Ravishankar K. Iyer | Zbigniew T. Kalbarczyk
Nithin M. Nakka

Dependable Computing

Design and Assessment

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Dependable Computing Design And Assessment:

Dependable Computing Ravishankar K. Iyer,Zbigniew T. Kalbarczyk,Nithin M. Nakka,2024-05-14 Dependable Computing Covering dependability from software and hardware perspectives Dependable Computing Design and Assessment looks at both the software and hardware aspects of dependability This book Provides an in depth examination of dependability fault tolerance topics Describes dependability taxonomy and briefly contrasts classical techniques with their modern counterparts or extensions Walks up the system stack from the hardware logic via operating systems up to software applications with respect to how they are hardened for dependability Describes the use of measurement based analysis of computing systems Illustrates technology through real life applications Discusses security attacks and unique dependability requirements for emerging applications e g smart electric power grids and cloud computing Finally using critical societal applications such as autonomous vehicles large scale clouds and engineering solutions for healthcare the book illustrates the emerging challenges faced in making artificial intelligence AI and its applications dependable and trustworthy This book is suitable for those studying in the fields of computer engineering and computer science Professionals who are working within the new reality to ensure dependable computing will find helpful information to support their efforts With the support of practical case studies and use cases from both academia and real world deployments the book provides a journey of developments that include the impact of artificial intelligence and machine learning on this ever growing field This book offers a single compendium that spans the myriad areas in which dependability has been applied providing theoretical concepts and applied knowledge with content that will excite a beginner and rigor that will satisfy an expert Accompanying the book is an online repository of problem sets and solutions as well as slides for instructors that span the chapters of the book **Dependable Computing Systems** Hassan B. Diab,Albert Y. Zomaya,2005-10-05 A team of recognized experts leads the way to dependable computing systems With computers and networks pervading every aspect of daily life there is an ever growing demand for dependability In this unique resource researchers and organizations will find the tools needed to identify and engage state of the art approaches used for the specification design and assessment of dependable computer systems The first part of the book addresses models and paradigms of dependable computing and the second part deals with enabling technologies and applications Tough issues in creating dependable computing systems are also tackled including Verification techniques Model based evaluation Adjudication and data fusion Robust communications primitives Fault tolerance Middleware Grid security Dependability in IBM mainframes Embedded software Real time systems Each chapter of this contributed work has been authored by a recognized expert This is an excellent textbook for graduate and advanced undergraduate students in electrical engineering computer engineering and computer science as well as a must have reference that will help engineers programmers and technologists develop systems that are secure and reliable **Dependable Computing--EDCC ...** ,2005

Dependable Computing for Critical Applications 4 Flaviu Cristian,Gerard LeLann,Teresa Lunt,2012-12-06 This volume

contains the articles presented at the Fourth InternationallFIP Working Conference on Dependable Computing for Critical Applications held in San Diego California on January 4 6 1994 In keeping with the previous three conferences held in August 1989 at Santa Barbara USA in February 1991 at Tucson USA and in September 1992 at Mondello Italy the conference was concerned with an important basic question can we rely on computer systems for critical applications This conference like its predecessors addressed various aspects of dependability a broad term defined as the degree of trust that may justifiably be placed in a system s reliability availability safety security and performance Because of its broad scope a main goal was to contribute to a unified understanding and integration of these concepts The Program Committee selected 21 papers for presentation from a total of 95 submissions at a September meeting in Menlo Park California The resulting program represents a broad spectrum of interests with papers from universities corporations and government agencies in eight countries The selection process was greatly facilitated by the diligent work of the program committee members for which we are most grateful As a Working Conference the program was designed to promote the exchange of ideas by extensive discussions All paper sessions ended with a 30 minute discussion period on the topics covered by the session In addition three panel sessions have been organizcd *Design of Dependable Computing Systems* J.C. Geffroy,G. Motet,2013-03-09 This book analyzes the causes of failures in computing systems their consequences as weIl as the existing solutions to manage them The domain is tackled in a progressive and educational manner with two objectives 1 The mastering of the basics of dependability domain at system level that is to say independently ofthe technology used hardware or software and of the domain of application 2 The understanding of the fundamental techniques available to prevent to remove to tolerate and to forecast faults in hardware and software technologies The first objective leads to the presentation of the general problem the fault models and degradation mechanisms wh ich are at the origin of the failures and finally the methods and techniques which permit the faults to be prevented removed or tolerated This study concerns logical systems in general independently of the hardware and software technologies put in place This knowledge is indispensable for two reasons A large part of a product s development is independent of the technological means expression of requirements specification and most of the design stage Very often the development team does not possess this basic knowledge hence the dependability requirements are considered uniquely during the technological implementation Such an approach is expensive and inefficient Indeed the removal of a preliminary design fault can be very difficult if possible if this fault is detected during the product s final testing **Dependable Computing - EDCC 2005** Mario Dal Cin,Mohamed Kaâniche,András Pataricza,2005-03-31 It is always a special honor to chair the European Dependable Computing C ference EDCC EDCC has become one of the well established conferences in the eld of dependability in the European research area Budapest was selected as the host of this conference due to its traditions in organizing international scienti c events and its traditional role of serving as a meeting point between East and West EDCC 5 was the fth in the series of these high quality scienti c conf

ences In addition to the overall signi cance of such a pan European event this year s conference was a special one due to historic reasons The roots of EDCC date back to the moment when the Iron Curtain fell Originally two groups of scientists from di erent European countries in Western and Eastern Europe who were active in research and education related to dependability created a joint forum in order to merge their communities as early as in 1989 This trend has continued up to today This year s conference was the rst one where the overwhelming majority of the research groups belong to the family of European nations united in the European Union During the past 16 years we observed that the same roots in all the professional cultural and scienti c senses led to a seamless integration of these research communities previously separated ar cially for a long time EDCC has become one of the main European platforms to exchange new searchideasinthe eldofdependability Dependable Computing - EDCC 2021 Workshops Rasmus Adler,Amel Bennaceur,Simon Burton,Amleto Di Salle,Nicola Nostro,Rasmus Løvenstein Olsen,Selma Saidi,Philipp Schleiss,Daniel Schneider,Hans-Peter Schwefel,2021-09-08 This book constitutes refereed proceedings of the Workshops of the 17th European Dependable Computing Conference EDCC Second Worskhop on Dynamic Risk Management for Autonomous Systems DREAMS 2021 Third Workshop on Dependable Solutions for Intelligent Electricity Distribution Grids DSOGRI 2021 13th Workshop on Software Engineering for Resilient Systems SERENE 2021 held in September 2021 Due to the COVID 19 pandemic the workshops were held virtually The 14 workshop papers presented were thoroughly reviewed and selected from 22 submissions The workshop papers complement the main conference topics by addressing dependability or security issues in specic application domains or by focussing in specialized topics such as system resilience *Computer Safety, Reliability, and Security* Erwin Schoitsch,2010-08-11 Computers and microprocessors are indispensable in modern technical systems their deployment spanning the domains automotive railway aerospace and transportation security energy supply telecommunication critical infrastructures and process ind tries They perform tasks that a few decades ago were very difficult if not impossible As they perform these tasks with increasing efficiency more and more tasks are shifted from hardware to software which means that the dependability of computer systems becomes crucial for the safety security and reliability of technical systems With the so called embedded systems becoming more and more intelligent networked and co operating with each other with humans and the environment computers have invaded all aspects of daily life New paradigms have arisen like ubiquitous computing systems of systems energy and resource awareness enormous complexity issues and the like requiring a more holistic systems view as well th So after 31 years of SAFECOMP the emphasis of the 29 event is on critical bedded systems which are almost omnipresent Their impact on our lives risks and challenges are often not well understood underestimated or exaggerated The p mary issue is to cope with complexity new failure modes and resource management due to shrinking feature size multi core systems and management of multiple variants while maintaining dependability properties and robustness Nuclear Engineering International ,1989 **Scientific and Technical**

Aerospace Reports ,1990 **1999 Pacific Rim International Symposium on Dependable Computing** ,1999 **Dependable Computing for Critical Applications 7** Charles B. Weinstock,John Rushby,1999 Annotation Presenting all 20 of the conferences talks covers assessing and coping with commercial off the shelf components formal methods distributed systems time triggered architecture fault tolerance and safety models of partitioning for integrated modular avionics dependability evaluation and probabilistic guarantees A summary is also provided for a panel on certifying and assessing critical systems Among the specific topics are building fault tolerant hardware clocks from commercial components improving the performance of atomic broadcast protocols using the newsmonger technique the experimentally validating high speed systems using physical fault injection and evaluating dependability using a multi criteria decision analysis procedure No mention is made of where or when the conference was held There is no subject index Annotation copyrighted by Book News Inc Portland OR **Choice** ,2006 **Proceedings** ,2000 Presents 36 contributions from the July 2000 workshop addressing electronic engineering concerns in the testing of electronics systems for the prevention of field failures Eleven sessions addressed topics such as fault tolerance and on line testing for reconfigurable systems reliability issues in Sixth IEEE International Symposium on High Assurance Systems Engineering ,2001 This volume contains the conference proceedings of the 2001 6th IEEE International Symposium on High Assurance Systems Engineering *Predictably Dependable Computing Systems* Brian Randell,1995-06-09 This book provides an overview of the work of two successive ESPRIT Basic Research Projects on Predictably Dependable Computing Systems PDCS as well as their major achievements The purpose of the projects has been to contribute to making the process of designing and constructing dependable computing systems much more predictable and cost effective The book contains a carefully edited selection of papers on all four main topics in PDCS fault prevention fault tolerance fault removal and fault forecasting Problems of real time and distributed systems system structuring qualitative evaluation and software dependability modelling are emphasized The book reports on the latest research on PDCS from a team including many of Europe s leading researchers Fundamentals of Dependable Computing for Software Engineers John Knight,2012-01-12 Fundamentals of Dependable Computing for Software Engineers presents the essential elements of computer system dependability The book describes a comprehensive dependability engineering process and explains the roles of software and software engineers in computer system dependability Readers will learn Why dependability matters What it means for a system to be dependable How to build a dependable software system How to assess whether a software system is adequately dependable The author focuses on the actions needed to reduce the rate of failure to an acceptable level covering material essential for engineers developing systems with extreme consequences of failure such as safety critical systems security critical systems and critical infrastructure systems The text explores the systems engineering aspects of dependability and provides a framework for engineers to reason and make decisions about software and its dependability It also offers a comprehensive approach to

achieve software dependability and includes a bibliography of the most relevant literature Emphasizing the software engineering elements of dependability this book helps software and computer engineers in fields requiring ultra high levels of dependability such as avionics medical devices automotive electronics weapon systems and advanced information systems construct software systems that are dependable and within budget and time constraints **Foundations of Dependable Computing** Gary M. Koob,Clifford G. Lau,2007-11-23 Foundations of Dependable Computing Paradigms for Dependable Applications presents a variety of specific approaches to achieving dependability at the application level Driven by the higher level fault models of Models and Frameworks for Dependable Systems and built on the lower level abstractions implemented in a third companion book subtitled System Implementation these approaches demonstrate how dependability may be tuned to the requirements of an application the fault environment and the characteristics of the target platform Three classes of paradigms are considered protocol based paradigms for distributed applications algorithm based paradigms for parallel applications and approaches to exploiting application semantics in embedded real time control systems The companion volume subtitled Models and Frameworks for Dependable Systems presents two comprehensive frameworks for reasoning about system dependability thereby establishing a context for understanding the roles played by specific approaches presented in this book s two companion volumes It then explores the range of models and analysis methods necessary to design validate and analyze dependable systems Another companion book published by Kluwer subtitled System Implementation explores the system infrastructure needed to support the various paradigms of Paradigms for Dependable Applications Approaches to implementing support mechanisms and to incorporating additional appropriate levels of fault detection and fault tolerance at the processor network and operating system level are presented A primary concern at these levels is balancing cost and performance against coverage and overall dependability As these chapters demonstrate low overhead practical solutions are attainable and not necessarily incompatible with performance considerations The section on innovative compiler support in particular demonstrates how the benefits of application specificity may be obtained while reducing hardware cost and run time overhead **Proceedings of the ACM SIGSOFT '89 Third Symposium on Software Testing, Analysis, and Verification** Richard A. Kemmerer,1989 **Information Processing 89** G. X. Ritter,1989 Proceedings Miscellaneous

Dependable Computing Design And Assessment Book Review: Unveiling the Magic of Language

In an electronic digital era where connections and knowledge reign supreme, the enchanting power of language has are more apparent than ever. Its capability to stir emotions, provoke thought, and instigate transformation is actually remarkable. This extraordinary book, aptly titled "**Dependable Computing Design And Assessment**," written by a very acclaimed author, immerses readers in a captivating exploration of the significance of language and its profound affect our existence. Throughout this critique, we will delve into the book is central themes, evaluate its unique writing style, and assess its overall influence on its readership.

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