Optimal sensing and control for robotic systems

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Abstract
The objective of my research is to develop control and sensing strategies for improving motor and sensing capabilities of robotic systems and artificial devices in order to better cope with a given task. The foundation of my research objective relies on nonlinear and optimal control, observability analysis and numerical optimization tools, taking often inspiration from naturalistic studies on living beings and their behaviors to drive the solution of the control and perception problem at hand. Results can be used to improve the scientific understanding of natural systems, but, most importantly, to enhance the performance of robots and artificial devices. In this talk I will show you how I achieved my research objective in different contests, ranging from the optimal visual servoing for nonholonomic vehicle equipped with limited Field-Of-View sensors to optimal control of Variable Stiffness Actuators for very dynamic tasks, passing through the optimal design of sensing gloves for human hand reconstruction and finishing with the active sensing control for estimation enhancement.

Biography
Paolo Salaris was born in Siena (Tuscany, Italy) in 1979. He received his Degree in Electrical Engineering from the University of Pisa in 2007. He got the Doctoral degree in Robotics, Automation and Bioengineering at the Research Center "E. Piaggio" of the University of Pisa in June 2011. He has been Visiting Scholar at Beckman Institute for Advanced Science and Technology, University of Illinois, Urbana-Champaign (US-IL) from March to October 2009. He has been a PostDoc at the Research Center "E. Piaggio" from June 2011 to January 2014 and at LAAS-CNRS in Toulouse within the Gepetto Team from February 2014 to July 2015. He spent few months at College de France, Paris, in 2013. Since October 2015 he is Inria researcher (CRCN) in the Lagadic Team, Sophia Antipolis, France. His main research interests within robotics are in optimal motion planning and control, control for nonholonomic systems, visual servoing, nonlinear observability/controllability and active sensing control for simple and multi-robot systems.