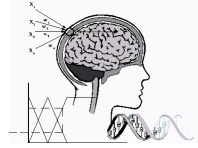# International

Innovation in Knowledge Based and Intelligent Engineering Systems

Invited Session to be held at
KES2025
The 29th International Conference on Knowledge-Based and Intelligent Information & Engineering Systems

Osaka, Japan, 10-12 September 2025

SUMMARY

Title of Session:
Smart Sustainable Agriculture and Food Production

Name, Title and Affiliation of Chair:
Prof. Robert J. Howlett
KES International & Cardiff Metropolitan University, Wales, UK

Details of Session

Civilisation faces huge challenges in the 21st century in feeding a growing population a healthy diet while avoiding excessive consumption of natural resources and damage to the environment. Innovative approaches are required to food production technology that increase yields and decrease waste, at the same time minimising harm to the ecosystem. Recent challenges such as the Covid global pandemic and armed conflicts in various parts of the world have demonstrated the importance of resilience throughout the 'Farm to Fork' food chain.

New technologies are increasingly being incorporated into various aspects of the food production process to meet these challenges. Modern smart digital paradigms are leading to the digitisation of agriculture and its own industrial revolution - agriculture 4.0.

Notable examples of this digital transformation of agriculture include:
- Artificial intelligence and machine learning (AI/ML) being used to optimise growing regimes;
- The Internet of Things (IoT), robotics, geolocation, being applied in precision agriculture;
- Vertical farms, repurposing redundant buildings and utilising smart systems for environmental control, increase the efficiency of food production, bringing it closer to consumers, reducing transport costs and emissions;
- Advances in smart sustainable energy technologies can reduce energy costs in greenhouses and controlled environment horticulture.

We invite contributions on topics showing how a range of smart technologies including AI/ML, the IoT and intelligent monitoring and control can be applied to the area of sustainable agriculture, food production and processing.

Topics

A few examples of applicable topics are provided below, but his list is not meant to be restrictive.

- smart and intelligent systems in agriculture 4.0, digital farming, precision agriculture
- smart systems in food production and processing
- AI/ML, IoT and robotics applied to agriculture and food production
- precision agriculture & data driven farming
- smart technology assisted open-field agriculture
- controlled and protected environment agriculture (C&PEA) and horticulture
- smart greenhouse technology, smart vertical farming
- smart control systems, energy efficiency and water efficiency for (C&PEA)
- integrating food production into smart buildings and smart towns/cities
- intelligent and data-driven approaches to growth optimisation, feeding regimes, crop disease diagnosis, etc

Submission of Papers

Papers must be prepared following the 'Information for Authors' to be found here …
http://kes2025.kesinternational.org/submission.php

Deadlines

- **Submission of Papers:** 28 April 2025
- **Notification of Review Result:** 19 May 2025
- **Submission of Final Camera-Ready Papers:** 2 June 2025

Examples of International Research Centres that Could Contribute (tentative):

- Cardiff Metropolitan University, Wales, UK
- University of Catania, Italy
- Politecnico di Bari / University of Bari, Italy
- University of Salento, Italy
- Harper Adams Agricultural College
- OXAGON, Neom, Saudi Arabia
- Tokyo Agriculture and Technology University, Japan
- Fujian Agriculture and Forestry University, China
- French National Institute for Agriculture, Food and Environment, France
- Nottingham Trent University, UK
- National University of Singapore, Singapore
- SINTEF Energy Research Institure, Norway
- University of Queensland, Australia

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