UNIVERSITAT DE BARCELONA

ICBA
AGRICULTURE FOR TOMORROW

International Conference on AI Applications in Agriculture

Key Details

Date: 19-20 July 2022
Time: 09:00-17:00 h GMT+2
Venue: Faculty of Biology, University of Barcelona, Barcelona, Spain

Background

Annual crop losses due to pests and diseases range from 20% to 40% globally, undermining rural livelihoods, national economies, and food security. Smart systems can help farmers make prompt in-situ diagnoses and facilitate effective response to plant diseases and pest attacks in their early stages.

The International Center for Biosaline Agriculture (ICBA), in partnership with the University of Barcelona (UB), are developing a user-friendly application for smartphones that smallholder farmers can use to identify and address diseases and nutritional disorders in their crops, and thus minimize losses in their yields. The project targets farmers in four countries of the Middle East and North Africa (MENA) region where ICBA has ongoing projects, including Egypt, Tunisia, and the United Arab Emirates (UAE). At a later stage, the application will be made available for other countries where ICBA operates and beyond.

While the application uses the power of artificial intelligence (AI) for a specific purpose, there are many other ways in which AI can support sustainable agriculture, from agronomy to breeding.

This conference will bring together experts and professionals in AI, crop management, breeding, as well as plant pathologists, to share their experience in the use of AI to solve real problems in agriculture. The main focus will be on how AI can contribute to the adaptation and sustainability of agriculture in the Mediterranean and the Middle East.

The International Center for Biosaline Agriculture (ICBA) is a unique applied agricultural research center with a focus on marginal areas where an estimated 1.7 billion people live. It identifies, tests and introduces resource-efficient, climate-smart crops and technologies that are best suited to different regions affected by salinity, water scarcity and drought. Through its work, ICBA helps to improve food security and livelihoods for some of the poorest rural communities around the world.

www.biosaline.org

Speakers

Dr. Tarifa Alzaabi
Acting Director General, International Center for Biosaline Agriculture (ICBA), UAE

Prof. Jordi García
Vice-president for Research, Universitat de Barcelona (UB), Spain

Dr. Henda Mahmoudi
Plant Physiologist, ICBA, UAE

Prof. José Luis Araus
Integrative Crop Ecophysiology Group, UB, Spain

Prof. Ignacio Romagosa
Director of Agrotecnio, Universitat de Lleida (UdL), Spain

Prof. José Crossa
International Maize and Wheat Improvement Center (CIMMYT), Mexico

Dr. Rakesh Kumar Singh
Program Leader, ICBA, UAE

Dr. Sumitha Thushar
ICBA, Dubai, UAE

Prof. José Armando Fernandez
University of Ibagué, Colombia

Speakers

Prof. Fred van Eeuwijk
University of Wageningen, The Netherlands

Dr. Alexis Comar
Hiphen, Avignon, France

Prof. Miguel Perez
ICREA – Universitat Autonoma de Barcelona, Spain

Dr. Zied Hammami
Agronomist, ICBA, UAE

Dr. Llorenç Cabrera-Bosquet
LEPSE, UMR INRA-SUPAGRO, Institut de Biologie Intégrative des Plantes, Montpellier, France

Prof. Shawn. C. Kefauver
Integrative Crop Ecophysiology Group, UB, Spain

Dr. Jordi Gené
Research Group in AgroICT & Precision Agriculture, UdL, Spain

Prof. Jose A. Jiménez Berni
Sustainable Agriculture Institute, Spanish National Research Council (CSIC) - Universidad de Córdoba, Spain

Dr. Joaquim Bellvert
Efficient Use of Water in Agriculture Program. Institute of Research, AgriFood & Technology (IRTA), Spain

Speakers

Eng. Shaimaa Ismail
Abu Dhabi, UAE

Dr. Adrian Gracia-Romero
Sustainable Field Crops Program, IRTA, Spain

Eng. Rami Hamza
Tunis, Tunisia

Angie L. Gámez
Agrobiotechnology Institute, CSIC-Universidad Pública de Navarra, Spain

Joel Segarra
Integrative Crop Ecophysiology Group, UB, Spain

Mr. Ghazi Al-Jabri
Capacity Development Specialist, ICBA, UAE

Agenda

Tuesday, 19 July 2022

08:00 – 09:00	**Registration**
09:00 – 10:00	**Opening ceremony** • Welcome remarks by **Prof. Jordi García** Vice-president for Research, Universitat de Barcelona (UB), Spain • Welcome remarks by **Dr. Tarifa Alzaabi**, Acting Director General, International center for Biosaline Agriculture (ICBA), UAE • The continuous need of agricultural research. **Prof. Ignacio Romagosa**, Director of Agrotecnio, Universitat de Lleida (UdL), Spain. • The Role of Innovation & Technology in Achieving Global Food Security, **Dr. Tarifa Alzaabi**, Acting Director General, ICBA, UAE • Research on Agriculture at the Universitat de Barcelona. **Prof. José Luis Araus**, Integrative Crop Ecophysiology Group, UB, Spain • Introduction of the project "Developing a user-friendly application for plant disorder detection for smallholder farmers" and ICBA's achievement in the use of AI in agriculture, **Dr. Henda Mahmoudi**, Plant Physiologist, ICBA, UAE • Group photo
10:00 – 10:30	**Coffee break**
10:30 – 12:30	**Session 1: AI in agriculture: potentialities and limitations** • Keynote speech. Genetic gains in modern plant breeding **Prof. José Crossa**, International Maize and Wheat Improvement Center (CIMMYT), Mexico • High throughput (HTP) phenotyping: a potential decision tool for selection from large populations, **Dr. Rakesh Kumar Singh**, Program Leader, ICBA, UAE • Implementation of Artificial Intelligence (AI) for sustainable agriculture, **Dr. Sumitha Thushar**, ICBA, Dubai, UAE • Deep leaning for detection of plant disorders in crop leaves: from data collection to framework tools. **Prof. José Armando Fernandez**, University of Ibagué, Colombia • Q&A
12:30 – 14:00	**Lunch break**

14:00 – 16:00

Session 2: Technical setup: AI toolsets, input data resources, algorithm categories, and data fusion

- Keynote speech: Dynamical phenotyping data: models and use. **Prof. Fred van Eeuwijk**, University of Wageningen, The Netherlands
- How is AI used to assess new traits in a context of High Throughput Phenotyping for plant breeding and product evaluation **Dr. Alexis Comar**, Hiphen, Avignon, France
- Computer generation of fruit shapes from DNA, **Prof. Miguel Perez**, ICREA – Universitat Autonoma de Barcelona, Spain.
- Precise agriculture technology: sensing technologies to improve the natural resource use under the marginal environment, **Dr. Zied Hammami**, Agronomist, ICBA, UAE
- Q&A

Wednesday, 20 July 2022

08:30 – 10:00

Session 3: Input data and AI application domains: examples

- Integrated analysis of phenomics data **Dr. Llorenç Cabrera-Bosquet**, LEPSE, UMR INRA-SUPAGRO, Institut de Biologie Intégrative des Plantes, Montpellier, France
- Deep learning architectures for forestry applications **Prof. Shawn. C. Kefauver**, Integrative Crop Ecophysiology Group, UB, Spain
- Fruit detection and sizing using photonic sensors and artificial intelligence, **Dr. Jordi Gené**, Research Group in AgroICT & Precision Agriculture, UdL, Spain

10:00 – 10:30 **Coffee break**

10:30 – 12:30

Session 3: Input data and AI application domains: examples, Cont

- Practical application for irrigation management in almonds **Prof. Jose A. Jiménez Berni**, Sustainable Agriculture Institute, Spanish National Research Council (CSIC) - Universidad de Córdoba, Spain
- Artificial Intelligence and Digital Twins for Agricultural Water Management **Dr. Joaquim Bellvert**, Efficient Use of Water in Agriculture Program. Institute of Research, AgriFood & Technology (IRTA), Spain
- Challenges for the data collection and AI application, **Eng. Shaimaa Ismail**, Abu Dhabi, UAE
- Challenges and opportunities of NDVI based-models for grain yield prediction, **Dr. Adrian Gracia-Romero**, Sustainable Field Crops Program, IRTA., Spain
- Q&A

12:30 – 14:00	**Lunch break**
14:00 – 16:00	**Session 4: AI in agriculture: future scenarios** • AI tools for future agriculture, **Eng. Rami Hamza**, Tunis, Tunisia • Using hyperspectral canopy reflectance for predicting leaf photosynthetic traits on spring wheat genotypes. **Angie L. Gámez- Agrobiotechnology Institute**, CSIC-Universidad Pública de Navarra, Spain. • Machine learning to estimate within field wheat grain yield using Sentinel-2 data, **Joel Segarra**, Integrative Crop Ecophysiology Group, UB, Spain • Highlights on the capacity development of the project in Egypt, Tunisia and the UAE, **Mr. Ghazi Al-Jabri**, Capacity Development Specialist, ICBA, UAE
16:00 – 17:00	**Closing ceremony** • Recommendations • Closing remarks