CALL FOR PAPERS

SPIE. MEDICAL IMAGING

16 - 20 February 2025
Town and Country Resort & Convention Center
San Diego, California, USA

Submit abstracts by
7 August 2024

Digital and Computational Pathology (MI109)

Conference Chairs: **John E. Tomaszewski,** Univ. at Buffalo (United States); **Aaron D. Ward,** The Univ. of Western Ontario (Canada)

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This conference will address digital and computational pathology, from acquisition of pathology data to its management, analysis, and interpretation by observers. With the recent advances in whole slide scanners and novel instrumentation for multispectral, multiparametric tissue imaging the use of digital pathology data is growing in importance. Both the pre-clinical and clinical modeling of disease states are addressed by the developing field of computational pathology. The evolving concepts of human intelligence-artificial intelligence interactions in our understanding of image data are foundational in computational pathology. There is evidence that digital and computational pathology can improve diagnosis and grading of cancer and other pathology tasks, but there are still limitations and challenges that must be addressed before it can be fully incorporated into the clinical workflow.

Although there has been great progress in the development and application of computational pathology methods over recent years, there are several significant computational challenges specific to pathology imaging that distinguish it from its radiological counterpart. There are also unique challenges in terms of how digitized pathology specimens and correlated data are presented to, modified and interpreted by clinicians and computers.

We invite submissions that address specific problems related to image acquisition, display, interpretation, computer-aided diagnosis, and quantitative image analysis of pathology specimens. We particularly welcome contributions that identify and address challenges encountered in digital pathology imaging as well as in new approaches for image capture and analysis. Suggested topics include:

IMAGE ACQUISITION, STORAGE, AND DISPLAY

- acquisition, storage, display and processing of digital microscopy images
- image mosaicking of nontraditional near-real-time microscopy (OCT, confocal)
- multispectral imaging
- high-dimensional multiplexed staining and imaging of tissues
- multi-focus volume imaging
- compression
- methodologies for the objective technical assessment of digital pathology systems including color calibration
- whole slide imaging
- strategies for data storage and remote processing.

QUANTITATIVE IMAGE ANALYSIS

- computer-aided diagnosis, prognosis and predictive analysis
- automated quantification of tissue biomarkers
- grading and classification of pathology images
- segmentation of cellular and tissue structures
- shape analysis and morphology in pathology imaging
- architectural feature extraction and quantification
- multispectral- and volume-based segmentation
- content-based image retrieval
- high-performance computing for whole-slide tissue image analysis
- multi-stain and multiplexed image analysis
- correlative microscopy
- understanding of image data across scale
- machine learning trends in digital pathology: handcrafted features versus deep learning.

INFORMATION FUSION

- radiology-pathology registration and fusion
- registration of multiple stained tissue microscopy images
- integration of digital image features with 'omics' data for fused diagnostics.

DIGITAL/COMPUTATIONAL PATHOLOGY AND THE PATHOLOGIST

- observer performance, human factors, reading strategies, and diagnostic interpretation issues
- remote consultation
- metrics, variability and standardization issues unique to digital pathology
- methodologies for the objective technical assessment of digital pathology systems
- optical probe tracking and visualization tools
- PACS and new DICOM standards for histopathology
- making the case for clinical digital pathology systems in pathology practice.

POSTER AWARD

The Digital and Computational Pathology conference will feature a cum laude poster award. All posters displayed at the meeting for this conference are eligible. Posters will be evaluated at the meeting by the awards committee. The winners will be announced during the conference and the presenting author will be recognized and awarded a certificate.

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Present your research at SPIE Medical Imaging

Follow the instructions below to develop a successful abstract for submission to a conference and review policies for publication in the Proceedings of SPIE in the SPIE Digital Library. Submissions subject to chair approval.

ABSTRACT SUBMISSION GUIDELINES

Important dates

Abstracts due	7 August 2024
Registration opens	October 2024
Authors notified and program posts online	28 October 2024
Applications open for RFW and conference awards	28 October 2024
Applications close for RFW and conference awards	29 November 2024
Submission system opens for manuscripts and poster PDFs*	16 December 2024
Poster PDFs due for spie.org preview and publication	22 January 2025
Manuscripts due	29 January 2025
Advance upload deadline for oral presentation slides**	14 February 2025

*Contact author or speaker must register prior to uploading
**After this date slides must be uploaded onsite at Speaker Check-in

SYMPOSIUM CHAIRS

Joseph Lo
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(United States)

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(United States)

What you will need to submit

- Presentation title
- Author(s) information
- Speaker biography (1000-character max including spaces)
- Abstract for technical review (200-300 words; text only)
- Summary of abstract for display in the program (50-150 words; text only)
- Keywords used in search for your paper (optional)
- Two- to four-page (not counting acknowledgements and references) supplemental file, prepared as a PDF formatted to SPIE manuscript specifications, that includes:
  - Paper title
  - Authors
  - Description of purpose
  - Method(s)
  - Results
  - Supporting images/tables/figures
  - Conclusions
  - Any new or breakthrough work to be presented
  - Whether the work is being, or has been, submitted for publication or presentation elsewhere, and, if so, indicate how the submissions differ.

Note: Only original material should be submitted. Commercial papers, papers with no new research/development content, and papers with proprietary restrictions will not be accepted for presentation.

How to submit your abstract

- Visit the conference page: **www.spie.org/mi109**
- You may submit more than one abstract, but submit each abstract only once
- Submit by clicking the "Submit An Abstract" button on that page
- Sign in to your SPIE account, or create an account if you do not already have one
- Follow the steps in the submission wizard until the submission process is completed
- If your submission is related to an application track below, indicate the appropriate track when prompted during the submission process

Application tracks

An application track is a grouping of presentations on a topic of interest across all conferences. During submission of the abstract, the submitting author should select an application track if it is relevant to their research. Learn more.

- **AI/ML:** Papers that showcase the use of artificial intelligence, machine learning, and deep learning to create and implement intelligent systems across multiple sectors, technologies, and applications
- **Sustainability:** Papers that highlight the use of optics and photonics for renewable energy, natural resource management, sustainable manufacturing, and greenhouse gas mitigation in support of the UN Sustainable Development Goals

Submission agreement

All presenting authors, including keynote, invited, oral, and poster presenters, agree to the following by submitting an abstract:

- Register and pay the conference registration fee
- Agree to receive email messaging for the conference series
- Oral presenters: agree to recording and publication of your onsite presentation (slides synched with voice) in the Proceedings of SPIE in the SPIE Digital Library
- Poster presenters: one person may not present more than two posters in a poster session; submit a poster PDF for preview in the online program (web and app) and for publication in the Proceedings of SPIE in the SPIE Digital Library
- Submit a manuscript by the advertised due date for publication in the Proceedings of SPIE in the SPIE Digital Library
- Obtain funding for registration fees, travel, and accommodations
- Attend the meeting
- Present at the scheduled time

Review and program placement

- To ensure a high-quality conference, all submissions will be assessed by the conference chair/editor for technical merit and suitability of content
- Conference chairs/editors and/or SPIE staff reserve the right to reject for presentation any paper that does not meet content or presentation expectations
- Final placement in an oral or poster session is subject to chair discretion

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