



Emerging Digital Micromirror Device Based Systems and Applications XIV (OE403)

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Conference Co-Sponsors:



The Digital Micromirror Device (DMD) was conceived at Texas Instruments in 1987, following a decade of work on analog deformable-mirror and cantilever-mirror devices. This particular optical MEMS or MOEMS device has been applied most famously to digital cinema projection systems, enterprise projectors and highly portable personal displays, all of which were enabled by DLP® technology. The DMD has been commercially available since 1996 leading to hundreds of products and innovative research projects spanning consumer, industrial, medical and automotive markets.

As was evident by this well-attended virtual conference at Photonics West 2021, the DMD and associated evaluation modules are enabling many exciting new applications and equipment beyond traditional display systems. By bringing together scientists, technologists, and developers, the goal of this conference is to highlight new and interesting means of applying DLP technology to solve problems across various markets.

Technical areas of particular interest include, but are not limited to:

PROGRAMMABLE PATTERNING AND ADVANCED IMAGING SOLUTIONS

- 3D metrology, machine vision, and factory automation
- compressive sensing
- computational imaging
- hyperspectral imaging
- security and surveillance
- spectroscopy (including mobile spectroscopy)
- volumetric scanning.

DISPLAY SOLUTIONS

- 3D displays (light-field, autostereoscopic, volumetric, multi-views, and holographic)
- augmented reality, virtual reality, and mixed reality
- automotive interior (head-up displays, interior displays, interior lighting)
- automotive exterior (headlight illumination, exterior lighting)
- intelligent lighting or displays.

MANUFACTURING SOLUTIONS

- additive manufacturing / 3D printing
- coding and marking
- direct imaging lithography
- industrial printers and exposure systems.

MEDICAL DEVICES

- biochemical visualization
- microscopy
- ophthalmology
- endoscopic imaging
- 3D bioprinting.

LIGHT MANIPULATION

- beam steering / wave-front shaping
- optical micromanipulation
- spectrally tunable light sources.

OTHER

- NIR applications
- optical telecommunications
- UV applications.

JOINT SESSION WITH BIOS B0500 AND OE403
Biomedical Imaging and Cell Manipulation using a Digital Micromirror Device or MEMS Array

This special joint session is in conjunction with BiOS conference B0500: Imaging, Manipulation, and Analysis of Biomolecules, Cells, and Tissues. The utilization of the DMD and other Optical MEMS arrays to manipulate light has numerous medical applications ranging from cancer detection to operating room aids to the manipulation of individual cells.

Papers are solicited that address the uses of a DMD and other Optical MEMS arrays with:

- 3D medical visualization
- confocal microscopes
- cytometers
- hyperspectral imaging
- image-guided intervention
- microscopy
- optoelectronic tweezers
- ophthalmology
- organs on a chip
- oxygenation measurements
- phototherapy
- selectable wavelength light sources
- spectroscopy (including mobile spectroscopy)
- structured light or 3D imaging
- tissue illumination.

JOINT SESSION WITH OE401 AND OE403
Advanced Fabrication using a Digital Micromirror Device or MEMS Array

Active research in the fields of advanced fabrication and MEMS Arrays, such as the digital micromirror device, have shown application and promise for implementing lithography and other forms of high precision printing. The purpose of this joint session is to explore the relationships between MEMS technology and fabrication as they relate to:

- 3D printing
- additive manufacturing
- lithography.

JOINT SESSION WITH OE702 AND OE403
AR/VR Displays using DMDs or other SLM Devices

AR/VR is an exciting area of development. Much progress hinges on the capabilities of light modulators. The purpose of this joint session is to explore and demonstrate the capabilities of different light modulators.

BEST PAPER AWARDS

We are pleased to announce that cash prizes, sponsored by Texas Instruments DLP Products and ViALUX GmbH, will be awarded to the best paper and best student paper in Emerging DMD-Based Systems and Applications. Qualifying papers will be evaluated by the awards committee. Manuscripts will be judged based on scientific merit, impact, and clarity. The winners will be announced during the conference and the presenting authors will be awarded a cash prize.

To be eligible for the Best Paper Award, you must:

- be listed as the first author on an accepted paper within this conference
- have conducted the majority of the work to be presented
- submit your manuscript online by the deadline
- present your paper as scheduled.

To be eligible for the Best Student Paper Award, you must:

- be a student without a doctoral degree (undergraduate, graduate, or PhD student)
 - submit your abstract online, and select "Yes" when asked if you are a full-time student, and select yourself as the speaker
 - when submitting your abstract, under TOPIC selection, choose "Consider for Best Student Paper Award"
 - be listed as the first and the presenting author on an accepted paper within this conference
 - have conducted the majority of the work to be presented
 - submit your manuscript online by the deadline
 - present your paper as scheduled.
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Present your research at SPIE Photonics West

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 | 11 August 2021 |
| Author notification | 11 October 2021 |
| Submission system opens for presentations and manuscripts* | 29 November 2021 |
| Manuscript due date | 29 December 2021 |
| Oral presentation videos due | 29 December 2021 |
| Poster PDF and preview videos due | 29 December 2021 |
| Oral presentation slide deadline | 20 January 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)
- 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/oe403call
- 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.
- If your submission is related to an application track below, indicate the appropriate track when prompted during the submission process.

Application track

- **Brain:** Papers that describe the development of innovative technologies that will increase our understanding of brain function.
- **Translational Research:** Papers that showcase the latest photonics technologies, tools, and techniques with high potential to impact healthcare.
- **3D Printing:** Papers that showcase innovative ways to apply this multidimensional/multidisciplinary technology.
- **COVID-19 Research:** Papers that illustrate the creativity and breadth of the optics and photonics community's response to the COVID-19 pandemic.

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 4-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 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.spiedigitallibrary.org)

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