

Introduction To Drones In Agriculture

THE DIGITAL AGRICULTURAL REVOLUTION

The book integrates computational intelligence, applied artificial intelligence, and modern agricultural practices and will appeal to scientists, agriculturists, and those in plant and crop science management. There is a need for synergy between the application of modern scientific innovation in the area of artificial intelligence and agriculture, considering the major challenges from climate change consequences viz. rising temperatures, erratic rainfall patterns, the emergence of new crop pests, drought, flood, etc. This volume reports on high-quality research (theory and practice including prototype & conceptualization of ideas, frameworks, real-world applications, policy, standards, psychological concerns, case studies, and critical surveys) on recent advances toward the realization of the digital agriculture revolution as a result of the convergence of different disruptive technologies. The book touches upon the following topics which have contributed to revolutionizing agricultural practices. Applications of Artificial Intelligence in Agriculture (AI models and architectures, system design, real-world applications of AI, machine learning and deep learning in the agriculture

domain, integration & coordination of systems and issues & challenges). IoT and Big Data Analytics Applications in Agriculture (theory & architecture and the use of various types of sensors in optimizing agriculture resources and final product, benefits in real-time for crop acreage estimation, monitoring & control of agricultural produce). Robotics & Automation in Agriculture Systems (Automation challenges, need and recent developments and real case studies). Intelligent and Innovative Smart Agriculture Applications (use of hybrid intelligence in better crop health and management). Privacy, Security, and Trust in Digital Agriculture (government framework & policy papers). Open Problems, Challenges, and Future Trends. Audience Researchers in computer science, artificial intelligence, electronics engineering, agriculture automation, crop management, and science.

Introduction to Information Systems, 8th Edition teaches undergraduate business majors how to use information technology to master their current or future jobs. Students develop a working understanding of information systems and information technology and learn how to apply concepts to successfully facilitate business processes. This program demonstrates that IT is the backbone of any business, whether a student is majoring in accounting, finance, marketing, human resources, production/operations

management, or MIS.

The 24 chapters in this book provides a deep overview of robotics and the application of AI and IoT in robotics. It contains the exploration of AI and IoT based intelligent automation in robotics. The various algorithms and frameworks for robotics based on AI and IoT are presented, analyzed, and discussed. This book also provides insights on application of robotics in education, healthcare, defense and many other fields which utilize IoT and AI. It also introduces the idea of smart cities using robotics.

This book systematically examines and quantifies industrial problems by assessing the complexity and safety of large systems. It includes chapters on system performance management, software reliability assessment, testing, quality management, analysis using soft computing techniques, management analytics, and business analytics, with a clear focus on exploring real-world business issues. Through contributions from researchers working in the area of performance, management, and business analytics, it explores the development of new methods and approaches to improve business by gaining knowledge from bulk data. With system performance analytics, companies are now able to drive performance and provide actionable insights for each level and for every role using key indicators, generate mobile-enabled scorecards, time series-based analysis using

charts, and dashboards. In the current dynamic environment, a viable tool known as multi-criteria decision analysis (MCDA) is increasingly being adopted to deal with complex business decisions. MCDA is an important decision support tool for analyzing goals and providing optimal solutions and alternatives. It comprises several distinct techniques, which are implemented by specialized decision-making packages. This book addresses a number of important MCDA methods, such as DEMATEL, TOPSIS, AHP, MAUT, and Intuitionistic Fuzzy MCDM, which make it possible to derive maximum utility in the area of analytics. As such, it is a valuable resource for researchers and academicians, as well as practitioners and business experts.

Agricultural Drones

Security and Performance

Agricultural Informatics

INTRODUCTION TO INTERNET OF THINGS: A THEORETICAL APPROACH

Information Science and Applications

Drones

Development and Future of Internet of Drones (IoD): Insights, Trends and Road Ahead

This book brings to readers thirteen chapters with contributions to the benefits of using IoT and Cloud Computing to agro-ecosystems from a multi-disciplinary perspective. IoT and Cloud systems have prompted the development of a Cloud digital

ecosystem referred to as Cloud-to-thing continuum computing. The key success of IoT computing and the Cloud digital ecosystem is that IoT can be integrated seamlessly with the physical environment and therefore has the potential to leverage innovative services in agro-ecosystems. Areas such as ecological monitoring, agriculture, and biodiversity constitute a large area of potential application of IoT and Cloud technologies. In contrast to traditional agriculture systems that have employed aggressive policies to increase productivity, new agro-ecosystems aim to increase productivity but also achieve efficiency and competitiveness in modern sustainable agriculture and contribute, more broadly, to the green economy and sustainable food-chain industry. Fundamental research as well as concrete applications from various real-life scenarios, such as smart farming, precision agriculture, green agriculture, sustainable livestock and sow farming, climate threat, and societal and environmental impacts, is presented. Research issues and challenges are also discussed towards envisioning efficient and scalable solutions to agro-ecosystems based on IoT and Cloud technologies. Our fundamental belief is that we can collectively trigger a new revolution that will transition agriculture into an equitable system that not only feeds the world, but also contributes to mitigating the climate change and biodiversity

crises that our historical actions have triggered. Agricultural drones are expected to revolutionize the way we conduct agronomic procedures and maintain natural vegetation on earth. This book explores the increasing importance of the role of aerial robots in managing agricultural farms and natural resources. *Agricultural Drones: A Peaceful Pursuit* provides a wealth of information on drone usage in agriculture. The book discusses the advanced sensors and imaging capabilities of drones that give farmers new ways to increase yields and reduce crop damage. An introductory chapter provides historical data, with details about various models of drones as well as the most recent and popular agricultural drones in usage. The book goes on to look at such topics as the use of drones for soil fertility, production agronomy, irrigation, weed control, pest and disease control, grain yield forecasting, and economic advantages from drone use. This timely and useful volume will be a valuable resource for faculty, agricultural extension officers, and farmers and farm consultancy agencies. This book would also serve as an excellent textbook for students in agriculture, engineering, geography, etc. Key features:

- outlines the advantages of using drones in agriculture, such as for the management of soil fertility, the study of natural resources and vegetation, the maintenance of adequate irrigation, and the control of weeds and pests
- covers the

economic advantages of using drones in agriculture

- examines the regulatory aspects of agricultural drones
- provides actual examples of drone usage in agriculture

This compilation has been designed to provide a comprehensive source of theoretical and practical update for scientists working in the broad field of soil science. The book explores all possible mechanisms and means to improve nutrient use efficiencies involving developing and testing of nanofertilizers, developing consortia based microbial formulations for mobilization of soil nutrients, and engineering of nutrient efficient crops using molecular biology and biotechnological tools. This is an all-inclusive collection of information about soil science. This book is of interest to teachers, researchers, soil scientists, capacity builders and policymakers. Also the book serves as additional reading material for undergraduate and graduate students of soil science, quantitative ecology, earth sciences, GIS and geodetic sciences, as well as geologists, geomorphologists, hydrologists and landscape ecology. National and international agriculture and soil scientists, policy makers will also find this to be a useful read.

Drone technologies have constantly been developing for over 100 years. The latest models exhibit a previously unseen set of specifications available to the end users. The collective effort of

distinguished international researchers, within the field of drone technologies, has been incorporated into this textbook suitable to the broader audience. The book has been edited by Prof. George Dekoulis, Aerospace Engineering Institute (AEI), Cyprus, an expert on state-of-the-art implementations of reconfigurable space engineering systems. The book consists of four main sections, namely, "Introduction," "Drone History," "Drone Design," and "Drone Applications." We hope this book will be beneficial to professionals, researchers, and academicians and, moreover, to inspire the younger generations into pursuing relevant academic studies and professional careers within the drone industry.

Conservation Drones

Unmanned Aerial Vehicle Systems in Crop Production

A Peaceful Pursuit

New Developments and Environmental Applications of Drones

Applications

AI and IoT-Based Intelligent Automation in Robotics
In October 2017, the Technical Centre for Agricultural and Rural Cooperation ACP-EU (CTA) in partnership with the NEPAD Agency, conducted a survey to understand the perceptions surrounding the use of drones for agriculture. Approximately 13,000 individuals (mainly English and French-speaking

readers of CTA e-publications or members of CTA-managed communities of practice) received an invitation to participate in the survey. The aim was to understand the general perceptions on the use of drones amongst stakeholders in agriculture and development cooperation with an emphasis on African regions. 16%, or a total of 1432 individuals (of whom 91% have worked or are currently working in Africa), completed the survey and had at least a working knowledge of drones in agriculture.

INTRODUCTION TO INTERNET OF THINGS: A THEORETICAL APPROACH written by Prof. Dr. S. Raviraja, Dr. A. Ganga Dinesh Kumar, Dr. Sreekumar Narayanan, Dr. Syed Azahad

This book covers three main types of agricultural systems: the use of robotics, drones (unmanned aerial vehicles), and satellite-guided precision farming methods. Some of these are well refined and are currently in use, while others are in need of refinement and are yet to become popular. The book provides a valuable source of information on this developing field for those involved with agriculture and farming and agricultural engineering. The book is also applicable as a textbook for students and a reference for faculty.

Drones in Smart-Cities: Security and Performance is the first book dedicated to drones in smart cities, helping address the many research challenges in bringing UAVs into practice. The book incorporates insights from the latest research in Internet of Things, big data, and cloud computing, 5G, and other

communication technologies. It examines the design and implementation of UAV, focusing on data delivery, performability, and security. Intended for researchers, engineers, and practitioners, *Drones in Smart-Cities: Security and Performance* combines the technical aspects with academic theory to help implement the smart city vision around the globe. Addresses UAV and IoT for smart cities applications Examines topics as UAV safety, challenges, localization methods. QoS, simulation tools, and more Collect the relevant knowledge in one resource, saving research time and effort

Unmanned Aerial Vehicle: Applications in Agriculture and Environment

Advances in Natural Computation, Fuzzy Systems and Knowledge Discovery

Proceedings of ICACCP 2021

Proceedings of FinDrones 2020

Fundamentals of Capturing and Processing Drone Imagery and Data

Proceedings of UASG 2019

IoT-based Intelligent Modelling for Environmental and Ecological Engineering

Drones are found in the airspace throughout the world and are more popular now than ever before. We see them in the newspaper, on the TV, in films, at sporting events, and soon, they might be delivering our shopping. One of the most significant developments in contemporary warfare is the use of unmanned aerial vehicles (UAVs) or drones as they are more commonly known. Drones can fly autonomously or be controlled by

remote control - their deployment is transforming the way wars are fought across the globe. Drones are not only used for fighting wars but for a wide-range of daily tasks such as photography, mapping, policing, delivery, search and rescue, meteorology and many more. Drones explores the history behind unmanned aircraft, it explains how they work and features the most well-known military and civilian drones in action today. From the armed and deadly MQ-9 Reaper, the long endurance RQ-4 Global Hawk to the small hand-launched Cropcam and the Remus autonomous underwater vehicle. Illustrated with 200 colour photographs and artworks, Drones is an exciting, accessibly written narrative about the latest in military and civilian aviation technology.

This book provides an overview of the basic concepts and components of UAVs, the various sensors used, architecture of autonomous UAVs, communication tools and devices to acquire real-time data from UAVs, the software needed to analyze the UAV data, required rules and regulations to fly UAVs, various application areas, and future areas of research which is needed to handle relevant challenges. FEATURES: Explores the utilization of UAVs in different application areas, such as construction, oil and gas, mining, agriculture, forestry, search and rescue, surveillance, transportation, disaster, logistics, health, journalism, and many more Covers the theory, hardware, and software components of UAVs Includes end of chapter review questions for better understanding of the subject matter.

This book covers how Internet of Things (IoT) has a role in shaping the future of our communities. The author

shows how the research and education ecosystem promoting impactful solutions-oriented science can help citizenry, government, industry, and other stakeholders to work collaboratively in order to make informed, socially-responsible, science-based decisions.

Accordingly, he shows how communities can address complex, interconnected socio-environmental challenges. This book addresses the key inter-related challenges in areas such as the environment, climate change, mining, energy, agro-economic, water, and forestry that are limiting the development of a sustainable and resilient society -- each of these challenges are tied back to IoT based solutions.

Presents research into sustainable IoT with respect to wireless communications, sensing, and systems

Provides coverage of IoT technologies in sustainability, health, agriculture, climate change, mining, energy, water management, and forestry Relevant for academics, researchers, policy makers, city planners and managers, technicians, and industry professionals in IoT and sustainability

Agriculture plays a vital role in a country ' s growth.

Modern-day technologies drive every domain toward smart systems. The use of traditional agricultural procedures to satisfy modern-day requirements is a challenging task. Cloud IoT Systems for Smart

Agricultural Engineering provides substantial coverage of various challenges of the agriculture domain through modern technologies such as the Internet of Things (IoT), cloud computing, and many more. This book offers various state-of-the-art procedures to be deployed in a

wide range of agricultural activities. The concepts are discussed with the necessary implementations and clear examples. Necessary illustrations are depicted in the chapters to ensure the effective delivery of the proposed concepts. It presents the rapid advancement of the technologies in the existing agricultural model by applying the cloud IoT techniques. A wide variety of novel architectural solutions are discussed in various chapters of this book. This book provides comprehensive coverage of the most essential topics, including: New approaches on urban and vertical farming Smart crop management for Indian farmers Smart livestock management Precision agriculture using geographical information systems Machine learning techniques combined with IoT for smart agriculture Effective use of drones in smart agriculture This book provides solutions for the diverse domain of problems in agricultural engineering. It can be used at the basic and intermediary levels for agricultural science and engineering graduate students, researchers, and practitioners.

Fundamental and Applied Scientific Research in the Development of Agriculture in the Far East (AFE-2021)

Unmanned Aerial Vehicles

Introduction to Unmanned Aircraft Systems

The Digital Agricultural Revolution

Proceedings of ICISA 2020

Computer Vision and Machine Learning in Agriculture

Wireless Communications, Sensing, and Systems

This book presents cases from different countries with a main focus on the perspectives of using precision farming in

Europe. Divided into 12 chapters it addresses some of the most recent developments and aspects of precision farming. The intention of this book is to provide an overview of some of the most promising technologies with precision agriculture from an economic point of view. Each chapter has been put together so that it can be read individually should the reader wish to focus on one particular topic. Precision Farming as a farm technology benefits from large-scale advantages due to relatively high investment costs and is primarily adopted on farms with medium to large field areas. Introduction to Unmanned Aircraft Systems surveys the fundamentals of unmanned aircraft system (UAS) operations, from sensors, controls, and automation to regulations, safety procedures, and human factors. It is designed for the student or layperson and thus assumes no prior knowledge of UASs, engineering, or aeronautics. Dynamic and well-illustrated, the first edition of this popular primer was created in response to a need for a suitable university-level textbook on the subject. Fully updated and significantly expanded, this new Second Edition: Reflects the proliferation of technological capability, miniaturization,

and demand for aerial intelligence in a post-9/11 world Presents the latest major commercial uses of UASs and unmanned aerial vehicles (UAVs) Enhances its coverage with greater depth and support for more advanced coursework Provides material appropriate for introductory UAS coursework in both aviation and aerospace engineering programs Introduction to Unmanned Aircraft Systems, Second Edition capitalizes on the expertise of contributing authors to instill a practical, up-to-date understanding of what it takes to safely operate UASs in the National Airspace System (NAS). Complete with end-of-chapter discussion questions, this book makes an ideal textbook for a first course in UAS operations.

This book discusses computer vision, a noncontact as well as a nondestructive technique involving the development of theoretical and algorithmic tools for automatic visual understanding and recognition which finds huge applications in agricultural productions. It also entails how rendering of machine learning techniques to computer vision algorithms is boosting this sector with better productivity by developing more precise systems. Computer vision and machine

learning (CV-ML) helps in plant disease assessment along with crop condition monitoring to control the degradation of yield, quality, and severe financial loss for farmers. Significant scientific and technological advances have been made in defect assessment, quality grading, disease recognition, pests, insects, fruits, and vegetable types recognition and evaluation of a wide range of agricultural plants, crops, leaves, and fruits. The book discusses intelligent robots developed with the touch of CV-ML which can help farmers to perform various tasks like planting, weeding, harvesting, plant health monitoring, and so on. The topics covered in the book include plant, leaf, and fruit disease detection, crop health monitoring, applications of robots in agriculture, precision farming, assessment of product quality and defects, pest, insect, fruits, and vegetable types recognition.

In this important new book the renowned historian Serge Gruzinski returns to two episodes in the sixteenth century which mark a decisive stage in global history and show how China and Mexico experienced the expansion of Europe. In the early 1520s, Magellan set sail for Asia by the Western route, Cortes seized Mexico and

some Portuguese based in Malacca dreamed of colonizing China. The Aztec Eagle was destroyed but the Chinese Dragon held strong and repelled the invaders - after first seizing their cannon. For the first time, people from three continents encountered one other, confronted one other and their lives became entangled. These events were of great interest to contemporaries and many people at the time grasped the magnitude of what was going on around them. The Iberians succeeded in America and failed in China. The New World became inseparable from the Europeans who were to conquer it, while the Celestial Empire became, for a long time to come, an unattainable goal. Gruzinski explores this encounter between civilizations that were different from one another but that already fascinated contemporaries, and he shows that our world today bears the mark of this distant age. For it was in the sixteenth century that human history began to be played out on a global stage. It was then that connections between different parts of the world began to accelerate, not only between Europe and the Americas but also between Europe and China. This is what is revealed by a global history of the sixteenth century, conceived as another way of reading the Renaissance,

less Eurocentric and more in tune with our age.

Strategic System Assurance and Business Analytics

Internet of Things for Sustainable Community Development

Drones in Smart-Cities

An Introduction

Mapping and Monitoring Biodiversity

Agricultural Robots

Agricultural Innovation Systems, Volume 2

This book aims to further build capacity in the conservation community to use drones for conservation and inspire others to adapt emerging technologies for conservation.

This book uses digital technologies for the sustainable development and productivity of the agricultural sector. The book presents technical developments in the IoT sector, sensors and smart agriculture machines, as well as solutions to digitize the farmer's life by delivering holistic management platforms and monitoring systems. The papers presented in the book are proceedings of the conference "Fundamental and Applied Scientific Research in the Development of Agriculture in the Far East (AFE-2021)" which took place in Ussuriysk, Russia. Innovative developments in the field of precision livestock farming, application of fertilizers of a new generation and production of eco-friendly products are presented here. This book is an indispensable tool for farming in any climatic conditions and any climatic zones, since it shares the

experience of sustainable farming in the Far East region, which is very valuable in conditions of a changing climate and stricter requirements of the market. The research results presented in the book will help in making the right decisions about the allocation of resources in agricultural systems.

The book will allow increasing awareness about the benefits of precision livestock farming, optimizing agricultural production, helping the farmers maximize their yield and minimize losses with efficient use of resources and decreasing skilled labor in agriculture

Despite the increasing population (the Food and Agriculture Organization of the United Nations estimates 70% more food will be needed in 2050 than was produced in 2006), issues related to food production have yet to be completely addressed. In recent years, Internet of Things technology has begun to be used to address different industrial and technical challenges to meet this growing need. These Agro-IoT tools boost productivity and minimize the pitfalls of traditional farming, which is the backbone of the world's economy. Aided by the IoT, continuous monitoring of fields provides useful and critical information to farmers, ushering in a new era in farming. The IoT can be used as a tool to combat climate change through greenhouse automation; monitor and manage water, soil and crops; increase productivity; control insecticides/pesticides; detect plant diseases; increase the rate of crop sales; cattle monitoring etc. Agricultural Informatics: Automation Using the IoT and Machine Learning focuses on all these topics, including a few case studies, and they give a clear indication

as to why these techniques should now be widely adopted by the agriculture and farming industries.

Unmanned Aircraft Systems delivers a much needed introduction to UAV System technology, taking an integrated approach that avoids compartmentalising the subject.

Arranged in four sections, parts 1-3 examine the way in which various engineering disciplines affect the design, development and deployment of UAS. The fourth section assesses the future challenges and opportunities of UAS. Technological innovation and increasingly diverse applications are two key drivers of the rapid expansion of UAS technology. The global defence budget for UAS procurement is expanding, and in the future the market for civilian UAVs is expected to outmatch that of the military. Agriculture, meteorology, conservation and border control are just a few of the diverse areas in which UAVs are making a significant impact; the author addresses all of these applications, looking at the roles and technology behind both fixed wing and rotorcraft UAVs. Leading aeronautical consultant Reg Austin co-founded the Bristol International Remotely Piloted Vehicle (RPV) conferences in 1979, which are now the longest-established UAS conferences worldwide. In addition, Austin has over 40 years' experience in the design and development of UAS. One of Austin's programmes, the "Sprite UAV System" has been deployed around the world and operated by day and night, in all weathers.

*Automation Using the IoT and Machine Learning
Artificial Intelligence and IoT-Based Technologies for*

Sustainable Farming and Smart Agriculture

A Compendium

Drones in agriculture in Africa and other ACP countries

The Eagle and the Dragon

Mobile Edge Computing

A survey on perceptions and applications

Unmanned aircraft systems (UAS) are rapidly emerging as flexible platforms for capturing imagery and other data across the sciences. Many colleges and universities are developing courses on UAS-based data acquisition.

Fundamentals of Capturing and Processing Drone Imagery and Data is a comprehensive, introductory text on how to use unmanned aircraft systems for data capture and analysis. It provides best practices for planning data capture missions and hands-on learning modules geared toward UAS data collection, processing, and applications. FEATURES Lays out a step-by-step approach to identify relevant tools and methods for UAS data/image acquisition and processing Provides practical hands-on knowledge with visual interpretation, well-organized and designed for a typical 16-week UAS course offered on college and university campuses Suitable for all levels of readers and does not require prior knowledge of UAS, remote sensing, digital image processing, or geospatial analytics Includes real-world environmental applications along with data interpretations and software used, often nonproprietary Combines the expertise of a wide range of UAS researchers and practitioners across the geospatial sciences This book provides a general introduction to

drones along with a series of hands-on exercises that students and researchers can engage with to learn to integrate drone data into real-world applications. No prior background in remote sensing, GIS, or drone knowledge is needed to use this book. Readers will learn to process different types of UAS imagery for applications (such as precision agriculture, forestry, urban landscapes) and apply this knowledge in environmental monitoring and land-use studies.

This book presents select proceedings of 11th International Conference on Information Science and Applications 2020 (ICISA 2020) and provides a snapshot of the latest issues encountered in technical convergence and convergences of security technology. It explores how information science is core to most current research, industrial and commercial activities and consists of contributions covering topics including Ubiquitous Computing, Networks and Information Systems, Multimedia and Visualization, Middleware and Operating Systems, Security and Privacy, Data Mining and Artificial Intelligence, Software Engineering, and Web Technology. Also the proceedings introduce the most recent information technology and ideas, applications and problems related to technology convergence, illustrated through case studies, and reviews converging existing security techniques. Through this book, readers can gain an understanding of the current state-of-the-art information strategies and technologies of convergence security.

The FAO-ITU E-agriculture strategy guide (available at <http://www.fao.org/3/a-i5564e.pdf>) is actively being used

to assist countries in the successful identification, development and implementation of sustainable ICT solutions for agriculture. The use of unmanned aerial vehicles (UAVs), also known as drones, and connected analytics has great potential to support and address some of the most pressing problems faced by agriculture in terms of access to actionable real-time quality data. Goldman Sachs predicts that the agriculture sector will be the second largest user of drones in the world in the next five years. Sensor networks based on the Internet of things (IoT) are increasingly being used in the agriculture sector to meet the challenge of harvesting meaningful and actionable information from the big data generated by these systems. This publication is the second in the series titled E-agriculture in action (2016), launched by FAO and ITU, and builds on the previous FAO publications that highlight the use of ICT for agriculture such as Mobile technologies for agriculture and rural development (2012), Information and communication technologies for agriculture and rural development (2013) and Success stories on information and communication technologies for agriculture and rural development (2015). The ultimate aim is to promote successful, scalable, sustainable and replicable ICT for agriculture (ICT4Ag) solutions.

This volume gathers the latest advances, innovations, and applications in the field of geographic information systems and unmanned aerial vehicle (UAV) technologies, as presented by leading researchers and engineers at the 1st International Conference on Unmanned Aerial System in Geomatics (UASG), held in

Roorkee, India on April 6-7, 2019. It covers highly diverse topics, including photogrammetry and remote sensing, surveying, UAV manufacturing, geospatial data sensing, UAV processing, visualization, and management, UAV applications and regulations, geoinformatics and geomatics. The contributions, which were selected by means of a rigorous international peer-review process, highlight numerous exciting ideas that will spur novel research directions and foster multidisciplinary collaboration among different specialists.

Robotics, Drones, Satellite-Guided Soil and Crop Management

Push Button Agriculture

Globalization and European Dreams of Conquest in China and America in the Sixteenth Century

Unmanned Aircraft Systems

Soil Science: Fundamentals to Recent Advances

Innovations and Challenges in Agriculture through Technology Disruptions

Cloud IoT Systems for Smart Agricultural Engineering

Over the past few decades, extensive research has been conducted on the applications of agricultural robots and automation to a variety of field and greenhouse operations, and technical fundamentals and their feasibility have also been widely demonstrated. Due to the unstructured environment, adverse interference and complicated and diversified operation process are the key of blocking its commercialization in robotic agricultural operations. Because

of the development of automation techniques, smart sensors, and information techniques, some types of agricultural robots have achieved considerable success in recent years. This book intends to provide the reader with a comprehensive overview of the current state of the art in agricultural robots, fundamentals, and applications in robotic agricultural operations.

"This volume provides a useful detailed review of 250 UAVs that examines their usefulness in enhancing profitability, yield, and quality of crop production. A detailed view of the recent trends indicates an increase in agricultural drone production. Millions of dollars have been invested in start-ups that produce agro-drones in past several years. North America, Europe, China and the Far East have excelled in offering a large number of UAV models. Some of them are versatile, a few are specific, and many of them are low cost. With so many drone models (over 1200) available, how do farmers and agricultural specialist choose the models best for them? This compendium examines the most useful drones and provides the pertinent details about each drone, its producer, cost incurred, and its pros and cons. It covers their technical specifications, suitability for various purposes, previous performances in farms, and possible benefits to farmers. The introduction sets the scene, emphasizing the need for this compendium and expounding on the benefits of UAVs in crop production.

The volume describes the agricultural uses of UAVs and provides a status report of the drone usage in farms. Drones can be used to measure soil fertility and monitor crops, to time the spraying of liquid fertilizers and plant protection chemicals to control pests and diseases, to monitor irrigation, to map yields, and to make forecasts. The volume goes into great detail about the specifications of each of 250 agricultural drone models covered. These include fixed-wing drones, fixed-wing (hybrid) VTOL helicopters, multi-copters, tilted-wing drones, etc. The book includes a few drones meant more for military or other purposes (e.g. recreation/fun) but that could be easily modified and adapted for the farming sector. A detailed listing of agricultural and nonagricultural uses of each drone model is made available. The reviews compare activities among the UAVs, such aerial imagery of crops, ability to provide spectral analyses to collect useful data about a crop's growth patterns, and how they can be used to gauge crop canopy temperature (i.e. water stress index), determine grain maturity, and much more. The volume also includes addresses and useful information about industries that produce drones have also been included. One chapter deals exclusively with blimps, balloons and kites that could also be used for aerial survey of crops. This timely book is just in time to address the burgeoning aerial robot industry

worldwide. This compendium will be valuable for farmers, agricultural engineers, agricultural research centers, universities, and faculty and students worldwide. Agricultural companies and those in aeronautics technology will also find much of value in this reference."--

This book provides a clear insight about IoD and its requirements, protocols, performance improvement, evaluation methods and challenging aspects, to the readers at one place. The recent enhancement of integrating drone with the Internet of things (IoT) technology promises tremendous global development. The top applications of the Internet of Drones (IoD) are expected to be infrastructure & building monitoring, fire service systems, insurance investigations, retail fulfilment, agriculture and forensic evidence collections. Conventional drone technology is enhanced with the Internet and other emerging technologies such as cloud computing, big data, artificial intelligence and communication networks which open up for enormous opportunities like ahead for on-demand service-oriented and user-friendly IoD applications. This book presents extensive knowledge about the role of IoT and emerging technology in drone networks. It focuses on major research areas of the Internet of Drones and its related applications. It provides a strong knowledge platform towards the Internet of Drones for graduates, researchers, data scientists, educators and

drone hobbyists.

This book consists of papers on the recent progresses in the state of the art in natural computation, fuzzy systems and knowledge discovery. The book is useful for researchers, including professors, graduate students, as well as R & D staff in the industry, with a general interest in natural computation, fuzzy systems and knowledge discovery. The work printed in this book was presented at the 2020 16th International Conference on Natural Computation, Fuzzy Systems and Knowledge Discovery (ICNC-FSKD 2020), held in Xi'an, China, from 19 to 21 December 2020. All papers were rigorously peer-reviewed by experts in the areas.

UAVS Design, Development and Deployment

A First Course in Aerial Robots and Drones

Fundamentals and Applications

E-agriculture in action: Drones for agriculture

Internet of Things and Its Applications

IoT Next Generation EcoAgro Systems

Mapping irrigated areas in the Limpopo Province, South Africa

As technology continues to saturate modern society, agriculture has started to adopt digital computing and data-driven innovations. This emergence of "smart" farming has led to various advancements in the field, including autonomous equipment and the collection

of climate, livestock, and plant data. As connectivity and data management continue to revolutionize the farming industry, empirical research is a necessity for understanding these technological developments. *Artificial Intelligence and IoT-Based Technologies for Sustainable Farming and Smart Agriculture* provides emerging research exploring the theoretical and practical aspects of critical technological solutions within the farming industry. Featuring coverage on a broad range of topics such as crop monitoring, precision livestock farming, and agronomic data processing, this book is ideally designed for farmers, agriculturalists, product managers, farm holders, manufacturers, equipment suppliers, industrialists, governmental professionals, researchers, academicians, and students seeking current research on technological applications within agriculture and farming.

This report summarizes the findings of a collaborative effort to map and assess irrigated areas in the Limpopo Province, South Africa. The study was

conducted by the International Water Management Institute (IWMI) in collaboration with the Department of Agriculture, Forestry and Fisheries (DAFF) and the Limpopo Department of Agriculture and Rural Development (LDARD), as part of the DAFF-supported 'Revitalization of irrigation in South Africa' project. Based on a combination of Landsat and Moderate Resolution Imaging Spectroradiometer (MODIS) satellite data, previous irrigated area mapping exercises carried out by DAFF and three-field ground truthing (GT) surveys, a total of 1.6 million hectares (Mha) of cropland were identified, with 262,000 ha actually irrigated in the 2015 winter season. The study also found that only 29% of all land equipped with center pivots was actually irrigated.

This book showcases how new and emerging technologies like Unmanned Aerial Vehicles (UAVs) are trying to provide solutions to unresolved socio-economic and environmental problems. Unmanned vehicles can be classified into five different types according to their operation. These five types are

unmanned ground vehicles, unmanned aerial vehicles, unmanned surface vehicles (operating on the surface of the water), unmanned underwater vehicles, and unmanned spacecraft. Unmanned vehicles can be guided remotely or function as autonomous vehicles. The technology has a wide range of uses including agriculture, industry, transport, communication, surveillance and environment applications. UAVs are widely used in precision agriculture; from monitoring the crops to crop damage assessment. This book explains the different methods in which they are used, providing step-by-step image processing and sample data. It also discusses how smart UAVs will provide unique opportunities for manufacturers to utilise new technological trends to overcome the current challenges of UAV applications. The book will be of great interest to researchers engaged in forest carbon measurement, road patrolling, plantation monitoring, crop yield estimation, crop damage assessment, terrain modelling, fertilizer control, and pest control.

This volume presents the conference proceedings from FinDrones2020. The book highlights recent developments in drone technology by experts, academicians, and entrepreneurs for applications in agriculture, forestry, and other industries. Emphasis is placed on contextualizing the conference presentations and content to Finland and the unique challenges typical to this region. The work will be of interest to academicians and professionals involved in remote sensing applications of unmanned aerial vehicles, as well as enthusiasts of drone technological developments.

Advanced Computational Paradigms and Hybrid Intelligent Computing

Introduction to Information Systems

An Illustrated Guide to the Unmanned Aircraft that are Filling our Skies

Precision Agriculture: Technology and Economic Perspectives

Unmanned Aerial System in Geomatics

A First Course in Aerial Robots and Drones provides an accessible and student friendly introduction to aerial robots and drones. Drones figure prominently as opportunities for students to learn various aspects of aerospace engineering and design. Drones offer an enticing entry point for STEM studies. As the use of drones in STEM studies grows, there is

an emerging generation of drone pilots who are not just good at flying, but experts in specific niches, such as mapping or thermography. Key Features: Focuses on algorithms that are currently used to solve diverse problems. Enables students to solve problems and improve their science skills. Introduces difficult concepts with simple, accessible examples. Suitable for undergraduate students, this textbook provides students and other readers with methods for solving problems and improving their science skills.

This book offers a holistic approach to the Internet of Things (IoT) model, covering both the technologies and their applications, focusing on uniquely identifiable objects and their virtual representations in an Internet-like structure. The authors add to the rapid growth in research on IoT communications and networks, confirming the scalability and broad reach of the core concepts. The book is filled with examples of innovative applications and real-world case studies. The authors also address the business, social, and legal aspects of the Internet of Things and explore the critical topics of security and privacy and their challenges for both individuals and organizations. The contributions are from international experts in academia, industry, and research.
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