

Reading free Solution manual fault tolerant systems koren (PDF)

there are many applications in which the reliability of the overall system must be far higher than the reliability of its individual components in such cases designers devise mechanisms and architectures that allow the system to either completely mask the effects of a component failure or recover from it so quickly that the application is not seriously affected this is the work of fault tolerant designers and their work is increasingly important and complex not only because of the increasing number of mission critical applications but also because the diminishing reliability of hardware means that even systems for non critical applications will need to be designed with fault tolerance in mind reflecting the real world challenges faced by designers of these systems this book addresses fault tolerance design with a systems approach to both hardware and software no other text on the market takes this approach nor offers the comprehensive and up to date treatment koren and krishna provide students designers and architects of high performance processors will value this comprehensive overview of the field the first book on fault tolerance design with a systems approach comprehensive coverage of both hardware and software fault tolerance as well as information and time redundancy incorporated case studies highlight six different computer systems with fault tolerance techniques implemented in their design available to lecturers is a complete ancillary package including online solutions manual for instructors and powerpoint slides fault tolerant systems second edition is the first book on fault tolerance design utilizing a systems approach to both hardware and software no other text takes this approach or offers the comprehensive and up to date treatment that koren and krishna provide the book comprehensively covers the design of fault tolerant hardware and software use of fault tolerance techniques to improve manufacturing yields and design and analysis of networks incorporating case studies that highlight more than ten different computer systems with fault tolerance techniques implemented in their design the book includes critical material on methods to protect against threats to encryption subsystems used for security purposes the text s updated content will help students and practitioners in electrical and computer engineering and computer science learn how to design reliable computing systems and how to analyze fault tolerant computing systems delivers the first book on fault tolerance design with a systems approach offers comprehensive coverage of both hardware and software fault tolerance as well as information and time redundancy features fully updated content plus new chapters on failure mechanisms and fault tolerance in cyber physical systems provides a complete ancillary package including an on line solutions manual for instructors and powerpoint slides this book describes the state of the art in energy efficient fault tolerant embedded systems it covers the entire product lifecycle of electronic systems design analysis and testing and includes discussion of both circuit and system level approaches readers will be enabled to meet the conflicting design objectives of energy efficiency and fault tolerance for reliability given the up to date techniques presented presents an illustrated a z encyclopedia containing approximately 600 entries on computer and technology related topics this book contains an edited selection of papers presented at the international workshop on defect and fault tolerance in vlsi systems held october 6 7 1988 in springfield massachusetts our thanks go to all the contributors and especially the members of the program committee for the difficult and time consuming work involved in selecting the papers that were presented in the workshop and reviewing the papers included in this book thanks are also due to the iee computer society in particular the technical committee on fault tolerant computing and the technical committee on vlsi and the university of massachusetts at amherst for sponsoring the workshop and to the national science foundation for supporting under grant number mip 8803418 the keynote address and the distribution of this book to all workshop attendees the objective of the workshop was to bring t ogether researchers and practition ers

from both industry and academia in the field of defect tolerance and yield enhancement in vlsi to discuss their mutual interests in defect tolerant architectures and models for integrated circuit defects faults and yield progress in this area was slowed down by the proprietary nature of yield related data and by the lack of appropriate forums for disseminating such information the goal of this workshop was therefore to provide a forum for a dialogue and exchange of views a follow up workshop in october 1989 with ch stapper from ibm and v k jain from the university of south florida as general co chairmen is being organized this book presents a paradigm for designing new generation resilient and evolving computer systems including their key concepts elements of supportive theory methods of analysis and synthesis of ict with new properties of evolving functioning as well as implementation schemes and their prototyping the book explains why new ict applications require a complete redesign of computer systems to address challenges of extreme reliability high performance and power efficiency the authors present a comprehensive treatment for designing the next generation of computers especially addressing safety critical autonomous real time military banking and wearable health care systems coding approaches to fault tolerance in combinational and dynamic systems describes coding approaches for designing fault tolerant systems i e systems that exhibit structured redundancy that enables them to distinguish between correct and incorrect results or between valid and invalid states since redundancy is expensive and counter intuitive to the traditional notion of system design the book focuses on resource efficient methodologies that avoid excessive use of redundancy by exploiting the algorithmic dynamic structure of a particular combinational or dynamic system the first part of coding approaches to fault tolerance in combinational and dynamic systems focuses on fault tolerant combinational systems providing a review of von neumann s classical work on probabilistic logics including some more recent work on noisy gates and describing the use of arithmetic coding and algorithm based fault tolerant schemes in algebraic settings the second part of the book focuses on fault tolerance in dynamic systems coding approaches to fault tolerance in combinational and dynamic systems also discusses how in a dynamic system setting one can relax the traditional assumption that the error correcting mechanism is fault free by using distributed error correcting mechanisms the final chapter presents a methodology for fault diagnosis in discrete event systems that are described by petri net models coding techniques are used to quickly detect and identify failures from the foreword hadjicostis has significantly expanded the setting to processes occurring in more general algebraic and dynamic systems the book responds to the growing need to handle faults in complex digital chips and complex networked systems and to consider the effects of faults at the design stage rather than afterwards george verghese massachusetts institute of technology coding approaches to fault tolerance in combinational and dynamic systems will be of interest to both researchers and practitioners in the area of fault tolerance systems design and control higher circuit densities increasingly more complex application objectives and advanced packaging technologies have substantially increased the need to incorporate defect tolerance and fault tolerance in the design of vlsi and wsi systems the goals of defect tolerance and fault tolerance are yield enhancement and improved reliability the emphasis on this area has resulted in a new field of interdisciplinary scientific research in fact advanced methods of defect fault control and tolerance are resulting in enhanced manufacturability and productivity of integrated circuit chips vlsi systems and wafer scale integrated circuits in 1987 dr w moore organized an international workshop on designing for yield at oxford university edited papers of that workshop were published in reference ii the participants in that workshop agreed that meetings of this type should be continued preferably on a yearly basis it was dr i koren who organized the ieee international workshop on defect and fault tolerance in vlsi systems in springfield massachusetts the next year selected papers from that workshop were published as the first volume of this series 21 this book covers aspects of system design and efficient modelling and also introduces various fault models and fault mechanisms associated with digital circuits integrated into system on chip soc multi

processor system on chip mp soc or network on chip noc this book presents the combined proceedings of the 12th kips international conference on ubiquitous information technologies and applications cute 2017 and the 9th international conference on computer science and its applications csa2017 both held in taichung taiwan december 18 20 2017 the aim of these two meetings was to promote discussion and interaction among academics researchers and professionals in the field of ubiquitous computing technologies these proceedings reflect the state of the art in the development of computational methods involving theory algorithms numerical simulation error and uncertainty analysis and novel applications of new processing techniques in engineering science and other disciplines related to ubiquitous computing james j jong hyuk park received ph d degrees in graduate school of information security from korea university korea and graduate school of human sciences from waseda university japan from december 2002 to july 2007 dr park had been a research scientist of r d institute hanwha s c co ltd korea from september 2007 to august 2009 he had been a professor at the department of computer science and engineering kyungnam university korea he is now a professor at the department of computer science and engineering and department of interdisciplinary bio it materials seoul national university of science and technology seoultech korea dr park has published about 200 research papers in international journals and conferences he has been serving as chair program committee or organizing committee chair for many international conferences and workshops he is a steering chair of international conferences mue futuretech csa cute ucawsn world it congress jeju he is editor in chief of human centric computing and information sciences hcis by springer the journal of information processing systems jips by kips and journal of convergence joc by kips cswrg he is associate editor editor of 14 international journals including jos jnca scn cj and so on in addition he has been serving as a guest editor for international journals by some publishers springer elsevier john wiley oxford univ press emerald inderscience mdpi he got the best paper awards from isa 08 and itcs 11 conferences and the outstanding leadership awards from ieee hpcc 09 ica3pp 10 iee ispa 11 pdcat 11 ieee aina 15 furthermore he got the outstanding research awards from the seoultech 2014 his research interests include iot human centric ubiquitous computing information security digital forensics vehicular cloud computing multimedia computing etc he is a member of the ieee ieee computer society kips and kmms vincenzo loaia bs 85 ms 87 phd 89 is full professor of computer science his research interests include intelligent agents ambient intelligence computational intelligence currently he is founder editor in chief of ambient intelligence and humanized computing and co editor in chief of softcomputing springer verlag he is chair of the task forces intelligent agents and ambient intelligence ieee cis ettc he has been chair the emergent technical committee emergent technology ieee cis society and vice chair of intelligent systems applications technical committee he has been author of more than 200 scientific works editor co editor of 4 books 64 journal papers 25 book chapters and 100 conference papers he is senior member of the ieee associate editor of ieee transactions on industrial informatics and associate editor of ieee transactions on systems man and cybernetics systems many times reviewers for national and international projects dr loaia is active in the research domain of agents ambient intelligence computational intelligence smartgrids distributed platform for enrich added value gangman yi in computer sciences at texas a m university usa in 2007 and doctorate in computer sciences at texas a m university usa in 2011 in may 2011 he joined system s w group in samsung electronics suwon korea he joined the department of computer science engineering gangneung wonju national university korea since march 2012 dr yi has been researched in an interdisciplinary field of researches his research focuses especially on the development of computational methods to improve understanding of biological systems and its big data dr yi actively serves as a managing editor and reviewer for international journals and chair of international conferences and workshops yunsick sung received his b s degree in division of electrical and computer engineering from pusan national university busan korea in 2004 his m s degree in computer engineering from dongguk university seoul korea in 2006 and his ph d degree in game engineering from

dongguk university seoul korea in 2012 he was employed as a member of the researcher at samsung electronics between 2006 and 2009 he was the plural professor at shinheung college in 2009 and at dongguk university in 2010 his main research interests are many topics in brain computer interface programming by demonstration ubiquitous computing and reinforcement learning his journal service experiences is associate editor at human centric computing and information sciences springer 2015 current faults are a concern for multi agent systems mas designers especially if the mas are built for industrial or military use because there must be some guarantee of dependability some fault classification exists for classical systems and is used to define faults when dependability is at stake such fault classification may be used from the beginning of the system s conception to define fault classes and specify which types of faults are expected thus one may want to use fault classification for mas however from fault classification to fault tolerance for multi agent systems argues that working with autonomous and proactive agents implies a special analysis of the faults potentially occurring in the system moreover the field of fault tolerance ft provides numerous methods adapted to handle different kinds of faults some handling methods have been studied within the mas domain adapting to their specificities and capabilities but increasing the large amount of ft methods therefore unless being an expert in fault tolerance it is difficult to choose evaluate or compare fault tolerance methods preventing a lot of developed applications from not only to being more pleasant to use but more importantly from at least being tolerant to common faults from fault classification to fault tolerance for multi agent systems shows that specification phase guidelines and fault handler studies can be derived from the fault classification extension made for mas from this perspective fault classification can become a unifying concept between fault tolerance methods in mas this book addresses the challenges associated with efficient mixed criticality mc system design we focus on application analysis through execution time analysis and task scheduling analysis in order to execute more low criticality tasks in the system i e improving the quality of service qos while guaranteeing the correct execution of high criticality tasks further this book addresses the challenge of enhancing qos using parallelism in multi processor hardware platforms this book constitutes the proceedings of the 41st international conference on computer safety reliability and security safecomp 2022 which took place in munich germany in september 2022 the 24 full papers included in this volume were carefully reviewed and selected from 93 submissions safecomp has contributed to the progress of the state of the art in dependable application of computers in safety related and safety critical systems safecomp is an annual event covering the state of the art experience and new trends in the areas of safety security and reliability of critical computer applications integrated circuit manufacturability provides comprehensive coverage of the process and design variables that determine the ease and feasibility of fabrication or manufacturability of contemporary vlsi systems and circuits this book progresses from semiconductor processing to electrical design to system architecture the material provides a theoretical background as well as case studies examining the entire design for the manufacturing path from circuit to silicon each chapter includes tutorial and practical applications coverage integrated circuit manufacturability illustrates the implications of manufacturability at every level of abstraction including the effects of defects on the layout their mapping to electrical faults and the corresponding approaches to detect such faults the reader will be introduced to key practical issues normally applied in industry and usually required by quality product and design engineering departments in today s design practices yield management strategies effects of spot defects inductive fault analysis and testing fault tolerant architectures and mcm testing strategies this book will serve design and product engineers both from academia and industry it can also be used as a reference or textbook for introductory graduate level courses on manufacturing distributed systems intertwine with our everyday lives the benefits and current shortcomings of the underpinning technologies are experienced by a wide range of people and their smart devices with the rise of large scale iot and similar distributed systems cloud bursting

technologies and partial outsourcing solutions private entities are encouraged to increase their efficiency and offer unparalleled availability and reliability to their users the research anthology on architectures frameworks and integration strategies for distributed and cloud computing is a vital reference source that provides valuable insight into current and emergent research occurring within the field of distributed computing it also presents architectures and service frameworks to achieve highly integrated distributed systems and solutions to integration and efficient management challenges faced by current and future distributed systems highlighting a range of topics such as data sharing wireless sensor networks and scalability this multi volume book is ideally designed for system administrators integrators designers developers researchers academicians and students this book constitutes the refereed proceedings of the 20th international conference on distributed and computer and communication networks dccn 2017 held in moscow russia in september 2017 the 39 full papers and the two short papers were carefully reviewed and selected from 176 submissions the papers cover the following topics computer and communication networks architecture optimization control in computer and communication networks performance and qos qoe evaluation in wireless networks analytical modeling and simulation of next generation communications systems queueing theory and reliability theory applications in computer networks wireless 4g 5g networks cm and mm wave radio technologies rfid technology and its application in intellectual transportation networks internet of things wearables and applications of distributed information systems probabilistic and statistical models in information systems mathematical modeling of high tech systems mathematical modeling and control problems distributed and cloud computing systems big data analytics welcome to the third international conference on information security and assurance isa 2009 isa 2009 was the most comprehensive conference focused on the various aspects of advances in information security and assurance the concept of security and assurance is emerging rapidly as an exciting new paradigm to provide reliable and safe life services our conference provides a chance for academic and industry professionals to discuss recent progress in the area of communication and networking including modeling simulation and novel applications associated with the utilization and acceptance of computing devices and systems isa 2009 was a successor of the first international workshop on information assurance in networks ian 2007 jeju island korea december 2007 and the second international conference on information security and assurance isa 2008 busan korea april 2008 the goal of this conference is to bring together researchers from academia and industry as well as practitioners to share ideas problems and solutions relating to the multifaceted aspects of information technology isa 2009 contained research papers submitted by researchers from all over the world in order to guarantee high quality proceedings we put extensive effort into reviewing the papers all submissions were peer reviewed by at least three program committee members as well as external reviewers as the quality of the submissions was quite high it was extremely difficult to select the papers for oral presentation and publication in the proceedings of the conference this volume of advances in intelligent systems and computing contains papers presented in the main track of iiti 2016 the first international conference on intelligent information technologies for industry held in may 16 21 in sochi russia the conference was jointly co organized by rostov state transport university russia and vřb technical university of ostrava czech republic with the participation of russian association for artificial intelligence raai and russian association for fuzzy systems and soft computing rafssc the volume is devoted to practical models and industrial applications related to intelligent information systems the conference has been a meeting point for researchers and practitioners to enable the implementation of advanced information technologies into various industries nevertheless some theoretical talks concerning the state of the art in intelligent systems and soft computing are included in the proceedings as well this book introduces the state of the art in research in parallel and distributed embedded systems which have been enabled by developments in silicon technology micro electro mechanical systems mems wireless communications computer networking and digital electronics these

systems have diverse applications in domains including military and defense medical automotive and unmanned autonomous vehicles the emphasis of the book is on the modeling and optimization of emerging parallel and distributed embedded systems in relation to the three key design metrics of performance power and dependability key features includes an embedded wireless sensor networks case study to help illustrate the modeling and optimization of distributed embedded systems provides an analysis of multi core many core based embedded systems to explain the modeling and optimization of parallel embedded systems features an application metrics estimation model markov modeling for fault tolerance and analysis and queueing theoretic modeling for performance evaluation discusses optimization approaches for distributed wireless sensor networks high performance and energy efficient techniques at the architecture middleware and software levels for parallel multicore based embedded systems and dynamic optimization methodologies highlights research challenges and future research directions the book is primarily aimed at researchers in embedded systems however it will also serve as an invaluable reference to senior undergraduate and graduate students with an interest in embedded systems research this book gathers recent research works in emerging artificial intelligence ai methods for the convergence of communication caching control and computing resources in cloud based internet of vehicles iov infrastructures in this context the book s major subjects cover the analysis and the development of ai powered mechanisms in future iov applications and architectures it addresses the major new technological developments in the field and reflects current research trends and industry needs it comprises a good balance between theoretical and practical issues covering case studies experience and evaluation reports and best practices in utilizing ai applications in iov networks it also provides technical scientific information about various aspects of ai technologies ranging from basic concepts to research grade material including future directions this book is intended for researchers practitioners engineers and scientists involved in designing and developing protocols and ai applications and services for iov related devices this book discusses new approaches and methods in the cybernetics algorithms and software engineering in the scope of the intelligent systems it brings new approaches and methods to real world problems and exploratory research that describes novel approaches in the cybernetics algorithms and software engineering in the scope of the intelligent systems this book constitutes the refereed proceedings of the computational methods in systems and software 2017 a conference that provided an international forum for the discussion of the latest high quality research results in all areas related to computational methods statistics cybernetics and software engineering combining different perspectives from materials science engineering and computer science this reference provides a unified view of the various aspects necessary for the successful realization of intelligent systems the editors and authors are from academia and research institutions with close ties to industry and are thus able to offer first hand information here they adopt a unique three tiered approach such that readers can gain basic intermediate and advanced topical knowledge the technology section of the book is divided into chapters covering the basics of sensor integration in materials the challenges associated with this approach data processing evaluation and validation as well as methods for achieving an autonomous energy supply the applications part then goes on to showcase typical scenarios where material integrated intelligent systems are already in use such as for structural health monitoring and smart textiles the encyclopedia of cloud computing provides it professionals educators researchers and students with a compendium of cloud computing knowledge authored by a spectrum of subject matter experts in industry and academia this unique publication in a single volume covers a wide range of cloud computing topics including technological trends and developments research opportunities best practices standards and cloud adoption providing multiple perspectives it also addresses questions that stakeholders might have in the context of development operation management and use of clouds furthermore it examines cloud computing s impact now and in the future the encyclopedia presents 56 chapters logically organized into 10 sections each chapter covers a major topic area with cross references to other chapters and

contains tables illustrations side bars as appropriate furthermore each chapter presents its summary at the beginning and backend material references and additional resources for further information the two volume set lnai 7267 and 7268 together with lncs 7269 constitutes the refereed proceedings of the 11th international conference on artificial intelligence and soft computing icaisc 2012 held in zakopane poland in april may 2012 the 212 revised full papers presented were carefully reviewed and selected from 483 submissions the papers are organized in topical sections on neural networks and their applications computer vision image and speech analysis data mining hardware implementation bioinformatics biometrics and medical applications concurrent parallel processing agent systems robotics and control artificial intelligence in modeling and simulation various problems of artificial intelligence this book covers a variety of topics in electronics and communication engineering especially in the area of microelectronics and vlsi design communication systems and networks and signal and image processing the content is based on papers presented at the 5th international conference on vlsi communication and signal processing vcas 2022 the book also discusses the emerging applications of novel tools and techniques in image video and multimedia signal processing this book is useful to students researchers and professionals working in the electronics and communication domain networks of today are going through a rapid evolution and there are many emerging areas of information networking and their applications heterogeneous networking supported by recent technological advances in low power wireless communications along with silicon integration of various functionalities such as sensing communications intelligence and actuations are emerging as a critically important disruptive computer class based on a new platform networking structure and interface that enable novel low cost and high volume applications several of such applications have been difficult to realize because of many interconnections problems to fulfill their large range of applications different kinds of networks need to collaborate and wired and next generation wireless systems should be integrated in order to develop high performance computing solutions to problems arising from the complexities of these networks this volume covers the theory design and applications of computer networks distributed computing and information systems the aim of the volume advanced information networking and applications is to provide latest research findings innovative research results methods and development techniques from both theoretical and practical perspectives related to the emerging areas of information networking and applications this book constitutes the refereed proceedings of the 8th international conference on interactive collaborative robotics icr 2023 held in baku azerbaijan during october 25 29 2023 the 33 full papers included in this book were carefully reviewed and selected from 56 submissions they were organized in topical sections as follows focused the foundations and means of collaborative behavior of one or more robots physically interacting with hu mans in operational environments configured with embedded sensor networks and cloud services under uncertainty and environmental variability coordinated relief to the affected areas needs to be given as soon as possible so to minimize further nefarious effects in such scenarios it is vital that communications between interested parties i e relief and security groups are established as quickly and as easily as possible ideally in a plug play or zero configuration fashion over the past few decades devices and technologies have been significantly miniaturized from one generation to the next providing far more potential in a much smaller package the smallest of these recently developed tools are miniscule enough to be invisible to the naked eye nanotechnology concepts methodologies tools and applications describes some of the latest advances in microscopic technologies in fields as diverse as biochemistry materials science medicine and electronics through its investigation of theories applications and new developments in the nanotechnology field this impressive reference source will serve as a valuable tool for researchers engineers academics and students alike dft 2004 showcases the latest research results in the in the field of defect and fault tolerance in vlsi systems its papers cover yield defect and fault tolerance error correction and circuit system reliability and dependability this book focuses on neuromorphic computing principles and organization and how to build fault

tolerant scalable hardware for large and medium scale spiking neural networks with learning capabilities in addition the book describes in a comprehensive way the organization and how to design a spike based neuromorphic system to perform network of spiking neurons communication computing and adaptive learning for emerging ai applications the book begins with an overview of neuromorphic computing systems and explores the fundamental concepts of artificial neural networks next we discuss artificial neurons and how they have evolved in their representation of biological neuronal dynamics afterward we discuss implementing these neural networks in neuron models storage technologies inter neuron communication networks learning and various design approaches then comes the fundamental design principle to build an efficient neuromorphic system in hardware the challenges that need to be solved toward building a spiking neural network architecture with many synapses are discussed learning in neuromorphic computing systems and the major emerging memory technologies that promise neuromorphic computing are then given a particular chapter of this book is dedicated to the circuits and architectures used for communication in neuromorphic systems in particular the network on chip fabric is introduced for receiving and transmitting spikes following the address event representation protocol and the memory accessing method in addition the interconnect design principle is covered to help understand the overall concept of on chip and off chip communication advanced on chip interconnect technologies including silicon photonic three dimensional interconnects and fault tolerant routing algorithms are also given the book also covers the main threats of reliability and discusses several recovery methods for multicore neuromorphic systems this is important for reliable processing in several embedded neuromorphic applications a reconfigurable design approach that supports multiple target applications via dynamic reconfigurability network topology independence and network expandability is also described in the subsequent chapters the book ends with a case study about a real hardware software design of a reliable three dimensional digital neuromorphic processor geared explicitly toward the 3d ics biological brain s three dimensional structure the platform enables high integration density and slight spike delay of spiking networks and features a scalable design we present methods for fault detection and recovery in a neuromorphic system as well neuromorphic computing principles and organization is an excellent resource for researchers scientists graduate students and hardware software engineers dealing with the ever increasing demands on fault tolerance scalability and low power consumption it is also an excellent resource for teaching advanced undergraduate and graduate students about the fundamentals concepts organization and actual hardware software design of reliable neuromorphic systems with learning and fault tolerance capabilities robust nano computing focuses on various issues of robust nano computing defect tolerance design for nano technology at different design abstraction levels it addresses both redundancy and configuration based methods as well as fault detecting techniques through the development of accurate computation models and tools the contents present an insightful view of the ongoing researches on nano electronic devices circuits architectures and design methods as well as provide promising directions for future research where is system architecture heading the special interest group on computer and systems architecture fachausschuss rechner und systemarchitektur of the german computer and information technology associations gi and itg addressed this question and discussed it during two future workshops in 2002 the result in a nutshell everything will change but everything else will remain future systems technologies will build on a mature basis of silicon and ic technology on well understood programming languages and software engineering techniques and on well established operating systems and middleware concepts newer and still exotic but exciting technologies like quantum computing and dna processing are to be watched closely but they will not be mainstream in the next decade although there will be considerable progress in these basic technologies is there any major trend which unifies these diverse developments there is a common denominator according to the result of the two future workshops which marks a new quality the challenge for future systems technologies lies in the mastering of complexity rigid and inflexible systems built under a strict top down regime

have reached the limits of manageable complexity as has become obvious by the recent failure of several large scale projects nature is the most complex system we know and she has solved the problem somehow we just haven't understood exactly how nature does it but it is clear that systems designed by nature like an anthill or a beehive or a swarm of birds or a city are different from today's technical systems that have been designed by engineers and computer scientists this book explores the technological developments at various levels of abstraction of the new paradigm of approximate computing the authors describe in a single source the state of the art covering the entire spectrum of research activities in approximate computing bridging device circuit architecture and system levels content includes tutorials reviews and surveys of current theoretical experimental results design methodologies and applications developed in approximate computing for a wide scope of readership and specialists serves as a single source reference to state of the art of approximate computing covers broad range of topics from circuits to applications includes contributions by leading researchers from academia and industry an invited talk recounts intel's experience with increasing die yield through cad algorithms and a panel discussion examines tools for the extracting of critical areas for a yield analysis of vlsi design others of the 34 papers cover critical area analysis defect sensitivity and reliability fault tolerant architectures and arrays yield projection and enhancement fault tolerant and testing techniques and self checking and coding techniques no subject index annotation copyright by book news inc portland or das buch behandelt die zuverlässigkeitsbewertung mechatronischer systeme speziell in frühen entwicklungsphasen herausforderung hierbei ist vor allem die ganzheitliche betrachtung der domänen mechanik elektronik und software sowie der unsicheren bzw unvollständigen daten neben der domänenübergreifenden betrachtungsweise vertiefen die autoren einzelne themenaspekte die der zuverlässigkeitsbewertung in frühen entwicklungsphasen dienen a three volume work bringing together papers presented at safeprocess 2003 including four plenary papers on statistical physical model based and logical model based approaches to fault detection and diagnosis as well as 178 regular papers

Fault-tolerant Systems

2007

there are many applications in which the reliability of the overall system must be far higher than the reliability of its individual components in such cases designers devise mechanisms and architectures that allow the system to either completely mask the effects of a component failure or recover from it so quickly that the application is not seriously affected this is the work of fault tolerant designers and their work is increasingly important and complex not only because of the increasing number of mission critical applications but also because the diminishing reliability of hardware means that even systems for non critical applications will need to be designed with fault tolerance in mind reflecting the real world challenges faced by designers of these systems this book addresses fault tolerance design with a systems approach to both hardware and software no other text on the market takes this approach nor offers the comprehensive and up to date treatment koren and krishna provide students designers and architects of high performance processors will value this comprehensive overview of the field the first book on fault tolerance design with a systems approach comprehensive coverage of both hardware and software fault tolerance as well as information and time redundancy incorporated case studies highlight six different computer systems with fault tolerance techniques implemented in their design available to lecturers is a complete ancillary package including online solutions manual for instructors and powerpoint slides

Fault-Tolerant Systems

2020-09-01

fault tolerant systems second edition is the first book on fault tolerance design utilizing a systems approach to both hardware and software no other text takes this approach or offers the comprehensive and up to date treatment that koren and krishna provide the book comprehensively covers the design of fault tolerant hardware and software use of fault tolerance techniques to improve manufacturing yields and design and analysis of networks incorporating case studies that highlight more than ten different computer systems with fault tolerance techniques implemented in their design the book includes critical material on methods to protect against threats to encryption subsystems used for security purposes the text s updated content will help students and practitioners in electrical and computer engineering and computer science learn how to design reliable computing systems and how to analyze fault tolerant computing systems delivers the first book on fault tolerance design with a systems approach offers comprehensive coverage of both hardware and software fault tolerance as well as information and time redundancy features fully updated content plus new chapters on failure mechanisms and fault tolerance in cyber physical systems provides a complete ancillary package including an on line solutions manual for instructors and powerpoint slides

Energy-Efficient Fault-Tolerant Systems

2013-09-07

this book describes the state of the art in energy efficient fault tolerant embedded systems it covers the entire product lifecycle of electronic systems design analysis and testing and includes discussion of both circuit and system level approaches readers will be enabled to meet the conflicting design objectives of energy efficiency and fault tolerance for reliability given the up to date techniques presented

Encyclopedia of Computer Science and Technology

2009

presents an illustrated a z encyclopedia containing approximately 600 entries on computer and technology related topics

Defect and Fault Tolerance in VLSI Systems

2012-12-06

this book contains an edited selection of papers presented at the international workshop on defect and fault tolerance in vlsi systems held october 6 7 1988 in springfield massachusetts our thanks go to all the contributors and especially the members of the program committee for the difficult and time consuming work involved in selecting the papers that were presented in the workshop and reviewing the papers included in this book thanks are also due to the iee computer society in particular the technical committee on fault tolerant computing and the technical committee on vlsi and the university of massachusetts at amherst for sponsoring the workshop and to the national science foundation for supporting under grant number mip 8803418 the keynote address and the distribution of this book to all workshop attendees the objective of the workshop was to bring t ogether researchers and practitioners from both industry and academia in the field of defect tolerance and yield enhancement in vlsi to discuss their mutual interests in defect tolerant architectures and models for integrated circuit defects faults and yield progress in this area was slowed down by the proprietary nature of yield related data and by the lack of appropriate forums for disseminating such information the goal of this workshop was therefore to provide a forum for a dialogue and exchange of views a follow up workshop in october 1989 with c h stapper from ibm and v k jain from the university of south florida as general co chairmen is being organized

Resilient Computer System Design

2015-04-15

this book presents a paradigm for designing new generation resilient and evolving computer systems including their key concepts elements of supportive theory methods of analysis and synthesis of ict with new properties of evolving functioning as well as implementation schemes and their prototyping the book explains why new ict applications require a complete redesign of computer systems to address challenges of extreme reliability high performance and power efficiency the authors present a comprehensive treatment for designing the next generation of computers especially addressing safety critical autonomous real time military banking and wearable health care systems

Coding Approaches to Fault Tolerance in Combinational and Dynamic Systems

2012-12-06

coding approaches to fault tolerance in combinational and dynamic systems describes coding approaches for designing fault tolerant systems i e systems that exhibit structured redundancy that enables them to distinguish between correct and incorrect results or between valid and invalid states since redundancy is expensive and counter intuitive to the traditional notion of system design the book focuses on resource efficient methodologies that avoid excessive use of redundancy by exploiting the algorithmic dynamic structure of a particular combinational or dynamic system the first part of coding approaches to fault tolerance in combinational and dynamic systems focuses on fault tolerant combinational systems providing a review of von neumann s

classical work on probabilistic logics including some more recent work on noisy gates and describing the use of arithmetic coding and algorithm based fault tolerant schemes in algebraic settings the second part of the book focuses on fault tolerance in dynamic systems coding approaches to fault tolerance in combinational and dynamic systems also discusses how in a dynamic system setting one can relax the traditional assumption that the error correcting mechanism is fault free by using distributed error correcting mechanisms the final chapter presents a methodology for fault diagnosis in discrete event systems that are described by petri net models coding techniques are used to quickly detect and identify failures from the foreword hadjicostis has significantly expanded the setting to processes occurring in more general algebraic and dynamic systems the book responds to the growing need to handle faults in complex digital chips and complex networked systems and to consider the effects of faults at the design stage rather than afterwards george verghese massachusetts institute of technology coding approaches to fault tolerance in combinational and dynamic systems will be of interest to both researchers and practitioners in the area of fault tolerance systems design and control

Defect and Fault Tolerance in VLSI Systems

2013-06-29

higher circuit densities increasingly more complex application objectives and advanced packaging technologies have substantially increased the need to incorporate defect tolerance and fault tolerance in the design of vlsi and wsi systems the goals of defect tolerance and fault tolerance are yield enhancement and improved reliability the emphasis on this area has resulted in a new field of interdisciplinary scientific research in fact advanced methods of defect fault control and tolerance are resulting in enhanced manufacturability and productivity of integrated circuit chips vlsi systems and wafer scale integrated circuits in 1987 dr w moore organized an international workshop on designing for yield at oxford university edited papers of that workshop were published in reference ii the participants in that workshop agreed that meetings of this type should be continued preferably on a yearly basis it was dr i koren who organized the ieee international workshop on defect and fault tolerance in vlsi systems in springfield massachusetts the next year selected papers from that workshop were published as the first volume of this series 21

Design and Test Technology for Dependable Systems-on-chip

2011-01-01

this book covers aspects of system design and efficient modelling and also introduces various fault models and fault mechanisms associated with digital circuits integrated into system on chip soc multi processor system on chip mp soc or network on chip noc

Advances in Computer Science and Ubiquitous Computing

2017-12-19

this book presents the combined proceedings of the 12th kips international conference on ubiquitous information technologies and applications cute 2017 and the 9th international conference on computer science and its applications csa2017 both held in taichung taiwan december 18 20 2017 the aim of these two meetings was to promote discussion and interaction among academics researchers and professionals in the field of ubiquitous computing technologies these proceedings reflect the state of the art in the development of computational methods involving theory algorithms numerical simulation error and uncertainty analysis and novel applications of new processing techniques in engineering

science and other disciplines related to ubiquitous computing james j jong hyuk park received ph d degrees in graduate school of information security from korea university korea and graduate school of human sciences from waseda university japan from december 2002 to july 2007 dr park had been a research scientist of r d institute hanwha s c co ltd korea from september 2007 to august 2009 he had been a professor at the department of computer science and engineering kyungnam university korea he is now a professor at the department of computer science and engineering and department of interdisciplinary bio it materials seoul national university of science and technology seoultech korea dr park has published about 200 research papers in international journals and conferences he has been serving as chair program committee or organizing committee chair for many international conferences and workshops he is a steering chair of international conferences mue futuretech csa cute ucawsn world it congress jeju he is editor in chief of human centric computing and information sciences hcis by springer the journal of information processing systems jips by kips and journal of convergence joc by kips cswrg he is associate editor editor of 14 international journals including jos jnca scn cj and so on in addition he has been serving as a guest editor for international journals by some publishers springer elsevier john wiley oxford univ press emerald inderscience mdpi he got the best paper awards from isa 08 and itcs 11 conferences and the outstanding leadership awards from ieee hpcc 09 ica3pp 10 iee ispa 11 pdcat 11 ieee aina 15 furthermore he got the outstanding research awards from the seoultech 2014 his research interests include iot human centric ubiquitous computing information security digital forensics vehicular cloud computing multimedia computing etc he is a member of the ieee ieee computer society kips and kmms vincenzo loa bs 85 ms 87 phd 89 is full professor of computer science his research interests include intelligent agents ambient intelligence computational intelligence currently he is founder editor in chief of ambient intelligence and humanized computing and co editor in chief of softcomputing springer verlag he is chair of the task forces intelligent agents and ambient intelligence ieee cis ettc he has been chair the emergent technical committee emergent technology ieee cis society and vice chair of intelligent systems applications technical committee he has been author of more than 200 scientific works editor co editor of 4 books 64 journal papers 25 book chapters and 100 conference papers he is senior member of the ieee associate editor of ieee transactions on industrial informatics and associate editor of ieee transactions on systems man and cybernetics systems many times reviewers for national and international projects dr loa is active in the research domain of agents ambient intelligence computational intelligence smartgrids distributed platform for enrich added value gangman yi in computer sciences at texas a m university usa in 2007 and doctorate in computer sciences at texas a m university usa in 2011 in may 2011 he joined system s w group in samsung electronics suwon korea he joined the department of computer science engineering gangneung wonju national university korea since march 2012 dr yi has been researched in an interdisciplinary field of researches his research focuses especially on the development of computational methods to improve understanding of biological systems and its big data dr yi actively serves as a managing editor and reviewer for international journals and chair of international conferences and workshops yunsick sung received his b s degree in division of electrical and computer engineering from pusan national university busan korea in 2004 his m s degree in computer engineering from dongguk university seoul korea in 2006 and his ph d degree in game engineering from dongguk university seoul korea in 2012 he was employed as a member of the researcher at samsung electronics between 2006 and 2009 he was the plural professor at shinheung college in 2009 and at dongguk university in 2010 his main research interests are many topics in brain computer interface programming by demonstration ubiquitous computing and reinforcement learning his journal service experiences is associate editor at human centric computing and information sciences springer 2015 current

From Fault Classification to Fault Tolerance for Multi-Agent Systems

2013-03-21

faults are a concern for multi agent systems mas designers especially if the mas are built for industrial or military use because there must be some guarantee of dependability some fault classification exists for classical systems and is used to define faults when dependability is at stake such fault classification may be used from the beginning of the system s conception to define fault classes and specify which types of faults are expected thus one may want to use fault classification for mas however from fault classification to fault tolerance for multi agent systems argues that working with autonomous and proactive agents implies a special analysis of the faults potentially occurring in the system moreover the field of fault tolerance ft provides numerous methods adapted to handle different kinds of faults some handling methods have been studied within the mas domain adapting to their specificities and capabilities but increasing the large amount of ft methods therefore unless being an expert in fault tolerance it is difficult to choose evaluate or compare fault tolerance methods preventing a lot of developed applications from not only to being more pleasant to use but more importantly from at least being tolerant to common faults from fault classification to fault tolerance for multi agent systems shows that specification phase guidelines and fault handler studies can be derived from the fault classification extension made for mas from this perspective fault classification can become a unifying concept between fault tolerance methods in mas

Quality-of-Service Aware Design and Management of Embedded Mixed-Criticality Systems

2023-10-28

this book addresses the challenges associated with efficient mixed criticality mc system design we focus on application analysis through execution time analysis and task scheduling analysis in order to execute more low criticality tasks in the system i e improving the quality of service qos while guaranteeing the correct execution of high criticality tasks further this book addresses the challenge of enhancing qos using parallelism in multi processor hardware platforms

Computer Safety, Reliability, and Security

2022-08-24

this book constitutes the proceedings of the 41st international conference on computer safety reliability and security safecomp 2022 which took place in munich germany in september 2022 the 24 full papers included in this volume were carefully reviewed and selected from 93 submissions safecomp has contributed to the progress of the state of the art in dependable application of computers in safety related and safety critical systems safecomp is an annual event covering the state of the art experience and new trends in the areas of safety security and reliability of critical computer applications

Integrated Circuit Manufacturability

1998-10-30

integrated circuit manufacturability provides comprehensive coverage of the process and design variables that determine the ease and feasibility of fabrication or manufacturability of contemporary vlsi systems and circuits this book progresses from semiconductor processing to electrical design to system

architecture the material provides a theoretical background as well as case studies examining the entire design for the manufacturing path from circuit to silicon each chapter includes tutorial and practical applications coverage integrated circuit manufacturability illustrates the implications of manufacturability at every level of abstraction including the effects of defects on the layout their mapping to electrical faults and the corresponding approaches to detect such faults the reader will be introduced to key practical issues normally applied in industry and usually required by quality product and design engineering departments in today s design practices yield management strategies effects of spot defects inductive fault analysis and testing fault tolerant architectures and mcm testing strategies this book will serve design and product engineers both from academia and industry it can also be used as a reference or textbook for introductory graduate level courses on manufacturing

Formal Techniques in Real-time and Fault-tolerant Systems

2000

distributed systems intertwine with our everyday lives the benefits and current shortcomings of the underpinning technologies are experienced by a wide range of people and their smart devices with the rise of large scale iot and similar distributed systems cloud bursting technologies and partial outsourcing solutions private entities are encouraged to increase their efficiency and offer unparalleled availability and reliability to their users the research anthology on architectures frameworks and integration strategies for distributed and cloud computing is a vital reference source that provides valuable insight into current and emergent research occurring within the field of distributed computing it also presents architectures and service frameworks to achieve highly integrated distributed systems and solutions to integration and efficient management challenges faced by current and future distributed systems highlighting a range of topics such as data sharing wireless sensor networks and scalability this multi volume book is ideally designed for system administrators integrators designers developers researchers academicians and students

Research Anthology on Architectures, Frameworks, and Integration Strategies for Distributed and Cloud Computing

2021-01-25

this book constitutes the refereed proceedings of the 20th international conference on distributed and computer and communication networks dccn 2017 held in moscow russia in september 2017 the 39 full papers and the two short papers were carefully reviewed and selected from 176 submissions the papers cover the following topics computer and communication networks architecture optimization control in computer and communication networks performance and qos qoe evaluation in wireless networks analytical modeling and simulation of next generation communications systems queueing theory and reliability theory applications in computer networks wireless 4g 5g networks cm and mm wave radio technologies rfid technology and its application in intellectual transportation networks internet of things wearables and applications of distributed information systems probabilistic and statistical models in information systems mathematical modeling of high tech systems mathematical modeling and control problems distributed and cloud computing systems big data analytics

Distributed Computer and Communication Networks

2017-09-06

welcome to the third international conference on information security and assurance isa 2009 isa 2009 was the most comprehensive conference focused on the various aspects of advances in information security and assurance the concept of security and assurance is emerging rapidly as an exciting new paradigm to provide reliable and safe life services our conference provides a chance for academic and industry professionals to discuss recent progress in the area of communication and networking including modeling simulation and novel applications associated with the utilization and acceptance of computing devices and systems isa 2009 was a successor of the first international workshop on information assurance in networks ian 2007 jeju island korea december 2007 and the second international conference on information security and assurance isa 2008 busan korea april 2008 the goal of this conference is to bring together researchers from academia and industry as well as practitioners to share ideas problems and solutions relating to the multifaceted aspects of information technology isa 2009 contained research papers submitted by researchers from all over the world in order to guarantee high quality proceedings we put extensive effort into reviewing the papers all submissions were peer reviewed by at least three program committee members as well as external reviewers as the quality of the submissions was quite high it was extremely difficult to select the papers for oral presentation and publication in the proceedings of the conference

Advances in Information Security and Assurance

2009-06-18

this volume of advances in intelligent systems and computing contains papers presented in the main track of iiti 2016 the first international conference on intelligent information technologies for industry held in may 16 21 in sochi russia the conference was jointly co organized by rostov state transport university russia and vřb technical university of ostrava czech republic with the participation of russian association for artificial intelligence raai and russian association for fuzzy systems and soft computing rafssc the volume is devoted to practical models and industrial applications related to intelligent information systems the conference has been a meeting point for researchers and practitioners to enable the implementation of advanced information technologies into various industries nevertheless some theoretical talks concerning the state of the art in intelligent systems and soft computing are included in the proceedings as well

Proceedings of the First International Scientific Conference "Intelligent Information Technologies for Industry" (IITI'16)

2016-05-10

this book introduces the state of the art in research in parallel and distributed embedded systems which have been enabled by developments in silicon technology micro electro mechanical systems mems wireless communications computer networking and digital electronics these systems have diverse applications in domains including military and defense medical automotive and unmanned autonomous vehicles the emphasis of the book is on the modeling and optimization of emerging parallel and distributed embedded systems in relation to the three key design metrics of performance power and dependability key features includes an embedded wireless sensor networks case study to help illustrate the modeling and optimization of distributed embedded systems provides an analysis of multi core many core based embedded systems to explain the modeling and optimization of parallel embedded systems features an application metrics estimation model markov modeling for fault tolerance and analysis and queueing theoretic modeling for performance evaluation discusses optimization approaches for distributed wireless sensor networks high

performance and energy efficient techniques at the architecture middleware and software levels for parallel multicore based embedded systems and dynamic optimization methodologies highlights research challenges and future research directions the book is primarily aimed at researchers in embedded systems however it will also serve as an invaluable reference to senior undergraduate and graduate students with an interest in embedded systems research

Modeling and Optimization of Parallel and Distributed Embedded Systems

2016-02-08

this book gathers recent research works in emerging artificial intelligence ai methods for the convergence of communication caching control and computing resources in cloud based internet of vehicles iov infrastructures in this context the book s major subjects cover the analysis and the development of ai powered mechanisms in future iov applications and architectures it addresses the major new technological developments in the field and reflects current research trends and industry needs it comprises a good balance between theoretical and practical issues covering case studies experience and evaluation reports and best practices in utilizing ai applications in iov networks it also provides technical scientific information about various aspects of ai technologies ranging from basic concepts to research grade material including future directions this book is intended for researchers practitioners engineers and scientists involved in designing and developing protocols and ai applications and services for iov related devices

Intelligent Technologies for Internet of Vehicles

2021-06-09

this book discusses new approaches and methods in the cybernetics algorithms and software engineering in the scope of the intelligent systems it brings new approaches and methods to real world problems and exploratory research that describes novel approaches in the cybernetics algorithms and software engineering in the scope of the intelligent systems this book constitutes the refereed proceedings of the computational methods in systems and software 2017 a conference that provided an international forum for the discussion of the latest high quality research results in all areas related to computational methods statistics cybernetics and software engineering

Cybernetics Approaches in Intelligent Systems

2017-09-04

combining different perspectives from materials science engineering and computer science this reference provides a unified view of the various aspects necessary for the successful realization of intelligent systems the editors and authors are from academia and research institutions with close ties to industry and are thus able to offer first hand information here they adopt a unique three tiered approach such that readers can gain basic intermediate and advanced topical knowledge the technology section of the book is divided into chapters covering the basics of sensor integration in materials the challenges associated with this approach data processing evaluation and validation as well as methods for achieving an autonomous energy supply the applications part then goes on to showcase typical scenarios where material integrated intelligent systems are already in use such as for structural health monitoring and smart textiles

Material-Integrated Intelligent Systems

2018-03-12

the encyclopedia of cloud computing provides it professionals educators researchers and students with a compendium of cloud computing knowledge authored by a spectrum of subject matter experts in industry and academia this unique publication in a single volume covers a wide range of cloud computing topics including technological trends and developments research opportunities best practices standards and cloud adoption providing multiple perspectives it also addresses questions that stakeholders might have in the context of development operation management and use of clouds furthermore it examines cloud computing s impact now and in the future the encyclopedia presents 56 chapters logically organized into 10 sections each chapter covers a major topic area with cross references to other chapters and contains tables illustrations side bars as appropriate furthermore each chapter presents its summary at the beginning and backend material references and additional resources for further information

Encyclopedia of Cloud Computing

2016-08-01

the two volume set lnai 7267 and 7268 together with lncs 7269 constitutes the refereed proceedings of the 11th international conference on artificial intelligence and soft computing icaisc 2012 held in zakopane poland in april may 2012 the 212 revised full papers presented were carefully reviewed and selected from 483 submissions the papers are organized in topical sections on neural networks and their applications computer vision image and speech analysis data mining hardware implementation bioinformatics biometrics and medical applications concurrent parallel processing agent systems robotics and control artificial intelligence in modeling and simulation various problems od artificial intelligence

Artificial Intelligence and Soft Computing

2012-04-17

this book covers a variety of topics in electronics and communication engineering especially in the area of microelectronics and vlsi design communication systems and networks and signal and image processing the content is based on papers presented at the 5th international conference on vlsi communication and signal processing vcas 2022 the book also discusses the emerging applications of novel tools and techniques in image video and multimedia signal processing this book is useful to students researchers and professionals working in the electronics and communication domain

VLSI, Communication and Signal Processing

2023-07-01

networks of today are going through a rapid evolution and there are many emerging areas of information networking and their applications heterogeneous networking supported by recent technological advances in low power wireless communications along with silicon integration of various functionalities such as sensing communications intelligence and actuations are emerging as a critically important disruptive computer class based on a new platform networking structure and interface that enable novel low cost and high volume applications several of such applications have been difficult to realize because of many interconnections problems to fulfill their large range of applications different kinds of networks need to collaborate and wired and next generation wireless systems should be integrated in order to develop high

performance computing solutions to problems arising from the complexities of these networks this volume covers the theory design and applications of computer networks distributed computing and information systems the aim of the volume advanced information networking and applications is to provide latest research findings innovative research results methods and development techniques from both theoretical and practical perspectives related to the emerging areas of information networking and applications

Advanced Information Networking and Applications

2023-03-19

this book constitutes the refereed proceedings of the 8th international conference on interactive collaborative robotics icr 2023 held in baku azerbaijan during october 25 29 2023 the 33 full papers included in this book were carefully reviewed and selected from 56 submissions they were organized in topical sections as follows focused the foundations and means of collaborative behavior of one or more robots physically interacting with hu mans in operational environments configured with embedded sensor networks and cloud services under uncertainty and environmental variability

Interactive Collaborative Robotics

2023-09-04

coordinated relief to the affected areas needs to be given as soon as possible so to minimize further nefarious effects in such scenarios it is vital that communications between interested parties i e relief and security groups are established as quickly and as easily as possible ideally in a plug play or zero configuration fashion

Telecommunications in Disaster Areas

2011-01-29

over the past few decades devices and technologies have been significantly miniaturized from one generation to the next providing far more potential in a much smaller package the smallest of these recently developed tools are miniscule enough to be invisible to the naked eye nanotechnology concepts methodologies tools and applications describes some of the latest advances in microscopic technologies in fields as diverse as biochemistry materials science medicine and electronics through its investigation of theories applications and new developments in the nanotechnology field this impressive reference source will serve as a valuable tool for researchers engineers academics and students alike

Nanotechnology: Concepts, Methodologies, Tools, and Applications

2014-02-28

dft 2004 showcases the latest research results in the in the field of defect and fault tolerance in vlsi systems its papers cover yield defect and fault tolerance error correction and circuit system reliability and dependability

Defect and Fault Tolerance in VLSI Systems

2004

this book focuses on neuromorphic computing principles and organization and how to build fault tolerant scalable hardware for large and medium scale spiking neural networks with learning capabilities in addition the book describes in a

comprehensive way the organization and how to design a spike based neuromorphic system to perform network of spiking neurons communication computing and adaptive learning for emerging ai applications the book begins with an overview of neuromorphic computing systems and explores the fundamental concepts of artificial neural networks next we discuss artificial neurons and how they have evolved in their representation of biological neuronal dynamics afterward we discuss implementing these neural networks in neuron models storage technologies inter neuron communication networks learning and various design approaches then comes the fundamental design principle to build an efficient neuromorphic system in hardware the challenges that need to be solved toward building a spiking neural network architecture with many synapses are discussed learning in neuromorphic computing systems and the major emerging memory technologies that promise neuromorphic computing are then given a particular chapter of this book is dedicated to the circuits and architectures used for communication in neuromorphic systems in particular the network on chip fabric is introduced for receiving and transmitting spikes following the address event representation aer protocol and the memory accessing method in addition the interconnect design principle is covered to help understand the overall concept of on chip and off chip communication advanced on chip interconnect technologies including si photonic three dimensional interconnects and fault tolerant routing algorithms are also given the book also covers the main threats of reliability and discusses several recovery methods for multicore neuromorphic systems this is important for reliable processing in several embedded neuromorphic applications a reconfigurable design approach that supports multiple target applications via dynamic reconfigurability network topology independence and network expandability is also described in the subsequent chapters the book ends with a case study about a real hardware software design of a reliable three dimensional digital neuromorphic processor geared explicitly toward the 3d ics biological brain s three dimensional structure the platform enables high integration density and slight spike delay of spiking networks and features a scalable design we present methods for fault detection and recovery in a neuromorphic system as well neuromorphic computing principles and organization is an excellent resource for researchers scientists graduate students and hardware software engineers dealing with the ever increasing demands on fault tolerance scalability and low power consumption it is also an excellent resource for teaching advanced undergraduate and graduate students about the fundamentals concepts organization and actual hardware software design of reliable neuromorphic systems with learning and fault tolerance capabilities

Neuromorphic Computing Principles and Organization

2022-05-31

robust nano computing focuses on various issues of robust nano computing defect tolerance design for nano technology at different design abstraction levels it addresses both redundancy and configuration based methods as well as fault detecting techniques through the development of accurate computation models and tools the contents present an insightful view of the ongoing researches on nano electronic devices circuits architectures and design methods as well as provide promising directions for future research

Proceedings of the 5th International Workshop on Reconfigurable Communication-centric Systems on Chip 2010 - ReCoSoC'10

2010

where is system architecture heading the special interest group on computer and systems architecture fachausschuss rechner und systemarchitektur of the german computer and information technology associations gi and itg a ed this question

and discussed it during two future workshops in 2002 the result in a nutshell everything will change but everything else will remain future systems technologies will build on a mature basis of silicon and ic technology on well understood programming languages and software engineering techniques and on well established operating systems and middleware concepts newer and still exotic but exciting technologies like quantum computing and dna processing are to be watched closely but they will not be mainstream in the next decade although there will be considerable progress in these basic technologies is there any major trend which unites these diverse developments there is a common denominator according to the result of the two future workshops which marks a new quality the challenge for future systems technologies lies in the mastering of complexity rigid and inflexible systems built under a strict top down regime have reached the limits of manageable complexity as has become obvious by the recent failure of several large scale projects nature is the most complex system we know and she has solved the problem somehow we just haven't understood exactly how nature does it but it is clear that systems designed by nature like an anthill or a beehive or a swarm of birds or a city are different from today's technical systems that have been designed by engineers and computer scientists

Robust Computing with Nano-scale Devices

2010-03-11

this book explores the technological developments at various levels of abstraction of the new paradigm of approximate computing the authors describe in a single source the state of the art covering the entire spectrum of research activities in approximate computing bridging device circuit architecture and system levels content includes tutorials reviews and surveys of current theoretical experimental results design methodologies and applications developed in approximate computing for a wide scope of readership and specialists serves as a single source reference to state of the art of approximate computing covers broad range of topics from circuits to applications includes contributions by leading researchers from academia and industry

Organic and Pervasive Computing -- ARCS 2004

2004-02-12

an invited talk recounts intel's experience with increasing die yield through cad algorithms and a panel discussion examines tools for the extracting of critical areas for a yield analysis of vlsi design others of the 34 papers cover critical area analysis defect sensitivity and reliability fault tolerant architectures and arrays yield projection and enhancement fault tolerant and testing techniques and self checking and coding techniques no subject index annotation copyright by book news inc portland or

Approximate Computing

2022-08-22

das buch behandelt die zuverlässigkeitsbewertung mechatronischer systeme speziell in frühen entwicklungsphasen herausforderung hierbei ist vor allem die ganzheitliche betrachtung der domänen mechanik elektronik und software sowie der unsicheren bzw unvollständigen daten neben der domänenübergreifenden betrachtungsweise vertiefen die autoren einzelne themenaspekte die der zuverlässigkeitsbewertung in frühen entwicklungsphasen dienen

Automatic Synthesis of Fault-tolerant VLSI Systems

1993

a three volume work bringing together papers presented at safeprocess 2003 including four plenary papers on statistical physical model based and logical model based approaches to fault detection and diagnosis as well as 178 regular papers

Proceedings, the IEEE International Workshop on Defect and Fault Tolerance in VLSI Systems, November 13-15, 1995, Lafayette, Louisiana

1995

Zuverlässigkeit mechatronischer Systeme

2009-02-17

Fault Detection, Supervision and Safety of Technical Processes 2003 (SAFEPROCESS 2003)

2004-02-27

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