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Language and Automata Theory and Applications Adrian-Horia Dediu 2012-02-29 This book constitutes the refereed proceedings of the 6th International Conference on Language and Automata Theory and Applications, LATA 2012, held in A Coruña, Spain in March 2012. The 41 revised full papers presented together with 3 invited talks and 2 invited tutorials were carefully reviewed and selected from 114 initial submissions. The volume features contributions from both classical theory fields and application areas; e.g. innformatics, systems biology, language technology, artificial intelligence, etc. Among the topics covered are algebraic language theory, automata and logic, systems analysis, systems verifications, computational complexity, decidability, unification, graph transformations, language-based cryptography, and applications in data mining, computational learning, and pattern recognition.
Membrane Computing George Eleftherakis 2007-11-25 For anyone needing to keep up to date with all the latest research in the field of membrane computing, this book will come as a breath of fresh air. It is the extended post-proceedings of the 8th International Workshop on Membrane Computing, held in June 2007. A total of 27 revised papers are presented. All of them have been through two rounds of reviewing. Special attention has been paid to the interaction of membrane computing with biology and computer science.
Applications of Membrane Computing Gabriel Ciobanu 2007-08-06 Membrane computing is a branch of natural computing which investigates computing models abstracted from the structure and functioning of living cells and from their interactions in tissues or higher-order biological structures. The models considered, called membrane systems (P systems), are parallel, distributed computing models, processing multisets of symbols in cell-like compartmental architectures. In many applications membrane systems have considerable advantages – among these are their inherently discrete nature, parallelism, transparency, scalability and nondeterminism. In dedicated chapters, leading experts explain most of the applications of membrane computing reported so far, in biology, computer science, computer graphics and linguistics. The book also contains detailed reviews of the software tools used to simulate P systems.
Membrane Computing Marian Gheorghe 2014-12-16 This book constitutes the thoroughly refereed post-conference proceedings of the 15th International Conference on Membrane Computing, CMC 2014, held in Prague, Czech Republic, in August 2014. The 19 revised selected papers presented together with 5 invited lectures were carefully reviewed and selected from 24 papers presented at the conference. In addition, two papers selected from the 22 papers presented at the regional version of CMC, the Asian Conference on Membrane Computing , ACMC 2014, held in Coimbatore, India, are included. The papers cover a wide range of topics in the area of membrane computing, which is an area of computer science aiming to abstract computing ideas and models from the structure and the functioning of living cells, as well as from the way the cells are organized in tissues or higher order structures.
Relations and Kleene Algebra in Computer Science Renate A. Schmidt 2006-08-17 The book constitutes the joint refereed proceedings of the 9th International Conference on Relational Methods in Computer Science, RelMiCS 2006, and the 4th International Workshop on Applications of Kleene Algebras, AKA 2006, held in Manchester, UK in August/September 2006. The 25 revised full papers presented together with two invited papers and the abstract of an invited talk were carefully reviewed and selected from 44 submissions.
Unconventional Computation Cristian S. Calude 2011-05-27 This book constitutes the refereed proceedings of the 10th International Conference on Unconventional Computation, UC 2011, held in Turku, Finland, in June 2011. The 17 revised full papers presented together with 6 extended abstracts of invited talks, and 3 extended abstracts of tutorials were carefully reviewed and selected from 33 initial submissions. The papers are devoted to all aspects of unconventional computation theory as well as experiments and applications. Typical topics are: natural computing including quantum, cellular, molecular, membrane, neural, and evolutionary computing, as well as chaos and dynamical system-based computing, and various proposals for computational mechanisms that go beyond the Turing model.
Membrane Computing Spain) Wmc 200 (2003 Tarragona 2004-01-28 This book constitutes the thoroughly refereed post-proceedings of the International Workshop on Membrane Computing, WMC 2003, held in Tarragona, Spain, in July 2003. The 26 revised full papers presented were carefully selected during two rounds of reviewing and improvement. All current topics in the emerging area of membrane computing are addressed, ranging from issues in mathematics and theoretical computer science to (potential) applications in biology, bioinformatics, sorting, ranking, linguistics, and computer graphics; several implementations and simulations on computers, computer networks, and reconfigurable hardware are presented too.
Membrane Computing Rudolf Freund 2021-06-03 This book constitutes the refereed post-conference proceedings of the 21st International Conference on Membrane Computing, CMC 2020, held as a virtual event, in September 2020. The 10 full papers presented were selected from 31 submissions. The papers deal with all aspects on membrane computing and related areas.
Membrane Computing Giancarlo Mauri 2008-01-04 This book constitutes the thoroughly refereed extended postproceedings of the 5th International Workshop on Membrane Computing, WMC 2004, held in Milan, Italy in June 2004. The 20 revised full papers presented together with 6 invited papers went through two rounds of reviewing and improvement. All current topics in the area of membrane computing are addressed, ranging from mathematics and theoretical computer science to applications in biology, linguistics, and computer graphics. Issues related to computational power and complexity classes, new classes of P systems, fuzzy approaches, and reversibility and energy consumption are dealt with as well.
Formal and Natural Computing Wilfried Brauer 2002-02-06 This book presents state of the art research in theoretical computer science and related ?elds. In particular, the following areas are discussed: automata theory, formal languages and combinatorics of words, graph transformations, Petri nets, concurrency, as well as natural and molecular computing. The articles are written by leading researchers in these areas. The writers were originally invited to contribute to this book but then the normal refereeing procedure was applied as well. All of the articles deal with some issue that has been under vigorous study during recent years. Still, the topics range from very classical ones to issues raised only two or three years ago. Both survey articles and papers attacking speci?c research problems are included. The book highlights some key issues of theoretical computer science, as they seem to us now at the beginning of the new millennium. Being a comprehensive overview of some of the most active current research in theoretical computer science, it should be of de?nite interest for all researchers in the areas covered. The topics range from basic decidability and the notion of information to graph grammars and graph transformations, and from trees and traces to aqueous algorithms, DNA encoding and self-assembly. Special e?ort has been given to lucid presentation. Therefore, the book should be of interest also for advanced students.
Computation, Cooperation, and Life Jozef Kelemen 2011-06-21 Gheorghe Păun has played an important role within a wide range of disciplines, from the foundations of traditional computation theory and formal language theory to research gaining its inspiration from living nature. He has significantly contributed to the development of these diverse fields, initiating and pioneering some of them with remarkable imaginativeness and enthusiasm. Gheorghe Păun's research focusses on systems inspired by structures and processes found in living systems, with the field of membrane computing or P systems being the most important of his initiatives. This Festschrift volume, published to honor Gheorghe Păun on the occasion of his 60th birthday, includes 16 contributions by his students and collaborators. The research presented aims to gain a better understanding of what computation is, to find better models of computation, and to look for new computing devices inspired by the structure and/or functioning of natural or societal systems. The papers are preceded by an introduction by Solomon Marcus, Gheorghe Păun's lifelong teacher and mentor, and are organized in topical sections on general computing, grammar systems, membrane systems, and inspirations from natural computing.
Unconventional Computation and Natural Computation Ian McQuillan 2019-05-27 This book constitutes the proceedings of the 18th International Conference on Unconventional Computation and Natural Computation, UCNC 2019, held in Tokyo, Japan, in June 2019. The 19 full papers presented were carefully reviewed and selected from 32 submissions. The papers cover topics such as hypercomputation; chaos and dynamical systems based computing; granular, fuzzy and rough computing; mechanical computing; cellular, evolutionary, molecular, neural, and quantum computing; membrane computing; amorphous computing, swarm intelligence; artificial immune systems; physics of computation; chemical computation; evolving hardware; the computational nature of self-assembly, developmental processes, bacterial communication, and brain processes.
Rough Sets Tamás Mihálydeák 2019-06-10 This LNAI 11499 constitutes the proceedings of the International Joint Conference on Rough Sets, IJCRS 2019, held in Debrecen, Hungary, in June 2019. The 41 full papers were carefully reviewed and selected from 71 submissions. The IJCRS conferences aim at bringing together experts from universities and research centers as well as the industry representing fields of research in which theoretical and applicational aspects of rough set theory already find or may potentially find usage. The papers are grouped in topical sections on core rough set models and methods; related methods and hybridization; areas of application.
Membrane Computing Gheorghe Paun 2013-11-20 Membrane computing is an unconventional model of computation associated with a new computing paradigm. The field of membrane computing was initiated in 1998 by the author of this book; it is a branch of natural computing inspired by the structure and functioning of the living cell and devises distributed parallel computing models in the form of membrane systems. This book is the first monograph surveying the new field in a systematic and coherent way. It presents the central notions and results: the main classes of P systems, the main results about their computational power and efficiency, a complete bibliography, and a series of open problems and research topics.
Computing with Cells Pierluigi Frisco 2009-05-21 Membrane systems are a new class of distributed and parallel model of computation inspired by the subdivision of living cells into compartments delimited by membranes. Their hierarchical internal structure, their locality of interactions, their inherent parallelism and also their capacity to create new compartments, represent the distinguishing hallmarks of membrane systems. Membrane computing, the study of membrane systems, is a fascinating and fast growing area of research. The main streams of current investigations in Membrane Computing concern theoretical computer science and the modelling of complex systems. In this monograph Pierluigi Frisco considers the former trend: he presents an in-depth study of the formal language and computational complexity aspects of the most widely investigated models of membrane systems. This study gives a comprehensive understanding of the computational power of the models considered, shows different proof techniques used for such study, and introduces links highlighting the similarities and differences between the their computational power. These models cover a broad range of features, giving a grasp of the enormous flexibility of the framework offered by membrane systems. Aimed at graduates and researchers in the field, who can use it as a reference text, and to people with an initial interest in Membrane Computing, who can use it as a clear and up to date starting point for Membrane Computing.
Membrane Computing Artiom Alhazov 2014-01-20 This book constitutes the thoroughly refereed post-conference proceedings of the 14th International Conference on Membrane Computing, CMC 2013, held in Chişinău, Republic of Moldova, in August 2013. The 16 revised selected papers presented together with 6 invited lectures were carefully reviewed and selected from 26 papers presented at the conference. Membrane computing is an area of computer science aiming to abstract computing ideas and models from the structure and the functioning of living cells, as well as from the way the cells are organized in tissues or higher order structures. It deals with membrane systems, also called P systems, which are distributed and parallel algebraic models processing multi sets of objects in a localized manner (evolution rules and evolving objects are encapsulated into compartments delimited by membranes), with an essential role played by the communication among compartments and with the environment.
Applications of Membrane Computing Gabriel Ciobanu 2010-02-12 Membrane computing is a branch of natural computing which investigates computing models abstracted from the structure and functioning of living cells and from their interactions in tissues or higher-order biological structures. The models considered, called membrane systems (P systems), are parallel, distributed computing models, processing multisets of symbols in cell-like compartmental architectures. In many applications membrane systems have considerable advantages – among these are their inherently discrete nature, parallelism, transparency, scalability and nondeterminism. In dedicated chapters, leading experts explain most of the applications of membrane computing reported so far, in biology, computer science, computer graphics and linguistics. The book also contains detailed reviews of the software tools used to simulate P systems.
Membrane Computing Thomas Hinze 2019-01-31 This book constitutes revised selected papers from the 19th International Conference on Membrane Computing (CMC19), CMC 2018, which was held in Dresden, Germany, in September 2018. The 15 papers presented in this volume were carefully reviewed and selected from 20 submissions. The contributions aim to abstract computing ideas and models from the structure and the functioning of living cells, as well as from the way the cells are organized in tissues or higher order structures.
Models of Computation in Context Benedikt Löwe 2011-06-22 This book constitutes the refereed proceedings of the 7th Conference on Computability in Europe, CiE 2011, held in Sofia, Bulgaria, in June/July 2011. The 22 revised papers presented together with 11 invited lectures were carefully reviewed and selected with an acceptance rate of under 40%. The papers cover the topics computability in analysis, algebra, and geometry; classical computability theory; natural computing; relations between the physical world and formal models of computability; theory of transfinite computations; and computational linguistics.
Unconventional Computation Christian S. Calude 2010-06-26 The 9th International Conference on Unconventional Computation, UC 2010, was organized under the auspices of EATCS and Academia Europaea, by the University of Tokyo (Tokyo, Japan), and the Center for Discrete Mathematics and Theoretical Computer Science (Auckland, New Zealand). It was held in Tokyoduring June 21–25,2010(seehttp://arn.local.frs.riken.jp/UC10/). The venue was the Sanjo (Hilltop) Conference Hall at Hongo Campus of the University of Tokyo. Hongo Campus was formerly the residence of the Maeda family, one of the richest feudal lords in the Edo period of Japan. The Japanese garden in the residence is partially preserved, including the pond and the hill on which the conference hall is located. Within walking distance from Hongo Campus are Ueno park with many museums, the Akihabara area, which is now the center of Japanesepop culture, and the Korakuenamusement park/baseball stadium. The International Conference on Unconventional Computation (UC) series (seehttp://www.cs.auckland.ac.nz/CDMTCS/conferences/uc/)isdevotedto all aspects of unconventional computation — theory as well as experiments and applications. Typical, but not exclusive, topics are: natural computing including quantum, cellular, molecular, membrane, neural, and evolutionary computing, as well as chaos and dynamical system-based computing, and various proposals for computational mechanisms that go beyond the Turing model.
Membrane Computing Carlos Martín-Vide 2004-02-02 This volume is based on papers presented at the Workshop on Membrane Computing, WMC 2003, which took place in Tarragona, Spain, in the - riod July 17-July 22, 2003. This was the Fourth Annual Membrane Computing Workshop, and the?rst one held outside Romania. The?rst three meetings were organized in Curtea de Argeı s, Romania - they took place in August 2000 (with the proceedings published in Lecture Notes in Computer Science, Vol. 2235), in August 2001 (with a selection of papers published as a special issue of F- damenta Informaticae, Vol. 49, Nos. 1-3, 2002), and in August 2002 (with the proceedings published in Lecture Notes in Computer Science, Vol. 2597). The 2003 workshop was the second workshop of the Molecular Computing Network (MolCoNet) funded by the EU Commission in the Fifth Framework Program Information Society Technologies (project number IST-2001-32008). The preproceedings of WMC 2003 were published as Technical Report 28/03 of theResearchGrouponMathematicalLinguisticsfromRoviraiVirgiliUniversity, Tarragona, and they were available during the workshop.
Membrane Computing Hendrik Jan Hoogeboom 2007-01-25 This book constitutes the thoroughly refereed extended post-proceedings of the 7th International Workshop on Membrane Computing, WMC 2006, held in Leiden, Netherlands in July 2006. The papers in this volume cover all the main directions of research in membrane computing, ranging from theoretical topics in mathematics and computer science, to application issues. Special attention was paid to the interaction of membrane computing with biology.
Membrane Computing Gheorghe Paun 2002-08-01 Membrane computing is an unconventional model of computation associated with a new computing paradigm. The field of membrane computing was initiated in 1998 by the author of this book; it is a branch of natural computing inspired by the structure and functioning of the living cell and devises distributed parallel computing models in the form of membrane systems. This book is the first monograph surveying the new field in a systematic and coherent way. It presents the central notions and results: the main classes of P systems, the main results about their computational power and efficiency, a complete bibliography, and a series of open problems and research topics.
Membrane Computing David Corne 2009-01-15 This volume contains a selection of papers presented at the 9th Workshop on Membrane Computing, WMC9, which took place in Edinburgh, UK, during July 28–31,2008. The ?rst three workshopson membrane computing were or- nized in Curtea de Arge¸ s, Romania – they took place in August 2000 (with the proceedings published in Lecture Notes in Computer Science, volume 2235), in August 2001 (with a selection of papers published as a special issue of Fun- menta Informaticae, volume 49, numbers 1–3, 2002), and in August 2002 (with the proceedings published in Lecture Notes in Computer Science, volume 2597). The next ?ve workshops were organized in Tarragona, Spain, in July 2003, in Milan, Italy, in June 2004, in Vienna, Austria, in July 2005, in Leiden, The Netherlands, in July 2006, and in Thessaloniki, Greece, in June 2007, with the proceedings published as volumes 2933, 3365, 3850, 4361, and 4860 of Lecture Notes in Computer Science.
Developments in Language Theory Masami Ito 2003-06-20 The refereed proceedings of the 6th International Conference on Developments in Language Theory, DLT 2002, held in Kyoto, Japan in September 2002. The 28 revised full papers presented together with 8 invited papers were carefully reviewed and selected from 63 submissions. Among the topics addressed are grammars and acceptors for strings, graphs, arrays, etc; efficient algorithms for languages; combinatorial and algebraic properties of languages; decision problems; relations to complexity theory, logic picture description and analysis, DNA computing, cryptography, concurrency, quantum computing, and algebraic systems.
Unconventional Computation and Natural Computation Giancarlo Mauri 2013-06-03 This book constitutes the refereed proceedings of the 12th International Conference on Unconventional Computation and Natural Computation, UCNC 2013, held in Milan, Italy, in July 2013. The 30 papers (28 full papers, 8 poster papers, and 2 invited papers) were carefully reviewed and selected from 46 submissions. The topics of the volume include: quantum, cellular, molecular, neural, DNA, membrane, and evolutionary computing; cellular automata; computation based on chaos and dynamical systems; massive parallel computation; collective intelligence; computation based on physical principles such as relativistic, optical, spatial, collision-based computing; amorphous computing; physarum computing; hypercomputation; fuzzy and rough computing; swarm intelligence; artificial immune systems; physics of computation; chemical computation; evolving hardware; the computational nature of self-assembly, developmental processes, bacterial communication, and brain processes.
Enjoying Natural Computing Carmen Graciani 2018-11-16 This Festschrift is in honor of Mario de Jesús Pérez-Jiménez, Professor in the Department of Computer Science of University of Seville, Spain, on the occasion of his 70th birthday. The title of this volume reflects both his main research area, viz., Natural Computing, and the guiding principle of his functioning: "once you choose to do something, enjoy doing it". The respect that Professor Mario de Jesús Pérez-Jiménez enjoys in the scientific community was well demonstrated by the enthusiastic response received to the request to contribute to this book. The contributions by more than 70 authors from 15 countries cover a wide spectrum of research areas and reflect well the broad range of research interests of Professor Mario de Jesús Pérez-Jiménez. The research areas presented in this Festschrift include membrane computing, spiking neural networks, phylogenetic networks, ant colonies optimization, workbench for biocomputing, reaction systems, entropy of computation, rewriting systems, and insertion-deletion systems.
Membrane Computing Gheorghe Paun 2003-07-01 This book constitutes the thoroughly refereed post-proceedings of the International Workshop on Membrane Computing, WMC-CdeA 2002, held in Curtea de Arges, Romania, in August 2002.The 29 revised full papers presented were carefully selected during two rounds of reviewing and revision; some were especially solicited for inclusion in the book after the workshop. Most papers address membrane systems and membrane computing from the point of view of theoretical computer science; some papers solve open problems and present new approaches, and others provide mathematical and biological background. All in all, the book presents the state of the art in membrane computing.
Membrane Computing Romania) Wmc-Cdea 200 (2002 Curtea-De-Arges 2003-02-25 This book constitutes the thoroughly refereed post-proceedings of the International Workshop on Membrane Computing, WMC-CdeA 2002, held in Curtea de Arges, Romania, in August 2002. The 29 revised full papers presented were carefully selected during two rounds of reviewing and revision; some were especially solicited for inclusion in the book after the workshop. Most papers address membrane systems and membrane computing from the point of view of theoretical computer science; some papers solve open problems and present new approaches, and others provide mathematical and biological background. All in all, the book presents the state of the art in membrane computing.
Evolvable Components Lukas Sekanina 2012-12-06 At the beginning of the 1990s research started in how to combine soft comput ing with reconfigurable hardware in a quite unique way. One of the methods that was developed has been called evolvable hardware. Thanks to evolution ary algorithms researchers have started to evolve electronic circuits routinely. A number of interesting circuits - with features unreachable by means of con ventional techniques - have been developed. Evolvable hardware is quite pop ular right now; more than fifty research groups are spread out over the world. Evolvable hardware has become a part of the curriculum at some universi ties. Evolvable hardware is being commercialized and there are specialized conferences devoted to evolvable hardware. On the other hand, surprisingly, we can feel the lack of a theoretical background and consistent design methodology in the area. Furthermore, it is quite difficult to implement really innovative and practically successful evolvable systems using contemporary digital reconfigurable technology.
Large-Scale Scientific Computing Ivan Lirkov 2010-05-10 This book constitutes the thoroughly refereed post-conference proceedings of the 7th International Conference on Large-Scale Scientific Computations, LSSC 2009, held in Sozopol, Bulgaria, in June 2009. The 93 revised full papers presented together with 5 plenary and invited papers were carefully reviewed and selected from numerous submissions for inclusion in the book. The papers are organized in topical sections on multilevel and multiscale preconditioning methods multilevel and multiscale methods for industrial applications, environmental modeling, control and uncertain systems, application of metaheuristics to large scale problems, monte carlo: methods, applications, distributed computing, grid and scientific and engineering applications, reliable numerical methods for differential equations, novel applications of optimization ideas to the numerical Solution of PDEs, and contributed talks.
Membrane Computing Alberto Leporati 2017-02-21 This book contains revised selected papers from the 17th International Conference on Membrane Computing, CMC 2017, held in Milan, Italy, in July 2016. The 19 full papers presented in this volume were carefully reviewed and selected from 28 submissions. They deal with membrane computing (P systems theory), an area of copmputer science aiming to abstract computing ideas and models from the structure and the functioning of living cells, as well as from the way the cells are organized in tissues or higher order structures. The volume also contains 3 invited talks in full-paper length.
Combinatorial Image Analysis Petra Wiederhold 2009-11-18 This volume constitutes the refereed proceedings of the 13th International Workshop on Combinatorial Image Analysis, IWCIA 2009, held in Playa del Carmen, Mexico, in November 2009. The 32 revised full papers and one invited paper presented were carefully reviewed and selected from 70 initial submissions. The papers are organized in topical sections on digital geometry: curves, straightness, convexity, geometric transformations, metrics, distance transforms and skeletons, segmentation, thinning, skeletonization, image representation, processing, analysis, reconstruction and recognition, digital tomography, image models based on geometry, combinatorics, arithmetics, algebra, mathematical morphology, topology and grammars, as well as digital topology and its applications to image modeling and analysis.
Swarm Intelligence Christian Blum 2008-09-24 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.
Real-life Applications with Membrane Computing Gexiang Zhang 2017-04-05 This book thoroughly investigates the underlying theoretical basis of membrane computing models, and reveals their latest applications. In addition, to date there have been no illustrative case studies or complex real-life applications that capitalize on the full potential of the sophisticated membrane systems computational apparatus; gaps that this book remedies. By studying various complex applications – including engineering optimization, power systems fault diagnosis, mobile robot controller design, and complex biological systems involving data modeling and process interactions – the book also extends the capabilities of membrane systems models with features such as formal verification techniques, evolutionary approaches, and fuzzy reasoning methods. As such, the book offers a comprehensive and up-to-date guide for all researchers, PhDs and undergraduate students in the fields of computer science, engineering and the bio-sciences who are interested in the applications of natural computing models.
Proceedings of the 2005 Workshop on Unconventional Computing C. Teuscher 2005-01 THE BOOK BRINGS TOGETHER WORK FROM A MULTIDISCIPLINARY CORE OF SCIENTISTS WHO ARE WORKING IN THE FIELD OF UNCONVENTIONAL COMPUTING. THE GOAL WAS TO PROVIDE A COMMON GROUND FOR DIALOG AND INTERACTION, TO HIGHLIGHT THE LATEST ADVANCES, AND TO DISCUSS THE MAIN DIRECTIONS FOR THE FUTURE. TOPICS INCLUDE PROGRAMMING OF CHEMICAL SYSTEMS, EVOLVING LOGICAL GATES IN LIQUID CRYSTAL, IMAGE PROCESSING IN CHEMICAL MEDIA, REACTION-DIFFUSION ELECTRONIC CIRCUITS FOR COMPUTATION AND PATTERN GENERATION, RULE MIGRATION IN CELLULAR AUTOMATA, MULTI-STATE QUANTUM AUTOMATA, DNA COMPUTING OF SHORTEST PATH PROBLEMS, AND ARTIFICIAL CHEMISTRIES. THE PAPERS COLLECTED IN THIS BOOK PROVIDE A GOOD OVERVIEW OF HOT RESEARCH TOPICS IN THE VIBRANT FIELD OF UNCONVENTIONAL COMPUTING.
Computing with New Resources Cristian S. Calude 2014-12-09 Professor Jozef Gruska is a well known computer scientist for his many and broad results. He was the father of theoretical computer science research in Czechoslovakia and among the first Slovak programmers in the early 1960s. Jozef Gruska introduced the descriptional complexity of grammars, automata, and languages, and is one of the pioneers of parallel (systolic) automata. His other main research interests include parallel systems and automata, as well as quantum information processing, transmission, and cryptography. He is co-founder of four regular series of conferences in informatics and two in quantum information processing and the Founding Chair (1989-96) of the IFIP Specialist Group on Foundations of Computer Science.
Membrane Computing Models: Implementations Gexiang Zhang 2021-07-01 The theoretical basis of membrane computing was established in the early 2000s with fundamental research into the computational power, complexity aspects and relationships with other (un)conventional computing paradigms. Although this core theoretical research has continued to grow rapidly and vigorously, another area of investigation has since been added, focusing on the applications of this model in many areas, most prominently in systems and synthetic biology, engineering optimization, power system fault diagnosis and mobile robot controller design. The further development of these applications and their broad adoption by other researchers, as well as the expansion of the membrane computing modelling paradigm to other applications, call for a set of robust, efficient, reliable and easy-to-use tools supporting the most significant membrane computing models. This work provides comprehensive descriptions of such tools, making it a valuable resource for anyone interested in membrane computing models.
The Oxford Handbook of Membrane Computing Gheorghe Paun 2009-12-24 Membrane Computing studies models of computation (called P systems) inspired by the structure and functioning of a living cell, in particular by the role of membranes in compartmentalization of living cells. This handbook provides the necessary biological and formal background, in a state-of-the-art review of current research.
Natural Computing and Beyond Yasuhiro Suzuki 2013-04-01 This book contains the joint proceedings of the Winter School of Hakodate (WSH) 2011 held in Hakodate, Japan, March 15–16, 2011, and the 6th International Workshop on Natural Computing (6th IWNC) held in Tokyo, Japan, March 28–30, 2012, organized by the Special Interest Group of Natural Computing (SIG-NAC), the Japanese Society for Artificial Intelligence (JSAI). This volume compiles refereed contributions to various aspects of natural computing, ranging from computing with slime mold, artificial chemistry, eco-physics, and synthetic biology, to computational aesthetics.