

Digital and Computational Pathology (M1109)

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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.

TOPIC AREAS: FOR THIS CONFERENCE ONLY

During the submission process, you will be asked to choose no more than three topics from the following list to assist in the review process.

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

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- 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

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Present your research at SPIE Medical Imaging

Below are abstract submission instructions, the accompanying submission agreement, conference presentation guidelines, and guidelines for publishing in the Proceedings of SPIE on the SPIE Digital Library. Submissions subject to chair approval.

Important dates

Abstract submission deadline	18 August 2021
Author notification	15 October 2021
Submission system opens for presentations and manuscripts*	13 December 2021
Manuscript due date	26 January 2022
Oral presentation videos due	26 January 2022
Poster PDF and preview videos due	26 January 2022
Oral presentation slide deadline	18 February 2022

*Authors must register prior to uploading.

What you will need to submit

- Title
- Author(s) information
- 250-word abstract for technical review
- 100-word summary for the program
- Keywords used in search for your paper (optional)
- Two- to four-page supplemental file, prepared as a PDF that includes:
 - Paper title
 - Authors
 - Following supplemental information:
 - Description of purpose
 - Method(s)
 - Results
 - New or breakthrough work to be presented
 - Conclusions
 - Whether the work is being, or has been, submitted for publication or presentation elsewhere, and, if so, indicate how the submissions differ
 - This file may contain supporting images/tables/figures

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/MI109call
- You may submit more than one abstract but submit each abstract only once.
- Click the "Submit An Abstract" button on the conference 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.

Submission agreement

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

- Register and pay the author registration fee.
- Oral presenters: Submit a presentation video by the advertised due date, or agree to the presentation capture of your presentation on site, for online conference viewing during the event and publication in the Proceedings of SPIE on the SPIE Digital Library.
- Poster presenters: Submit a Poster PDF and optional preview video by the advertised due date, for online conference viewing during the event and publication in the Proceedings of SPIE on the SPIE Digital Library.
- Submit a four-page-minimum manuscript by the advertised due date, for online conference viewing during the event and publication in the Proceedings of SPIE on the SPIE Digital Library.
- Obtain funding for registration fees, travel, and accommodations, independent of SPIE, through their sponsoring organizations.
- Ensure that all clearances, including government and company clearance, have been obtained to present and publish. If you are a DoD contractor in the USA, allow at least 60 days for clearance.
- 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 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's discretion.

Publication of Proceedings in the SPIE Digital Library

- SPIE will publish all presentations for viewing during the conference, as well as permanently archive all presentations in the conference proceedings on the SPIE Digital Library.
- SPIE retains rights to distribute and market the official SPIE recording of the presentation, presentation video, and/or poster.
- Most SPIE conferences follow an onsite publication model, meaning that manuscripts received by the advertised due date will be published for online viewing during the event, as well as archived in the SPIE Digital Library.
- A select few of SPIE conferences may elect to follow a Post-Meeting model of publication in order to conduct a more thorough review of manuscripts. In this model, manuscripts will be published 2-4 weeks after the event in the SPIE Digital Library, and may not be published for online viewing during the event.
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- Conference chairs/editors may require manuscript revision before approving publication and reserve the right to reject for publication any paper that does not meet acceptable standards for a scientific publication.
- Conference chair/editor decisions on whether to allow publication of a manuscript are final.
- Only papers, presentations, and posters presented at the conference and received according to publication guidelines and due dates will be published in the conference Proceedings of SPIE on the SPIE Digital Library.
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- More publication information available on the [SPIE Digital Library](http://www.spie.org).

ABSTRACT SUBMISSION GUIDELINES

MEDICAL IMAGING SYMPOSIUM CHAIRS



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Contact information

QUESTIONS?

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