

Journal of Micro-Bio Robotics

Special Issues on “Frontiers of Robotic Endoscopy”

Call for Papers

Objectives of the Special Issue:

The scope of this special issue is to advance knowledge in the field of robotics applied to endoscopy, through smart tethered and untethered instruments and capsule-based robots.

Gastrointestinal endoscopy dates back to the 1860s, but many of the most significant advancements have been made within the past decade. Wireless capsule endoscopy (WCE), a revolutionary clinical alternative to traditional flexible scopes, enables inspection of the digestive system with minimal discomfort for the patient or the need for sedation, mitigating some of the risks of standard flexible endoscopy. Although WCE has entered the medical scene as a disruptive technology, it presents a number of limitations, e.g., the impossibility to actively control locomotion and camera orientation, which leads to low diagnostic specificity and false-positive results. Therefore, the natural evolution of clinical WCE consists of integrating mechanisms for closed-loop active locomotion and providing the capsule with sensors and tools for diagnosis and therapy.

This special issue seeks to address some of these questions by soliciting original and unpublished articles. A wide range of open challenges about robotic endoscopic capsule will be addressed in the dedicated issue of the Journal of Micro-Bio Robotics. Ranging from active locomotion mechanisms to sensing and therapeutic modules, the original contributions will cover key aspects of smart robotic devices for gastrointestinal procedures approaching issues, such as: i) capsules and novel flexible endoscopic devices, ii) robotic locomotion for active endoscopic capsules and iii) sensing and therapeutic modules. Contributions can be theoretical or experimental studies; the special issue is open to any kind of robotic platform and device and it is interested in the perspective of presenting engineering designs, modelling and developments, also supported by experimentations in synthetic or wet (*i.e.*, *ex-vivo* and *in-vivo*) conditions. Robotic capsule-based medical devices for other endoluminal districts and smart solutions for industrial endoscopic applications (*e.g.*, pipe inspection) will be also considered and included in this special issue.

The topics of interest include but are not limited to:

- Flexible endoscopes and applications, medical and not (*e.g.*, also industrial applications);
- Endoscopic capsules for endoluminal procedures (digestive tract but also in other districts);
- Physical simulations, mechanical and magnetic modelling and FEM;
- Design criteria and methodologies of endoscopic capsule and flexible smart endoscopes;
- Locomotion and localization methodologies for endoscopic capsules;
- Sensing, telemetry and data communication;
- Motion planning and autonomous/assisted diagnosis and therapy;
- Mesoscale mechanisms for diagnosis and therapy delivery;
- Power supply and innovative energy solutions for endoluminal robots;
- Experimental methodologies and settings (also standards and benchmarking) for evaluation of usability and acceptability of endoscopic robotic platforms (hardware and/or software);
- Accessibility and dependability evaluation (costs, level of difficulties, safety certification, etc.) of endoscopic robotic platforms;
- Professional training and education for endoscopic procedures: novel platforms and protocols for training;
- Future trends, challenges and perspectives.

Important Dates:

Deadline for paper submission: December 20, 2015

Notification of first review decision: February 15, 2016

Deadline for revised paper submission: March 25, 2016

Notification of final publication decision: April 15, 2016

On-line publication: May 1, 2016

Information for submitting the paper to the Journal of Micro-Bio Robotics:

Journal information: <http://www.springer.com/engineering/electronics/journal/12213>

Paper submission link: <http://www.editorialmanager.com/jmbr/>

Please indicate in the cover letter that the authors want to submit the contribution to the Special Issue on “Frontiers of Robotic Endoscopy” in the Journal of Micro-Bio Robotics.

Guest Editors: Gastone Ciuti, The BioRobotics Institute, Scuola Superiore Sant’Anna, Italy.