1. Record Nr. UNINA9910686479303321

Titolo IoT and AI in agriculture : self-sufficiency in food production to achieve society 5.0 and SDG's globally / / Tofael Ahamed, editors

Pubbl/distr/stampa Singapore : , : Springer, , [2023]
©2023

ISBN 981-19-8113-2

Edizione [1st ed. 2023.]

Descrizione fisica 1 online resource (XVII, 461 p. 1 illus.)

Disciplina 338.16

Soggetti Agricultural innovations
Artificial intelligence - Agricultural applications
Internet of things - Industrial applications

Lingua di pubblicazione Inglese

Formato Materiale a stampa

Livello bibliografico Monografia

Nota di bibliografia Includes bibliographical references.

Nota di contenuto Chapter 1. IoT x AI: Introducing Agricultural Innovation for Global Food Production -- Chapter 2. Transforming Controlled Environment Plant Production toward Circular Bioeconomy Systems -- Chapter 3. Artificial Lighting Systems for Plant Growth and Development in Indoor Farming -- Chapter 4. An IoT-based Precision Irrigation System to Optimize Plant Water Requirements for Indoor and Outdoor Farming Systems -- Chapter 5. Artificial Intelligence & Internet of Things: Application in Urban Water Management -- Chapter 6.Purification of Agricultural Polluted Water Using Solar Distillation and Hot Water Producing with Continuous Monitoring Based on IoT -- Chapter 7. Long Range Wide Area Network (LoRaWAN) for Oil Palm Soil Monitoring -- Chapter 8. Application of Smart Machine Vision in Agriculture, Forestry, Fishery, and Animal Husbandry -- Chapter 9. Artificial Intelligence in Agriculture: Commitment to Establish Society 5.0 -- Chapter 10. Potentials of Deep Learning Frameworks for Tree Trunk Detection in Orchard to Enable Autonomous Navigation System -- Chapter 11. Real Time Pear Fruit Detection and Counting Using YOLOv4 Models and Deep SORT -- Chapter 12. Pear Recognition in an Orchard from 3D Stereo Camera Datasets to Develop an Autonomous Mechanism Compared with Deep Learning Algorithms -- Chapter 13. Thermal Imaging and Deep Learning Object Detection Algorithms for Early

Sommario/riassunto	This book reviews recent innovations in the smart agriculture space that use the Internet of Things (IoT) and sensing to deliver Artificial Intelligence (AI) solutionsto agricultural productivity in the agricultural production hubs. In this regard, South and Southeast Asia are one of the major agricultural hubs of the world, facing challenges of climate change and feeding the fast-growing population. To addresssuch challenges, a transboundary approach along with AI and BIG data for bioinformatics are required to increase yield and minimize pre- and post-harvest losses in intangible climates to drive the sustainable development goal (SDG) for feeding a major part of the 9 billion population by 2050 (Society 5.0 SDG 1 & 2). Therefore, this book focuses on the solution through smart IoT and AI-based agriculture including pest infestation and minimizing agricultural inputs for in-house and fields production such as light, water, fertilizer and pesticides to ensure food security aligns with environmental sustainability. It provides a sound understanding for creating new knowledge in line with comprehensive research and education orientation on how the deployment of tiny sensors, AI/Machine Learning (ML), controlled UAVs, and IoT setups for sensing, tracking, collection, processing, and storing information over cloud platforms for nurturing and driving the pace of smart agriculture in this current time. The book will appeal to several audiences and the contents are designed for researchers, graduates, and undergraduate students working in any area of machine learning, deep learning in agricultural engineering, smart agriculture, and environmental science disciplines. Utmost care has been taken to present a varied range of resource areas along with immense insights into the impact and scope of IoT, AI and ML in the growth of intelligent digital farming and smart agriculture which will give comprehensive information to the targeted readers. .