

Guest Editorial

Special Issue on Smart Sensing for Agriculture

SEAMLESS integration of sensor technologies with traditional agriculture has led to a revolutionary transformation in agriculture. This has motivated researchers to use sensor technology, GPS guidance, control systems, drones, and software services for ensuring optimal conditions for the crops and soil. For instance, unmanned surveillance on the agricultural field, automated soil and crop assessment, etc., assist the farmers by monitoring the soil conditions, environmental factors, and crop features. Smart sensing enables the objects to be sensed and controlled remotely using network model. Sensors help in collecting real-time data about the crops, soil, and surrounding conditions. The collected data can be used in managing the agricultural activities by performing predictive analysis using various machine learning and deep learning techniques. These advanced learning techniques mitigate the human errors by analyzing the large amount of sensory data and facilitate smart sensing in agriculture.

This Special Issue mainly focuses on design and implementation of novel sensing technologies, self-calibration of agricultural sensors, circuits or techniques for irrigation monitoring, multi-modal sensing techniques with data synchronization, smart sensing for agricultural equipment monitoring, smart sensing for soil and water supply monitoring, smart sensing for storage and greenhouse automation system, smart sensing for crop monitoring, smart sensing for waste products and pest management in agriculture, smart sensing for minimizing food deficit and optimizing farming productivity, smart sensing for agriculture supply chain, smart sensing for livestock monitoring, creating agricultural datasets and benchmarks, and novel applications of smart sensing for agriculture.

The Guest Editors of this Special Issue accepted 21 articles for publication. The accepted articles titled are as multi-modal sensing platform for continuous analysis of maple syrup in production process, smart secure sensing for IoT-based agriculture: blockchain perspective, smart sensing-enabled decision support system for water scheduling in orange orchard, a flexible privacy-preserving data publishing scheme based on smart agriculture, an intelligent and optimal resource allocation approach in sensor networks for smart agri-IoT, smart irrigation system for precision agriculture, a novel device for sustainable automatic disease prediction, crop selection, and irrigation in the Internet-of-Agro-Things for smart agriculture, extracting the forest type from remote sensing images by random forest, trajectory design for UAV-to-Ground communication with energy optimization using genetic algorithm for agriculture application, soil sensors-based prediction system for plant diseases using exploratory data analysis

and machine learning, distributed learning-based smart virtual sensing for precision agriculture, unmanned aerial vehicles in smart agriculture: applications, requirements, challenges, image compression, and plants classification using machine learning in controlled-environment agriculture: Antarctic station use case, smart sensing-based functional control for reducing uncertainties in agricultural farm data analysis, copper complex-coated nano-patterned fiber-tip guided mode resonance device for selective detection of ethylene, a smart droplet detection approach with vision sensing technique for agricultural aviation application, automatic control system of balancing agricultural stereo cultivation based on wireless sensors, routing and spectrum allocation in elastic optical networks for ecosystem monitoring, grape esca and isariopsis detection network based on multi-task learning, and attention features, toward precision agriculture: IoT-enabled intelligent irrigation systems using deep learning neural network, and deep aerial semantic segmentation framework for IoT-assisted precision agriculture.

Finally, the Guest Editors of this Special Issue would like to express their gratitude to all the authors for their efforts in writing such high-quality articles and to all the reviewers for their precious time. They also wish to thank the Editor-in-Chief, Sandro Carrara, Associate Editor-in-Chief, Gerald Gerlach, and Leigh Ann Testa, for their support in the publication of this Special Issue.

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