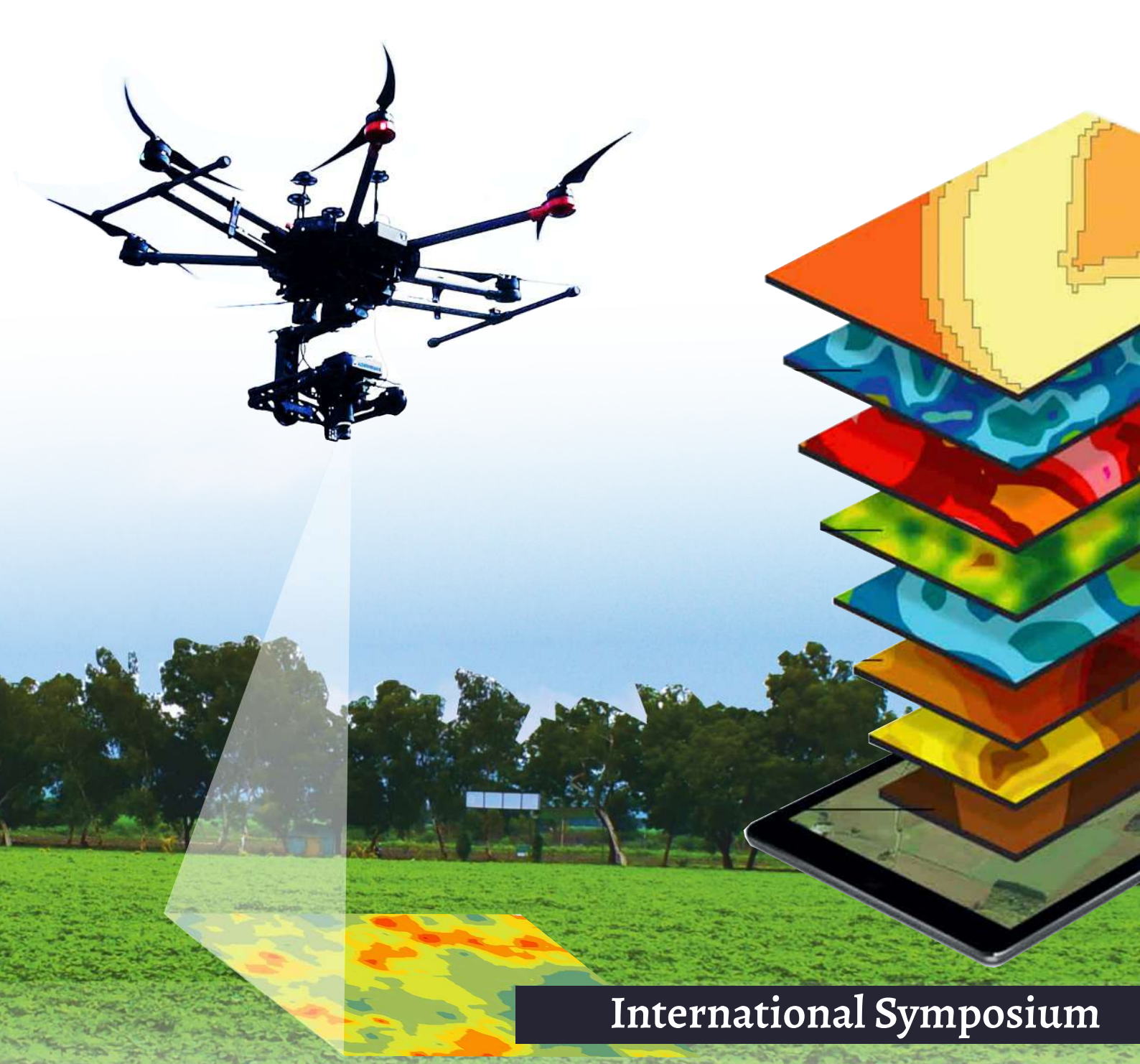

International Symposium

AI &Hyperspectral Imaging for Agriculture

ISHAg

December 20-21, 2023

Grand Peshwa, Four Points By Sheraton Hotel and Serviced Apartments, Viman Nagar, Pune, Maharashtra 411014, India.

http://mpkv-cff2023.in/
https://www.mpkv-caast.ac.in/

भाकृअनुप ICAR
NAHEP

MAHATMA PHULE KRISHI VIDYAPEETH
अन्नं बहु कुर्वीत तद् व्रतम्

Importance

Artificial Intelligence (AI) is the intelligence of machines or software as against to the intelligence of humans. AI makes machines that can think like humans. AI technologies process large amounts of data in ways, unlike human and when embedded with other digital technologies, AI can make the system "smart". AI has the vast applications in agriculture from weather predictions, monitoring the crop health, determine the optimal irrigation schedule; and nutrient application timings, recommend suitable agronomic practices to pest and disease management and many more. As such these are future farming technologies. However there is need to deliberate on the potential of AI in agriculture.

The electromagnetic radiation reflected, absorbed, or transmitted by the material at different wavelengths is known as spectral response or characteristics. As each material reflects, absorbs, or transmits light in a unique way depending on its surface properties; the spectral response is unique and hence it is also termed as the spectral signature. These unique spectral signatures of the material can be exploited for various applications. The traditional imaging captures the information that human eyes can see (visual range) i.e. in three bands of color (red, green, and blue). However, the hyperspectral imaging is a technique that involves capturing and processing information from across the electromagnetic spectrum in many more bands, often spanning the ultraviolet, visible, and infrared regions of the spectrum that human eyes cannot see. In hyperspectral imaging, each pixel in an image contains a spectrum of information rather than just color. This allows for a more detailed analysis of the objects or scenes being imaged. By analyzing the spectral characteristics of objects or surfaces, it is possible to identify and classify materials, monitor changes, and gain insights into the composition and health of different surfaces.

The ability of the hyperspectral imaging to capture detailed spectral information across a broad range of wavelengths makes this technique a powerful tool for various scientific, industrial, and commercial applications. It enables more appropriate analysis and interpretation of the data compared to traditional imaging methods; and hence being used for various applications in remote sensing, medical imaging, food quality inspection, forensic, mining; and military and defense. Hyperspectral imaging also offers a wide range of applications in agriculture, leveraging its ability to capture detailed spectral information from crops and soil. Some of the key applications include: land cover mapping, pest and disease detection, identification of nutrient deficiency, weed detection, biomass and yield estimation, drought monitoring, irrigation scheduling, soil moisture monitoring and genetic research. Hyperspectral imaging has the capability of early detection of abiotic and biotic stresses in plants and hence this technique has the potential for the development of early warning systems in agriculture. More importantly the ability of the spectral sensors to integrate with IoT enabled system makes the hyper-spectral imaging the significant applications for the real time, climate smart and precision agriculture.

In order to investigate the AI and hyperspectral imagining technologies and explore further their various applications in agriculture for real-time, climate smart and precision agriculture; and to make the students, researchers, practioners, and industries aware about the advances in AI and hyperspectral imaging technologies; and bring them on one platform to deliberate on several aspects of AI and hyperspectral imaging technologies, the **"International Symposium on Hyperspectral Imaging for Agriculture"** is organized with following specific objectives.

Objectives

1. To deliberate on various instrumentations including cameras and sensors required for the AI and spectral imaging in agriculture.
2. To discuss on exploring various applications of AI and hyperspectral imaging for real-time, climate smart and precision agriculture.
3. To deliberate on the possibilities of integrating the hyperspectral imaging techniques with other digital tools such as Computer vision, AI and ML; UAVs and IoTs.
4. To make aware researchers, industries and students about the latest developments and advancements in AI and hyperspectral imaging for agriculture and their potential benefits.
5. To provide a platform to meet, share ideas, and explore possible national and global partnerships and collaborations for potential applications of AI and hyperspectral imaging in Indian context.

Themes

- Spectral imaging applications for a-biotic and biotic stress management
- AI applications in agriculture
- Computer vision and Instrumentations for the AI and spectral imaging (lab, field and air-borne)
- Integration of AI and spectral imaging with other digital technologies

Programme and Technical Sessions

Date: 20 December, 2023

0830 to 0945 h	Breakfast and Networking
1000 to 1100 h	Inauguration
1100 to 1130 h	Hi-tea, Networking break
1130 to 1300 h	**Key Note Session-I** (Digital Technologies for Agriculture)
1300 to 1400 h	Lunch break
1400 to 1530 h	**Technical Session-I** (Spectral imaging applications for abiotic and biotic stress management) **Theme Presentations** (by invited experts) **Presentations of accepted research and practioners papers**
1530 to 1600 h	Poster presentation, Networking and hi-tea
1600 to 1730 h	**Technical Session-II** (AI applications for agriculture) **Theme Presentations** (by invited experts) **Presentations of accepted research and practioners papers**

Date: 21 December, 2023

0930 to 1100 h	**Technical Session-III** (Computer vision and Instrumentations for the AI and spectral imaging (lab, filed and air-borne)) **Theme Presentations** (by invited experts) **Presentations of accepted research and practioners papers**
1100 to 1130 h	Poster presentation, Networking and hi-tea
1130 to 1300 h	**Technical Session-IV** (Integration of AI and spectral imaging with other digital technologies) **Theme Presentations** (by invited experts) **Presentations of accepted research and practioners papers**
1300 to 1400 h	Lunch
1400 to 1530 h	**Key Note Session-II** (Digital Technologies for Agriculture)
1530 to 1600 h	Hi-tea, Networking
1600 to 1730 h	Concluding Session

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Call for Papers

Category of papers

The papers are invited on one or more themes of the Symposium in following categories from:

- **Academician, Scientists and Researchers:** The research papers based on the applications of AI and multi/hyper spectral imaging in agriculture, spectral instrumentations and their integration with other digital technologies.
- **Entrepreneurs, Start-ups, Practioners and Industries:** The practioners/ description papers based on the developed and under-development AI and spectral imaging applications, instrumentations and tools.
- **Students:** The papers on the development of the concepts, framework and systems.
- **Others:** The papers on challenges, issues and policies; and measures for wider adoption of AI and spectral imaging technologies; possible advances in AI and hyperspectral imaging.

Acceptance of the Papers and Form of the Presentations

The papers submitted for the Symposium will be entered through the peered review process and depending on the comments from the reviewers, the accepted papers will be considered for the "Oral" or "Poster" presentations.

The Submission of the Papers

- **The format:** The formats of the papers to be submitted in various categories are available at https://mpkv-cff2023.in/Home/ishag/3
- The papers in the prescribed format need to be uploaded at https://mpkv-cff2023.in/Home/ishag/3 and/or emailed to info@mpkv-cff2023.in

Click

Publication of the Papers

All the papers accepted in various categories and presentation forms will be published in the Symposium Proceedings after due modifications by the authors/presenters as per the comments received during the presentations. The selected papers from all the categories accepted for oral presentations will also be published in the **"Journal of Agricultural Research and Technology"** jointly published by all the four agricultural universities in the State of Maharashtra after processing thorough the review process of the journal.

Awards

The poster presentations of the scientists/faculties and practioners; and the oral and poster presentations of the students will be evaluated by the International and National Experts and the selected oral and poster papers will be awarded in various categories.

Key Dates

- **Registration**
  - With normal registration fees: **8 December, 2023**
  - With late registration fees: **15 December, 2023**
- **No on-spot registration**
  - The registration will be closed once the prescribed numbers of delegates have registered.
- **Paper submissions**
  - Last date of submission of papers: **8 December, 2023**
  - Communication regarding the final acceptance: **12 December, 2023**
- **The dates of the Symposium**
  - **20-21 December, 2023**

Registration

Registration Fees

For participation only

- **Registration fee for the participants other than students:** **Rs. 10000/-** and late registration fee (i.e. registration after 15 December, 2023): **Rs. 15000/-**
- **Registration fee for the students:** **Rs. 4000/-** and late registration fee (i.e. registration after 15 December, 2023): **Rs. 6000/-**

For participation with paper presentation

- Registration fee for the presenting author of the paper accepted for the **oral presentation** (however registration is mandatory): **Rs. 3000/-**
- Registration fee for the presenting author of the paper accepted for the **poster presentation** (however registration is mandatory): **Rs. 5000/-**
- Registration fee for presenting author **(if student)** of the paper accepted for the **oral and/or poster presentation** (however registration is mandatory): **Rs. 500/-**
- Registration fee for the authors whose submitted **papers have not been accepted for oral or poster presentation and desire to participate:** **Rs. 10000/-** and **if student**: **Rs. 4000/-**

Mode of Payment

Online and links will be available during the Registration Process.

Registration includes

- Access to the Inaugural and Closing Programs, Key Note Sessions and Technical Sessions
- Access to other parallel Symposia (depending on availability of seats)
- Opportunity for networking with National and International Experts, Industries, Start-ups, Entrepreneurs, Students and Farmers
- Registration kit with the specified literature
- Snacks/Lunch during the Symposium

Click here to **Register**

Click here for Registration

Accommodation

Limited accommodations are available in the guest houses of NCL (CSIR), IITM, IMD, IE(I), NIV, ICAR-NRCs, University of Pune and Govt. guest houses on first-come first-serve and payment basis. The participants can contact them directly or indicate the requirement during the registration process (while submitting the application form). Accommodation will not be available at MPKV Guest houses in Pune. There are plenty of hotels in Pune and especially near the venue of the Symposium. The participants are advised to book these hotels, if required, in advance. The list of the hotels along-with the contacts and the tariffs is available at the Symposium Website.

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Organizers

About CAAST-CSAWM

The project entitled **"Center for Advanced Agricultural Science and Technology (CAAST) on Climate Smart Agriculture and Water Management (CSAWM)"** is being implemented in Mahatma Phule Krishi Vidyapeeth (An Agricultural University), Rahuri, Maharashtra under World Bank Sponsored National Agricultural Higher Education Project (NAHEP) of Indian Council of Agricultural Research (ICAR), New Delhi, Government of India, Since 2018. The major objectives of CAAST-CSAWM project are;

- *To develop the capacity amongst the faculties and scientists for the development and adoption of Precision Farming, Climate Smart Agriculture and Water Management Technologies*
- *To start a one-year Post-Graduate Diploma in "Climate Smart Agriculture and Water Management" for developing human resources to create entrepreneurship and enhance employability in the public sectors and private industries, strengthen the current M.Sc., M. Tech. and Ph.D. programme (for their research projects, and make provision for the prospective beginner/middle-level faculties/researchers for Post Doctorate studies in precision water management, precision climate-smart agriculture and Geoinformatic*
- *To develop an integrated system including RS/GIS and GPS tools, modelling and SDSS tools using unmanned aerial system (UAS aka. drone) and sensor-based technologies, mobile applications and their applications climate-smart and precision agriculture and water management*
- *To conduct end-to-end capacity building through on-the-job training and case study-based learning; enhance the employment and placement rate; and business and entrepreneurship opportunities*
- *To develop the capacity amongst the faculties and students of MPKV Rahuri and other Agricultural Universities and related organizations for the development and adoption of the precise Climate Smart Agriculture and Water Management technologies as well as to conduct on-the-job training and case study based learning to enhance the employment and placement rate; and business and entrepreneurship opportunities.*

With this background, CAAST-CSAWM, MPKV, Rahuri is organising International Symposium on **"Hyperspectral Imaging for Agriculture" during 20-21 December, 2023 at Pune.**

Click here to know more about CAAST-CSAWM

Organizing Committee

- **Patrons**
  Dr. Prashantkumar Patil, Hon'ble Vice Chancellor, Mahatma Phule Krishi Vidyapeeth, Rahuri
  Dr. R.C. Agrawal, Deputy Director General (Edu.) and National Director, ICAR-NAHEP, New Delhi
- **Convenors**
  Dr. Sunil Gorantiwar, Director of Research; Head (Ag. Engg.) & Principal Investigator (CAAST-CSAWM), MPKV Rahuri
  Dr. Anuradha Agrawal, National Coordinator (CAAST), ICAR-NAHEP, New Delhi
- **Co-Convenor**
  Dr. Mukund Shinde, Professor (SWCE) and Co-Principal Investigator (CAAST-CSAWM), MPKV Rahuri
- **Organizing Secretary**
  Dr. Sunil Kadam, Associate Professor (IDE), CAAST-CSAWM, MPKV Rahuri (+91-9403608302)
- **Joint Organizing Secretary**
  Dr. Pawan Kulwal, Professor (Ag. Botany) and Member, CAAST-CSAWM, MPKV Rahuri (+91-9404113740)
- **Co-Ordinators**
  Dr. Anand Bade (+91-9420009118), **Dr. L.B. Thulasiram and Dr. Anil Patel,** Research Associates, CAAST-CSAWM, MPKV Rahuri

For updates, visit: http://mpkv-cff2023.in/

World Bank Aided
ICAR- National Agricultural Higher Education Project (NAHEP)
Centre for Advanced Agricultural Science and Technology
for Climate Smart Agriculture and Water Management
Mahatma Phule Krishi Vidyapeeth, Rahuri
413 722 Maharashtra, India