Chapter 18
Nós e os Robots / Os Robots e Nós: Insights from an Exhibition

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Key words: Robotic Technology, Social Robots, HRI, User's Awareness and Education, Ethics, Harmonious Integration

18.1 Introduction

The increasing development of robotic technology in the last decades is leading to its fast implementation in distinct domains of human life. Factory automation, transportation, military purposes, medical appliances and service applications for edutainment or personal assistance are just some of the fields where this technology has been deployed.

Robotic technology was initially restricted to the secluded industrial environments (e.g., Fig. 18.1a) or to the scenarios of research testbeds. In both cases none or very limited interaction with common people or even visibility was expected. However, in the last decades, robots have progressively become involved in increasingly more complex and less structured tasks and activities, having started to interact with real people in public and/or private social spaces (e.g., Fig 18.1b).

Robots are designed by people to be used by or with people, in human benefit, this means, effectively contributing to the well-being and ultimately happiness of human beings. This is, in fact, what it is generally expected of technological development, as a whole, though all along the road, this is not always a fact.

However, successful deployment does not just depend on the efficiency and effectiveness of its performance but also on its harmonious integration in human life.

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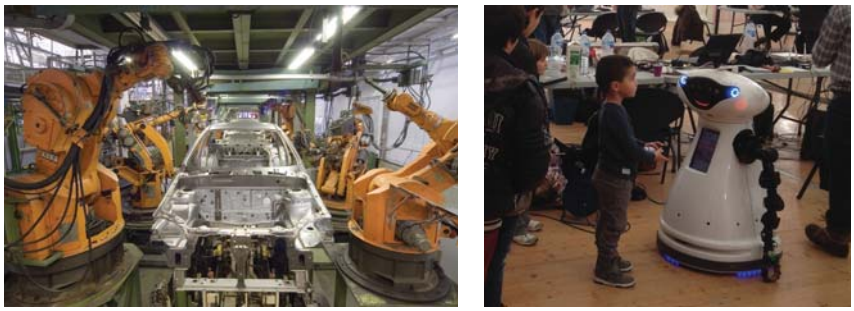


(a) (b)

Fig. 18.1 (a) Robots in an industrial environment, KUKA (2016); (b) Robots interacting with humans, RoCKIn (2016).

This integration demands the creation, before its massive implementation, of space and time for people to come close, get acquainted and have the chance to interact with the different forms robotic technology can assume. Giving them the chance to come to know more about the technology and its limitations, to express their doubts, to learn how to interact with it and last but not least to develop an awareness relatively to the ethical issues that can already be anticipated. This is an educational process that should be set as a priority in all forms of technological development, but that is particularly relevant to the ones with huge impact on the way people live and establish relationships, as it happens with ICT technologies.

The exhibition "Nós e os Robots / Os Robots e Nós" that took place in the main exhibition room of the Pavillion of Science, in Lisbon, was a fundamental part of ICRE 2015. The goal of the exhibition was to create a space and time for people to come close to real technology, interacting with it and starting to make an idea on how it will be when robots come to share our daily environment in a constant way.

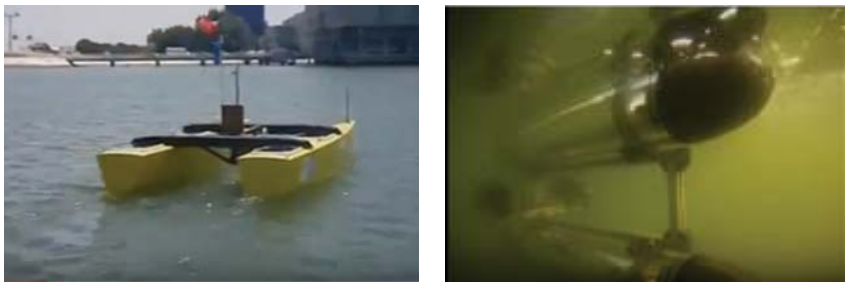
The exhibition's title aims to highlight the circular nature inherent to the semantics of the concept of [interaction] itself. The virtual circle drawn by every instance of HRI, binding the end-user and the robot, is a process in which both parts are assigned an identical agent role. The Portuguese and French morphology and syntax reflect this symmetrical relationship: "Nous et les Robots / Les Robots et Nous", "Nós e os Robots / Os Robots e Nós" translates a relationship where each of the participants is, at a time, respectively, the subject and the recipient in the closed circle that every interaction always involves.

18.2 Exhibition and Exhibitors

As mentioned before, the exhibition's main goal was to bring close to the public a broad range of real autonomous robots performing live demos. These robots

represented not only research and development activities of the academia, but also commercial applications promoted by companies with robots as their core products.

The Institute for Systems and Robotics (ISR/IST), a university-based research center focused on advanced multidisciplinary research activities, in the areas of Robotic Systems and Information Processing, participated in the exhibition with the works of three of its research groups.



(a) (b)

Fig. 18.2 (a) DELFIMx (2016); (b) Medusa (2016).

The Dynamical Systems and Ocean Robotics Laboratory (DSOR), showing videos of their marine autonomous vehicles (Fig. 18.2), since it was not possible having them performing there, the Computer and Robot Vision Laboratory (VisLab), demoing Vizzy, Fig. 18.3a, a wheeled humanoid robot for assistive robotics performing simple tasks, such as people following and object grasping, and the Intelligent Robots and Systems Group (IRSg), making demos of the wheeled robot MBot (Fig. 18.3b) performing tasks in a domestic setting,integrating speech interaction, navigation, and object manipulation.

(a) (b) (c)

Fig. 18.3 (a) Vizzy (2016); (b) MBot (2016); (c) Frog (2016).

Another university-based research group focused on autonomous agents- the Intelligent Agents and Synthetic Characters Group (GAIPS) from INESC-ID, presented several interactive demos involving embodied agents that interact with the public by involving them in games. One of the demos had a large interactive table through which the public could play a game with a robot. The interaction was affective, in the sense that the human player's emotions were explicitly modeled by the system.

IdMind, a IST spin-off devoted to the development and construction of mobile robots, demoed several robots, including FROG (Fig. 18.3c), an outdoor guide for public spaces, such as a zoo.

It should also be mentioned that the Pavilion of Knowledge, where the exhibition took place, is currently using a mbot as a welcoming guide to the museum. This robot, called Viva, was also circulating among the exhibition area, actively interacting with the public.

TURFLYNX was another IST spin-off present. This is devoted to the development and construction of autonomous lawn mowers for large areas. Since their robots were too big to fit inside the exhibition building, they were present with videos and informational leaflets.

Being a company that exploits the intersection between robotics and art, Artica, a company specialized in multimedia interactive installations, demoed Gyro, a small affordable robot built on-top the Arduino platform.

The Portuguese Air Force Academy (AFA), also present, has been very active in the past years on the development and construction of drones for defense applications, namely for surveillance missions. Having developed the capacity for building these drones from scratch up to the systems integration and validation, they showed some of their drones, together with videos featuring the missions they have been involved recently.

(a) (b)

Fig. 18.4 Photos of the exhibitors: (a) from left to right, GAIPS and ISR, (b) from left to right, TURFLYNX, Artica, AFA, and IdMind. The Viva robot is also visible in (b) (leftmost white mobile robot).

Together, these exhibitors covered not just several dimensions of the presence of robots in our society- from completely non-interactive applications to social/service

robots capable of exhibiting affective behaviors- but they brought together research prototypes and commercial applications.

18.3 The Reaction of the Public

The exhibition was visited by groups of children from schools on working days and by whole families during the weekend. The children were extremely enthusiastic with the mobile platforms. This was pushed to the extreme once they were allowed to remote control the robots: they formed queues waiting in line for the chance of remote controlling a robot, even for a few seconds each.

(a) (b)

Fig. 18.5 Interacting with the robots.

It should also be noted that, even thought the behaviors exhibited by these mobile robots were extremely simple, children very often ascribed to them much more complex constructs, such as intentions and emotions. This contributed to their engagement as well as to the active participation of adults who were also very curious about the robotic technology. In most cases, the exhibition provided a great opportunity not only for a first interaction with robots, but also for lively discussions between the public and the robot manufacturers about their technological specificities but also about their roles in daily life.

18.4 Conclusion

The interest and curiosity shown by grown ups and children relatively to the robots on display and their excitement when interacting with them, during the exhibit, demonstrates the educational role this type of events can play. We firmly believe that the periodic realization of events of this kind provides a fundamental educational

tool in what relates the end-users' future practices, guiding them on the best ways on how to benefit from technological development in a framework where safety and ethical standards are respected and user-experience is gratifying.

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Vizzy (2016) Image available online (Vislab- ISR/IST- University of Lisbon)