gadgets) and this process will modify severely how the natural analysis of morphological phenomenology is performed. At the same time, we can find robots into the market with variable morphologies (combining biped walking with four-legged translation or even wheels; with adjustable body characteristics), something that can confuse the human interacting with the robot. While we do not have a clear control of current morphological aspects involved into HRI, a new set of challenges is in front of us.

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