

From the Turing test to science fiction: The challenges of social robotics

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Abstract. The Turing test (1950) sought to distinguish whether a speaker engaged in a computer talk was a human or a machine [6]. Science fiction has immortalized several humanoid robots full of humanity, and it is nowadays speculating about the role the human being and the machine may play in this “pas à deux” in which we are irremissibly engaged [12]. Where is current robotics research heading to? Industrial robots are giving way to social robots designed to aid in healthcare, education, entertainment and services. In the near future, robots will assist disabled and elderly people, do chores, act as playmates for youngsters and adults, and even work as nannies and reinforcement teachers. This poses new requirements to robotics research, since social robots must be easy to program by non-experts [10], intrinsically safe [3], able to perceive and manipulate deformable objects [2, 8], tolerant to inaccurate perceptions and actions [4, 7] and, above all, they must be endowed with a strong learning capacity [1, 9] and a high adaptability [14] to non-predefined and dynamic environments. Taking as an example projects developed at the Institut de Robòtica i Informàtica Industrial (CSIC-UPC), some of the scientific, technological and ethical challenges [5, 11, 13] that this robotic evolution entails will be showcased.



Setups for some projects on robot perception and manipulation recently developed at IRI (CSIC-UPC): a) perceiving and handling clothes [7, 8], b) measuring the chlorophyll of plant leaves for phenotyping [2].



Setups for some projects on robot perception and manipulation recently developed at IRI (CSIC-UPC) (cont.): c) Learning from demonstration using a haptic device [9], d) interactive learning in the ARMAR robot developed at Karlsruhe Institute of Technology [1, 14].

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