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Machines and humans facing the 10101 century

Monograph coordinated by Carme Torras and Ramon López de Mántaras

Robotics and artificial intelligence are two scientific research fields that receive considerable attention from the media and, consequently, from society. Unfortunately, many advances are reported to the general public in sensationalist (or even alarmist) terms, leading to false hopes or unjustified fears, and taking the focus from other key points. For instance, recent successes in artificial intelligence, amplified by the media, are the cause of a mistaken perception of this discipline's state of the art. The reality is that artificial intelligence is still far from achieving many high-level cognitive skills; particularly, common sense reasoning. Computers will keep increasing in competence, but it will be a long time until they develop a true understanding of the world around them, assuming it is at all possible. On the other hand, the debate on ethical issues arising from robotics advances, such as the use of robots for social environments and functions (like teachers or nannies) or the socioeconomical effects of the introduction of robots in industrial contexts to substitute human labour, keeps being postponed.

The present monograph aims to pick up these issues and, above all, infect *Mètode SSJ*'s readers with enthusiasm for an exciting field. Therefore, we suggest a journey from the beginnings of artificial intelligence and its pending challenges to some of its most surprising (and difficult to

understand) successes and failures; from humans who amplify their abilities through brain-computer interfaces to humanoid robots designed to imitate humans' movements and skills; from the great potential of robotics to help humankind in the most daring circumstances to the ethical, social, and affective challenges related to the introduction of robots in everyday life. All this thanks to leading international experts on the increasingly complex relationship between machines and the humans who created them.

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The illustrations within the monograph are the work of a unique artist: The Painting Fool (TPF), an artificial intelligence originally created by the British Professor of Computational Creativity Simon Colton. This selection of works captures the capabilities and eclecticism of an entity for which the definition of *software* seems to fall short.

In this spread, *The dancing salesman problem*, by The Painting Fool (digital image, 2011). The title refers to a classic computer problem, known as the «travelling salesman problem». The problem tries to ascertain which would be the shortest path (the optimal one) a traveling salesman should follow to visit a number of cities only once and then returning to the point of origin at the end. In the picture, TPF replaces the cities with painted sections.