Hybrid Control Of Long Endurance Aerial Robotic Vehicles

A Hybrid Optimal Control Approach to Maximum Endurance of Aircraft

Solid oxide fuel cells (SOFCs) are promising electrochemical power generation devices that can convert chemical energy of a fuel into electricity in an efficient, environmental-friendly, and quiet manner. Due to their high operating temperature, SOFCs feature fuel flexibility as internal reforming of hydrocarbon fuels and ammonia thermal cracking can be realized in SOFC anode. This book presents an overview of the SOFC technology with a focus on the recent developments in new technologies and new ideas for addressing the key issues of SOFC development. This book first introduces the fundamental principles of SOFCs and compares SOFC technology with conventional heat engines as well as low temperature fuel cells. Then the latest developments in SOFC R&D are reviewed and future directions are discussed. Key issues related to SOFC performance improvement, long-term stability, mathematical modelling, as well as system integration/control are addressed, including material development, infiltration technique for nano-structured electrode fabrication, focused ion beam – scanning electron microscopy (FIB-SEM) technique for microstructure reconstruction, the Lattice Boltzmann Method (LBM) simulation at pore scale, multi-scale modelling, SOFC integration with buildings and other cycles for stationary applications.

The Encyclopedia of Electrochemical Power Sources is a truly interdisciplinary reference for those working with batteries, fuel cells, electrolyzers, supercapacitors, and photo-electrochemical cells. With a focus on the environmental and economic impact of electrochemical power sources, this five-volume work consolidates coverage of the field and serves as an entry point to the literature for professionals and students alike. Covers the main types of power sources, including their operating principles, systems, materials, and applications Serves as a primary source of information for electrochemists, materials scientists, energy technologists, and engineers Incorporates nearly 350 articles, with timely coverage of such topics as environmental and sustainability considerations

The International Conference on Intelligent Unmanned Systems 2011 was organized by the International Society of Intelligent Unmanned Systems and locally by the Center for Bio-Micro Robotics Research at Chiba University, Japan. The event was the 7th conference continuing from previous conferences held in Seoul, Korea (2005, 2006), Bali, Indonesia (2007), Nanjing, China (2008), Jeju, Korea (2009), and Bali, Indonesia (2010). ICIUS 2011 focused on both theory and application, primarily covering the topics of robotics, autonomous vehicles, intelligent unmanned technologies, and biomimetics. We invited seven keynote speakers who dealt with related state-of-the-art technologies including unmanned aerial vehicles (UAVs) and micro air vehicles (MAVs), flapping wings (FWs), unmanned ground vehicles (UGVs), underwater vehicles (UVs), bio-inspired robotics, advanced control, and intelligent systems, among others. This book is a collection of excellent papers that were updated after presentation at ICIUS2011. All papers that form the chapters of this book were reviewed and revised from the perspective of advanced relevant technologies in the field. The aim of this book is to stimulate interactions among researchers active in the areas pertinent to intelligent unmanned systems.

Proceedings of 2021 Chinese Intelligent Systems Conference

Airship Technology

Official Gazette of the United States Patent and Trademark Office

Fuel Cell Science, Engineering and Technology

Volume II

This book explores how Artificial Intelligence (AI), by leading to an increase in the autonomy of machines and robots, is offering opportunities for an expanded but uncertain impact on society by humans, machines, and robots. To help readers better understand the relationships between AI, autonomy, humans and machines that will help society reduce human errors in the use of advanced technologies (e.g., airplanes, trains, cars), this edited volume presents a wide selection of the underlying theories, computational models, experimental methods, and field applications. While other literature deals with these topics individually, this book unifies the fields of autonomy and AI, framing them in the broader context of effective integration for human-autonomous machine and robotic systems. The contributions, written by world-class researchers and scientists, elaborate on key research topics at the heart of effective human-machine-robot-systems integration. These topics include, for example, computational support for intelligence analyses; the challenge of verifying today's and future autonomous systems; comparisons between today's machines and autism; implications of human information interaction on artificial intelligence and errors; systems that reason; the autonomy of machines, robots, buildings; and hybrid teams, where hybrid reflects arbitrary combinations of humans, machines and robots. The contributors span the field of autonomous systems research, ranging from industry and academia to government. Given the broad diversity of the research in this book, the editors strove to thoroughly examine the challenges and trends of systems that implement and exhibit AI; the social implications of present and future systems made autonomous with AI; systems with AI seeking to develop trusted relationships among humans, machines, and robots; and the effective human systems integration that must result for trust in these new systems and their applications to increase and to be sustained.

All life came from sea but all robots were born on land. The vast majority of both industrial and mobile robots operate on land, since the technology to allow them to operate in and under the ocean has only become available in recent years. A number of complex issues due to the unstructured, hazardous undersea environment, makes it difficult to travel in the ocean while today's technologies allow humans to land on the moon and robots to travel to Mars . . Clearly, the obstacles to allowing robots to operate in a saline, aqueous, and pressurized environment are formidable. Mobile robots operating on land work under nearly constant atmospheric pressure; their legs (or wheels or tracks) can operate on a firm footing; their bearings are not subjected to moisture and corrosion; they can use simple visual sensing and be observed by their creators working in simple environments. In contrast, consider the environment where undersea robots must operate. The pressure they are subjected to can be enormous, thus requiring extremely rugged designs. The deep oceans range between 19,000 to 36,000 ft. At a mere 33-foot depth, the pressure will be twice the normal one atmosphere pressure of 29. 4 psi. The chemical environment of the sea is highly corrosive, thus requiring the use of special materials. Lubrication of moving parts in water is also difficult, and may require special sealed, waterproof joints.

Fuel cells are expected to play a major role in the future power supply that will transform to renewable, decentralized and fluctuating primary energies. At the same

time the share of electric power will continually increase at the expense of thermal and mechanical energy not just in transportation, but also in households. Hydrogen as a perfect fuel for fuel cells and an outstanding and efficient means of bulk storage for renewable energy will spearhead this development together with fuel cells. Moreover, small fuel cells hold great potential for portable devices such as gadgets and medical applications such as pacemakers. This handbook will explore specific fuel cells within and beyond the mainstream development and focuses on materials and production processes for both SOFC and lowtemperature fuel cells, analytics and diagnostics for fuel cells, modeling and simulation as well as balance of plant design and components. As fuel cells are getting increasingly sophisticated and industrially developed the issues of quality assurance and methodology of development are included in this handbook. The contributions to this book come from an international panel of experts from academia, industry, institutions and government. This handbook is oriented toward people looking for detailed information on specific fuel cell types, their materials, production processes, modeling and analytics. Overview information on the contrary on mainstream fuel cells and applications are provided in the book 'Hydrogen and Fuel Cells', published in 2010.

This book constitutes the refereed proceedings of the 9th International Conference on Computational Logistics, ICCL 2018, held in Vietri sul Mare, Italy, in October 2018. The 32 full papers presented were carefully reviewed and selected from 71 submissions. They are organized in topical sections as follows: maritime shipping and routing, container handling and container terminals, vehicle routing and multi-modal transportation, network design and scheduling, logistics oriented combinatorial optimization.

Jane's Armour and Artillery

From Materials to System Modeling

Advances in Visual Computing

Neural network control of a parallel hybrid-electric propulsion system for a small unmanned aerial vehicle

Solid Oxide Fuel Cells

The 19th International Symposium ISRR

This book presents the proceedings of the 17th Chinese Intelligent Systems Conference, held in Fuzhou, China, on Oct 16-17, 2021. It focuses on new theoretical results and techniques in the field of intelligent systems and control. This is achieved by providing in-depth study on a number of major topics such as Multi-Agent Systems, Complex Networks, Intelligent Robots, Complex System Theory and Swarm Behavior, Event-Triggered Control and Data-Driven Control, Robust and Adaptive Control, Big Data and Brain Science, Process Control, Intelligent Sensor and Detection Technology, Deep learning and Learning Control Guidance, Navigation and Control of Flight Vehicles and so on. The book is particularly suited for readers who are interested in learning intelligent system and control and artificial intelligence. The book can benefit researchers, engineers, and graduate students.

As with other transportation methods, safety issues in aircraft can result in a total loss of life. Recently, the air transport industry has come under immense scrutiny after several deaths occurred due to aircraft design and airlines that allowed improperly inspected aircraft to fly. Spacecraft too have found errors in system software that could lead to catastrophic failure. It is imperative that the aviation and aerospace industries continue to revise and refine safety protocols from the construction and design of aircraft, to secure and improve aviation systems, and to test and inspect aircraft. The Research Anthology on Reliability and Safety in Aviation Systems, Spacecraft, and Air Transport is a vital reference source that examines the latest scholarly material on the use of adaptive and assistive technologies in aviation to establish clear guidelines for the design and implementation of such technologies to better serve the needs of both military and civilian pilots. It also covers new information technology use in aviation systems to streamline the cybersecurity, decision making, planning, and design processes within the aviation industry. Highlighting a range of topics such as air navigation systems, computer simulation, and airline operations, this multi-volume book is ideally designed for pilots, scientists, engineers, aviation operators, air traffic controllers, air crash investigators, teachers, academicians, researchers, and students.

Many industries have begun to recognize the potential support that unmanned aerial vehicles (UAVs) offer, and this is no less true for the commercial sector. Current research on this field is narrowly focused on technological development to improve the functionality of delivery and endurance of the drone delivery in logistics, as well as on regulatory challenges posed by such operations. There is a need for further attention to be applied to operational and integration challenges associated with UAVs. Unmanned Aerial Vehicles in Civilian Logistics and Supply Chain Management is a collection of innovative research that investigates the opportunities and challenges for the use of UAVs in logistics and supply chain management with a specific aim to focus on the multifaceted impact of drone delivery. While highlighting topics including non-military operations, public management, and safety culture, this book is ideally designed for government administrators, managers, industry professionals, researchers, and students.

This book is a compilation of peer-reviewed papers from the 2018 Asia-Pacific International Symposium on Aerospace Technology (APISAT 2018). The symposium is a common endeavour between the four national aerospace societies in China, Australia, Korea and Japan, namely, the Chinese Society of Aeronautics and Astronautics (CSAA), Royal Aeronautical Society Australian Division (RAeS Australian Division), the Korean Society for Aeronautical and Space Sciences (KSAS) and the Japan Society for Aeronautical and Space Sciences (JSASS). APISAT is an annual event initiated in 2009 to provide an opportunity for researchers and engineers from Asia-Pacific countries to discuss current and future advanced topics in aeronautical and space engineering.

Intelligent Unmanned Systems

Encyclopedia of Electrochemical Power Sources

8th EASN-CEAS Workshop on Manufacturing for Growth and Innovation

Materials, Processes, Systems and Technology

Revolutionizing Environmental Monitoring

Fuel Cell Science and Engineering

This book addresses the adoption of intelligent algorithms for resolving challenges in different aspects of the society such as sport, cyber-security, COVID-19 pandemic, advertising, driving, smart environment sensors, blockchain, cloud computing, and health. In addition, the book also covers machine learning fundamentals such as feature selection. The book presents practical simulation results and different illustrations in different chapters for easy understanding of concepts and approaches. The types of contributions in the book are as follows: original research, survey, and theoretical insight that describe

advancement in the adoption of technique for resolving the broad range of challenges. Researchers, undergraduates, postgraduates, and industry experts will find the book as a valuable resource that bridges theory and practice. .

For the latest twenty to thirty years, a significant number of AUVs has been created for the solving of wide spectrum of scientific and applied tasks of ocean development and research. For the short time period the AUVs have shown the efficiency at performance of complex search and inspection works and opened a number of new important applications. Initially the information about AUVs had mainly review-advertising character but now more attention is paid to practical achievements, problems and systems technologies. AUVs are losing their prototype status and have become a fully operational, reliable and effective tool and modern multi-purpose AUVs represent the new class of underwater robotic objects with inherent tasks and practical applications, particular features of technology, systems structure and functional properties.

The international IEEE Aerospace Conference is organized to promote interdisciplinary understanding of aerospace systems, their underlying science, and technology

According to Aulus Gellius, Archytas, the Ancient Greek philosopher, mathematician, astronomer, statesman, and strategist, was reputed to have designed and built, around 400 BC, the first artificial, self-propelled flying device, a bird-shaped model propelled by a jet of what was probably steam, said to have actually flown some 200 metres. This machine, which its inventor called The Pigeon, may have been suspended on a wire or pivot for its flight. The 9th century Muslim Berber inventor, Abbas Ibn Firnas's glider is considered by John Harding to be the first attempt at heavier-than-air flight in aviation history. In 1010 AD an English monk, Eilmer of Malmesbury purportedly piloted a primitive gliding craft from the tower of Malmesbury Abbey. Eilmer was said to have flown over 200 yards (180 m) before landing, breaking both his legs. He later remarked that the only reason he did not fly further was because he forgot to give it a tail, and he was about to add one when his concerned Abbot forbade him any further experiments. Bartolomeu de Gusmao, Brazil and Portugal, an experimenter with early airship designs. In 1709 demonstrated a small airship model before the Portuguese court, but never succeeded with a full-scale model. Pilatre de Rozier, Paris, France, first trip by a human in a free-flying balloon (the Montgolfiere), built by Joseph-Michel and Jacques-Etienne Montgolfier, . 9 km covered in 25 minutes on October 15, 1783. (see Le Globe below for first unmanned flight, 2 months earlier) Professor Jacques Charles and Les Freres Robert, two French brothers, Anne-Jean and Nicolas-Louis, variously shared three milestones of pioneering flight: Le Globe, the first unmanned hydrogen gas balloon flew on 26 August 1783. On 1 December 1783 La Charliere piloted by Jacques Charles and Nicolas-Louis Robert made the first manned hydrogen balloon flight. In 1951, the Lockheed XFV-1 and the Convair XFY tailsitters were both designed around the Allison YT40 turboprop engine drivin

Underwater Vehicles

International Conference on Emerging Applications and Technologies for Industry 4.0 (EATI'2020)

A Hybrid Optimal Control Approach to Maximum Endurance of Aircraft

Naval Aviation News

Underwater Robots

The Proceedings of the 2018 Asia-Pacific International Symposium on Aerospace Technology (APISAT 2018)

From fundamental physics concepts to the World Wide Web, the Telecommunications Illustrated Dictionary, Second Edition describes protocols, computer and telephone devices, basic security concepts, and Internet-related legislation, along with capsule biographies of the pioneering inventors who developed the technologies that changed our world. The new edition offers even more than the acclaimed and bestselling first edition, including: Thousands of new definitions and existing definitions updated and expanded Expanded coverage, from telegraph and radio technologies to modern wireline and mobile telephones, optical technologies, PDAs, and GPS-equipped devices More than 100 new charts and illustrations Expanded appendices with categorized RFC listings Categorized charts of ITU-T Series Recommendations that facilitate online lookups Hundreds of Web URLs and descriptions for major national and international standards and trade organizations Clear, comprehensive, and current, the Telecommunications Illustrated Dictionary, Second Edition is your key to understanding a rapidly evolving field that, perhaps more than any other, shapes the way we live.

Regularly updated to ensure you stay informed of the latest developments throughout the year, Jane's Armour and Artillery is your essential battlefield reference.

This important volume provides a plethora of information on aerial vehicles and their possible roles in revolutionizing agricultural procedures through spectral analysis of terrains, soils, crops, water resources, diseases, floods, drought, and farm activities. There are several semi-autonomous and autonomous (robotic) aerial vehicles that are examined for their efficiency in offering detailed spectral data about agrarian regions and individual farms. Among them, small drone aircrafts such as fixed-winged and copter models have already caught the imagination of farmers. They are spreading fast in every nook and corner of the farm world. However, there are many more aerial robots that are utilized in greater detail during farming. In this volume, the focus is on aerial vehicles such as parafoils, blimps, aerostats, and kites, and how they are being evaluated for use in experimental farms and fields. A few aerial vehicles, such as robotic parafoils, have been adopted to procure aerial spectral data and visual imagery to aid agronomic procedures. These and other aerial robots are expected to change and improve the use of the sky in agricultural endeavors and the way we conduct agronomic procedures in the very near future. This volume is a timely resource for agricultural researchers, professors and students, and the general public who are interested in aerial vehicles.

Aircraft performance optimization is a ?eld of increasing interest, especially with the prevalent use of ?ight management systems (FMS) on commercial aircraft, as well as the growing ?eld of autonomous aircraft. This thesis addresses the maximum endurance performance mode. Maximizing the endurance of an aircraft has several applications in data collection, surveillance, and commercial ?ights. Each of these applications may be best suited for different aircraft such as ?xed-wing or quad-rotor vehicles, with power plants being either fuel-burning or electric. The objectives of this thesis are to solve the maximum endurance problem using an optimal control framework for ?xed-wing aircraft while developing a uni?ed model of energy-depletion which encompasses both fuel-burning and all-electric aircraft. The uni?ed energy-depletion model allows the results to be applied to turbojet, turbofan, turboprop, and all-electric aircraft. The problem of maximum endurance in cruise will be solved for a three-phase model of ?ight including climb, cruise, and descent. This problem is solved using a hybrid optimal control framework using a uni?ed energy-depletion model. One of the advantages of using an optimal control framework is the possibility to develop analytical solutions. The results of this thesis include a general solution for maximizing the endurance of ?xed-wing aircraft, as well as speci?c

analytical solutions for each aircraft con?guration wherever possible. Some bene?ts of analytical solutions are that they require the least amount of computation time and provide insight into the problem including sensitivities and physical dependencies. Simulations are provided to validate the results in the case of speci?c aircraft con?gurations (turbojet, turbofan, turboprop, and all-electric).

Trademarks

Parafoils, Blimps, Aerostats, and Kites

NUSYS'20

2020 IEEE Aerospace Conference

9th International Conference, ICCL 2018, Vietri sul Mare, Italy, October 1–3, 2018, Proceedings

Long-Term Endurance Determinations Using Traditional Accelerated Aging in Combination with Oxidative Stability Testing Resorting to Isothermal DSC Measurements of Oxidation Induction and Maximum Times

Parallel hybrid-electric propulsion systems would be beneficial for small unmanned aerial vehicles (UAVs) used for military, homeland security, and disaster monitoring missions involving intelligence, surveillance, or reconnaissance (ISR). The benefits include increased time-on-station and range than electric-powered UAVs and stealth modes not available with gasoline-powered UAVs. A conceptual design of a small UAV with a parallel hybrid-electric propulsion system, an optimization routine for the energy use, the application of a neural network to approximate the optimization results, and simulation results are provided. The two-point conceptual design includes an internal combustion engine sized for cruise and an electric motor and lithium-ion battery pack sized for endurance speed. The flexible optimization routine allows relative importance to be assigned between the use of gasoline, electricity, and recharging. The Cerebellar Model Arithmetic Computer (CMAC) neural network approximates the optimization results and is applied to the control of the parallel hybrid-electric propulsion system. The CMAC controller saves on the required memory compared to a large look-up table by two orders of magnitude. The energy use for the hybrid-electric UAV with the CMAC controller during a one-hour and a three-hour ISR mission is 58% and 27% less, respectively, than for a gasoline-powered UAV.

This book is the second edition of Environmental Monitoring using GNSS and highlights the latest developments in global navigation satellite systems (GNSS). It features a completely new title and additional chapters that present emerging challenges to environmental monitoring—"climate variability/change and food insecurity." Since the publication of the first edition, much has changed in both the development and applications of GNSS, a satellite microwave remote sensing technique. It is the first tool to span all four dimensions of relevance to humans (position, navigation, timing and the environment), and it has widely been used for positioning (both by military and civilians), navigation and timing. Its increasing use is leading to a new era of remote sensing that is now revolutionizing the art of monitoring our environment in ways never imagined before. On the one hand, nearly all GNSS satellites (Global Positioning System (GPS), Global Navigation Satellite System (GLONASS), Galileo and Beidou) have become operational, thereby providing high-precision, continuous, all-weather and near real- time remote sensing multi-signals beneficial to environmental monitoring. On the other hand, the emerging challenges of precisely monitoring climate change and the demand for the production of sufficient food for ever-increasing populations are pushing traditional monitoring methods to their limits. In this regard, refracted GNSS signals (i.e., occulted GNSS signals or GNSS meteorology) are now emerging as sensors of climate variability, while the reflected signals (GNSS reflectometry or GNSS-R) are increasingly finding applications in determining, e.g., soil moisture content, ice and snow thickness, ocean heights, and wind speed and direction, among others. Furthermore, the increasing recognition and application of GNSS-supported unmanned aircraft vehicles (UAV)/drones in agriculture (e.g., through the determination of water holding capacity of soil) highlights the new challenges facing GNSS. As such, this new edition three new chapters address GNSS reflectometry and applications; GNSS sensing of climate variability; and the applications in UAV/drones. Moreover, it explores the application of GNSS to support integrated coastal zone management.

This book covers comprehensively the theories and practical design of magnetic communications. It emphasizes the differences between it and RF communications. It first provides the models and signal propagation principles of magnetic communication systems. Then it describes the hardware architecture of the system, including transmitter, MODEM, inductors, coils, etc. Then, it discusses the corresponding communication software design principles and cases. Finally, it presents several types of practical implementations and applications.

This second edition includes updated chapters from the first edition as well as five additional new chapters (Light detection and ranging (LiDAR), CORONA historical de-classified products, Unmanned Aircraft Vehicles (UAVs), GNSS-reflectometry and GNSS applications to climate variability), shifting the main focus from monitoring and management to extreme hydro-climatic and food security challenges and exploiting big data. Since the publication of first edition, much has changed in terms of technology, and the demand for geospatial data has increased with the advent of the big data era. For instance, the use of laser scanning has advanced so much that it is unavoidable in most environmental monitoring tasks, whereas unmanned aircraft vehicles (UAVs)/drones are emerging as efficient tools that address food security issues as well as many other contemporary challenges. Furthermore, global navigation satellite systems (GNSS) are now responding to challenges posed by climate change by unravelling the impacts of teleconnection (e.g., ENSO) as well as advancing the use of reflected signals (GNSS-reflectometry) to monitor, e.g., soil moisture variations. Indeed all these rely on the explosive use of "big data" in many fields of human endeavour. Moreover, with the ever-increasing global population, intense pressure is being exerted on the Earth's resources, leading to significant changes in its land cover (e.g., deforestation), diminishing biodiversity and natural habitats, dwindling fresh water supplies, and changing weather and climatic patterns (e.g., global warming, changing sea level). Environmental monitoring techniques that provide information on these are under scrutiny from an increasingly environmentally conscious society that demands the efficient delivery of such information at a minimal cost. Environmental changes vary both spatially and temporally, thereby putting pressure on traditional methods of data acquisition, some of which are highly labour intensive, such as animal tracking for conservation purposes. With these challenges, conventional monitoring techniques, particularly those that record spatial changes call for more sophisticated approaches that deliver the necessary information at an affordable cost. One direction being pursued in the development of such techniques involves environmental geoinformatics, which can act as a stand-alone method or complement traditional methods.

Unmanned Aerial Vehicles in Civilian Logistics and Supply Chain Management

Unmanned Aerial Systems

Unmanned Aircraft Systems

The Aviation History
Emerging Applications and Technologies for Industry 4.0
Research Anthology on Reliability and Safety in Aviation Systems, Spacecraft, and Air Transport

During the service life of electrical equipment, organic electrical insulating materials used at elevated service temperatures can degrade as a result of progressive chemical reactivity. It is therefore essential that normal operating temperature limits be established for such materials. The traditional approach is to accelerate the degradation process with simultaneous testing at moderately elevated temperatures above the intended service temperatures of both the candidate material and a control reference material. With proper application of a chemical kinetic model, a service limit is established for the candidate material based on the comparative test performance, with the control having known long-term thermal service capabilities. There are practical limits on the maximum test temperatures and corresponding minimum test times to ensure an accurate representation of the service degradation mechanism during the test program. This results in an onerous, unavoidably protracted test time for these thermal aging studies. A number of relatively rapid analytical techniques have been proposed to reduce the test times without compromising the accuracy of the determined service limit. The most successful of these often involve hybrid testing, as a combination of a rapid analytical technique and part of the traditional program at the higher test temperatures and shorter test times, to result in a desirable and substantial reduction in test program times. This paper will review the principles of the traditional program, and the theory and initial results of a proposed hybrid technique based on oxidative stability testing using oxidation induction.

This book contains 35 chapters written by experts in developing techniques for making aerial vehicles more intelligent, more reliable, more flexible in use, and safer in operation.It will also serve as an inspiration for further improvement of the design and application of aeral vehicles. The advanced techniques and research described here may also be applicable to other high-tech areas such as robotics, avionics, vetronics, and space.
This Special Issue contains selected papers from works presented at the 8th EASN–CEAS (European Aeronautics Science Network–Council of European Aerospace Societies) Workshop on Manufacturing for Growth and Innovation, which was held in Glasgow, UK, 4–7 September 2018. About 150 participants contributed to a high-level scientific gathering providing some of the latest research results on the topic, as well as some of the latest relevant technological advancements. ?ine interesting articles, which cover a wide range of topics including characterization, analysis and design, as well as numerical simulation, are contained in this Special Issue.
Industry and society are complex socio-technical systems, and both face problems that can only be solved by collaboration between different disciplines. Collaboration between academia and practice is also needed to develop viable solutions. Many engineering problems also require such an approach, which is known as Transdisciplinary Engineering (TE). This book presents the proceedings of the 26th ISTE International Conference on Transdisciplinary Engineering, held in Tokyo, Japan, from 30 July - 1 August 2019. The title of the conference was: Transdisciplinary Engineering for Complex Socio-technical Systems, and of the 86 submitted papers, 68 peer-reviewed papers by authors from 17 countries were delivered at the conference. These papers range from theoretical and conceptual to strongly pragmatic. They address industrial best practice and are grouped here under 10 themes: advanced robotics for smart manufacturing; design of personalized products and services; engineering methods for industry 4.0; additive and subtractive manufacturing; decision supporting tools and methods; complex systems engineering; big data analytics in manufacturing and services; concurrent engineering; cost modeling; and digital manufacturing, modeling and simulation. Presenting the latest research results and knowledge of product creation processes and related methodologies, the book will be of interest to researchers, design practitioners, and educators alike.
Handbook of Clean Energy Systems, 6 Volume Set
The Telecommunications Illustrated Dictionary, Second Edition
Aerial Robotics in Agriculture
Proceedings of 2021 International Conference on Autonomous Unmanned Systems (ICAUS 2021)
Environmental Geoinformatics
Robotics Research

Unmanned Aerial Systems: Theoretical Foundation and Applications presents some of the latest innovative approaches to drones from the point-of-view of dynamic modeling, system analysis, optimization, control, communications, 3D-mapping, search and rescue, surveillance, farmland and construction monitoring, and more. With the emergence of low-cost UAS, a vast array of research works in academia and products in the industrial sectors have evolved. The book covers the safe operation of UAS, including, but not limited to, fundamental design, mission and path planning, control theory, computer vision, artificial intelligence, applications requirements, and more. This book provides a unique reference of the state-of-the-art research and development of unmanned aerial systems, making it an essential resource for researchers, instructors and practitioners. Covers some of the most innovative approaches to drones Provides the latest state-of-the-art research and development surrounding unmanned aerial systems Presents a comprehensive reference on unmanned aerial systems, with a focus on cutting-edge technologies and recent research trends in the area
This comprehensive guide to modern airship design and operation, written by world experts, is the only up-to-date book on airship technology intended as a technical guide to those interested in studying, designing, building, flying, and operating airship. In addition to basic airship principles, the book covers conventional and unconventional design in a panoramic and in-depth manner focusing on four themes: (1) basic principles such as aerostatics, aerodynamics, propulsion, materials and structures, stability and control, mooring and ground handling, and piloting and meteorology; (2) different airship types including conventional (manned and unmanned), hot air, solar powered, and hybrid; (3) airship applications including surveillance, tourism, heavy lift, and disaster and humanitarian relief; and (4) airship roles and economic considerations. This second edition introduces nine new chapters and includes significant revisions and updates to five of the original chapters.
Covering the design, development, operation and mission profiles of unmanned aircraft systems, this single, comprehensive volume forms a complete, stand-alone reference on the topic. The volume integrates with the online Wiley Encyclopedia of Aerospace Engineering, providing many new and updated articles for existing subscribers to that work.
This book comprises the proceedings of the 12th National Technical Symposium on Unmanned System Technology 2020 (NUSYS'20) held on October 27-28, 2020. It covers a number of topics, including intelligent robotics, novel sensor technology, control algorithms, acoustics signal processing, imaging techniques, biomimetic robots, green energy sources, and underwater communication backbones and protocols, and it appeals to researchers developing marine technology solutions and policy-makers interested in technologies to facilitate the exploration of coastal and oceanic regions.
11th International Symposium, ISVC 2015, Las Vegas, NV, USA, December 14-16, 2015, Proceedings, Part I
Scientific and Technical Aerospace Reports

GNSS Environmental Sensing
Magnetic Communications: From Theory to Practice
Autonomous Control Systems and Vehicles
Aerial Vehicles

The two volume set LNCS 9474 and LNCS 9475 constitutes the refereed proceedings of the 11th International Symposium on Visual Computing, ISVC 2015, held in Las Vegas, NV, USA in December 2015. The 115 revised full papers and 35 poster papers presented in this book were carefully reviewed and selected from 260 submissions. The papers are organized in topical sections: Part I (LNCS 9474) comprises computational bioimaging; computer graphics; motion and tracking; segmentation; recognition; visualization; mapping; modeling and surface reconstruction; advancing autonomy for aerial robotics; medical imaging; virtual reality; observing humans; spectral imaging and processing; intelligent transportation systems; visual perception and robotic systems. Part II (LNCS 9475): applications; 3D computer vision; computer graphics; segmentation; biometrics; pattern recognition; recognition; and virtual reality.

The Handbook of Clean Energy Systems brings together an international team of experts to present a comprehensive overview of the latest research, developments and practical applications throughout all areas of clean energy systems. Consolidating information which is currently scattered across a wide variety of literature sources, the handbook covers a broad range of topics in this interdisciplinary research field including both fossil and renewable energy systems. The development of intelligent energy systems for efficient energy processes and mitigation technologies for the reduction of environmental pollutants is explored in depth, and environmental, social and economic impacts are also addressed. Topics covered include: Volume 1 - Renewable Energy: Biomass resources and biofuel production; Bioenergy Utilization; Solar Energy; Wind Energy; Geothermal Energy; Tidal Energy. Volume 2 - Clean Energy Conversion Technologies: Steam/Vapor Power Generation; Gas Turbines Power Generation; Reciprocating Engines; Fuel Cells; Cogeneration and Polygeneration. Volume 3 - Mitigation Technologies: Carbon Capture; Negative Emissions System; Carbon Transportation; Carbon Storage; Emission Mitigation Technologies; Efficiency Improvements and Waste Management; Waste to Energy. Volume 4 - Intelligent Energy Systems: Future Electricity Markets; Diagnostic and Control of Energy Systems; New Electric Transmission Systems; Smart Grid and Modern Electrical Systems; Energy Efficiency of Municipal Energy Systems; Energy Efficiency of Industrial Energy Systems; Consumer Behaviors; Load Control and Management; Electric Car and Hybrid Car; Energy Efficiency Improvement. Volume 5 - Energy Storage: Thermal Energy Storage; Chemical Storage; Mechanical Storage; Electrochemical Storage; Integrated Storage Systems. Volume 6 - Sustainability of Energy Systems: Sustainability Indicators, Evaluation Criteria, and Reporting; Regulation and Policy; Finance and Investment; Emission Trading; Modeling and Analysis of Energy Systems; Energy vs. Development; Low Carbon Economy; Energy Efficiencies and Emission Reduction. Key features: Comprising over 3,500 pages in 6 volumes, HCES presents a comprehensive overview of the latest research, developments and practical applications throughout all areas of clean energy systems, consolidating a wealth of information which is currently scattered across a wide variety of literature sources. In addition to renewable energy systems, HCES also covers processes for the efficient and clean conversion of traditional fuels such as coal, oil and gas, energy storage systems, mitigation technologies for the reduction of environmental pollutants, and the development of intelligent energy systems. Environmental, social and economic impacts of energy systems are also addressed in depth. Published in full colour throughout. Fully indexed with cross referencing within and between all six volumes. Edited by leading researchers from academia and industry who are internationally renowned and active in their respective fields. Published in print and online. The online version is a single publication (i.e. no updates), available for one-time purchase or through annual subscription.

Proceedings of the 12th National Technical Seminar on Unmanned System Technology 2020
Computational Logistics
Transdisciplinary Engineering for Complex Socio-technical Systems
Theoretical Foundation and Applications
Energy Research Abstracts
Autonomy and Artificial Intelligence: A Threat or Savior?