



Soft Mechatronics and Wearable Systems (SSN05)

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The conference aims to explore new concepts, technologies, and potential applications that are crucial to soft sensors, actuators, energy harvesting, soft robotics, and wearable systems. These technologies are applied to human and complex systems in engineering and medicine. The focus of this year's theme will be on emerging areas of wearable technology, such as the Internet of Things (IoT), virtual reality, and augmented reality. It will also cover smart textile innovation, organic thin films and printable flexible electronics, thought-controlled devices and systems, mobile wearable healthcare systems, wireless power feedback routines and devices for medical technology, smart optical materials technology, long-life micro-power systems, and thermoelectric energy conversion films and systems.

The conference aims to facilitate interdisciplinary exchange to promote a better understanding of engineering systems from biological ones. This includes topics such as nanowires, carbon nanotubes, magnetic nanotubes, organic electronics, MEMS, bioMEMS, nanostructures, nano-electronics, microfluidics, high selectivity and sensitivity biological and chemical sensors, detection of harmful chemical and biological agents, microsensors for radioactivity, low power consumption physical and chemical sensors, security electronics, reliability and failure aspects, biomedical applications, biomimetics, fast DNA sequencing, smart drug delivery, polymer electronics, nano-optics, analytical techniques at the nanoscale, nano-assembly behavior, nano-integration, noise aspects, and information technology at nanoscale, multifunctional nanosystems, and nano/bio interface.

Additionally, the conference will focus on advanced methods for testing, reliability, packaging, and metrology of micro- and nano-scale materials and devices. The conference invites papers on a variety of related topics:

FUNCTIONAL MATERIALS AND CONVERGENCE TECHNOLOGIES

- nanomaterials: CNT, graphene, nanowire, MXene, MOF, CTF, COF, etc.
- biomaterials: cellulose, silk, chitosan, diatom, etc
- functional materials for soft sensors, actuators, and energy harvesters
- functional materials for wearable systems
- integration of nano- and micro-sensors with microelectronics
- integration of sensors with flexible organic electronics
- nano-, bio- and IT-convergence technologies.

SOFT ACTUATORS AND SOFT ROBOTICS

- soft materials and soft actuators
- stretchable electrodes and devices
- electroactive-polymer-based artificial muscles
- soft haptic feedback and tactile devices
- enhanced virtual reality with haptics
- metaverse
- soft robotics and mechatronic devices.

ENERGY MATERIALS AND MICRO-POWER SYSTEMS

- triboelectric nanogenerator (TEG) and energy harvesting
- TEG-based sensors and applications
- energy transfer and conversion technologies
- biomedical and implantable applications
- functional energy storage devices
- micro-power device concepts for long-life operation
- emerging and nascent materials for micro-power devices
- micro-battery and structural battery.

WEARABLE TECHNOLOGIES AND INTERFACING WITH INDUSTRIES

- e-textile based smart garments
- health monitoring e-bra, e-bro, and e-band aid
- monitoring health conditions with flexible wireless EEG, EOG, EMG sensors
- smart communication module with smart phone, Wi-Fi, GSM, GPRS
- panel with industries pursuing the wearable technology
- organic thin film and printable electronics
- integration of flex electronics for wearable devices
- wearable power
- smart textiles
- textile-based supercapacitors and batteries
- virtual reality and augmented reality.

APPLICATIONS IN ENGINEERING AND MEDICINE

- thermoelectric energy conversion systems
- thin-film hybrid PV/thermoelectric solar panels
- biomedical
- pharmaceutical
- human-computer interactions
- brain-computer interface; brain-machine interface
- surgical procedures and nanosystems implementation
- wireless power feedback routines and devices for medical applications.

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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 | 13 September 2023 |
| Registration opens | Early December 2023 |
| Author notified and program posts online | 4 December 2023 |
| Submission system opens for manuscripts and poster PDFs* | 22 January 2024 |
| Poster PDFs due for spie.org preview and publication | 28 February 2024 |
| Manuscripts due | 6 March 2024 |
| Advance upload deadline for oral presentation slides** | 22 March 2024 |

*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 two- to three-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/SSN05call
- 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 tracks

An application track is a grouping of presentations on a topic of interest across all conferences. During submission of the abstract, the submitting author should select an application track if it is relevant to their research.

- **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
- **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:

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- 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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