



Autonomous Air and Ground Sensing Systems for Agricultural Optimization and Phenotyping VII (SI211)

Conference Chairs: **J. Alex Thomasson**, Mississippi State Univ. (United States); **Alfonso F. Torres-Rua**, Utah State Univ. (United States)

Program Committee: **Christoph Bauer**, KWS SAAT AG (Germany); **Subodh Bhandari**, California State Polytechnic Univ., Pomona (United States); **Andrew N. French**, Agricultural Research Service (United States); **Yufeng Ge**, Univ. of Nebraska-Lincoln (United States); **Xiongze Han**, Kangwon National Univ. (Korea, Republic of); **Seth C. Murray**, Texas A&M Univ. (United States); **Haly Neely**, Texas A&M Univ. (United States); **Carl Salvaggio**, Rochester Institute of Technology (United States); **Michael Sama**, Univ. of Kentucky (United States); **Sindhuja Sankaran**, Washington State Univ. (United States); **Ajay Sharda**, Kansas State Univ. (United States); **Yeyin Shi**, Univ. of Nebraska-Lincoln (United States)

Conference Co-Sponsor:

syngenta

The use of optics and photonics in agriculture is a rapidly emerging and promising area of study, given the potential impact these technologies offer for rapid crop improvement through phenomics research as well optimization of on-farm crop production. This field is in an exciting period of exploration and expansion, as the use of ground- and air-based sensor platforms now permits revolutionizing the measurement of plant traits by adding great detail, high throughput, and concomitantly large data volumes. This conference brings together researchers and practitioners in this field to discuss the latest technologies, methods and findings.

Proximal and remote sensing systems including point and array detectors deployed on automated ground-based and aerial vehicles in the context of production agriculture and/or phenomics are within the scope of this conference. Both active and passive sensing methods as well as sensors based on various light-scattering modes including fluorescence and Raman are pertinent. Optical sensing extending from the UV through the IR where thermal imaging becomes an important methodology is included in the area of interest.

This conference will emphasize ground-based robots and unmanned aerial vehicles (UAVs) equipped with sensors for measuring phenotypes such as yield, drought tolerance, various stresses, etc. Contributions are sought on sensing technologies; sensor platforms; and data collection, analysis and visualization schemes. While not an exhaustive list, the following exemplifies the technologies and methodologies of interest:

- UAVs for remote sensing in agriculture, including autonomous control issues, imaging workflow issues, and imaging software issues
- Ground-based robots for phenotyping
- Hyperspectral imaging
- Multispectral imaging
- Lidar
- Thermal-infrared cameras
- Fluorescence cameras
- Mobile Raman spectrometers
- Image analysis, data management and data visualization
- Theoretical and empirical estimation techniques including machine learning

BEST PAPER AWARDS

The Conference Chairs and Program Committee would like to recognize pioneers in the field with a Best Paper Award sponsored by Syngenta. Two candidates will be selected: one winner for the Best Paper Award and a Runner-up. This award is open to student and postdoctoral lead authors who present in this conference.

2021 Best Paper Award Winners

Automated calibration pipeline for agricultural sUAS based remote sensing [117470D]. Given to: Wade Pines, Rochester Institute of Technology (United States).

Runner-up

Evapotranspiration partitioning assessment using a machine-learning-based leaf area index and the two-source energy balance model with sUAV information [117470N]. Rui Gao, Utah State University (United States).

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/SI211call
- 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).

SYMPOSIUM CHAIRS



Augustus Fountain III
Professor,
Department of Chemistry
and Biochemistry, The
University of South
Carolina (USA)



Teresa Pace
Technical Fellow,
IMS, Aeromet, L3
Technologies, Inc. (USA)

**SPIE. DIGITAL
LIBRARY**

**SPIE WILL PUBLISH YOUR
RESEARCH GLOBALLY**

www.SPIEDigitalLibrary.org

Your work will live far beyond the conference room—all proceedings from this meeting will be published in the SPIE Digital Library. Promote yourself, your ideas, and your organization to millions of key researchers from around the world through this web-based repository of the latest technical information.

Contact information

QUESTIONS?

AuthorHelp@SPIE.org

www.spie.org/SI211call