

Special Issue on
Recent Developments in Image Computing for Clinical Endoscopy and Video-Guided Procedures

CALL FOR PAPERS

Endoscopy is the gold standard method for visualization of internal organs in procedures of surgery and diagnosis across multiple clinical specialties. Despite the advances in medical imaging and computer vision techniques, image-guidance and computer-aided diagnosis in endoscopy are still challenging. Difficulties include the small field of view of the endoscopic cameras, the motion blur and abrupt changes in viewpoint due to close range acquisition, the scenes with low contrasted textures, and several other issues that make the analysis and interpretation of endoscopic video-sequences highly problematic.

The aim of this special issue is to collate articles on emerging and modern endoscopic data processing techniques and to highlight their potential to improve the efficiency of diagnosis, image-guidance, and intraoperative navigation. This special issue seeks submissions on novel image analysis techniques applied to standard (white light, fluorescence, etc.) endoscopy as well as the development of new endoscope modalities and the treatment of data acquired with such devices currently under development in laboratories (e.g., endoscopes for multispectral image acquisition, endoscopes based on the use of specific lighting to enhance some tissues, and 3D endoscopes). All types of endoscopy or video-guided procedures are of interest including but not limited to laparoscopy, cystoscopy, gastroscopy, colonoscopy, bronchoscopy, arthroscopy, and capsule endoscopy.

While this special issue is intended to publish papers on specific, original, and challenging image processing techniques, it also welcomes review articles which describe the current state of the art in endoscopic image acquisition, processing, and interpretation.

Potential topics include but are not limited to the following:

- ▶ Robot-assisted surgery for endoscopy
- ▶ Endoscopic image segmentation (textures, colour, and image primitives)
- ▶ Endoscopic image registration and optical flow
- ▶ Instrument tracking and recognition for endoscopy
- ▶ Data extraction and classification using supervised or unsupervised approaches in endoscopy
- ▶ Machine learning and deep learning for endoscopy
- ▶ Multimodal image/data fusion: fusion of endoscopic images from different modalities, fusion of 3D data (CT, MRI, etc.), and endoscopic images
- ▶ Augmented reality in endoscopy
- ▶ Endoscope field of view expansion using 2D and 3D image mosaicing
- ▶ 3D surface reconstruction: passive and active methods (e.g., structure from motion (SfM), shape from X, and simultaneous localization and mapping (SLAM))
- ▶ Endoscope calibration
- ▶ Organ motility understanding
- ▶ Nonconventional endoscopic imaging systems and related data processing, such as multispectral or fluorescence image processing
- ▶ Novel vision sensors (e.g., omnidirectional camera, hyperspectral camera) for endoscopy

Authors can submit their manuscripts through the Manuscript Tracking System at <https://mts.hindawi.com/submit/journals/ijbi/rdes/>.

Papers are published upon acceptance, regardless of the Special Issue publication date.

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