



## Autonomous Air and Ground Sensing Systems for Agricultural Optimization and Phenotyping VI (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); **Sindhujha Sankaran**, Washington State Univ. (United States); **Ajay Sharda**, Kansas State Univ. (United States); **Yeyin Shi**, Univ. of Nebraska-Lincoln (United States)

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 breeding and genetics as well optimization of on-farm crop production. The 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 and automated ground-based and aerial vehicles applied to agriculture and high-throughput phenotyping are within the scope of this conference. Both active and passive sensing methods as well as sensors based on material reflectance and transmission and such physical phenomena as fluorescence and Raman scattering are pertinent to this conference. Optical sensing extending from the UV through the IR where thermal imaging becomes an important methodology is yet another area of active research of interest.

This conference will place emphasis on the use of unmanned aerial vehicles (UAVs) and ground-based robotic platforms equipped with various sensing technologies for the purpose of plant and crop phenotyping studies as applied to improving crop characteristics including yield, drought tolerance, stress detection, etc.. Contributions are sought on sensing technologies; sensor platforms; and data collection, analysis and visualization schemes. Contributions are welcome which contain results from field studies on topics such as, but not limited to:

- 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.

### 2020 BEST PAPER AWARD WINNERS

#### Award Winner

**Implications of Soil and Canopy Temperature Uncertainty in the Estimation of Surface Energy Fluxes Using TSEB2T and High-resolution Imagery in Commercial Vineyards** [11414-14]

Given to: **Ayman Nassar**, Utah State Univ. (United States)

#### Runner-up

**Faster-R-CNN based deep learning for locating corn tassels in UAV imagery** [11414-5]

Given to: **Aziza Al-Zadjali**, Univ. of Nebraska-Lincoln (United States)

## Present your research at SPIE Defense + Commercial Sensing

Follow these instructions to develop a successful abstract and accompanying manuscript for the conference and for publication in the Proceedings of SPIE in the SPIE Digital Library.

### How to submit an abstract

1. Browse the conference program and select conference(s) that most closely match the topics of the research you wish to present. *Important: each abstract may be submitted to one conference only.*
2. Click "Submit an Abstract" from within the conference you've chosen, and you'll be prompted to sign in to your spie.org account to complete the submission wizard.

### What you will need to submit

A completed electronic submission should include the following:

- Title
- Author(s)' information
- 250-word abstract for technical review
- 100-word summary for the program
- Keywords used in search for your paper (optional)
- Your decision on publishing your presentation recording to the SPIE Digital Library (slide capture and audio)
- Some conferences may indicate additional requirements in the Call for Papers (for example: instructions for competing for awards)

**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.

### Submission agreement

Presenting authors, including keynote, invited, oral, and poster presenters, agree to the following conditions by submitting an abstract:

- Register and attend the meeting.
- Present as scheduled.
- Publish a 6- to 20-page manuscript in Proceedings of SPIE in 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.

### Important dates

Abstracts Submission Deadline	7 October 2020
Acceptance Notification Sent to Contact Author	4 December 2020
Manuscripts Due	17 March 2021

### Review and program placement

- To ensure a high-quality conference, all submissions will be assessed by the Conference Chair/Editors for technical merit and suitability of content.
- Conference Chair/Editors reserve the right to reject for presentation any paper that does not meet content or presentation expectations.
- Final placement in a speaker or poster session is subject to the Chairs' discretion.

### Publication of Proceedings in the SPIE Digital Library

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- More publication information available on the SPIE Digital Library.

### Contact information

For questions about your presentation, submitting an abstract post-deadline, or the meeting, contact **Kirsten Anderson** or **Aron Miller**, your Conference Program Coordinators..

For questions about your manuscript, contact **AuthorHelp@spie.org**.

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### We are here to ensure that your work is shared with your colleagues.

How that looks may change as world events impact our personal and professional lives. Rest assured, if the timing of an in-person meeting will not allow us to gather, we will leverage our Digital Forum platform and virtual meetups to give you alternative ways to connect with your community.

We look forward to connecting with you soon.



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