Design and Quality for Biomedical Technologies XVII (BO303)

Conference Chairs: Jeeseong Hwang, National Institute of Standards and Technology (United States); Gracie Vargas, The Univ. of Texas Medical Branch (United States)

Conference Co-Chair: T. Joshua Pfefer, U.S. Food and Drug Administration (United States)

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SPECIAL ABSTRACT REQUIREMENTS

Submissions to this conference must include:

• 100-word text abstract (for online program)
• 250-word text abstract (for technical review)
• 2-page extended abstract (for committee review only). The extended abstract must be submitted as a separate document limited to two pages, including tables and figures. Include author names and affiliations; text; any figures, tables, or images; and sufficient data to permit peer review.

Rapid advances in optical technologies and computational power have brought about a revolution in biomedical imaging, sensing and therapeutics. These advances necessitate parallel progress in techniques used for development and evaluation and that enhance rigor and reproducibility and result in safe, effective, and commercially-viable biomedical technologies. This conference will focus on topics that are critical to optimizing design and ensuring quality, including:

I. DESIGN

• optical components and system architecture
• methods for optimizing performance through design
• computational modeling to optimize system design
• design for robustness to patient variables
• design for women’s health applications
• design for health equity in minority populations
• emerging micro-optics and MEMS-based technology
• sources, detectors and other components
• illumination and detection geometry for spectroscopy and imaging
• designing reliable machine learning algorithms
• validation and application of computer-aided design tools
• AI-aided imaging: design and analysis.

II. QUALITY

• Quality by Design (QbD)
• best practices for standardized device testing
• device calibration and intercomparison
• test methods and models for evaluating skin pigmentation
• metrology
• development/evaluation of novel measurement tools
• validation of computer-aided diagnosis algorithms
• critical metrics for assessing quality
• quality, compliance and regulatory issues related to biomedical devices
• statistical approaches for evaluating biophotonic technologies
• patient and user safety; photothermal, photochemical, etc.

III. RELIABILITY

• physics, analysis, failure mechanisms
• testing for failure
• aging, dormancy and component degradation
• computational and analytical modeling for reliability
• determination of factors of safety
• reprocessing and clinical device performance

Submit abstracts by 19 July 2023

www.spie.org/BO303call
#PhotonicsWest
IV. PHANTOM-BASED TESTING

- standardized image quality testing
- applications of phantoms for performance comparison
- clinical implementation of phantoms, e.g., clinical trial standardization
- phantom-based validation of numerical models
- tissue-mimicking and standard reference materials
- materials and phantoms for women’s health, e.g., cervical/vaginal applications
- materials and phantoms for health equity, e.g., skin pigmentation
- advanced phantom fabrication approaches, e.g., multi-photon 3D printing
- anthropomorphic and biomimetic (functional) phantoms
- dynamic test methods, e.g., for pulse oximetry
- validation of phantom morphology and properties
- reliable optical property characterization
- phantom design, fabrication, and validation procedures
- assessing phantom stability and robustness
- testing and uncertainty analysis
- computational phantoms
- use of phantoms for training AI algorithms.
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

<table>
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<tr>
<th>Event</th>
<th>Date</th>
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<tr>
<td>Abstracts due</td>
<td>19 July 2023</td>
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<tr>
<td>Registration opens</td>
<td>October 2023</td>
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<tr>
<td>Authors notified and program posts online</td>
<td>9 October 2023</td>
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<tr>
<td>Submission system opens for manuscripts and poster PDFs*</td>
<td>27 November 2023</td>
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<tr>
<td>Poster PDFs due for spie.org preview and publication</td>
<td>3 January 2024</td>
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<td>Manuscripts due</td>
<td>10 January 2024</td>
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<tr>
<td>Advance upload deadline for oral presentation slides**</td>
<td>25 January 2024</td>
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*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
- 250-word abstract for technical review
- 100-word summary of abstract for display in the program
- Keywords used in search for your paper (optional)
- Check the individual conference call for papers for additional requirements (for example, some conferences require 2- to 3-page extended summary for technical review, or have 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/BO303call
- 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

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 leaning 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

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 program during and immediately after the event. Each poster must have a unique presenter; one person may not present more than one poster per session
- 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 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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- Only manuscripts, presentations, and posters presented at the conference and received according to publication guidelines and due dates will be published in the Proceedings of SPIE in the SPIE Digital Library
- Manuscripts, presentations, and posters will be officially published after the event in the SPIE Digital Library
- Conference chairs/editors may require revision before approving publication and reserve the right to reject for publication any manuscript or presentation that does not meet acceptable standards for a scientific publication
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- More publication information available on the SPIE Digital Library

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For questions about publication or the SPIE Digital Library, contact your proceedings coordinator.