University of Basel

Department of
Biomedical Engineering

Seminar Series Robotics, Lasers and Beyond

Lecture Room 14.03.002, Department Biomedical Engineering, Gewerbestrasse 14, Allschwil

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Robotic assistance and safe interaction in surgical robotics

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Abstract

The introduction of robotics into the operating room has redefined many concepts of traditional surgery. More and more medical operations have taken advantage from the development of advanced robotic technologies and intelligent systems supporting the surgeon during both the pre-operative planning and the actual execution of the task. The talk is divided in two part. The first part is dedicated to provide an overview and discussion on past and recent research projects in the field and on the current research activities. In the second part of the talk, interaction control strategies and flexible and robust teleoperation systems will be presented to show examples of implementation of robot control architectures for surgical applications. Moreover, recent advancements in technologies like augmented reality and virtual fixtures generation to provide assistance to the surgeon in the operating room will be presented.

Curriculum:

Federica Ferraguti is currently Assistant Professor at the Department of Sciences and Methods for Engineering, University of Modena and Reggio Emilia, Italy. She received the B.Sc. and M.Sc. in Industrial and Management Engineering from the University of Modena and Reggio Emilia (Italy) in 2008 and 2011 respectively, and her Ph.D. in Industrial Innovation Engineering from the University of Modena and Reggio Emilia (Italy) in 2015. She has been a Visiting Researcher at the Rehabilitation Engineering Lab at ETH Zurich, Switzerland in 2013. Her research deals with collaborative robotics, industrial robotics, augmented reality, surgical robotics, teleoperation, control of robotic systems, physical human-robot interaction and learning from demonstration. She obtained the “Fabrizio Flacco Young Author Best Paper Award 2017” of the IEEE Robotics and Automation Society – Italian Chapter. She was involved in the European Project ISUR (Intelligent Surgical Robotics), funded under 7th FWP, aimed at developing a robotic system to carry out autonomously simple surgical actions and now in the H2020 Project SARAS (Smart Autonomous Robotic Assistant Surgeon). She was then involved in projects aimed at a safe physical human-robot interaction like National Project ADAPTIVE MANUFACTURING, part of the Cluster Nazionale Fabbrica Intelligente, the H2020 European Project SYMPLEXITY and INCLUSIVE.