

Cuttlefish Algorithm A Novel Bio Inspired Optimization

The 2020 edition of *The State of World Fisheries and Aquaculture* has a particular focus on sustainability. This reflects a number of specific considerations. First, 2020 marks the twenty-fifth anniversary of the Code of Conduct for Responsible Fisheries (the Code). Second, several Sustainable Development Goal indicators mature in 2020. Third, FAO hosted the International Symposium on Fisheries Sustainability in late 2019, and fourth, 2020 sees the finalization of specific FAO guidelines on sustainable aquaculture growth, and on social sustainability along value chains. While Part 1 retains the format of previous editions, the structure of the rest of the publication has been revised. Part 2 opens with a special section marking the twenty fifth anniversary of the Code. It also focuses on issues coming to the fore, in particular, those related to Sustainable Development Goal 14 and its indicators for which FAO is the "custodian" agency. In addition, Part 2 covers various aspects of fisheries and aquaculture sustainability. The topics discussed range widely, from data and information systems to ocean pollution, product legality, user rights and climate change adaptation. Part 3 now forms the final part of the publication, covering projections and emerging issues such as new technologies and aquaculture biosecurity. It concludes by outlining steps towards a new vision for capture fisheries. *The State of World Fisheries and Aquaculture* aims to provide objective, reliable and up-to-date information to a wide audience – policymakers, managers, scientists, stakeholders and indeed everyone interested in the fisheries and aquaculture sector.

The ability to trace and authenticate a food product is of major concern to the food industry. This important topic is reviewed extensively in this authoritative text on current and emerging techniques. Part one deals with analytical techniques applied to food authentication. There are chapters on both established and developing technologies, as well as discussions of chemometrics and data handling. Part two relates these methodologies to particular food and beverage products, such as meat, dairy products, cereals and wine. In part three traceability is reviewed in detail, looking at the development of efficient traceability systems and their application in practice to such areas as animal feed and fish processing. *Food Authenticity and Traceability* is an essential reference for all those concerned with food safety and quality. Outlines methods and issues in food authentication and traceability Deals with analytical techniques applied to food authentication, with chapters on established and developing technologies, chemometrics and data handling Explores how techniques are applied in particular sectors and reviews recent developments in traceability systems for differing food products

International Conference on Innovative Computing and Communications Springer Nature

If we lived in a liquid world, the concept of a "machine" would make no sense. Liquid life is metaphor and apparatus that discusses the consequences of thinking, working, and living through liquids. It is an irreducible, paradoxical, parallel, planetary-scale material condition, unevenly distributed spatially, but temporally continuous. It is what remains when logical explanations can no longer account for the experiences that we recognize as part of "being alive." Liquid life references a third-millennial understanding of matter that seeks to restore the agency of the liquid soul for an ecological era, which has been banished by reductionist, "brute" materialist discourses and mechanical models of life. Offering an alternative worldview of the living realm through a "new materialist" and "liquid" study of matter, it conjures forth examples of creatures that do not obey mechanistic concepts like predictability, efficiency, and rationality. With the advent of molecular science, an increasingly persuasive ontology of liquid technologies can be identified. Through the lens of lifelike dynamic droplets, the agency for these systems exists at the interfaces between different fields of matter/energy that respond to highly local effects, with no need for a central organizing system. *Liquid Life* seeks an alternative partnership between humanity and the natural world. It provokes a re-invention of the languages of the living realm to open up alternative spaces for exploration: Rolf Hughes' "angelology" of language explores the transformative invocations of prose poetry, and Simone Ferracina's graphical notations help shape our concepts of metabolism, upcycling, and designing with fluids. A conceptual and practical toolset for thinking and designing, *Liquid Life* reunites us with the irreducible "soul substance" of living things, which will neither be simply "solved," nor go away. Rachel Armstrong is Professor of Experimental Architecture at Newcastle University (UK), and has also been a Rising Waters II Fellow for the Robert Rauschenberg Foundation (April-May 2016), TWOTY futurist in 2015, Fellow of the British Interplanetary Society, and a Senior TED Fellow in 2010. She is also the coordinator of the Living Architecture project, an EU-funded project that establishes the principles for our buildings to share some of the properties of living things, e.g. metabolism, operating at the intersection of architecture, building construction, bio-energy and synthetic biology. She is also the author of *Vibrant Architecture* (De Gruyter, 2015), *Star Ark: A Living, Self-Sustaining Spaceship* (Springer, 2017), and *Soft Living Architecture: An Alternative View of Bio-informed Design Practice* (Bloomsbury, 2018).

Two Centuries of Darwin is the outgrowth of an Arthur M. Sackler Colloquium, sponsored by the National Academy of Sciences on January 16-17, 2009. In the chapters of this book, leading evolutionary biologists and science historians reflect on and commemorate the Darwinian Revolution. They canvass modern research approaches and current scientific thought on each of the three main categories of selection (natural, artificial, and sexual) that Darwin addressed during his career. Although Darwin's legacy is associated primarily with the illumination of natural selection in *The Origin*, he also contemplated and wrote extensively about what we now term artificial selection and sexual selection. In a concluding section of this book, several science historians comment on Darwin's seminal contributions. *Two Centuries of Darwin* is the third book of the *In the Light of Evolution* series. Each installment in the series explores evolutionary perspectives on a particular biological topic that is scientifically intriguing but also has special relevance to contemporary societal issues or challenges. The ILE series aims to interpret phenomena in various areas of biology through the lens of evolution and address some of the most intellectually engaging, as well as pragmatically important societal issues of our times.

The two volumes LNCS 11982 and 11983 constitute the proceedings of the 11th International Symposium on Cyberspace Safety and Security, CSS 2019, held in Guangzhou, China, in December 2019. The 61 full papers and 40 short papers presented were carefully reviewed and selected from 235 submissions. The papers cover a broad range of topics in the field of cyberspace safety and security, such as authentication, access control, availability, integrity, privacy, confidentiality, dependability and sustainability issues of cyberspace. They are organized in the following topical sections: network security; system security; information security; privacy preservation; machine learning and security; cyberspace safety; big data and security; and cloud and security;

Are we alone? asks the writeup on the back cover of the dust jacket. The contributors to this collection raise questions that may have been overlooked by physical scientists about the ease of establishing meaningful communication with an extraterrestrial intelligence. By drawing on issues at the core of contemporary archaeology and anthropology, we can be much better prepared for contact with an extraterrestrial civilization, should that day ever come. NASA SP-2013-4413.

The book includes high-quality research papers presented at the International Conference on Innovative Computing and Communication (ICICC 2018), which was held at the Guru Nanak Institute of Management (GNIM), Delhi, India on 5–6 May 2018. Introducing the innovative works of scientists, professors, research scholars, students and industrial experts in the field of computing and communication, the book promotes the transformation of fundamental research into institutional and industrialized research and the conversion of applied exploration into real-time applications.

This book highlights a broad range of modern information technology tools, techniques, investigations and open challenges, mainly with applications in systems research and computational physics. Divided into three major sections, it begins by presenting specialized calculation methods in the framework of data analysis and intelligent computing. In turn,

the second section focuses on application aspects, mainly for systems research, while the final section investigates how various tasks in the basic disciplines—mathematics and physics—can be tackled with the aid of contemporary IT methods. The book gathers selected presentations from the 3rd Conference on Information Technology, Systems Research and Computational Physics (ITSRCP'18), which took place on 2–5 July 2018 in Krakow, Poland. The intended readership includes interdisciplinary scientists and practitioners pursuing research at the interfaces of information technology, systems research, and computational physics.

Many researchers have focused on the diagnosis of heart disease, yet the accuracy of the diagnosis results is low. To address this issue, an IoT framework is proposed to evaluate heart disease more accurately using a Modified Deep Convolutional Neural Network (MDCNN). The smartwatch and heart monitor device that is attached to the patient monitors the blood pressure and electrocardiogram (ECG). The MDCNN is utilized for classifying the received sensor data into normal and abnormal.

How Creativity Happens In The Brain is about the brain mechanisms of creativity, how a grapefruit-sized heap of meat crackling with electricity manages to be so outrageously creative. It has a sharp focus: to stick exclusively to sound, mechanistic explanations and convey what we can, and cannot, say about how brains give rise to creative ideas. The book features selected high-quality papers presented in International Conference on Computing, Power and Communication Technologies 2019 (GUCON 2019), organized by Galgotias University, India, in September 2019. Discussing in detail topics related to electronics devices, circuits and systems; signal processing; and bioinformatics, multimedia and machine learning, the papers in this book provide interesting reading for researchers, engineers, and students.

From simple cases such as hook and latch attachments found in Velcro to articulated-wing flying vehicles, biology often has been used to inspire many creative design ideas. The scientific challenge now is to transform the paradigm into a repeatable and scalable methodology. Biologically Inspired Design explores computational techniques and tools that can help integrate the method into design practice. With an inspiring foreword from Janine Benyus, Biologically Inspired Design contains a dozen chapters written by some of the leading scholars in the transdisciplinary field of bioinspired design, such as Frank Fish, Julian Vincent and Jeannette Yen from biology, and Amarek Chakrabarti, Satyandra Gupta and Li Shu from engineering. Based in part on discussions at two workshops sponsored by the United States National Science Foundation, this volume introduces and develops several methods and tools for bioinspired design including: Information-processing theories, Natural language techniques, Knowledge-based tools, and Functional approaches and Pedagogical techniques. By exploring these fundamental theories, techniques and tools for supporting biologically inspired design, this volume provides a comprehensive resource for design practitioners wishing to explore the paradigm, an invaluable guide to design educators interested in teaching the method, and a preliminary reading for design researchers wanting to investigate bioinspired design.

This book includes high-quality research papers presented at the Third International Conference on Innovative Computing and Communication (ICICC 2020), which is held at the Shaheed Sukhdev College of Business Studies, University of Delhi, Delhi, India, on 21-23 February, 2020. Introducing the innovative works of scientists, professors, research scholars, students and industrial experts in the field of computing and communication, the book promotes the transformation of fundamental research into institutional and industrialized research and the conversion of applied exploration into real-time applications.

Nature-Inspired Optimization Algorithms provides a systematic introduction to all major nature-inspired algorithms for optimization. The book's unified approach, balancing algorithm introduction, theoretical background and practical implementation, complements extensive literature with well-chosen case studies to illustrate how these algorithms work. Topics include particle swarm optimization, ant and bee algorithms, simulated annealing, cuckoo search, firefly algorithm, bat algorithm, flower algorithm, harmony search, algorithm analysis, constraint handling, hybrid methods, parameter tuning and control, as well as multi-objective optimization. This book can serve as an introductory book for graduates, doctoral students and lecturers in computer science, engineering and natural sciences. It can also serve a source of inspiration for new applications. Researchers and engineers as well as experienced experts will also find it a handy reference. Discusses and summarizes the latest developments in nature-inspired algorithms with comprehensive, timely literature Provides a theoretical understanding as well as practical implementation hints Provides a step-by-step introduction to each algorithm

This book presents and applies a novel efficient meta-heuristic optimization algorithm called Colliding Bodies Optimization (CBO) for various optimization problems. The first part of the book introduces the concepts and methods involved, while the second is devoted to the applications. Though optimal design of structures is the main topic, two chapters on optimal analysis and applications in constructional management are also included. This algorithm is based on one-dimensional collisions between bodies, with each agent solution being considered as an object or body with mass. After a collision of two moving bodies with specified masses and velocities, these bodies again separate, with new velocities. This collision causes the agents to move toward better positions in the search space. The main algorithm (CBO) is internally parameter independent, setting it apart from previously developed meta-heuristics. This algorithm is enhanced (ECBO) for more efficient applications in the optimal design of structures. The algorithms are implemented in standard computer programming languages (MATLAB and C++) and two main codes are provided for ease of use. Evolutionary algorithms are becoming increasingly attractive across various disciplines, such as operations research, computer science, industrial engineering, electrical engineering, social science and economics. Introduction to Evolutionary Algorithms presents an insightful, comprehensive, and up-to-date treatment of evolutionary algorithms. It covers such hot topics as: • genetic algorithms, • differential evolution, • swarm intelligence, and • artificial immune systems. The reader is introduced to a range of

applications, as Introduction to Evolutionary Algorithms demonstrates how to model real world problems, how to encode and decode individuals, and how to design effective search operators according to the chromosome structures with examples of constraint optimization, multiobjective optimization, combinatorial optimization, and supervised/unsupervised learning. This emphasis on practical applications will benefit all students, whether they choose to continue their academic career or to enter a particular industry. Introduction to Evolutionary Algorithms is intended as a textbook or self-study material for both advanced undergraduates and graduate students. Additional features such as recommended further reading and ideas for research projects combine to form an accessible and interesting pedagogical approach to this widely used discipline.

This book constitutes the refereed proceedings of the 19th EPIA Conference on Artificial Intelligence, EPIA 2019, held in Funchal, Madeira, Portugal, in September 2019. The 119 revised full papers and 6 short papers presented were carefully reviewed and selected from a total of 252 submissions. The papers are organized in 18 tracks devoted to the following topics: AIEd - Artificial Intelligence in Education, AI4G - Artificial Intelligence for Games, AIoTA - Artificial Intelligence and IoT in Agriculture, AIL - Artificial Intelligence and Law, AIM - Artificial Intelligence in Medicine, AICPDES - Artificial Intelligence in Cyber-Physical and Distributed Embedded Systems, AIPES - Artificial Intelligence in Power and Energy Systems, AITS - Artificial Intelligence in Transportation Systems, ALEA - Artificial Life and Evolutionary Algorithms, AmlA - Ambient Intelligence and Affective Environments, BAAI - Business Applications of Artificial Intelligence, GAI- General AI, IROBOT - Intelligent Robotics, KDBI - Knowledge Discovery and Business Intelligence, KRR - Knowledge Representation and Reasoning, MASTA - Multi-Agent Systems: Theory and Applications, SSM - Social Simulation and Modelling, TeMA - Text Mining and Applications.

A broad spectrum of modern Information Technology (IT) tools, techniques, main developments and still open challenges is presented. Emphasis is on new research directions in various fields of science and technology that are related to data analysis, data mining, knowledge discovery, information retrieval, clustering and classification, decision making and decision support, control, computational mathematics and physics, to name a few. Applications in many relevant fields are presented, notably in telecommunication, social networks, recommender systems, fault detection, robotics, image analysis and recognition, electronics, etc. The methods used by the authors range from high level formal mathematical tools and techniques, through algorithmic and computational tools, to modern metaheuristics.

Nature-inspired computation and swarm intelligence have become popular and effective tools for solving problems in optimization, computational intelligence, soft computing and data science. Recently, the literature in the field has expanded rapidly, with new algorithms and applications emerging. Nature-Inspired Computation and Swarm Intelligence: Algorithms, Theory and Applications is a timely reference giving a comprehensive review of relevant state-of-the-art developments in algorithms, theory and applications of nature-inspired algorithms and swarm intelligence. It reviews and documents the new developments, focusing on nature-inspired algorithms and their theoretical analysis, as well as providing a guide to their implementation. The book includes case studies of diverse real-world applications, balancing explanation of the theory with practical implementation. Nature-Inspired Computation and Swarm Intelligence: Algorithms, Theory and Applications is suitable for researchers and graduate students in computer science, engineering, data science, and management science, who want a comprehensive review of algorithms, theory and implementation within the fields of nature inspired computation and swarm intelligence. Introduces nature-inspired algorithms and their fundamentals, including: particle swarm optimization, bat algorithm, cuckoo search, firefly algorithm, flower pollination algorithm, differential evolution and genetic algorithms as well as multi-objective optimization algorithms and others Provides a theoretical foundation and analyses of algorithms, including: statistical theory and Markov chain theory on the convergence and stability of algorithms, dynamical system theory, benchmarking of optimization, no-free-lunch theorems, and a generalized mathematical framework Includes a diversity of case studies of real-world applications: feature selection, clustering and classification, tuning of restricted Boltzmann machines, travelling salesman problem, classification of white blood cells, music generation by artificial intelligence, swarm robots, neural networks, engineering designs and others

This book provides a platform for exploring nature-inspired optimization techniques in the context of imaging applications. Optimization has become part and parcel of all computational vision applications, and since the amount of data used in these applications is vast, the need for optimization techniques has increased exponentially. These accuracy and complexity are a major area of concern when it comes to practical applications. However, these optimization techniques have not yet been fully explored in the context of imaging applications. By presenting interdisciplinary concepts, ranging from optimization to image processing, the book appeals to a broad readership, while also encouraging budding engineers to pursue and employ innovative nature-inspired techniques for image processing applications.

This book covers controller tuning techniques from conventional to new optimization methods for diverse control engineering applications. Classical controller tuning approaches are presented with real-world challenges faced in control engineering. Current developments in applying optimization techniques to controller tuning are explained. Case studies of optimization algorithms applied to controller tuning dealing with nonlinearities and limitations like the inverted pendulum and the automatic voltage regulator are presented with performance comparisons. Students and researchers in engineering and optimization interested in optimization methods for controller tuning will utilize this book to apply optimization algorithms to controller tuning, to choose the most suitable optimization algorithm for a specific application, and to develop new optimization techniques for controller tuning. This book brings together the current state-of-the-art research in Self Organizing Migrating Algorithm (SOMA) as a novel population-based evolutionary algorithm, modeled on the predator-prey relationship, by its leading practitioners. As the first ever book on SOMA, this book is geared towards graduate students, academics and researchers, who are looking for a good optimization algorithm for their applications. This book presents the methodology of SOMA, covering both the real and discrete domains, and its various implementations in different research areas. The easy-to-follow and implement methodology used in the book will make it easier for a reader to implement, modify and utilize SOMA.

This revised and expanded new edition is a meticulously documented resource dealing with the age-old creation/evolution controversy. The author, who received a PhD from M.I.T., carefully explains and illustrates scientific evidence from biology, astronomy, and the physical and earth sciences that relates to origins and the flood. The hydroplate theory, developed after more than 30 years of study by Dr. Walt Brown, explains, with overwhelming scientific evidence, earth's defining geological event - a worldwide flood. This book includes an index, extensive endnotes and references, technical notes, answers to 36 frequently asked questions on related topics, and hundreds of illustrations, most in full color.

A fully updated overview of the causation, function, development and evolution of cephalopod behaviour, richly illustrated in full

colour.

This book presents a detailed description, analysis, comparison of the latest research and developments in photovoltaic energy. Discussing everything from semiconductors to system integration, and applying various advanced technologies to stand alone and electric utility interfaced in normal and abnormal operating conditions of PV systems, this book provides a thorough introduction to the topic. This book brings together research from around the world, covering the use of technologies such as embedded systems, the Internet of things and blockchain technologies for PV systems for different applications including controllers, solar trackers and cooling systems. The book is of interest to electronic and mechanical engineers, researchers and students in the field of photovoltaics.

The translated, complete text of Derrida's 1997 ten-hour address, "The Autobiographical Animal," focusing on the industrialized treatment of animals. *The Animal That Therefore I Am* is at once an affectionate look back over the multiple roles played by animals in Derrida's work and a profound philosophical investigation and critique of the relegation of animal life that takes place as a result of the distinction dating from Descartes between man as thinking animal and every other living species. That starts with the very fact of the line of separation drawn between the human and the millions of other species that are reduced to a single "the animal." Derrida finds that distinction, or versions of it, surfacing in thinkers as far apart as Descartes, Kant, Heidegger, Lacan, and Levinas, and he dedicates extended analyses to the question in the work of each of them. The book's autobiographical theme intersects with its philosophical analysis through the figures of looking and nakedness, staged in terms of Derrida's experience when his cat follows him into the bathroom in the morning. In a classic deconstructive reversal, Derrida asks what this animal sees and thinks when it sees this naked man. Yet the experiences of nakedness and shame also lead all the way back into the mythologies of "man's dominion over the beasts" and trace a history of how man has systematically displaced onto the animal his own failings or *bêtises*. *The Animal That Therefore I Am* is at times a militant plea and indictment regarding, especially, the modern industrialized treatment of animals. However, Derrida cannot subscribe to a simplistic version of animal rights that fails to follow through, in all its implications, the questions and definitions of "life" to which he returned in much of his later work.

The book's contributing authors are among the top researchers in swarm intelligence. The book is intended to provide an overview of the subject to novices, and to offer researchers an update on interesting recent developments. Introductory chapters deal with the biological foundations, optimization, swarm robotics, and applications in new-generation telecommunication networks, while the second part contains chapters on more specific topics of swarm intelligence research.

These volumes of "Advances in Intelligent Systems and Computing" highlight papers presented at the "Third Iberian Robotics Conference (ROBOT 2017)". Held from 22 to 24 November 2017 in Seville, Spain, the conference is a part of a series of conferences co-organized by SEIDROB (Spanish Society for Research and Development in Robotics) and SPR (Portuguese Society for Robotics). The conference is focused on Robotics scientific and technological activities in the Iberian Peninsula, although open to research and delegates from other countries. Thus, it has more than 500 authors from 21 countries. The volumes present scientific advances but also robotic industrial applications, looking to promote new collaborations between industry and academia.

Natural Language and Possible Minds: How Language Uncovers the Cognitive Landscape of Nature examines the intrinsic connection between natural language and the nature of mentality, offering to show how language can shed light on the forms of other types of mentality in non-humans.

This open access book provides a comprehensive examination of the European Landing Obligation policy from many relevant perspectives. It includes evaluations of its impacts at economical, socio-cultural, ecological and institutional levels. It also discusses the feasibility and benefits of several potential mitigation strategies. The book was timely published, exactly at the time where the Landing Obligation was planned to be fully implemented. This book is of significant interest to all stakeholders involved, but also to the general public of Europe and to other jurisdictions throughout the world that are also searching for ways to deal with by-catch and discard issues.

Human cortical bone as a structural material : Hierarchical design and biological degradation / Robert Ritchie and Elizabeth A. Zimmermann -- Bio-inspiration from nacre / Nima Rahbar and Sina Askarinejad -- Bio-inspiration from bamboo / Ting Tan and Wole Soboyejo.

The definitive guide to peptidomics- a hands-on lab reference The first truly comprehensive book about peptidomics for protein and peptide analysis, this reference provides a detailed description of the hows and whys of peptidomics and how the techniques have evolved. With chapters contributed by leading experts, it covers naturally occurring peptides, peptidomics methods and new developments, and the peptidomics approach to biomarker discovery. Explaining both the principles and the applications, *Peptidomics: Methods and Applications*: * Features examples of applications in diverse fields, including pharmaceutical science, toxicity biomarkers, and neuroscience * Details the successful peptidomic analyses of biological material ranging from plants to mammals * Describes a cross section of analytical techniques, including traditional methodologies, emerging trends, and new techniques for high throughput approaches An enlightening reference for experienced professionals, this book is sufficiently detailed to serve as a step-by-step guide for beginning researchers and an excellent resource for students taking biotechnology and proteomics courses. It is an invaluable reference for protein chemists and biochemists, professionals and researchers in drug and biopharmaceutical development, analytical and bioanalytical chemists, toxicologists, and others.

Our current knowledge of marine organisms and the factors affecting their ecology, distribution and evolution has been revolutionised by the use, in the last 20 years, of molecular population genetics tools. This book is the result of a meeting of world-leading experts, in Rio de Janeiro, where the state of the art of this field was reviewed. Topics covered include the molecular analysis of bio-invasions, the recent developments in marine biotechnology, the factors affecting levels of genetic variation and population structure in marine organisms and their application to conservation biology, fisheries and aquaculture. This is the first book dedicated to the genetic study of marine organisms. It will be very useful to biology students, scientists and anyone working or simply interested in areas such as marine biology, zoology, ecology, and population and molecular genetics.

At the dawn of the 4th Industrial Revolution, the field of Deep Learning (a sub-field of Artificial Intelligence and Machine Learning) is growing continuously and rapidly, developing both theoretically and towards applications in increasingly many and diverse other disciplines. The book at hand aims at exposing its reader to some of the most significant recent advances in deep learning-based technological applications and consists of an editorial note and an additional fifteen (15) chapters. All chapters in the book were invited from authors who work in the corresponding chapter theme and are recognized for their significant research contributions.

In more detail, the chapters in the book are organized into six parts, namely (1) Deep Learning in Sensing, (2) Deep Learning in Social Media and IOT, (3) Deep Learning in the Medical Field, (4) Deep Learning in Systems Control, (5) Deep Learning in Feature Vector Processing, and (6) Evaluation of Algorithm Performance. This research book is directed towards professors, researchers, scientists, engineers and students in computer science-related disciplines. It is also directed towards readers who come from other disciplines and are interested in becoming versed in some of the most recent deep learning-based technological applications. An extensive list of bibliographic references at the end of each chapter guides the readers to probe deeper into their application areas of interest.

This book comprises select proceedings of the International Conference on Emerging Technologies for Farming – Energy & Environment – Water (ITsFEW 2018). The contents are divided into three parts viz., (i) Developments in Farming, (ii) Energy and Environment, and (iii) Water Conservation and Management. The book aims to provide timely solutions, using innovative and emerging technologies, to the global challenges in agriculture, energy, environment, and water management. Some of the topics covered in this book include remote sensing for smart farming, GIS, irrigation engineering, soil science and agronomy, smart grids, renewable energy, energy management systems, energy storage technologies, biological water treatment, industrial waste water treatment, watershed management and sustainability. Given the wide range of topics discussed, the book will be very useful for students, researchers and practitioners interested in agricultural and environmental engineering.

This self-contained book, written by active researchers, presents up-to-date information on smart maintenance strategies for human–robot interaction (HRI) and the associated applications of novel search algorithms in a single volume, eliminating the need to consult scattered resources. Unlike other books, it addresses maintaining a smart HRI from three dimensions, namely, hardware, cyberware, and hybrid-asset management, covering problems encountered in each through a wide variety of representative examples and elaborated illustrations. Further, the diverse mathematical models and intelligent systems constructions make the book highly practical. It enables readers interested in maintenance, robotics, and intelligent systems but perplexed by myriads of interrelated issues to grasp basic methodologies. At the same time, the referenced literature can be used as a roadmap for conducting deeper researches.

Functional advanced biopolymers have received far less attention than renewable biomass (cellulose, rubber, etc.) used for energy production. Among the most advanced biopolymers known is chitosan. The term chitosan refers to a family of polysaccharides obtained by partial de-N-acetylation from chitin, one of the most abundant renewable resources in the biosphere. Chitosan has been firmly established as having unique material properties as well as biological activities. Either in its native form or as a chemical derivative, chitosan is amenable to being processed—typically under mild conditions—into soft materials such as hydrogels, colloidal nanoparticles, or nanofibers. Given its multiple biological properties, including biodegradability, antimicrobial effects, gene transfectability, and metal adsorption—to name but a few—chitosan is regarded as a widely versatile building block in various sectors (e.g., agriculture, food, cosmetics, pharmacy) and for various applications (medical devices, metal adsorption, catalysis, etc.). This Special Issue presents an updated account addressing some of the major applications, including also chemical and enzymatic modifications of oligos and polymers. A better understanding of the properties that underpin the use of chitin and chitosan in different fields is key for boosting their more extensive industrial utilization, as well as to aid regulatory agencies in establishing specifications, guidelines, and standards for the different types of products and applications.

Hard machining is a relatively recent technology that can be defined as a machining operation, using tools with geometrically defined cutting edges, of a work piece that has hardness values typically in the 45-70HRC range. This operation always presents the challenge of selecting a cutting tool insert that facilitates high-precision machining of the component, but it presents several advantages when compared with the traditional methodology based in finish grinding operations after heat treatment of work pieces. Machining of Hard Materials aims to provide the reader with the fundamentals and recent advances in the field of hard machining of materials. All the chapters are written by international experts in this important field of research. They cover topics such as: • advanced cutting tools for the machining of hard materials; • the mechanics of cutting and chip formation; • surface integrity; • modelling and simulation; and • computational methods and optimization. Machining of Hard Materials can serve as a useful reference for academics, manufacturing and materials researchers, manufacturing and mechanical engineers, and professionals in machining and related industries. It can also be used as a text for advanced undergraduate or postgraduate students studying mechanical engineering, manufacturing, or materials.

Network on Chip (NoC) addresses the communication requirement of different nodes on System on Chip. The bio-inspired algorithms improve the bandwidth utilization, maximize the throughput and reduce the end-to-end latency and inter-flit arrival time. This book exclusively presents in-depth information regarding bio-inspired algorithms solving real world problems focussing on fault-tolerant algorithms inspired by the biological brain and implemented on NoC. It further documents the bio-inspired algorithms in general and more specifically, in the design of NoC. It gives an exhaustive review and analysis of the NoC architectures developed during the last decade according to various parameters. Key Features: Covers bio-inspired solutions pertaining to Network-on-Chip (NoC) design solving real world examples Includes bio-inspired NoC fault-tolerant algorithms with detail coding examples Lists fault-tolerant algorithms with detailed examples Reviews basic concepts of NoC Discusses NoC architectures developed-to-date

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