CALL FOR PAPERS

SPIE. PHOTONICS WEST OPTO

25 - 30 January 2025
The Moscone Center
San Francisco, CA, USA

Submit abstracts by
17 July 2024

AI and Optical Data Sciences VI (OE207)

Conference Chairs: **Masaya Notomi,** NTT Basic Research Labs. (Japan); **Tingyi Zhou,** SiLC Technologies, Inc. (United States)

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The exponential increase in the amount of data created every day has led to a new era in data exploration. This demands novel compute and data processing paradigms including co-design, hardware-algorithm optimization, and machine- and deep learning approaches. Optical sensors and fibers have enabled the capture and transfer of massive data across both short and long distances and have formed the backbone of the internet. Data-center traffic is dominated by machine learning training tasks driving by larger models and structured data. Furthermore, space technology, e-mobility and autonomous vehicles are driving the need for network edge intelligence. Lastly, the field of biological research and healthcare have been transformed by photonics sensing technologies ranging from imaging, tomography to spectroscopy. These trends are fueling the need and the opportunity for artificial intelligence (AI) techniques that take advantage of the massive amount of data routed through optical fibers of data-centers and the network edge, are generated by analog sensors and from IoT and metrology instruments alike. Going forward, the convergence of AI with cutting-edge optics and photonics will have a transformative impact on communication, imaging, sensing, and AR/VR systems, etc. With the advent of photonic integrated circuits, the miniaturization and synergistic design with electronics allows for More-than-Moore machine learning architectures.

The goal of this conference is to serve as a unique platform for bringing together artificial intelligence and photonics researchers from around the world to showcase the newest trends and best practices in the field. Researchers from leading companies and universities present their high-impact research and products and exchange new ideas.

Topics of interest include but are not limited to:
- Photonic hardware accelerators
- Novel photonic devices for machine learning
- Heterogenous Integration of PICs
- Advanced packaging of PICs
- Analog optical computing
- Physics-inspired machine learning algorithms
- Physics-AI symbiosis
- Inverse design of metamaterials via machine learning
- Computational imaging
- Optical classification and real-time inference
- Compressed sensing
- Imaging and spectroscopy
- Optical encryption and security
- Mobile edge computing
- Photonic reservoir computing
- Reinforcement learning based on physical phenomena
- Augmented reality and virtual reality
- Time stretch instruments.

www.spie.org/oe207call

#PhotonicsWest

SPIE.

Present your research at SPIE Photonics West

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.

Important dates

Abstracts due	17 July 2024
Registration opens	October 2024
Authors notified and program posts online	7 October 2024
Submission system opens for manuscripts and poster PDFs*	25 November 2024
Poster PDFs due for spie.org preview and publication	2 January 2025
Manuscripts due	8 January 2025
Advance upload deadline for oral presentation slides**	23 January 2025

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

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)
- Check the individual conference call for papers for additional requirements (i.e., special abstract requirements 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/oe207call
- Choose one conference that most closely matches the topics of your abstract. You may submit more than one abstract, but submit each abstract only once
- Click the title of the conference to view the full description and 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 track

Listed below are the application tracks available for this meeting. Application tracks aggregate presentations and focus on emerging technical and societal needs that require a multidisciplinary approach.

- **AI/ML:** Papers that highlight 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
- **Brain function:** Papers that highlight the development of innovative optics and photonics technologies that increase our understanding of brain physiology and function
- **Translational research:** Papers that highlight the transition from bench to bedside using the latest photonics technologies, tools, and techniques for healthcare
- **3D printing:** Papers that highlight the innovative use of optics and photonics in multidisciplinary applications for multidimensional manufacturing
- **Photonic chips:** Papers that highlight advances in materials, design, fabrication, integration, testing and packaging of photonic components at the chip level

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 conference registration fee
- Agree to receive email messaging for the conference series
- 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: one person may not present more than two posters in a poster session; poster presenters may submit an optional poster PDF available 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 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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- Manuscripts, presentations, and posters will be officially published after the event in the SPIE Digital Library
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