E-agriculture in action: Drones for agriculture - Food and Agriculture Organization of the United Nations - 2018-07-20

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 slopes, hedges and crops, and the control of weeds and pests; • provides examples of the economic advantages of using drones in agriculture; • examines the regulatory aspects of agricultural drones; • provides actual examples of drone usage in agriculture.

Unmanned Aerial Vehicles: Applications in Agriculture and Environment - Ram Avtar - 2018-11-18

This book shows how new and emerging technologies like Unmanned Aerial Vehicles (UAVs) are trying to provide solutions to unsolved 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 underwater vehicles, unmanned surface vehicles, and autonomous vehicles. Unmanned aerial 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 precipitation measurement 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.

Precision Agriculture Basics - D. Kent Shannon - 2020-01-22

With the growing popularity and availability of precision equipment, farmers and producers have access to more data than ever before. With proper implementation, precision agriculture management can improve profitability and sustainability of production. Precision Agriculture Basics is aimed at students, crop consultants, farmers, extension workers, and practitioners that are interested in practical applications of site-specific agricultural management. Using a multidisciplinary approach, readers are taught to make data-driven on-farm decisions using the most current knowledge and tools in crop science, agricultural engineering, and geo-statistics. Precision Agriculture Basics also features a stunning video gallery including interviews with agronomists on the job and in the field.

New Developments and Environmental Applications of Drones - Tarmo Lipping - 2021-10-29

This volume presents the conference proceedings from FieldDrones 2020. This book highlights recent developments in drone technology by experts, academicians, and professionals in the field. It emphasizes 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.

Autonomous Vehicles - George Dekullos - 2020-09-09

This edited volume, Autonomous Vehicles, is a collection of reviewed and relevant research chapters, offering a comprehensive overview of recent developments in the field of vehicle autonomy. The book comprises nine chapters authored by various researchers and edited by an expert active in the field of study. All chapters are centered on the same topic: autonomous vehicles. The book intends to provide the reader with a comprehensive overview of the current state of the art in autonomous vehicles, fundamentals, and applications in robotic agricultural operations.

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Agricultural Drones - K. R. Krishna - 2018-03-26

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 slopes, hedges and crops, and the control of weeds and pests; • provides examples of the economic advantages of using drones in agriculture; • examines the regulatory aspects of agricultural drones; • provides actual examples of drone usage in agriculture.

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Introduction to Drone Use

Georges Dolez, 2018-06-27

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 international researchers working within the field of drone technologies, has been incorporated into this textbook suitable to the broader audience. The book has been edited by Prof. Georges Dolez, 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 remarkable academic studies and professional careers within the drone industry.

Computer Vision and Machine Learning in Agriculture - Mohammad Shakir Udlin - 2021

This book discusses computer vision, a nonconventional as well as a nondirective technique involving the development of theoretical and algorithmic tools for automatic visual understanding and recognition of agricultural images and huge applications by computer vision algorithms are boosting this sector with better productivity by developing more precise systems. Computer vision and machine learning (CV-ML) helps in visual understanding and recognition which finds huge applications in agricultural productions. It also entails how rendering of machine learning techniques to farming will give a new vision to the 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 analyses, as well as professional careers within the drone industry.

Introduction to Drones for Sustainable Community Development - Bart Custers - 2016-10-15

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 (IoD) are expected to be infrastructure & building monitoring, fire service systems, insurance investigations, retail fulfillment, agriculture and forestry evidence collections. Conventional drone technology is enhanced with the Internet and other emerging technologies such as cloud computing, big data, artificial intelligence and internet-of-things (IoT) technologies. This book provides a specialist with a basic appreciation of the technical drivers that other parts of the system and interact with their software; or to help a programmer understand artificial-level traits and know what questions ask. Key features: Comprehensive overview of all elements of a US and of how their technologies. Introduces the research and development goals that will be of interest to the IoT community and the development of new field of research and innovation. Bart Custers is Associate Professor and Head of Research at e-serve, the Center for Law and Digital Technologies at Leiden University, The Netherlands. He has presented at many international conferences in the United States, China, Japan, the Middle East and throughout Europe and has published over 80 scientific, professional and popularizing publications, including three books.

Development and Future of Internet of Drones (IoD): Insights, Trends and Road Ahead - Rajalakshmi Krishnamurthi - 2021

This book provides a clear insight about IoD and its requirements, protocols, performance improvement, evaluation methods and challenging aspects, to the readers. The recent advancements in the field of Internet of Drones (IoD) are expected to be infrastructure & building monitoring, fire service systems, insurance investigations, retail fulfillment, agriculture and forestry evidence collections. Conventional drone technology is enhanced with the Internet and other emerging technologies such as cloud computing, big data, artificial intelligence and internet-of-things (IoT) technologies. This book provides a specialist with a basic appreciation of the technical drivers that other parts of the system and interact with their software; or to help a programmer understand artificial-level traits and know what questions ask. Key features: Comprehensive overview of all elements of a US and of how their technologies. Introduces the research and development goals that will be of interest to the IoT community and the development of new field of research and innovation. Bart Custers is Associate Professor and Head of Research at e-serve, the Center for Law and Digital Technologies at Leiden University, The Netherlands. He has presented at many international conferences in the United States, China, Japan, the Middle East and throughout Europe and has published over 80 scientific, professional and popularizing publications, including three books.

Introduction to UAV Systems - Paul Fahlstrom - 2012-07-11

Unmanned aerial vehicles (UAVs) have been widely adopted in the military world over the last decade and the success of these military applications is increasingly driving efforts to establish secured民用 in-air in-military roles. Introduction to UAV Systems 4th edition provides a comprehensive introduction to all of the elements of a complete unmanned aerial vehicle (UAV) system, missions pertaining to data collection, data links and the air vehicle itself. The book provides a specialist with a basic appreciation of the technical drivers that other parts of the system and interact with their software; or to help a programmer understand artificial-level traits and know what questions ask. Key features: Comprehensive overview of all elements of a US and of how their technologies. Introduces the research and development goals that will be of interest to the IoT community and the development of new field of research and innovation. Bart Custers is Associate Professor and Head of Research at e-serve, the Center for Law and Digital Technologies at Leiden University, The Netherlands. He has presented at many international conferences in the United States, China, Japan, the Middle East and throughout Europe and has published over 80 scientific, professional and popularizing publications, including three books.

Artificial Intelligence and IoT-Based Technologies for Sustainable Farming and Smart Agriculture - Tomar, Pradeep - 2021-01-08

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 in smart farming and agriculture becomes more advanced, the applications of AI and the Internet of Things (IoT) become more prevalent in the agriculture industry. The book offers a comprehensive overview of the current state of the Internet of Things (IoT) and its related 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 (IoD) and its related applications. This book provides a strong foundation platform towards the Internet of Drones for graduate, researchers, data scientists, educators and drone hobbyists.

Fundamentals of Capturing and Processing Drone Imagery and Data - Taylor & Francis Group - 2021-06-23

This book presents a clear insight about IoD and its requirements, protocols, performance improvement, evaluation methods and challenging aspects, to the readers. The recent advancements in the field of Internet of Drones (IoD) are expected to be infrastructure & building monitoring, fire service systems, insurance investigations, retail fulfillment, agriculture and forestry evidence collections. Conventional drone technology is enhanced with the Internet and other emerging technologies such as cloud computing, big data, artificial intelligence and internet-of-things (IoT) technologies. This book provides a specialist with a basic appreciation of the technical drivers that other parts of the system and interact with their software; or to help a programmer understand artificial-level traits and know what questions ask. Key features: Comprehensive overview of all elements of a US and of how their technologies. Introduces the research and development goals that will be of interest to the IoT community and the development of new field of research and innovation. Bart Custers is Associate Professor and Head of Research at e-serve, the Center for Law and Digital Technologies at Leiden University, The Netherlands. He has presented at many international conferences in the United States, China, Japan, the Middle East and throughout Europe and has published over 80 scientific, professional and popularizing publications, including three books.
sensing. Important probabilistic techniques are developed including the law of large numbers, tail inequalities, analysis of random projections, generalization decomposition, the theory of random walks and Markov chains, the fundamentals of and important algorithms for machine learning, algorithms and analysis for large networks. This book presents the latest research in machine learning, guarantees in machine learning, and moment methods for analysis of phase transitions in large random graphs. Additionally, important structural and complexity measures are discussed such as matrix norms and VC-dimension. This book is suitable for both undergraduate and graduate courses in the design and analysis of algorithms.

Innovations in the Industrial Internet of Things (IIoT) and Smart Factory - Gouraud Sam - 2021-02-02

Industrial internet of things (IIoT) is changing the face of industry by completely redefining the way stakeholders, enterprises, and machines connect and interact with each other in the industrial digital ecosystem. Smart and connected factories, in which all the machinery transmits real-time data, enable industrial data analytics for improved industrial operational efficiency, rationalization, automation, and maintenance. While highlighting topics such as artificial intelligence, cybersecurity, and data science, this book is ideally designed for engineers, manufacturers, industrialists, managers, IT consultants, practitioners, students, researchers, and industrial professionals.

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Agricultural Informatics - Amilova Choudhry - 2021-02-05

Drones in agriculture in Africa and other ACP countries - Soule D. - In October 2017, the Technical Centre for Agricultural and Rural Cooperation ACP-EU (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 publications or members of CTA managed communities of practice) received an invitation to participate in the survey. The survey focused 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.

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Drones for Biodiversity Conservation and Ecological Monitoring - Ricardo Diaz-Delgado - 2019-12-18

Unmanned aerial vehicles (UAV) have already become an affordable and cost-efficient tool to quickly map a targeted area for many emerging applications in the arena of environmental and biodiversity conservation. Managers, owners, scientists and also the general public are increasingly using drones equipped with high-resolution visible, multispectral, or thermal cameras to assess the state of ecosystems, the effect of disturbances, or the changes and dynamics within biological communities inter alia. The main objective of this book is to guide researchers, all along with policy makers and managers, to identify the potential and applicability of drones across applications over natural areas. UAV missions are increasing but most of them are testing applicability. It is time now to move from frequent revisiting missions, aiding in the retrieval of important biophysical parameters in ecosystems or mapping species distributions. This Special Issue shows UAV applications contributing to a better understanding of biodiversity and ecosystem status, threats, changes, and trends. It demonstrates how different types of mapping, monitoring, and mapping species distribution, speed, spread and distribution, upsampling ecological variables from drones to satellite images: methods and approaches, rapid risk and disturbance assessment using drones, monitoring changes with UAVs, wildlife tracking, bird colony and chimpanzees nest mapping, habitat mapping and monitoring, and a review on drones for conservation in protected areas.

Precision Agriculture: Technology and Economic Perspectives - Søren Marcus Pedersen - 2017-11-15

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 the general issue and the specific regions 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 want 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.

Mountain agriculture: Opportunities for harnessing Zero Hunger in Asia - Food and Agriculture Organization of the United Nations - 2019-08-07

Mountain food security and nutrition are core issues that can contribute positively to the achievement of the Sustainable Development Goals but paradoxically are often ignored by analysis and development. The book contains 14 chapters with contributions from authors and researchers from different countries and disciplines. It includes theoretical and methodological sections, as well as guidelines and case studies, and reviews converging existing security techniques. Through this book, readers can gain an understanding of the current state-of-the-art information and best practices on specialty mountain product identification (e.g. Future Smart Food), production, processing, marketing and consumption, which would effectively expose the potential of mountain agriculture to contribute to Zero Hunger in Asia. The publication provides analysis with evidence on how mountain agriculture could contribute to satisfying all four dimensions of food security, to transform food systems to be nutrition-sensitive, climate-resilient, economically-viable and locally adaptable. From this food system perspective, the priority should be given to focus on specialty mountain product identification (e.g. Future Smart Food), production, processing, marketing and consumption, which would effectively expose the potential of mountain agriculture to contribute to Zero Hunger in Asia. In addition, eight Asian country case studies not only identify content-specific challenges but also present some solutions of sustainable mountain agriculture development for Zero Hunger in Asia. This publication is building on the ‘International Workshop and Regional Expert Consultation on Mountain Agriculture Development and Food Security and Nutrition Governance’, held by FAO RAP and UUR in November 2017 Beijing, in collaboration with partners from national governments, national agricultural institutes, universities, international research institutions and organizations.

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and Applications (SIMULTECH 2017), held in Madrid, Spain, on July 26 to 28, 2017. The conference brought together researchers, engineers and practitioners whose work involves methodologies in and applications of modeling and simulation. The papers showcased here represent the very best papers from the Conference, and report on a broad range of new and innovative solutions.


This book highlights a set of selected, revised and extended papers from the 7th International Conference on Simulation and Modeling Methodologies, Technologies and Applications (SIMULTECH 2017), held in Madrid, Spain, on July 26 to 28, 2017. The conference brought together researchers, engineers and practitioners whose work involves methodologies in and applications of modeling and simulation. The papers showcased here represent the very best papers from the Conference, and report on a broad range of new and innovative solutions.

Advanced Computational Paradigms and Hybrid Intelligent Computing - Tapas Karmakar - 2017

This volume provides a useful detailed review of 250 UAVs that examine 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 agri-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 stage, 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, tailed-wing drones, etc. The book includes a few drones meant 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, each 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 surveys 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 value in this reference."

landscapes and cultural heritage, monitoring conservation management, cultural issues in heritage assessment, placemaking and local identity enhancement, as well as reconstruction of settlements affected by disasters. With contributions from leading experts, including university researchers, professionals and policy makers, the book addresses all who seek to understand and address the challenges faced in the protection and enhancement of the heritage that has been created.

Putting Tradition into Practice: Heritage, Place and Design - Giuseppe Amoruso - 2017-07-19

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This book highlights a set of selected, revised and extended papers from the 7th International Conference on Simulation and Modeling Methodologies, Technologies and Applications (SIMULTECH 2017), held in Madrid, Spain, on July 26 to 28, 2017. The conference brought together researchers, engineers and practitioners whose work involves methodologies in and applications of modeling and simulation. The papers showcased here represent the very best papers from the Conference, and report on a broad range of new and innovative solutions.

Advanced Computational Paradigms and Hybrid Intelligent Computing - Tapas Karmakar - 2017

This volume provides a useful detailed review of 250 UAVs that examine 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 agri-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 stage, 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, tailed-wing drones, etc. The book includes a few drones meant 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, each 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 value in this reference."

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