



McGill

Mechanical Engineering Colloquium

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MacDonald Engineering Building (MD) 267 1400 – 1500

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*Human-Robot Cooperation in Small-Medium Enterprises: safety related aspects
and new applications*

Abstract:

The human-robot collaboration (HRC) is on the top of the wish list of the Small-Medium Enterprises. Indeed, the cooperative tasks represent an incredibly rich configuration for many industrial applications. The HRC involves a two-level challenge: first, many different disciplines as mechanical design, control engineering, actuation, vision, system engineering, sensors *etc.* have to work together for a step-change in the design of industrial robots in order to face the HRC requirements; second, the human safety has to be guaranteed in each possible condition for each HW/SW configuration.

The talk will briefly introduce the HRC and the related multidisciplinary aspects, and, then, it will focus on the operational safety, that is, on the analysis of guide-rules and methods helping the design of fail-safe robot control systems. Specific attention will be paid to the upcoming Technical Specifications ISO TS15066 (to be published December 2015), that will be the pivot for the next generation of industrial application.

About the Speaker:

Eng. PhD Nicola Pedrocchi holds a M.Sc. (cum laude) in Mechanical Engineering (2004) and PhD in Mechanical Engineering (2008) at the University of Brescia (Italy). He is permanent researcher at Institute of Industrial Technologies and Automation (ITIA) of the National Council of Research (CNR) of Italy. He is responsible of the group of industrial robotics and control. His research field is on control techniques for Industrial Manipulators in advanced application requiring the interaction robot-environment (e.g. technological tasks) or robot-human operator (e.g. workspace sharing, teach-by-demonstration). He is involved in researches for accurate elastic modelling and dynamic calibration of Industrial Robots. In the last years, he has also investigated the use of standard small industrial robots for the neurological rehabilitation of post-stroke as a paradigmatic field of application for modelling, control, safety. On behalf of ITIA, he has been the referent (principal investigator or scientific representative) for many European Projects – FourByThree (H2020), ROBOFOOT (FP7), FLEXICAST (FP7), NEXT (FP6), SMErobot (FP6), – and he has been involved in - TRANS-IND(FP7), NET4M(FP7), ACTIVE (FP7). He is author and co-author on more than 40 articles published in International Conferences and refereed journals.