



## Optics, Photonics and Digital Technologies for Imaging Applications VIII (PE109)

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Moore's law has fostered the steady growth of digital image processing, though computational complexity remains a significant problem for most digital image processing applications. At the same time, research in the field of optical image processing has matured, potentially bypassing the limitations of digital approaches and giving rise to new applications. Additionally, from an image acquisition perspective, the rapid convergence of digital imaging devices is driving a robust industrial growth of photonics technologies.

Already, photonics-based enablers can be found in a myriad of imaging and visualization applications such as head-mounted displays, light-field and holographic displays, image sensing, illumination systems, and high-performance light engines - all of which have significant volume positions in the photonics market. Along with the growing interest in emerging multimedia applications, the demand for new photonics enablers is steadily increasing, and new technologies are continuously created to meet the needs.

In miniaturizing digital cameras, new challenges emerge when striving for high performance combined with mass-volume production. This requires the design of sophisticated lens elements and new types of imaging optics, optimized image processing pipelines, compact, high-performance sensors, etc. Microscopy and tomography solutions typically rely on the combined deployment of digital, optical and photonics components where technological advances give rise to unprecedented accuracy and functionality.

These new applications have specific requirements and put new challenges on the optical designs. Finally, we have recently observed the vast emergence of (deep) learning-based solutions in imaging, processing, and visualization.

This conference aims to create a joint forum for both research and application communities in optics, photonics, and digital imaging technologies to share expertise, solve present-day application bottlenecks and propose new application areas. Consequently, this conference has a broad scope, ranging from basic and applied research. The conference sessions will address (but not be limited to) the following topics:

- image sensors (CCD, CMOS, and others like OPD arrays)
- image acquisition and computational imaging (image reconstruction, phase image restoration, image fusion, high dynamic range imaging, light-field imaging, point-cloud imaging, holographic imaging, compressive sensing)
- camera optics (imaging lenses, design, flashes, adaptive optics, wafer-level optics, novel lenses, extended depth of focus, etc.)
- camera systems and characterization (system design, testing, metrics, standards, image processing chains)
- photonics components and enabling technologies (micro-optics, lens arrays, filters, optical interconnects, optical storage)
- image transformations (wavelet theory, space theory, geometrical transforms, restoration)
- image analysis (motion estimation, segmentation, object tracking, pattern recognition, classification)
- learning-based solutions (machine learning, deep learning, explainable learning)
- image information management (coding, cryptography, watermarking, storage and retrieval systems, resolution enhancement)
- displays, projectors, and applications (augmented and virtual reality glasses, high-dynamic range, stereoscopic, light field, and holographic visualization)
- optical engines for displays (LED and RGB-laser-based engines, spatial light modulators, etc.)
- display illumination (light-guide solutions, micro-optics, design)
- microscopy and tomography technologies
- interaction between architectures, systems or devices for optical and digital image processing (also includes bioinspired imaging solutions)
- objective and subjective quality assessment and measurement
- applications (medical, microscopy, surveillance, security, remote sensing, industrial inspection, entertainment)
- standardization.

### Present your research at SPIE Photonics Europe

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

Abstracts due	30 November 2023
Authors notified and programme posts online	25 January 2024
Registration opens	8 January 2024
Submission system opens for manuscripts and poster videos/PDFs*	5 February 2024
Manuscripts due	20 March 2024

\*Contact author or speaker must register prior to uploading

#### 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 programme (50-150 words; text only)
- Keywords used in search for your paper (optional)
- Check the individual conference call for papers for additional requirements (i.e. extended abstract PDF upload for review or instructions for award competitions)

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/pe109call](http://www.spie.org/pe109call)
- You may submit more than one abstract, but submit each abstract only once
- Submit by clicking 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
- If your submission is related to an application track below, indicate the appropriate track when prompted during the submission process

#### 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: recording and publication of your onsite presentation (slides synched with voice) for publication in the Proceedings of SPIE in the SPIE Digital Library
- Poster presenters: submit a poster PDF by the advertised due dates for publication in the Proceedings of SPIE in the SPIE Digital Library; poster PDFs may also be published and viewable in the spie.org programme during and immediately after the event. Each poster must have a unique presenter; one person may not present more than one poster
- Email messaging for the conference series
- 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 programme 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 discretion

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