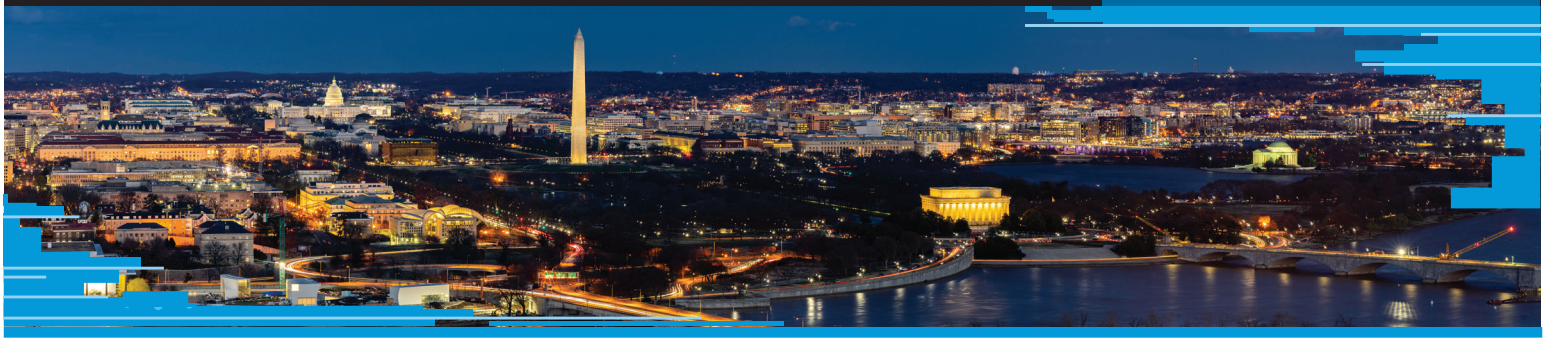
CALL FOR PAPERS

SPIE. DEFENSE+ COMMERCIAL SENSING

21 - 25 April 2024
Gaylord National Resort & Convention Center
National Harbor, Maryland, USA

Submit abstracts by
11 October 2023



Automatic Target Recognition XXXIV (DCS116)

Conference Chairs: **Riad I. Hammoud,** PlusAI, Inc. (United States); **Timothy L. Overman,** Prime Solutions Group, Inc. (United States); **Abhijit Mahalanobis,** The Univ. of Arizona (United States)

Program Committee: **Kenny Chen,** Lockheed Martin Missiles and Fire Control (United States); **Leon Cohen,** Hunter College (United States); **Frederick D. Garber,** Wright State Univ. (United States); **Izidor Gertner,** The City College of New York (United States); **Megan King,** U.S. Army Combat Capabilities Development Command (United States); **Bing Li,** Lockheed Martin Corp. (United States); **Jason P. Luck,** Lockheed Martin Missiles and Fire Control (United States); **Asif Mehmood,** Joint Artificial Intelligence Ctr. (United States); **Olga Mendoza-Schrock,** Air Force Research Lab. (United States); **Robert R. Muise,** Univ. of Central Florida (United States); **Nasser M. Nasrabadi,** West Virginia Univ. (United States); **Lakshmanan Nataraj,** Mayachitra, Inc. (United States); **Saurabh Prasad,** Univ. of Houston (United States); **Vahid R. Riasati,** California State Univ., Northridge (United States); **Firooz A. Sadjadi,** Emerging Concepts Laboratory LLC (United States); **Cem Safak Sahin,** Systems & Technology Research (United States); **Angel D. Sappa,** ESPOL Polytechnic Univ. (Ecuador), Vintra Inc. (United States), Univ. Autònoma de Barcelona (Spain); **Jason R. Stack,** Office of Naval Research (United States); **Michael Teutsch,** HENSOLDT Optronics GmbH (Germany); **Alan J. Van Nevel,** Naval Postgraduate School (United States); **Vincent J. Velten,** Air Force Research Lab. (United States); **Donald Waagen,** Air Force Research Lab. (United States); **Edmund Zelnio,** Air Force Research Lab. (United States)

This conference on Automatic Target Recognition (ATR) emphasizes all aspects relating to the modern automatic and machine assisted target recognition technologies. Novel methods in these key areas are of particular interest: deep-learning and model-based object/target recognition,, adaptive and learning approaches, and advanced signal and image processing concepts for detection, multi-target and High Value Target (HVT) tracking. ATR solutions for various sensors such as sonar/acoustic, neuromorphic (event) sensors, electro-optical, infrared, radar, laser radar, multispectral, and hyperspectral sensors will be considered. Papers dealing with the entire spectrum of algorithms, systems, and architecture in ATR will be also considered.

An extremely important challenge for ATR is the evaluation and prediction of ATR performance given the practical limitation that data sets cannot represent the extreme variability of the real world. Methods are sought that allow a rapid insertion of new targets and adaptive algorithms capable of supporting flexible and sustained employment of ATR. A key technical challenge is the development of affordable ATR solutions that employ an open architecture to provide timely hardware and software insertion.

Papers are solicited in the following and related topics:

MACHINE LEARNING FOR ATR
- deep learning
- adversarial learning
- multi-view learning
- training methodologies
- quantum machine learning
- end-to-end interpretable ATR networks

GEOSPATIAL REMOTE SENSING SYSTEMS
- object recognition from multi-view 3D
- object level change detection, finding and extracting discrete discrepancies (objects) from multi-temporal satellite images
- wide-area search: finding and localizing the object of interest in a satellite image
- sensemaking- inferring activity or predicting events from satellite imagery
- performance evaluation issues.

IR-BASED SYSTEMS
- detection, tracking, and recognition
- phenomenological modeling of targets and background
- polarization diversity
- target/object and scene segmentation
- passive autonomous navigation
- performance evaluation issues.

HYPERSPECTRAL-BASED SYSTEMS
- detection, tracking, and recognition
- phenomenological modeling of targets and background
- polarization and waveform adaptation
- target/object and scene segmentation
- performance evaluation issues.

RADAR/LASER RADAR-BASED SYSTEMS
- high-range resolution radar techniques
- joint radar target tracking and classification approaches
- ultra-wide band radar techniques
- Doppler, polarization, and waveform diversity for target classification
- detection, tracking, recognition, segmentation, target, and clutter modeling
- multisensory processing and fusion
- performance evaluation issues.

NEW METHODOLOGIES
- information theoretical approaches in ATR
- distributed and centralized sensor decision making
- model-based object recognition

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- neural networks for ATR applications
- wavelet decomposition methods for ATR
- machine-learning approaches such as deep-learning, transfer-learning, dictionary-learning, and manifold-learning applications to ATR
- mission adaptive systems
- data characterization
- performance estimation and modeling
- ATR development tools
- ATR architecture
- algorithms for human detection, tracking, and activity recognition.

PANEL DISCUSSION ON MACHINE LEARNING FOR AUTOMATIC TARGET RECOGNITION (ML4ATR)

Following the great success of past ML4ATR sessions, we intend to organize another session in 2024. The Machine Learning for Automatic Target Recognition (ML4ATR) session at SPIE Defense + Security (ATR conference) highlights the accomplishments to date and challenges ahead in designing and deploying deep learning and big data analytics algorithms, systems, and hardware for ATR. It provides a forum for researchers, practitioners, solution architects and program managers across all the widely varying disciplines of ATR involved in connecting, engaging, designing solutions, setting up requirements, testing and evaluating to shape the future of this exciting field. ML4ATR topics of interest include training deep-learning-based ATR with limited measured/real data, multi-modal satellite/hyperspectral/sonar/FMV imagery analytics, graph analytic multi-sensory fusion, change detection, pattern-of-life analysis, adversarial learning, trust, and ethics. We invite experts in the field to join this panel discussion in 2024. Each panelist gives a short keynote talk about their projects on machine learning for ATR.

BEST PAPER AWARD AND BEST STUDENT PAPER AWARD

To be eligible for this award, you must submit a manuscript, be accepted for an oral presentation, and you or your co-author must present your paper on-site. All students are eligible if the abstract was accepted during the academic year the student graduated. Students are required to be enrolled in a university degree granting program. Manuscripts will be judged on technical merit, presentation/speaking skills, and audience interaction. Winners will be announced after the meeting and will be included in the proceedings. All winners will receive an Award Certificate and recognition on SPIE.org.

JOINT SESSION

A joint session on artificial intelligence/deep learning (AI/DL) is being planned with the Infrared Technology and Applications conference. We expect to be cover AI/DL in design of IR systems, subsystems, and components (military as well as commercial), and DL in IR-based detection, tracking, and recognition systems.

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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.

Important dates

Abstracts Due	11 October 2023
Registration opens	8 January 2024
Authors notified and program posts online	15 January 2024
Submission system opens for manuscripts and poster PDFs*	19 February 2024
Poster PDFs due for spie.org preview and publication	27 March 2024
Manuscripts due	3 April 2024
Advance upload deadline for oral presentation slides**	19 April 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

- 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. extended abstract PDF upload for review 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/DCS116call
- 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 tracks

Listed below are the application tracks available for this meeting. 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 showcase the use of artificial intelligence, machine learning, and deep learning to create and implement intelligent systems

Microelectronics: Papers that highlight advances in materials, design, fabrication, integration and applications of silicon or compound semiconductor microelectronics for use in the security and defense sectors and the commercial marketplace.

Sustainability: Papers that feature solutions to achieving net zero energy consumption, waste, and carbon emissions within optics and photonics

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
- 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

Publication of Proceedings in the SPIE Digital Library

Increase your professional visibility and publish in the world's largest collection of optics and photonics research. Your peers access approximately 18 million papers, presentations, and posters from the SPIE Digital Library each year.

- 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.

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