Title	DEXMART — DEXterous and autonomous dual-arm/hand robotic manipulation with sMART sensory-motor skills: A bridge from natural to artificial cognition
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Abstract	The DEXMART project is focused on artificial systems reproducing smart sensory-motor human skills, which operate in unstructured real-world environments. The emphasis is on manipulation capabilities achieved by dexterous and autonomous, and also human aware dual-arm/hand robotic systems. The goal is to allow a dual-arm robot including two multi-fingered redundant hands to grasp and manipulate the same objects used by human beings. The objects shall be allowed to have different shape, dimension and weight. The manipulation will take place in an unsupervised, robust and dependable manner so as to allow the robot to safely cooperate with humans for the execution of given tasks. The robotic system has to possess the ability to autonomously decide between different manipulation options. It has to properly and quickly react to unexpected situations and events as well as understand changes in the behaviour of humans cooperating with it. Moreover, in order to act in a changing scenario, the robot should be able to acquire knowledge by learning new action sequences so as to create a consistent and comprehensive manipulation knowledge base through an actual reasoning process. The possibility to exploit the high power-to-weight ratio of smart materials and structures will be explored aimed at the design of new hand components (finger, thumb, wrist) and sensors that will pave the way for the next generation of dexterous robotic hands.
Type	Abstract with podium presentation