

Ergonomic Design in Interaction with Robots

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EDITORIAL

The presence of robots in society is an implacable fact, although in the industrial field it has had a sustained growth in recent decades, it is in the field of social or service robotics where unstoppable growth is being experienced.

Social robots are those robots designed to interact with people to provide a positive result on them [1]. Social robots have application in education, communication, entertainment and assistance to people. They communicate with people using people's natural channels, such as gestures, voice, body or touch movements. They should be designed in such a way that they provoke a positive emotional acceptance and response in people, contemplating not only aspects of physical safety, but also how they influence them emotionally. This is why some of these robots usually have an anthropomorphic or zoomorphic construction.

The emotional acceptance of the presence of robots in the close environment of people also raises aspects of the field of psychology. One of these aspects is known as the uncanny valley phenomenon [2]. It is observed that if the robots have a certain humanoid form there tends to be a positive acceptance by the people, but as the robots are more like a person, a rejection appears, a repulsion. It is a phenomenon similar to the one observed when observing a corpse or a clearly ill person.

With the rise of Industry 4.0 there is a tendency for robots to work side by side with humans safely thanks to collaborative Robotics [3]. Similarly, the robotic structures that form exoskeletons are showing great potential in the field of care and rehabilitation [4]. In the field of communication and social interaction, the use of social robots in trade fairs, museums, shopping centers and hotel receptions is increasingly common. Due to the aging of the population, assistance to people is becoming increasingly necessary and the use of technology for remote assistance is increasingly available. New paradigms must appear that allow the incorporation of remote assistance robots with greater acceptance [5].

Robots can also work together with people to make it easier for them to perform work ergonomically. In the authors propose a method where the robot assists in real time a manual work done by the person in such a way that a well-established ergonomic procedure is always guaranteed [6].

As in the interaction with computers, interaction with robots should be considered from the moment of conception and design. With this premise, the design of the interaction with robots should be centered on the person. The design must face aspects of not only how the person and the robots interact but also how the environment must adapt for a satisfactory coexistence of both. Some design methods contemplate three different perspectives; Robot-to-object design, where the robot is designed to adapt to surrounding objects; Object-to-robot, where are the objects of the environment where they must adapt to the robots; Robot-and-object, where both are conveniently designed adapting to each other [7].

Again, the multidisciplinary collaboration of engineers, psychologists and architects is necessary to build a highly technological society where people and robots live together safely to meet the needs of a growing and dependent population.

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Received: February 18, 2020; Accepted: February 19, 2020; Published: February 26, 2020

Citation: Muñoz LM (2020) Ergonomic Design in Interaction with Robots. *J Ergonomics* 10:e186. doi: 10.35248/2165-7556.20.10.e186

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