Autonomous Mining Unmanned Systems Technology

The interdisciplinary field of smart digital systems is crucial to modern computer science, encompassing artificial intelligence, information systems and engineering. For over a decade the mission of KES International has been to provide publication opportunities for all those who work in knowledge intensive subjects. The conferences they run worldwide are aimed at facilitating the dissemination, transfer, sharing and brokerage of knowledge in a number of leading edge technologies. _x000D_ This book presents some 80 papers selected after peer review for inclusion in three KES conferences, held as part of the Smart Digital Futures 2014 (SDF-14) multi-theme conference in Chania, Greece, in June 2014. The three conferences are: Intelligent Decision Technologies (KES-IDT-14), Intelligence Interactive Multimedia Systems and Services (KES-IIMSS-14), and Smart Technology-based Education and Training (KES-STET-14). _x000D_ The book will be of interest to all those whose work involves the development and application of intelligent digital systems.

Business strategy is not an abstract concept; it is a type of work that is designed for complex theoretical conceptualization. While there are numerous sources exploring the theoretical ideas of strategy, very few demonstrate the real value of strategy tools, concepts, and models in practice. Cases on Digital Strategies and Management Issues in Modern Organizations is a pivotal reference source that provides original case studies designed to explore various strategic issues facing contemporary organizations, evaluate the usefulness of strategy tools and models, and examine how successful and failing companies have faced strategic issues with practical ideas and solutions. While highlighting topics such as business ethics, stakeholder analysis, and corporate governance, this publication demonstrates various ways that different models/tools can be applied in different types of companies for various purposes and from diverse perspectives. This book is ideally designed for managers, executives, managing directors, business strategists, industry professionals, students, researchers, and academicians seeking current research on key business framework strategies.

This book constitutes the proceedings of the 11th International Conference on Wireless Algorithms, Systems, and Applications, WASA 2016, held in Bozeman, MT, USA, in August 2016.The 50 full papers and 9 invited papers presented werde carefully reviewed and selected from 148 submissions. WASA is designed to be a forum for theoreticians, system and application designers, protocol developers and practitioners to discuss and express

their views on the current trends, challenges, and state-of-the-art solutions related to various issues in wireless networks. Topics of interests include, but not limited to, effective and efficient state-of-the-art algorithm design and analysis, reliable and secure system development and implementations, experimental study and testbed validation, and new application exploration in wireless networks.

35th Annual German Conference on AI, Saarbrücken, Germany, September 24-27, 2012, Proceedings

Report of the Committee on Appropriations (to Accompany H.R. 3338) Together with Additional Views

joint and national needs

Biologically Inspired Approaches for Locomotion, Anomaly Detection and Reconfiguration for Walking Robots

Advancing Autonomous Systems

Cases on Digital Strategies and Management Issues in Modern Organizations

Recent advances in autonomous system capabilities have improved their performance sufficiently to make the integration of unmanned and autonomous vehicles systems into human-centered civilian environments a realistic near-term goal. In these systems, such as the national highway system, mining operations, and manufacturing operations, unmanned and autonomous systems will be required to interact with large numbers of other unmanned vehicle systems as well as with manned vehicles and other human collaborators. While prior research provides information on the different methods of controlling unmanned vehicles and the effects of these methods on individual vehicle behavior, it has typically focused on only a small number of unmanned systems acting in isolation. The qualities that provide the desired behavior of an autonomous system behavior in isolation may not be the same as the characteristics that lead to desirable performance while interacting with multiple heterogeneous actors. Additionally, the integration of autonomous systems may include constraints on operations that limit interactions between manned and unmanned agents. It is not clear which constraints might be most effective in promoting safe operations and how these constraints may interact with unmanned system control architectures. Examining the effects of unmanned systems in these large, complex systems in reality would require significant capital investment and the physical construction and implementation of the un- manned vehicles of interest. Both of these aspects make empirical testing either difficult or impossible to perform and may also limit the ability of testing to fully examine all the parameters of interest in a safe and efficient manner. The objective of this thesis is the creation of a simulation environment that can replicate the behavior of the unmanned vehicle systems, manned vehicles, and human collaborators in the environment in order to enable an exploration of how parameters related to individual actor behavior and actor interactions affect performance. The aircraft carrier flight deck is chosen as an

example domain, given that current operations require significant interactions between human collaborators and manned vehicles and current research addresses the development of unmanned vehicle systems for flight deck operations. Because the complexity of interactions be- tween actors makes the creation of closed-form solutions of system behavior difficult, an agent-based modeling approach is taken. First, a list of actors and their characteristic tasks, decision-making processes, states, and parameters for current aircraft carrier flight deck operations was generated. Next, these models were implemented in an object-oriented programming language, enabling the definition of independent tasks, actors, parameters, and states. These models were later extended to incorporate features of unmanned vehicle control architectures by making minor modifications to the state, logic functions, or parameters of current agents (or tasks). This same tactic can be applied by future researchers to further pursue examinations of other in influential aspects of system performance or to adapt the model to other domains. This model, the Multi-Agent Safety and Control Simulation (MASCS), was then compared to data for current flight deck operations to calibrate and partially validate simulation outputs, first addressing an individual vehicle task before proceeding to mission tasks utilizing many vehicles at once. The MASCS model was extended to incorporate models of different unmanned vehicle control architectures and different safety protocols that affect vehicle integration. These features were then tested at different densities of mission operations on the flight deck and compositions (unmanned vs. manned) of missions in order to fully explore the interactions between variables. These results suggest hat productivity on the flight deck is more heavily influenced by the safety protocols that in influence vehicle integration as opposed to the types of unmanned vehicle control architecture employed. Vehicle safety is improved by increasing the number of high-level constraints on operations (e.g. separating unmanned and manned aircraft spatially or temporally), but these high-level constraints may conflict with implicit constraints that are part of crew-vehicle interactions. Additional testing explored the use of MASCS in understanding the effects of changes to the operating environment, independent of changes to unmanned vehicle control architectures and safety protocols, as well as how the simulation can be used to explore the vehicle design space. These results indicate that, at faster operational tempos, latencies in vehicle operations drive significant differences in productivity that are exacerbated by the safety protocols applied to operations. In terms of safety, a tradeoff between slightly increased vehicle safety and significant increases in the risk rate of crew activity is created at faster tempos in this environment. Lastly, the limitations and generalizability of the MASCS model for use in other Heterogeneous Manned-Unmanned Environments (HMUEs) was discussed, along with potential future work to expand the models.

It is widely anticipated that autonomous vehicles will have a transformational impact on military forces and will play a key role in many future force structures.

As a result, many tasks have already been identified that unmanned systems could undertake more readily than humans. However, for this to occur, such systems will need to be agile, versatile, persistent, reliable, survivable and lethal. This will require many of the vehicles 'cognitive' or higher order functions to be more fully developed, whereas to date only the 'component' or physical functions have been successfully automated and deployed. The book draws upon a broad range of others' work with a view to providing a product that is greater than the sum of its parts. The discussion is intentionally approached from the perspective of improving understanding rather than providing solutions or drawing firm conclusions. Consequently, researchers reading this book with the hope of uncovering some novel theory or approach to automating an unmanned vehicle will be as disappointed as the capability planner who anticipates a catalogue of technical risks and feasibility options against his favoured list of component technologies and potential applications. Nevertheless, it is hoped that both will at least learn something of the other's world and that progress will ensue as a result. For the defence policy and decision maker, this is a "must-read" book which brings together an important technology summary with a considered analysis of future doctrinal, legal and ethical issues in unmanned and autonomous systems. For research engineers and developers of robotics, this book provides a unique perspective on the implications and consequences of our craft; connecting what we do to the deployment and use of the technology in current and future defence systems. Professor Hugh Durrant-Whyte

This book constitutes the refereed proceedings of the 35th Annual German Conference on Artificial Intelligence, KI 2012, held in Saarbrücken, Germany, in September 2012. The 19 revised full papers presented together with 9 short papers were carefully reviewed and selected from 57 submissions. The papers contain research results on theory and applicaiton of all aspects of AI.

Trends and Advances

Report of the Committee on Appropriations Together with Additional Views to Accompany H.R. 5631).

Department of Defense Appropriations Bill, 2002, and Supplemental Appropriations, 2002

Marine Scientific Research, New Marine Technologies and the Law of the Sea

KI 2012: Advances in Artificial Intelligence

Navigation and Control Technologies for Unmanned Systems

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.

This book focuses on the importance of human factors in the development of safe and reliable

robotic and unmanned systems. It discusses solutions for improving the perceptual and cognitive abilities of robots, developing suitable synthetic vision systems, coping with degraded reliability in unmanned systems, and predicting robotic behavior in relation to human activities. It covers the design of improved, easy to use, human–system interfaces, together with strategies for increasing human–system performance, and reducing cognitive workload at the user interface. It also discusses real-world applications and case studies of human-robot and human-agent collaboration in different business and educational endeavors. The second part of the book reports on research and developments in the field of human factors in cybersecurity.Contributions cover the technological, social, economic and behavioral aspects of the cyberspace, providing a comprehensive perspective to manage cybersecurity risks. Based on the two AHFE 2021 Conferences such as the AHFE 2021 Conference on Human Factors in Robots, Drones and Unmanned Systems, and the AHFE 2021 Conference on Human Factors in Cybersecurity, held virtually on 25–29 July, 2021, from USA, this book offers extensive information and highlights the importance of multidisciplinary approaches merging engineering, computer science, business and psychological knowledge. It is expected to foster discussion and collaborations between researchers and practitioners with different background, thus stimulating new solutions for the development of reliable and safe, human-centered, highly functional devices to perform automated and concurrent tasks, and to achieve an inclusive, holistic approach for enhancing cybersecurity.

Proceedings of 2021 International Conference on Autonomous Unmanned Systems (ICAUS 2021)Springer NatureAutonomous VehicleBoD – Books on Demand

Department of Defense appropriations bill, 2007 : report of the Committee on Appropriations together with additional views to accompany H.R. 5631)

Unmanned Systems

Operations Research for Unmanned Systems

Proceedings of 2021 International Conference on Autonomous Unmanned Systems (ICAUS 2021)

Proceedings and Debates of the ... Congress

Proceedings of the ... International Symposium on Technology and the Mine Problem

The maritime domain, hosting the highways of global prosperity—through trade, industrial raw material and energy links—rates high in its potential for conflict. As the global pendulum of economic vibrancy swings eastwards, the Indian Ocean Region (IOR) has been receiving increasing attention from all actors, state as well as non-state ones, and now presents itself in sharp focus as one of the volatile seascapes on this earth. The navies operating in the region will, therefore, need to depend on high technology and associated doctrines and procedures, so as to effectively deal with the wide spectrum of challenges therein. It will also become incumbent upon such littoral states as can afford the high cost of technology, to catch up so as to maintain their relevance in the great game being played out in their very own backyard. The United States as a leader in inventing and exploiting technology sets its own benchmarks in internalization of advanced technologies to undertake maritime missions at and from the sea in support of its military operations ashore. China, on the other hand, has been striving towards achieving asymmetric war-fighting capabilities, supported by other developing technologies as well as core

capabilities like the Beidou position-fixing system, which would be central to network-centric operations, including missile guidance systems. As the IOR increasingly transforms into an arena of extra-regional power play, the implications of technologically enabled confrontations and their impact on resident states are poised to weigh in on a scale never imagined before. There is thus, a greater need for India to gain in-depth knowledge of and develop a perspective on advanced technology sensors, weapons, supporting infrastructures, doctrines and futuristic concepts in the maritime domain and their potential as strategic game changers in the IOR. This book aims to foster greater understanding of the challenges facing the IOR and also look at how the technological advances in the maritime domain may possibly handle such challenges. It should provide useful resource material to those investigating the impact of technology on meeting the maritime challenges in the IOR.

This book provides information on data-driven infrastructure design, analytical approaches, and technological solutions with case studies for smart cities. This book aims to attract works on multidisciplinary research spanning across the computer science and engineering, environmental studies, services, urban planning and development, social sciences and industrial engineering on technologies, case studies, novel approaches, and visionary ideas related to data-driven innovative solutions and big data-powered applications to cope with the real world challenges for building smart cities.

Marine Scientific Research, New Marine Technologies and the Law of the Sea offers expert insights into new legal developments covering marine scientific research (MSR) including marine genetic resources regime development and emerging marine technologies including floating nuclear power plants.

Basic to Advanced Concepts of Robotics Engineering

Hearing Before the Subcommittee on Mineral Resources Development and Production of the Committee on Energy and Natural Resources, United States Senate, One Hundred Third Congress, First Session, on the Current Status and Future Potential of Technology Used to Explore and Mine the Oceans, November 4, 1993

Congressional Record

ROBOTICS ENGINEERING

Technology Development for Army Unmanned Ground Vehicles

Unmanned Systems Technology

The Congressional Record is the official record of the proceedings and debates of the United States Congress. It is published daily when Congress is in session. The Congressional Record began publication in 1873. Debates for sessions prior to 1873 are recorded in The Debates and Proceedings in the Congress of the United States (1789-1824), the Register of Debates in Congress (1824-1837), and the Congressional Globe (1833-1873)

Robotics is an area of engineering and science that encompasses electronics, mechanical

engineering, and computer science, among other disciplines. This branch is concerned with the design, building, and use of robots, as well as sensory feedback and data processing. In the coming years, these are some of the technologies that will replace humans and human activities. These robots are designed to be utilised for a variety of tasks, however they are currently being used in sensitive environments such as bomb detection and deactivation. Robots can take on any shape, although many of them have a human-like look. The robots that have taken on a human-like appearance are expected to move, speak, and think like humans. Robotics is the engineering discipline that deals with the conception, design, operation, and manufacture of robots. Issac Asimov, a science fiction novelist, claimed to be the first to name robotics in a short tale written in the 1940s. Issac proposed three principles for guiding these types of robotic robots in that scenario. Issac's three rules of Robotics were later named after these three ideas. The following are the three laws: Humans will never be harmed by robots. With the exception of breaking law one, robots will follow human commands. Without breaking any other restrictions, robots will defend themselves. Characteristics The following are some of the properties of robots: Robots have a physical body that they can move around in. They are maintained in place by their body's structure and moved by their mechanical components. Robots will be nothing more than a software programme if they don't have an appearance. On-board control unit is another name for the brain in robots. This robot receives data and then sends commands as an output. Otherwise, the robot will just be a remote-controlled machine without this control device. Sensors: These sensors are used in robots to collect data from the outside world and deliver it to the Brain. These sensors, in essence, have circuits in them that produce voltage. Actuators are the robots that move and the pieces that move with the help of these robots. Motors, pumps, and compressors are examples of actuators. These actuators are told when and how to respond or move by the brain. Robots can only work or respond to instructions that are given to them in the form of a programme. These programmes merely inform the brain when to do certain things, such as move or make sounds. These programmes only instruct the robot on how to make judgments based on sensor data. The robot's behaviour is determined by the programme that was created for it. When the robot starts moving, it's easy to identify what kind of programme it's running. The Different Types of Robots The following are some examples of robots: Articulated: This robot's distinguishing feature is its rotational joints, which range in number from two to ten or more. The rotary joint is attached to the arm, and each joint is known as an axis, which allows for a variety of movements. Cartesian robots are also referred to as gantry robots. The Cartesian coordinate system, i.e. x, y, and z, is used in these three joints. Wrists are fitted to these robots to give rotatory mobility. Cylindrical robots contain at least one rotatory and one prismatic joint for connecting the links. Rotatory joints are used to rotate along an axis, while prismatic joints offer linear motion. Spherical robots are sometimes known as polar robots. The arm has a twisting joint that connects it to the base, as well as two rotatory joints and one linear joint. Scara: Assembly robots are the most common use for these robots. Its arm is shaped like a cylinder. It features two parallel joints that give compliance in a single plane. Delta: These robots have a spider-like structure to them. They're made up of joint

parallelograms joined by a shared basis. In a dome-shaped work area, the parallelogram moves. They're mostly used in the food and electronics industries. Robots' scope and limitations: Advanced machines are robots that are trained to make decisions on their own and are utilised to do advanced tasks. When designing a robot, the most crucial considerations are what function the robot will perform and what the robot's constraints are. Each robot has a fundamental level of complexity, with each level having a scope that restricts the functions that may be done. The number of limbs, actuators, and sensors used in basic robots determines their complexity, whereas the number of microprocessors and microcontrollers used in sophisticated robots determines their complexity. As with any increase,

This book includes research papers from the 11th National Technical Symposium on Unmanned System Technology. Covering 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, it will appeal to researchers developing marine technology solutions and policy-makers interested in technologies to facilitate the exploration of coastal and oceanic regions.

11th International Conference, WASA 2016, Bozeman, MT, USA, August 8-10, 2016. Proceedings

NASA Technical Memorandum

Advances in Human Factors in Robots, Unmanned Systems and Cybersecurity

Ocean Mining Technology

Communications, Signal Processing, and Systems

UTM

When discussing the risk of introducing drones into the National Airspace System, it is necessary to consider the increase in risk to people in manned aircraft and on the ground as well as the various ways in which this new technology may reduce risk and save lives, sometimes in ways that cannot readily be accounted for with current safety assessment processes. This report examines the various ways that risk can be defined and applied to integrating these Unmanned Aircraft Systems (UAS) into the National Airspace System managed by the Federal Aviation Administration (FAA). It also identifies needs for additional research and developmental opportunities in this field.

The threat of an attack involving an unmanned system armed with a weapon of mass destruction is a present one. With two million drones projected to be flying US skies in 2020, unmanned aircraft systems in the air domain pose a significant challenge to the nation's security. Other technological advancements, such as artificial intelligence, combined with unmanned systems, have transformed the threat's very nature, yet the skies are not the only domain of concern. The technology is also developing rapidly in unmanned undersea and surface systems, expanding potential weapons of mass destruction delivery options. This publication is an examination of unmanned aerial systems (UAS), unmanned surface systems (USS), and unmanned undersea systems (UUS). The technological innovation that led to the global commercialization of UAS is underway with USS and UUS. Until recently, no known scholarly studies existed that examined the vulnerabilities of one sector of US critical infrastructure to attack by UAS until A

Phenomenological Examination of US Nuclear Power Plants to Attack by Unmanned Aerial Systems was published late in 2020. According to the Nuclear Regulatory Commission (NRC), there had been fifty-seven UAS incursions over twenty-four US nuclear power plants in the past five years, representing one of sixteen sectors of US critical infrastructure (Gardiner 2016; Rogoway and Trevithick 2020; Hambling 2020). Federal departments and organizations have largely ignored the threat potential that UAS pose despite the strategic guidance laid out in the 2017 National Security Strategy of the US. The nation's national security demands a close examination of the vulnerabilities and is immediately working to close those security gaps. This publication will focus on the emergency of new UAS capabilities and highlight the latest technologies, capabilities, and the significant national security threat implications that UAS, USS, and UUS platforms represent to US critical infrastructure.

The first edited volume addressing analysis for unmanned vehicles, with focus on operations research rather than engineering The editors have a unique combination of extensive operational experience and technical expertise Chapters address a wide-ranging set of examples, domains and applications Accessible to a general readership and also informative for experts

Assessing the Risks of Integrating Unmanned Aircraft Systems (UAS) into the National Airspace System

Data-Driven Mining, Learning and Analytics for Secured Smart Cities

Advances in Human Factors in Robots and Unmanned Systems

NUSYS'19

An Analysis of Current and Future Technology for Unmanned Maritime Vehicles

Deep Learning for Unmanned Systems

Unmanned ground vehicles (UGV) are expected to play a key role in the Armyâ€™s Objective Force structure. These UGVs would be used for weapons platforms, logistics carriers, and reconnaissance, surveillance, and target acquisition among other things. To examine aspects of the Armyâ€™s UGV program, assess technology readiness, and identify key issues in implementing UGV systems, among other questions, the Deputy Assistant Secretary of the Army for Research and Technology asked the National Research Council (NRC) to conduct a study of UGV technologies. This report discusses UGV operational requirements, current development efforts, and technology integration and roadmaps to the future. Key recommendations are presented addressing technical content, time lines, and milestones for the UGV efforts.

This book brings together papers presented at the 2020 International Conference on Communications, Signal Processing, and Systems, which provides a venue to disseminate the latest developments and to discuss the interactions and links between these multidisciplinary fields. Spanning topics ranging from communications, signal processing and systems, this book is aimed at undergraduate

and graduate students in Electrical Engineering, Computer Science and Mathematics, researchers and engineers from academia and industry as well as government employees (such as NSF, DOD and DOE).

Autonomous vehicles, despite their relatively short history, have already found practical application in many areas of human activity. Such vehicles are usually replacing people in performing tasks that require long operating time and are held in inaccessible or hazardous environments. Nevertheless, autonomous robotics is probably the area that is being developed the most because of the great demand for such devices in different areas of our lives. This book is a collection of experiences shared by scientists from different parts of the world doing researches and daily exploiting autonomous systems. Giving this book in the hands of the reader, we hope that it will be a treasure trove of knowledge and inspiration for further research in the field of autonomous vehicles.

Indian and American Perspectives on Technological Developments in the Maritime Domain and Their Strategic Implications in the Indian Ocean Region

Technical digest

Evaluating Safety Protocols for Manned-unmanned Environments Through Agent-based Simulation

NUSYS'20

Proceedings of the AHFE 2021 Virtual Conferences on Human Factors in Robots, Drones and Unmanned Systems, and Human Factors in Cybersecurity, July 25-29, 2021, USA

This book focuses on the importance of human factors in the development of safe and reliable unmanned systems. It discusses current challenges such as how to improve the perceptual and cognitive abilities of robots, develop suitable synthetic vision systems, cope with degraded reliability in unmanned systems, predict robotic behavior in case of a loss of communication, the vision for future soldier-robot teams, human-agent teaming, real-world implications for human-robot interaction, and approaches to standardize both the display and control of technologies across unmanned systems. Based on the AHFE 2017 International Conference on Human Factors in Robots and Unmanned Systems, held on July 17–21 in Los Angeles, California, USA, this book is expected to foster new discussion and stimulate new advances in the development of more reliable, safer, and highly functional devices for carrying out automated and concurrent tasks.

Governing Military Technologies in the 21st Century is one of the first books to tackle the big five technological threats all in one place: nanotech, robotics, cyberwar, human enhancement, and, non-

lethal weapons, weaving a historical, legal, and sociopolitical fabric into a discussion of their development, deployment, and, potential regulation.

This book is used at the graduate or advanced undergraduate level and many others. Manned and unmanned ground, aerial and marine vehicles enable many promising and revolutionary civilian and military applications that will change our life in the near future. These applications include, but are not limited to, surveillance, search and rescue, environment monitoring, infrastructure monitoring, self-driving cars, contactless last-mile delivery vehicles, autonomous ships, precision agriculture and transmission line inspection to name just a few. These vehicles will benefit from advances of deep learning as a subfield of machine learning able to endow these vehicles with different capability such as perception, situation awareness, planning and intelligent control. Deep learning models also have the ability to generate actionable insights into the complex structures of large data sets. In recent years, deep learning research has received an increasing amount of attention from researchers in academia, government laboratories and industry. These research activities have borne some fruit in tackling some of the challenging problems of manned and unmanned ground, aerial and marine vehicles that are still open. Moreover, deep learning methods have been recently actively developed in other areas of machine learning, including reinforcement training and transfer/meta-learning, whereas standard, deep learning methods such as recent neural network (RNN) and coevolutionary neural networks (CNN). The book is primarily meant for researchers from academia and industry, who are working on in the research areas such as engineering, control engineering, robotics, mechatronics, biomedical engineering, mechanical engineering and computer science. The book chapters deal with the recent research problems in the areas of reinforcement learning-based control of UAVs and deep learning for unmanned aerial systems (UAS) The book chapters present various techniques of deep learning for robotic applications. The book chapters contain a good literature survey with a long list of references. The book chapters are well written with a good exposition of the research problem, methodology, block diagrams and mathematical techniques. The book chapters are lucidly illustrated with numerical examples and simulations. The book chapters discuss details of applications and future research areas.

Savior or Threat

Smart Digital Futures 2014

Autonomous Vehicles in Support of Naval Operations

Governing Military Technologies in the 21st Century: Ethics and Operations

Department of Defense Appropriations Bill, 2007

Proceedings of the AHFE 2017 International Conference on Human Factors in Robots and Unmanned Systems, July 17–21, 2017, The Westin Bonaventure Hotel, Los Angeles, California, USA

The increasing presence of mobile robots in our everyday lives introduces the requirements for their intelligent and autonomous features. Therefore the next generation of mobile robots

should be more self-capable, in respect to: increasing of their functionality in unforeseen situations, decreasing of the human involvement in their everyday operations and their maintenance; being robust; fault tolerant and reliable in their operation. Although mobile robotic systems have been a topic of research for decades and aside the technology improvements nowadays, the subject on how to program and making them more autonomous in their operations is still an open field for research. Applying bio-inspired, organic approaches in robotics domain is one of the methodologies that are considered that would help on making the robots more autonomous and self-capable, i.e. having properties such as: self-reconfiguration, self-adaptation, self-optimization, etc. In this book several novel biologically inspired approaches for walking robots (multi-legged and humanoid) domain are introduced and elaborated. They are related to self-organized and self-stabilized robot walking, anomaly detection within robot systems using self-adaptation, and mitigating the faulty robot conditions by self-reconfiguration of a multi-legged walking robot. The approaches presented have been practically evaluated in various test scenarios, the results from the experiments are discussed in details and their practical usefulness is validated.

This book introduces unmanned aircraft systems traffic management (UTM) and how this new paradigm in traffic management integrates unmanned aircraft operations into national airspace systems. Exploring how UTM is expected to operate, including possible architectures for UTM implementations, and UTM services, including flight planning, strategic coordination, and conformance monitoring, Unmanned Aircraft Systems Traffic Management: UTM considers the boundaries of UTM and how it is expected to interlace with tactical coordination systems to maintain airspace safety. The book also presents the work of the global ecosystem of players advancing UTM, including relevant standards development organizations (SDOs), and considers UTM governance paradigms and challenges. FEATURES Describes UTM concept of operations (ConOps) and global variations in architectures Explores envisioned UTM services, including flight planning, strategic coordination, conformance monitoring, contingency management, constraints and geo-awareness, and remote identification Highlights cybersecurity standards development and awareness Covers approaches to the approval, management, and oversight of UTM components and ecosystem Considers the future of UTM and potential barriers to its success, international coordination, and regulatory reform This book is an essential, in-depth, annotated resource for developers, unmanned aircraft system operators, pilots, policy makers, researchers, and academics engaged in unmanned systems, transportation management, and the future of aviation.

Autonomous vehicles (AVs) have been used in military operations for more than 60 years, with torpedoes, cruise missiles, satellites, and target drones being early examples.1 They have also been widely used in the civilian sector--for example, in the disposal of explosives, for work and measurement in radioactive environments, by various offshore industries for both creating and maintaining undersea facilities, for atmospheric and undersea research, and by industry in automated and robotic manufacturing. Recent military experiences with AVs have consistently demonstrated their value in a wide range of missions, and anticipated developments of AVs hold promise for increasingly significant roles in future naval operations. Advances in AV capabilities are enabled (and limited) by progress in the technologies of computing and robotics, navigation, communications and networking, power sources and propulsion, and materials. Autonomous Vehicles in Support of Naval Operations is a forward-looking discussion of the naval operational environment and vision for the Navy and Marine Corps and of naval mission needs and potential applications and limitations of AVs. This report considers the potential of AVs for naval operations, operational needs and technology issues, and opportunities for improved operations.

Developments and Challenges for Autonomous Unmanned Vehicles

Autonomous Vehicle

Unmanned Aircraft Systems Traffic Management
Technical Digest
United States Congressional Serial Set, Serial No. 15056, House Reports Nos. 395-518
Proceedings of the 12th National Technical Seminar on Unmanned System Technology 2020