Comparing System Dynamics And Agent Based Simulation For

Seascape Ecology provides a comprehensive look at the state-of-the-science in the application of landscape ecology to the seas and provides guidance for future research priorities. The first book devoted exclusively to this rapidly emerging and increasingly important discipline, it is comprised of contributions from researchers at the forefront of seascape ecology working around the world. It presents the principles, concepts, methodology, and techniques informing seascape ecology and reports on the latest developments in the application of the approach to marine ecology and management. A growing number of marine scientists, geographers, and marine managers are asking questions about the marine environment that are best addressed with a landscape ecology perspective. Seascape Ecology represents the first serious effort to fill the gap in the literature on the subject. Key topics and features of interest include: The origins and history of seascape ecology and various approaches to spatial patterning in the sea The links between seascape patterns and ecological processes, with special attention paid to the roles played by seagrasses and salt marshes and animal movements through seascapes Human influences on seascape ecology—includes models for assessing human-seascape interactions A special epilogue in which three eminent scientists who have been instrumental in shaping the course of landscape ecology offer their insights and perspectives Seascape Ecology is a must-read for researchers and professionals in an array of disciplines, including marine biology, environmental science, geosciences, marine and coastal management, and environmental protection. It is also an excellent supplementary text for university courses in those fields.

This two-volume set LNCS 12777 and 12778 constitutes the thoroughly refereed proceedings of the 12th International Conference on Digital Human Modeling and Applications in Health, Safety, Ergonomics and Risk Management, DHM 2021, which was held virtually as part of the 23rd HCI International Conference, HCII 2021, in July 2021. The total of 1276 papers and 241 posters included in the 39 HCII 2021 proceedings volumes was carefully reviewed and selected from 5222 submissions. DHM 2021 includes a total of 56 papers; they were organized in topical sections named: Part I, Human Body, Motion and Behavior: Ergonomics, human factors and occupational health; human body and motion modeling; and language, communication and behavior modeling. Part II, AI, Product and Service: Rethinking healthcare; artificial intelligence applications and ethical issues; and digital human modeling in product and service design.

Operational Research (OR) deals with the use of advanced analytical methods to support better decision-making. It is multidisciplinary with strong links to management science, decision science, computer science and many application areas such as engineering, manufacturing, commerce and healthcare. In the study of emergent behaviour in complex adaptive systems, Agent-based Modelling & Simulation (ABMS) is being used in many different domains such as healthcare, energy, evacuation, commerce, manufacturing and defense. This collection of articles presents a convenient introduction to ABMS with papers ranging from contemporary views to representative case studies. The OR Essentials series presents a unique cross-section of high quality research work fundamental to understanding contemporary issues and research across a range of Operational Research (OR) topics. It brings together some of the best research papers from the esteemed Operational Research Society and its associated journals, also published by Palgrave Macmillan.

This book constitutes the revised versions of the invited and selected papers from the Second Epistemological Perspectives on Simulation Workshop, EPOS 2006, which was held in Brescia, Italy, during October 5-6, 2006. The 11 papers presented together with 2 invited papers were carefully reviewed and selected from 35 submissions. The topics addressed were epistemological and methodological contents, such as the relevance of empirical foundations for agent-based simulations, the role of theory, the concepts and meaning of emergence, the trade-off between simplification and complexification of models.

This book contains all refereed papers that were accepted to the fourth edition of the « Complex Systems Design & Management » (CSD&M 2013) international conference which took place in Paris (France) from December 4-6, 2013. These proceedings cover the most recent trends in the emerging field of complex systems sciences & practices from an industrial and academic perspective, including the main industrial domains (transport, defense & security, electronics, energy & environment, e-services), scientific & technical topics (systems fundamentals, systems architecture & engineering, systems metrics & quality, systemic tools) and system types (transportation systems, embedded systems, software & information systems, systems of systems, artificial ecosystems). The CSD&M 2013 conference is organized under the guidance of the CESAMES non-profit organization.

Mitigating climate change is one of the most profound challenges facing humankind. In industrialized countries, the residential housing sector produces roughly one-fourth of the greenhouse gas emissions. One solution to reduce these emissions is the availability of building codes that require high levels of energy efficiency. Given the current scientific knowledge, more research is needed to gain a proper systemic understanding of the underlying socio-economic and technical system. Such an understanding is crucial for developing high energy-efficiency standards because this system develops gradually over time and cannot be changed swiftly. This book creates a feedback-rich simulation model for analyzing the effects of different administrative policies on energy demand, the improvement of energy efficiency by means of building codes, and reductions in the greenhouse gas emissions. The dynamic model can contribute substantially to the discourse on energy policies and guide effective administrative interventions. The book will be a valuable resource for officials in the public energy administration, as well as researchers in the areas of innovation, diffusion processes, co-evolution, standardization, and simulation modelling.

The AI conference series is the premier event sponsored by the Canadian - ciety for the Computational Studies of Intelligence / Soci ?et ?e canadienne pour l' ?etude d'intelligence par ordinateur. Attendees enjoy our typically Canadian - mosphere –hospitable and stimulating. The Canadian AI conference showcases the excellent research work done by Canadians, their international colleagues, and others choosing to join us each spring. International participation is always high; this year almost 40% of the submitted papers were from non-Canadian - searchers. We accepted 24 papers and 8 poster papers from 52 full-length papers submitted. We also accepted eight of ten abstracts submitted to the Graduate Student Symposium. All of these accepted papers appear in this volume. The Canadian AI Conference is the oldest continuously-held national AI c- ference in the world. (ECCAI's predecessor, AISB, held meetings in 1974, but these have since become international.) Conferences have been held biennially since 1976, and annually since 2000. AI 2002 again joined its sister Canadian computer science conferences, Vision Interface and Graphics Interface, enri- ing the experience for all participants. The joint meeting allows us to stay - formed about other areas, to make new contacts, and perhaps to investigate cross-disciplinary research. This year the conferences was held on the beautiful campus of the University of Calgary, and many participants took the opportunity to tour nearby Ban? and the magni?cent Rocky Mountains.

Human resources management is essential for any workplace environment and is deemed most effective when a strategic focus is in place to ensure that people can facilitate that achievement of organizational goals. But, effective human resource management also contains an element of risk management for an organization which, as a minimum, ensures legislative compliance. Human Resources Management: Concepts, Methodologies, Tools, and Applications compiles the most sought after case studies, architectures, frameworks, methodologies, and research related to human resources management. Including over 100 chapters from professional, this three-volume collection presents an in-depth analysis on the fundamental aspects, tools and technologies, methods and design, applications, managerial impact, social/behavioral perspectives, critical issues, and emerging trends in the field, touching on effective and ineffective management practices when it comes to human resources. This multi-volume work is vital and highly accessible across the hybrid domain of business and management, essential for any library collection.

This volume focuses on critical issues surrounding the intersection of genetics, health, and society. It provides a critical

examination of sociological and biomedical approaches to genomics, including strengths and limitations of each perspective.

This book constitutes the refereed proceedings of the 11th International Conference on Artificial Immune Systems, ICARIS 2012, held in Taormia, Italy, in August 2012. The 19 revised selected papers presented were carefully reviewed and selected for inclusion in this book. In addition 4 papers of the workshop on bio and immune inspired algorithms and models for multi-level complex systems are included in this volume. Artificial immune systems (AIS) is a diverse and maturing area of research that bridges the disciplines of immunology, biology, medical science, computer science, physics, mathematics and engineering. The scope of AIS ranges from modelling and simulation of the immune system through to immune-inspired algorithms and in silico, in vitro and in vivo solutions.

This volume constitutes the proceedings of the 4th IFIP WG 8.1 Working Conference on the Practice of Enterprise Modeling, held in Oslo, Norway, during November 2-3, 2011. The conference series is a dedicated forum where the use of enterprise modeling (EM) in practice is addressed by bringing together researchers, users, and practitioners in order to develop a better understanding of the practice of EM, to contribute to improved industrial EM applications, and to share knowledge and experiences. The 18 papers presented were carefully reviewed and selected from 38 submissions. Authored by both researchers and practitioners, they reflect the fact that EM encompasses human, organizational issues as well as technical aspects related to the development of information systems. The papers are organized in five thematic sessions on process modeling, business modeling, enterprise architecture, EM, and model-driven development. In addition, two keynotes on EM in an agile world and on intra- and inter-organizational process mining complete the volume.

This book contains a selection of papers presented during a special workshop on Complexity Science organized as part of the 9th International Conference on GIScience 2016. Expert researchers in the areas of Agent-Based Modeling, Complexity Theory, Network Theory, Big Data, and emerging methods of Analysis and Visualization for new types of data explore novel complexity science approaches to dynamic geographic phenomena and their applications, addressing challenges and enriching research methodologies in geography in a Big Data Era.

"This reference set provides a complete understanding of the development of applications and concepts in clinical, patient, and hospital information systems"--Provided by publisher.

"This book provides theoretical frameworks and the latest empirical research findings used by medical professionals in the implementation of multi-agent systems"--Provided by publisher.

"This set of books represents a detailed compendium of authoritative, research-based entries that define the contemporary state of knowledge on technology"--Provided by publisher.

This book constitutes the post-conference proceedings of the Third International Workshop on Machine Learning, Optimization, and Big Data, MOD 2017, held in Volterra, Italy, in September 2017. The 50 full papers presented were carefully reviewed and selected from 126 submissions. The papers cover topics in the field of machine learning, artificial intelligence, computational optimization and data science presenting a substantial array of ideas, technologies, algorithms, methods and applications.

This new interdisciplinary work presents system dynamics as a powerful approach to enable analysts build simulation models of social systems, with a view toward enhancing decision making. Grounded in the feedback perspective of complex systems, the book provides a practical introduction to system dynamics, and covers key concepts such as stocks, flows, and feedback. Societal challenges such as predicting the impact of an emerging infectious disease, estimating population growth, and assessing the capacity of health services to cope with demographic change can all benefit from the application of computer simulation. This text explains important building blocks of the system dynamics approach, including material delays, stock management heuristics, and how to model effects between different systemic elements. Models from epidemiology, health systems, and economics are presented to illuminate important ideas, and the R programming language is used to provide an open-source and interoperable way to build system dynamics models. System Dynamics Modeling with R also describes hands-on techniques that can enhance client confidence in system dynamic models, including model testing, model analysis, and calibration. Developed from the author's course in system dynamics, this book is written for undergraduate and postgraduate students of management, operations research, computer science, and applied mathematics. Its focus is on the fundamental building blocks of system dynamics models, and its choice of R as a modeling language make it an ideal reference text for those wishing to integrate system dynamics modeling with related data analytic methods and techniques.

This book constitutes the refereed proceedings of the 4th International Conference on Artificial Immune Systems, ICARIS 2005, held in Banff, Alberta, Canada, in August 2005. The 37 revised full papers presented were carefully reviewed and selected from 68 submissions. The papers are organized in topical sections on conceptual, formal, and theoretical frameworks, immunoinformatics, theoretical and experimental studies on artificial immune systems, and applications of artificial immune systems.

Model-Based Approaches to Learning provides a new perspective called learning by system modeling. This book explores the learning impact of students when constructing models of complex systems.

For reseach in all subjects and among different philisopical paradigms, research methodologies form one of the key issues to rely on. This volume brings a series of papers together, which present different research methodologies as applied in supply chain management. This comprises review oriented papers that look at what kind of methodologies have been applied, as well as methodological papers discussing new developments needed to successfully conduct research in supply chain management. The third group is made up of applications of the respective methodologies, which serve as examples on how the different methodological approaches can be applied. All papers have undergone a review process to ensure their quality. Therefore, we hope that this book will serve as a valid source for current and future researchers in the field. While the workshop on "Research Methodologies in Supply Chain Management" took place at the Supply Chain Management Center, Carl von Ossietzky Univ- sity in Oldenburg, Germany, it is based on a collaboration with the Supply Chain Management Group of the Department of Operations Management at the Cop- hagen Business School and the Department of Production Management at the Vienna University of

Economics and Business Administration. We would like to thank all those who contributed to the workshop and this book. John Morecroft's book is an ideal text for students interested in system modelling and its application to a range of real world problems. The book covers all that is necessary to develop expertise in system dynamics modelling and through the range of applications makes a persuasive case for the power and scope of the approach. As such it will appeal to practitioners as well as students. Robert Dyson, Professor of Operational Research, Associate Dean, Warwick Business School. Much more than an introduction, John Morecroft's Strategic Modelling and Business Dynamics uses interactive "management flight simulators" to create an engaging and effective learning environment in which readers, whatever their background, can develop their intuition about complex dynamic systems. The numerous examples provide a rich test-bed for the development of systems thinking and modelling skills John Sterman, Jay W. Forrester Professor of Management, MIT Sloan School of Management This book, with its vivid examples and simulators, will help to bring modelling, system dynamics and simulation into the mainstream of management education where they now belong. John A. Quelch, Professor of Marketing, Harvard Business School, Former Dean of London Business School This text fills the gap between texts focusing on the purely descriptive systems approach and the more technical system dynamics ones. Ann van Ackere, Professor of Decision Sciences, HEC Lausanne, Universit? de Lausanne Strategic modelling based on system dynamics is a powerful tool for understanding how firms adapt to a changing environment. The author demonstrates the appeal and power of business modelling to make sense of strategic initiatives and to anticipate their impacts through simulation. The book offers various simulators that allow readers to conduct their own policy experiments. Dr. Erich Zahn, Professor of Strategic Management, Betriebswirtschaftliches Institut, University of Stuttgart A website to accompany the book can be found at www.wiley.com/college/morecroft housing supplementary material for both students and lecturers.

The Handbook of Applied System Science is organized around both methodological approaches in systems science, and the substantive topic to which these approaches have been applied. The volume begins with an essay that introduces three system science methods: agent-based modeling, system dynamics, and network analysis. The remainder of the volume is organized around three broad topics: (1) health and human development, (2) environment and sustainability, and (3) communities and social change. Each part begins with a brief introductory essay, and includes nine chapters that demonstrate the application of system science methods to address research questions in these areas. This handbook will be useful for work in Public Health, Sociology, Criminal Justice, Social Work, Political Science, Environmental Studies, Urban Studies, and Psychology.

This unique book brings together a comprehensive set of papers on the background, theory, technical issues and applications of agent-based modelling (ABM) within geographical systems. This collection of papers is an invaluable reference point for the experienced agent-based modeller as well those new to the area. Specific geographical issues such as handling scale and space are dealt with as well as practical advice from leading experts about designing and creating ABMs, handling complexity, visualising and validating model outputs. With contributions from many of the world's leading research institutions, the latest applied research (micro and macro applications) from around the globe exemplify what can be achieved in geographical context. This book is relevant to researchers, postgraduate and advanced undergraduate students, and professionals in the areas of quantitative geography, spatial analysis, spatial modelling, social simulation modelling and geographical information sciences.

HICSS 2005 consists of over 550 papers in nine major tracks. HICSS provides a unique source of ideas, advances, and applications among academicians and practitioners in the information, computing, and system sciences. The HICSS series of conferences is now in the 38th year. Very few conferences have been able to grow and develop as HICSS has over this period. The computer age is barely 50 years old, and HICSS has been an important event in the world of computer science and information technology during most of that time.

Comparing System Dynamics and Agent-based SimulationAgent-based Modeling and SimulationSpringer

This book is a printed edition of the Special Issue "Agent-Based Modelling and Landscape Change" that was published in Land

"This book presents a comprehensive resource elucidating the adoption and usage of health informatics"--Provided by publisher.

This volume constitutes the thoroughly refereed post-conference proceedings of the 10th International Workshop on Agent-Oriented Software Engineering, AOSE 2009, held in Budapest, Hungary, in May 2009 as part of AAMAS 2009, the 8th International Conference on Autonomous Agents and Multiagent Systems. The 10 revised full papers presented were carefully selected from numerous initial submissions during two rounds of reviewing and improvement. The papers have been organized into three sections on multi-agent organizations, concrete development techniques, and - one step higher - going beyond the concrete technique and proposing a development method for designing concrete types of systems. This state-of-the-art survey is rounded off by five additional lectures addressing key areas in development: agent-oriented modelling languages, implementation of MAS, testing of MAS, software processes, and formal methods for the development of MAS. They permit analysis of the current state in the generation of specifications of MAS, the way these specifications can be implemented, how they can be validated, and what steps are necessary to do so.

This book constitutes the refereed proceedings of the 10th International Conference on Artificial Immune Systems, ICARIS 2011, held in Cambridge, UK, in July 2011. The 37 revised full papers were carefully reviewed and selected from numerous submissions. The papers are organized in topical sections on immunoinformatics and computational immunology; theory of immunological computation; and applied immunological computation.

Today's ever more complex world creates challenges for decision makers. This volume reviews the principles underlying complex decision making, the handling of uncertainties in dynamic environments, and the various modeling approaches. Beginning with a discussion of the underlying concepts, theories and empirical evidence, the book gives you a range of practical tools and techniques for decision making in complex environments and systems.

This book presents the proceedings of the Tenth International Conference on Management Science and Engineering Management (ICMSEM2016) held from August 30 to September 02, 2016 at Baku, Azerbaijan and organized by the International Society of Management Science and Engineering Management, Sichuan University (Chengdu, China) and Ministry of Education of Azerbaijan. The aim of conference was to foster international research collaborations in management science and engineering management as well as to provide a forum to present current research findings. The presented papers were selected and reviewed by the Program Committee, made up of respected experts in the area of management science and engineering management from around the globe. The contributions focus on identifying management science problems in engineering, innovatively using management theory and methods to solve engineering problems effectively and establishing novel management theories and methods to address new engineering management issues.

This series is directed to diverse managerial professionals who are leading the transformation of individual domains by using expert information and domain knowledge to drive decision support systems (DSSs). The series offers a broad range of subjects addressed in specific areas such as health care, business management, banking, agriculture, environmental improvement, natural resource and spatial management, aviation administration, and hybrid applications of information technology aimed to interdisciplinary issues. This book series is

composed of three volumes: Volume 1 consists of general concepts and methodology of DSSs; Volume 2 consists of applications of DSSs in the biomedical domain; Volume 3 consists of hybrid applications of DSSs in multidisciplinary domains. The book is shaped upon decision support strategies in the new infrastructure that assists the readers in full use of the creative technology to manipulate input data and to transform information into useful decisions for decision makers.

The two-volume set LNAI 8856 and LNAI 8857 constitutes the proceedings of the 13th Mexican International Conference on Artificial Intelligence, MICAI 2014, held in Tuxtla, Mexico, in November 2014. The total of 87 papers plus 1 invited talk presented in these proceedings were carefully reviewed and selected from 348 submissions. The first volume deals with advances in human-inspired computing and its applications. It contains 44 papers structured into seven sections: natural language processing, natural language processing applications, opinion mining, sentiment analysis, and social network applications, computer vision, image processing, logic, reasoning, and multi-agent systems, and intelligent tutoring systems. The second volume deals with advances in nature-inspired computation and machine learning and contains also 44 papers structured into eight sections: genetic and evolutionary algorithms, neural networks, machine learning, machine learning applications to audio and text, data mining, fuzzy logic, robotics, planning, and scheduling, and biomedical applications.

This book constitutes the proceedings of the 13th International Conference on Social, Cultural, and Behavioral Modeling, SBP-BRiMS 2020, which was planned to take place in Washington, DC, USA. Due to the COVID-19 pandemic the conference was held online during October 18–21, 2020. The 33 full papers presented in this volume were carefully reviewed and selected from 66 submissions. A wide number of disciplines are represented including computer science, psychology, sociology, communication science, public health, bioinformatics, political science, and organizational science. Numerous types of computational methods are used, such as machine learning, language technology, social network analysis and visualization, agent-based simulation, and statistics.

The information infrastructure - comprising computers, embedded devices, networks and software systems - is vital to day-to-day operations in every sector: information and telecommunications, banking and finance, energy, chemicals and hazardous materials, agriculture, food, water, public health, emergency services, transportation, postal and shipping, government and defense. Global business and industry, governments, indeed society itself, cannot function effectively if major components of the critical information infrastructure are degraded, disabled or destroyed. Critical Infrastructure Protection describes original research results and innovative applications in the interdisciplinary field of critical infrastructure protection. Also, it highlights the importance of weaving science, technology and policy in crafting sophisticated, yet practical, solutions that will help secure information, computer and network assets in the various critical infrastructure sectors. Areas of coverage include: themes and issues; control systems security; infrastructure modeling and simulation; risk and impact assessment. This book is the tenth volume in the annual series produced by the International Federation for Information Processing (IFIP) Working Group 11.10 on Critical Infrastructure Protection, an international community of scientists, engineers, practitioners and policy makers dedicated to advancing research, development and implementation efforts focused on infrastructure protection. The book contains a selection of fourteen edited papers from the Tenth Annual IFIP WG 11.10 International Conference on Critical Infrastructure Protection, held at SRI International, Arlington, Virginia, USA in the spring of 2016. Critical Infrastructure Protection is an important resource for researchers, faculty members and graduate students, as well as for policy makers, practitioners and other individuals with interests in homeland security.

Fifteen papers were presented at the first workshop on Multi-Agent Systems and Agent-Based Simulation held as part of the Agents World conference in Paris, July 4-- 6, 1998. The workshop was designed to bring together two developing communities: the multi-agent systems researchers who were the core participants at Agents World, and social scientists interested in using MAS as a research tool. Most of the social sciences were represented, with contributions touching on sociology, management science, economics, psychology, environmental science, ecology, and linguistics. The workshop was organised in association with SimSoc, an informal group of social scientists who have arranged an irregular series of influential workshops on using simulation in the social sciences beginning in 1992. While the papers were quite heterogeneous in substantive domain and in their disciplinary origins, there were several themes which recurred during the workshop. One of these was considered in more depth in a round table discussion led by Jim Doran at the end of the workshop on 'Representing cognition for social simulation', which addressed the issue of whether and how cognition should be modelled. Quite divergent views were expressed, with some participants denying that individual cognition needed to be modelled at all, and others arguing that cognition must be at the centre of social simulation.

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