

## Introduction To Drones In Agriculture

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

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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 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 agrodrones 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

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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 as 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 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.

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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 geared 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 geostatistics. Precision Agriculture Basics also features a stunning video glossary including interviews with agronomists on the job and in the field.

A start-to-finish roadmap on incorporating drone technology into your AEC firm workflow Drone Technology in Architecture, Engineering and Construction: A Strategic Guide to Unmanned Aerial Vehicle Operation and Implementation is the only process-driven, step-by-step handbook to implement drone technology in AEC workflows. It provides a comprehensive and practical roadmap for architecture, engineering, and construction firms to incorporate drones into their design and construction processes. The book offers extensive information on drone data processing, and includes guidance on how to acquire, manipulate and

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use the various data types produced from drone flights. The creation of three-dimensional data and visualizations are covered in-depth. Drone Technology reviews how to select and fly drones based on data needs and initial costs, and how to collect and maintain required flight logs, licenses, and permits. Drone Technology uses several real-world project examples that demonstrate and explain how drones can be used to collect:

- Full-color orthorectified imagery
- Accurate 3D point cloud and mesh models
- Topographic contours
- Digital Elevation Models (DEMs)

The project examples also describe how these datasets can be integrated with 3D models of proposed conditions, photos, and other project datasets. Drone Technology in Architecture, Engineering and Construction is an essential guide for a wide variety of professionals, from civil engineers to landscape architects. It provides information on professional use of drones for those just considering the technology, to those already flying drones professionally. It is an invaluable guide for anyone working in the design or construction of buildings and landscapes.

Agricultural Drones A Peaceful Pursuit CRC Press

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

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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.

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,

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geomorphologists, hydrologists and landscape ecology. National and international agriculture and soil scientists, policy makers will also find this to be a useful read. 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 unmanned aircraft in non-military roles. Introduction to UAV Systems, 4th edition provides a comprehensive introduction to all of the elements of a complete Unmanned Aircraft System (UAS). It addresses the air vehicle, mission planning and control, several types of mission payloads, data links and how they interact with mission performance, and launch and recovery concepts. This book provides enough information to encourage a student to learn more; to provide a specialist with a basic appreciation of the technical issues that drive other parts of the system and interact with their specialty; or to help a program manager understand system-level tradeoffs and know what questions to ask. Key features: Comprehensive overview of all elements of a UAS and of how they interact. Introduces the underlying concepts of key subsystems. Emphasizes system-integration issues and how they relate to subsystem design choices. Practical discussion of issues informed by lessons learned in UAV programs. Introduction to UAV Systems, 4th edition is written both for newcomers to the subject and for experienced members of the UAV community who desire a comprehensive overview at the system level. As well as being a primary text for an introductory course on UAS or a supplementary text in a course that goes into more

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depth in one of the individual technologies involved in a UAS, this book is a useful overview for practicing engineers, researchers, managers, and consultants interested in UAV systems.

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)

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solutions.

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.

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.

Unmanned Rotorcraft Systems explores the research and development of fully-functional miniature UAV (unmanned aerial vehicle) rotorcraft, and provides a complete

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treatment of the design of autonomous miniature rotorcraft UAVs. The unmanned system is an integration of advanced technologies developed in communications, computing, and control areas, and is an excellent testing ground for trialing and implementing modern control techniques. Included are detailed expositions of systematic hardware construction, software systems integration, aerodynamic modeling; and automatic flight control system design. Emphasis is placed on the cooperative control and flight formation of multiple UAVs, vision-based ground target tracking, and landing on moving platforms. Other issues such as the development of GPS-less indoor micro aerial vehicles and vision-based navigation are also discussed in depth: utilizing the vision-based system for accomplishing ground target tracking, attacking and landing, cooperative control and flight formation of multiple unmanned rotorcraft; and future research directions on the related areas.

This report aims to identify the different scenarios where the process of digital transformation is taking place in agriculture. This identifies those aspects of basic conditions, such as those of infrastructure and networks, affordability, education and institutional support. In addition, enablers are identified, which are the factors that allow adopting and integrating changes in the production and decision-making processes. Finally identify through cases, existing literature and reports how substantive changes are taking place in the adoption of digital technologies in agriculture.

This book aims to further build capacity in the conservation community to use drones for

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conservation and inspire others to adapt emerging technologies for conservation. 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. 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 improving operational efficiency, productivity, and industrial processes, thus creating new business opportunities, asset utilization, and connected services. IIoT leads factories to step out of legacy environments and arcane processes towards open digital industrial ecosystems. Innovations in the Industrial Internet of Things (IIoT) and Smart Factory is a pivotal reference source that discusses the

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development of models and algorithms for predictive control of industrial operations and focuses on optimization of industrial operational efficiency, rationalization, automation, and maintenance. While highlighting topics such as artificial intelligence, cyber security, and data collection, this book is ideally designed for engineers, manufacturers, industrialists, managers, IT consultants, practitioners, students, researchers, and industrial industry professionals. 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

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academicians, as well as practitioners and business experts.

This book tackles the regulatory issues of Unmanned Aerial Systems (UAS) or Remotely-Piloted Aerial Systems (RPAS), which have profound consequences for privacy, security and other fundamental liberties. Collectively known as “drones,” they were initially deployed for military purposes: reconnaissance, surveillance and extrajudicial executions. Today, we are witnessing a growth of their use into the civilian and humanitarian domain. They are increasingly used for goals as diverse as news gathering, aerial inspection of oil refinery flare stacks, mapping of the Amazonian rain-forest, crop spraying and search and rescue operations. The civil use of drones is becoming a reality in the European Union and in the US. The drone revolution may be a new technological revolution. Proliferation of the next generation of “recreational” drones show how drones will be sold as any other consumer item. The cultural perception of the technology is shifting, as drones are increasingly being used for humanitarian activities, on one hand, but they can also firmly be situated in the prevailing modes of postmodern governance on the other hand. This work will be of interest to researchers in Criminology and Criminal Justice interested in issues related to surveillance, security, privacy, and technology. It will also provide a criminological background for related legal issues, such as privacy law, aviation law, international criminal law, and comparative law. 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 complete in itself but united under a common research study topic. This publication aims to provide a thorough overview of the

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latest research efforts by international authors, open new possible research paths for further novel developments, and to inspire the younger generations into pursuing relevant academic studies and professional careers within the autonomous vehicle field.

The fast and easy way to pick out, set up, and learn to fly your drone Ready to soar into the world of unmanned aircraft? Drones For Dummies introduces you to the fascinating world of UAVs. Written in plain English and brimming with friendly instruction, Drones For Dummies provides you with the information you need to find and purchase the right drone for your needs, examples of ways to use a drone, and even drone etiquette and the laws and regulations governing consumer drone usage. Plus, you'll discover the basics of flight, including how to use a drone to capture photos and video. Originally designed to assist in military and special operations applications, the use of drones has expanded into the public service sector and the consumer market for people looking to have a good time flying an aircraft remotely. Drones For Dummies covers everything you need to know to have fun with your UAV, and is packed with cool ways to expand your drone's use beyond simply flying. Pick the perfect drone to suit your needs Properly set up and fly a drone Use a drone to capture images and footage with a camera Tips for maintaining your drone If you're interested in the exciting new technology of unmanned aircraft vehicles, Drones For Dummies helps you take flight.

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,

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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 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 book analyses the legal, ethical and social aspects of using deep-learning AI robotic

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products. The collective effort of distinguished international researchers has been incorporated into one book suitable for the broader audience interested in the emerging scientific field of roboethics. The book has been edited by Prof. George Dekoulis, Aerospace Engineering Institute, Cyprus, expert on state-of-the-art implementations of robotic systems for unmanned spacecraft navigation and other aerospace applications. We hope this book will increase the sensitivity of all the community members involved with roboethics. The significance of incorporating all aspects of roboethics right at the beginning of the creation of a new deep-learning AI robot is emphasised and analysed throughout the book. AI robotic systems offer an unprecedented set of virtues to the society. However, the principles of roboethical design and operation of deep-learning AI robots must be strictly legislated, the manufacturers should apply the laws and the knowledge development of the AI robots should be closely monitored after sales. This will minimise the drawbacks of implementing such intelligent technological solutions. These devices are a representation of ourselves and form communities like us. Learning from them is also a way to improve ourselves.

Agricultural automation is the core technology for computer-aided agricultural production management and implementation. An integration of equipment, infotronics, and precision farming technologies, it creates viable solutions for challenges facing the food, fiber, feed, and fuel needs of the human race now and into the future. Agricultural Automat

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

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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.

The volume contains 69 high quality papers presented at International Conference on Computational Intelligence and Informatics (ICCI 2017). The conference was held during 25-27, September, 2017 at Department of Computer Science and Engineering, JNTUHCEH, Hyderabad, Telangana, India. This volume contains papers mainly focused on data mining, wireless sensor networks, parallel computing, image processing, network security, MANETS, natural language processing, and internet of things.

Given the popularity of drones and the fact that they are easy and cheap to buy, it is generally expected that the ubiquity of drones will significantly increase within the next few years. This raises questions as to what is technologically feasible (now and in the future), what is acceptable from an ethical point of view and what is allowed from a legal point of view. Drone technology is to some extent already available and to some extent still in development. The aim and scope of this book is to map the opportunities and threats associated with the use of drones and to discuss the ethical and legal issues of the use of drones. This book provides an overview of current drone technologies and applications and of what to expect in the next few years. The question of how to regulate the use of drones in the future is addressed, by considering conditions and contents of future drone legislation and by analyzing issues surrounding privacy and safeguards that can be taken. As such, this book is valuable to scholars in several disciplines, such as law, ethics, sociology, politics and public administration, as well as to practitioners and others who may be confronted with the use of

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drones in their work, such as professionals working in the military, law enforcement, disaster management and infrastructure management. Individuals and businesses with a specific interest in drone use may also find in the nineteen contributions contained in this volume unexpected perspectives on this new field of research and innovation. Bart Custers is Associate Professor and Head of Research at eLaw, the Center for Law and Digital Technologies at Leiden University, The Netherlands. He has presented his work at 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.

This open access book disseminates some of the results of the European H2020 AiRT Project (Technology transfer of RPAs for the creative industry). In particular, it presents findings related to mitigating safety and security concerns when civil drones are piloted by the service sector (mainly, the creative industry). European policies regarding drones generally focus on outdoor drones, but they are also used indoors. Moreover, a number of European countries have fragmented regulations on drone use, and as a result, European institutions are attempting address these issues. This work is based on a detailed study of the European policies, a comparative analysis of the regulation in various European countries, an analysis of the drone sector in Europe, and primary data from members of the creative industry. The authors created focus groups in Spain, the UK and Belgium in order to discuss with the creative industry the concerns on safety and security when using civil drones for their work. Based on these results, the

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book offers advice to the European industry, as well as new insights for academics and policymakers. This work was published by Saint Philip Street Press pursuant to a Creative Commons license permitting commercial use. All rights not granted by the work's license are retained by the author or authors.

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.

An inclusive, digitally-enabled agricultural transformation could help achieve meaningful livelihood improvements for Africa's smallholder farmers and pastoralists. It could drive greater engagement in agriculture from women and youth and create employment opportunities along the value chain. At CTA we staked a claim on this power of digitalisation to more systematically transform agriculture early on. Digitalisation, focusing on not individual ICTs but the application of these technologies to entire value

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chains, is a theme that cuts across all of our work. In youth entrepreneurship, we are fostering a new breed of young ICT 'agripreneurs'. In climate-smart agriculture multiple projects provide information that can help towards building resilience for smallholder farmers. And in women empowerment we are supporting digital platforms to drive greater inclusion for women entrepreneurs in agricultural value chains. 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. Unmanned aircraft systems (UAS) are rapidly emerging as flexible platforms for

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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.

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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.

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.

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