



Thermosense: Thermal Infrared Applications XLIV (SI206)

Conference Chair: **Arantza Mendioroz**, Univ. of the Basque Country (Spain)

Conference Co-Chair: **Nicolas P. Avdelidis**, Cranfield Univ. (United Kingdom)

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Thermosense is the oldest and largest international technical conference focused on scientific, industrial, and medical uses of infrared imaging, infrared temperature measurements, and image analysis. Its regular printed proceedings are found in most scientific and engineering libraries, providing an unequaled depth and breadth of technical information and reference data.

The Thermosense conference promotes worldwide exchange of information about research, uses and applications of infrared (IR) imaging technology. This includes infrared thermography and thermal infrared sensing primarily in the NIR, SWIR, MWIR and LWIR bands. Thermosense encompasses technical papers, workshops and short-courses. Since 1978, these activities have included topics from the fundamentals of infrared imaging and calibration to virtually all infrared research and applications. Special emphasis has been on problem solving and turning new developments into standard practices. This year, we would like to have special sessions on (1) In-process monitoring and additive manufacturing, (2) Automatic inspection, predictive maintenance, quality control and AI, and (3) Multispectral and multi-imaging techniques.

BEST STUDENT PAPER AWARD

The Conference Chair, Co-Chair and Program Committee would like to recognize outstanding young researchers with a Best Student Paper Award. The award is open to any first-author student presenting orally at Thermosense.

Prize: A certificate and a FLIR One Pro for iPhone to the student.

Academics, research and professional practical papers are solicited related to infrared applications (NIR/SWIR /MWIR/LWIR) in the areas listed below, and are also welcome in other areas.

ADDITIVE MANUFACTURING

- in-situ monitoring
- post build inspection
- molten metals measurement

AEROSPACE APPLICATIONS

- aircraft NDT
- process monitoring
- corrosion/FOD/fatigue
- aging aircraft
- spacecraft and satellites

ARTIFICIAL INTELLIGENCE IN INFRARED APPLICATIONS

- machine learning
- deep learning
- cognitive computing
- Internet of Things
- big data

AUTOMOTIVE INDUSTRY AND AUTONOMOUS DRIVING

- IR imaging for autonomous vehicles
- predictive maintenance – electrical
- predictive maintenance - mechanical
- automotive NDT
- process monitoring - automation
- driver vision enhancement

BUILDING AND CULTURAL HERITAGE APPLICATIONS

- energy conservation and energy efficiency
- construction quality control
- roof moisture surveying
- weatherization
- artwork analysis
- assessment of conservation interventions

CALIBRATION

- standards
- sources
- instruments traceability
- atmospheric transmission

DETECTION OF GAS AND OTHER LEAKS

- pipelines, oil fields, offshore platforms, refineries
- gas pumping stations, gasoline stations
- UXO: unexploded ordinance

DRONE AND AIRBORNE THERMOGRAPHY

- environmental monitoring
- building assessment
- solar cell and power plant inspection
- inspection and monitoring of aircraft structures

ENVIRONMENTAL AND AGRICULTURAL MONITORING

- agriculture and water conservation
- fish and wildlife migration
- geology - volcanoes activity
- pollution and storm water monitoring
- seawater sensing

FIBER OPTICS FOR INFRARED

- detection of hazardous chemicals
- remote sensing in high temperature and corrosive environments
- medical applications

FIRE ANALYSIS AND DETECTION

- wildfire
- home and building fire
- pool fires
- fire research
- flame emission

FOOD PROCESSING AND HANDLING

- quality control monitoring
- temperatures of animals at slaughter
- foreign object detection and characterization

HYPERSPECTRAL (HS) AND MULTISPECTRAL (MS) IMAGERY

- identify materials
- detecting processes and objects

INFRASTRUCTURE

- transportation – roads, bridges, airports, harbors, reservoirs, and dams
- energy – nuclear, wind, solar, fossil fuels power plants

INFRARED IMAGE FUSION APPLICATIONS AND MULTI-IMAGING TECHNIQUES

- biological and medical
- field security
- process monitoring

LOSS PREVENTION

- roof inspections
- electrical equipment
- switchboards

MANUFACTURING AND PROCESSING INDUSTRIES, PROCESS CONTROL

- composite fabrication and uses
- glass and ceramics
- metals processing
- petrochemical
- plastics
- pulp and paper
- semiconductors and microelectronics
- quality control and predictive maintenance applications

INFRARED NONDESTRUCTIVE TESTING (IR NDT) AND MATERIALS EVALUATION

- composite structures (aerospace, marine, wind turbine blades, etc.)
- metallic structures (aerospace, turbine blades, and other)
- inspection data fusion
- fatigue analysis/ thermal stress analysis (TSA)
- sonic IR
- IR NDT combined with other techniques (ultrasound, x-ray, terahertz, etc.).
- thermal properties of materials
- underground anomalies
- electronic components

MEDICAL APPLICATIONS AND COVID PANDEMIC

- fever detection for pandemic containment
- health screening and diagnostics
- veterinary applications

POWER GENERATION AND DISTRIBUTION

- nuclear, wind, and solar power plants
- field measurement issues
- power plant heat-rate efficiency
- electrical and mechanical P/PM

RESEARCH AND DEVELOPMENT

- multi-spectral/hyperspectral imaging
- enhanced spatial resolution
- enhanced time resolution
- microscopy
- thermal modeling, CFD and FEA

REMOTE SENSING AND SECURITY

- Search and rescue (fire, snow, etc.)
- law enforcement
- maritime guidance

ROBOTIC APPLICATIONS

- Automated Fiber Layout
- Welding
- Large Area Contour Following

STANDARDS, CERTIFICATIONS AND GUIDELINES

- NDT
- buildings
- condition monitoring

Selected papers will be recommended for publication in related SPIE journals such as *Optical Engineering* and *Journal of Electronic Imaging*.

THERMOSENSE VENDOR PRESENTATION AND RECEPTION XVIII
CALL FOR PRESENTATIONS

Calling all SPIE—DCS 2022 Exhibiting Companies – Gaylord Palms Hotel Orlando, Florida

Monday 4 - April 2022

Share the Latest—What's new in hardware & software for thermography, thermal imaging, and non-contact temperature measurement?

The Vendors Session started eighteen years ago and has become a very popular and well-attended success. This Special Session provides an early opportunity for exhibitors to highlight their latest technology and newest products to the Thermosense, Infrared industry, and Defense + Commercial Sensing (DCS) technical audience prior to the opening of the DCS22 Expo. In a relaxed atmosphere, enjoy a casual meeting setting with ample time for questions and answers. This session enables the conference attendees and visitors to better prioritize their activities when visiting the Expo (highlights your company)

Session includes:

- Exhibitors sharing state-of-the-art in future generation of infrared detectors, IR imagers radiometric and non-radiometric, IR image processing systems and IR systems integration. Drones and Robots
- Explores other related infrared optics, semitransparent materials, coatings, filter, characterization and calibration sources, infrared fiber optics, coolers, multispectral and hyperspectral cameras
- It also covers topics related hardware and software involved in infrared applications: NIR - SWIR - MWIR - LWIR
- Infrared industry manufacturing & applications: artificial intelligence, big data, data analytics, datasets and advanced algorithms. Smarter IR sensor/systems technology connected to Internet of Things (IoT / IIoT)
- Infrared Industry: training, standards and hardware accessories

For more information please check online.

Audience background:

Innovative infrared systems & applications research, Applications engineers & professionals, Advanced optics engineers, Photonics and imaging researchers, Photonics Engineering, Infrared systems engineers, Calibration & Test engineers, Academics, Physicists, Exhibition-Only Visitors, and other Exhibitor Representatives (DCS-2022).

To Participate:

Open to all DCS22 exhibitors offering products or services related to infrared sensing or imaging, or photonics. There are no restrictions to the content or topics of submissions: Technical, Academics or Commercial within Infrared Imaging, thermometry Hardware, Optics, Accessories, and Software. Session format features 12-16 minutes oral presentations from hardware, software, artificial Intelligence involved, whose product lines impact thermal imaging applications and the infrared industry in general. No additional charge to participate. Reservations are open now, with limited time slots available.

If you are interested in participating, or have any questions, please contact moderators:

- Andres E. Rozlosnik, SI Termografia Infrarroja (Argentina), aer@termografia.com
- Sheng-Jen (Tony) Hsieh, Texas A&M Univ. (USA), hsieh@tamu.edu

Present your research at SPIE Defense + Commercial Sensing

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.

ABSTRACT SUBMISSION GUIDELINES

Important dates

Abstract submission deadline	6 October 2021
Author notification	3 December 2021
Submission system opens for presentations and manuscripts*	31 January 2022
Manuscript due	9 March 2022
Oral presentation videos due	9 March 2022
Poster PDF and preview videos due	9 March 2022
Oral presentation slide deadline	1 April 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/SI206call
- 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.

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.
- Authors must be authorized to transfer copyright of the manuscript to SPIE, or provide a suitable publication license. Authors retain the right to prepare derivative publications based on the paper.
- 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 Chairs/Editors 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.
- SPIE partners with relevant scientific databases to enable researchers to find the papers in the Proceedings of SPIE easily. The databases that abstract and index these papers include Astrophysical Data System (ADS), Ei Compendex, CrossRef, Google Scholar, Inspec, Scopus, and Web of Science.
- More publication information available on the [SPIE Digital Library](http://www.spie.org/SI206call).

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Contact information

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