

Workshop

Evaluating effectiveness and acceptance of robots in surgery: user centered design and economic factors

Organizers:

Paolo Fiorini, University of Verona, Italy

Giancarlo Ferrigno, Politecnico di Milano, Italy

Joerg Raczekowsky, Karlsruhe Institute of Technology, Germany

<http://www.eurosurge.eu/eurosurge/events/workshop-icra-2013>

Objectives

The International Workshop on Medical Robots, held in Milan on July 3rd 2012, promoted by the joint standardization working group of IEC SC 62A and ISO/TC 184/SC 2 on 'Medical electrical equipment and systems using robotic technology (Medical robots)' discussed the following points: the surgical robot cost effectiveness has to be proven, at least for specific kinds of surgery; to increase acceptability and effectiveness, new devices, inspired by nature and endowed with cognitive capabilities, should be proposed to step further. As a matter of fact, surgical robotics is more than 30 years old, nevertheless the turnover of new systems in terms of product and/or company failures is still high and the clinical uptake still limited. Main critical points are safety, usability and cost/benefit ratio. Only a user centered design and applications that really need and can take advantage of robotic surgery can effectively enter and remain in the healthcare market. The objective of the workshop is thus to bring together young and senior scientists, company developers and end users to bridge the existing gaps between technology push and end users pull. Through the workshop, the end users will have the possibility to present practical requirements of their daily activities, while technological scientists will be able to share their latest ideas for the benefit of patients (better outcome, less risks and pain, faster recovery and better cosmetic results) and surgeons (ergonomy of the master stations, realistic sensory feedback and virtual environment for training). The presentations cover all these aspects, from new approaches to surgical robots design (i.e. bio-inspiration, modularity etc.) to the cost effectiveness for the healthcare providers, to effectiveness for the citizens, and benefits for companies. Possible coordination actions for examining these aspects in more detail will also be discussed.

Topics of interest

- User centered design in surgical robots
- Modular surgical robots design
- Surgical robots technology assessment
- Standardization of surgical robots
- New approaches to surgical robots for increased clinical uptake (bio-inspired, autonomous, ...)
- Use cases showing new requirements (end users)
- Exploitation barriers to surgical robots
- Coordination actions for requirements definitions
- The role of the training in robotic surgery clinical uptake
- Ethical and legal issues...

Invited Speakers:

- Arianna Menciassi, Scuola Superiore Sant'Anna, Pisa - Italy
- Cameron Riviere, Carnegie Mellon University, Pittsburg - PA - USA
- Elena De Momi, Politecnico di Milano, Milano – Italy
- Alicia Casals, Institute for bioengineering of Catalonia, Barcelona – Spain
- Joerg Raczekowsky, KIT, Karlsruhe - Germany
- Guang-Zhong Yang, Imperial College, London - UK
- Patrick Finlay, Medimatton, Beaconsfield - UK
- Simon Di Maio, Intuitive Surgical, Sunnyvale – CA – USA
- Thomas Neff, Kuka Laboratories, Augsburg - Germany
- Alberto Arezzo, University of Torino, Torino - Italy

This workshop is supported by IEEE RAS Technical Committee on Robotics and Automation

Program

Time	Talk
08:45 – 09:00	Introduction and motivation (organizers)
	The academic research perspective
09:00 – 09:20	Experience at University of Verona (Paolo Fiorini)
09:20 – 09:40	Surgical robotics at Carnegie Mellon (Cameron Riviere)
09:40 – 10:00	Brain mapping in robotic interventions (Elena De Momi)
10:00 - 10:30	Coffee Break
10:30 – 10:50	Surgical robotics at Imperial College (Guang-Zhong Yang)
10:50 – 11:10	Complexity-performance and usability of surgical robots (A. Casals)
11:10 – 11:30	Surgical robots: compact design and bio-inspiration (A. Menciassi)
11:30 – 11:50	Surgical robotics at KIT, the OP sense platform (J. Raczek)
	Submitted contributions session
11:50 – 12:05	Ergonomics of User Interfaces (Giacinto Barresi – IIT – Italy)
12:05 – 12:20	TOF Guided Endoscope Navigation (S.Haase, Univ. Erlangen – DE)
12:20 – 12:35	US Guided Robot for Orthopedics (P.Goncalves IDMEC – Portugal)
12:35 – 12:50	Bio-inspired RMIS (H. Wurdemann – King's College, London, UK)
12:50 - 14:00	Lunch Break
	The industry perspective
14:00 – 14:20:	The case of Intuitive Surgical (Intuitive representative)
14:20 – 14:40	Solutions for robotics surgery (Patrick Finlay)
14:40 – 15:00	Medical Robotics a KUKA Laboratories (Thomas Neff)
	The medical doctors perspective
15:00 – 15:30	Surgical robotics practice (Alberto Arezzo)
15:30 - 16:00	Coffee Break
16:00 – 17:45	Panel discussion
17:45 – 18:00	Workshop conclusions and wrap up
18:00	End

Organizers

Paolo Fiorini,
University of Verona,
Verona - Italy
paolo.fiorini@univr.it

Giancarlo Ferrigno,
Politecnico di Milano,
Milano - Italy
giancarlo.ferrigno@polimi.it

Joerg Raczekowsky,
Karlsruhe Institute of Technology,
Karlsruhe - Germany
rkowsky@ira.uka.de

Contact

Paolo Fiorini
paolo.fiorini@univr.it