



Guest Editorial

Special Issue: Medical Robotics and Human Interfaces

Significant advances have been made in the field of medical robotics in recent decades. Spanning series and parallel robotic architectures, rigid and soft materials, and a variety of control approaches to move instruments to various areas in the patient's body, the potential for robotic applications in medicine remains vast. As the hardware, software, and control technologies underlying robotic solutions continue to mature and develop to be more clinically applicable with minimal risks, new robotic medical applications will continue to emerge.

A related area of growing interest is the interactions between human operators and various (including robotic) medical devices. Without appropriate, accurate, and user-friendly interfaces, the uses of these technologies are limited. Haptic devices are an example of the profound effect that interface devices can have on practical functionality and applicability of the technology in medical applications. The benefits of such medical devices may include facilitating minimally invasive surgeries in aiding with complex surgical tasks inside a patient's body.

We thank the authors who have contributed to this special issue for their very interesting papers in several subjects, covering many recent areas and results linked to Medical Robotics and Human Interfaces.

This Special Issue gathers a group of articles at the intersection of medical robotics and human interfaces for medical applications. Within its pages, the reader will find new design, computational modeling, and experimental characterization for devices related to surgical robotics, including variable-stiffness grasping, multimodal risk planning, and capsule robotics, as well as applications in pituitary surgery, tissue ablation, bone or spine surgery,

colonoscopy, endovascular surgery, laparoscopic surgery, and neurosurgery. In the realm of rehabilitation and assistive devices, contributed papers address therapeutic motion of the trunk, elbow, and ankle-foot complex and target tasks such as stair climbing. Other topics addressed include surgical path planning and motion mapping, surgical performance evaluation measures, computer-assisted surgical learning, design for tele-operation, and human factors applied to self-care devices.

As a result of the significant efforts of the authors, reviewers, editors, and publisher, we are very pleased to share with you this selection of papers that we hope you will find valuable and inspiring toward further research and achievements in the field of Medical Robotics and Human Interfaces. We further realize that translating these research achievements into safe and effective technologies for patients can be challenging and take time, and this special issue hopes to facilitate advancements in this area by sharing the current scientific knowledge, and limitations that may exist, toward achieving clinical utility.

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