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Runtime Environment RTE | Embedded Academy E-Learning Runtime Analysis in AUTOSAR Projects - Automatization of Real-Time Analysis
Introduction, Challenges, and Standardization
Architecture, Programming and Design
Vehicular Networking
Architecting Dependable Systems II
PROCEEDINGS OF THE 21ST CONFERENCE ON FORMAL METHODS IN COMPUTER-AIDED DESIGN - FMCAD 2021
Simulation and Testing for Vehicle Technology
8th International Conference, MODELSWARD 2020, Valletta, Malta, February 25-27, 2020, Revised Selected Papers
Springer Handbook of Automation
Proceedings of the 4th International Conference on Electrical and Information Technologies for Rail Transportation (EITRT) 2019
Algorithm & SoC Design for Automotive Vision Systems
Designing and Optimizing System Software
Applied Software Architecture
Embedded Software and Systems
Generic Tools, Specific Languages
2009 IEEE Conference on Emerging Technologies and Factory Automation

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Model-Based Design and Simulation
Develop customized drivers for embedded Linux
Embedded Systems Foundations of Cyber-Physical Systems
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NATHALIA MALIK

*Introduction, Challenges, and
Standardization* Springer Nature

This book addresses the various challenges and open questions relating to CAN communication networks. Opening with a short introduction into the fundamentals of CAN, the book then examines the problems and solutions for the physical layout of networks, including EMC issues and topology

layout. Additionally, a discussion of quality issues with a particular focus on test techniques is presented. Each chapter features a collection of illuminating insights and detailed technical information supplied by a selection of internationally-regarded experts from industry and academia. Features: presents thorough coverage of architectures, implementations and application of CAN transceiver, data link layer and so-called higher layer software; explains CAN EMC characteristics and countermeasures, as

well as how to design CAN networks; demonstrates how to practically apply and test CAN systems; includes examples of real networks from diverse applications in automotive engineering, avionics, and home heating technology.

ARCHITECTURE, PROGRAMMING AND DESIGN

Tata McGraw-Hill Education

An emerging trend in the automobile industry is its convergence with information technology (IT). Indeed, it has been estimated that almost 90% of new automobile technologies involve IT in some form. Smart driving technologies that improve safety as well as green fuel technologies are quite representative of the convergence between IT and automobiles. The smart driving

technologies include three key elements: sensing of driving environments, detection of objects and potential hazards and the generation of driving control signals including warning signals. Although radar-based systems are primarily used for sensing the driving environments, the camera has gained importance in advanced driver assistance systems (ADAS). This book covers system-on-a-chip (SoC) designs—including both algorithms and hardware—related with image sensing and object detection by using the camera for smart driving systems. It introduces a variety of algorithms such as lens correction, super resolution, image enhancement and object detections from the images captured by low-cost vehicle camera. This is followed

by implementation issues such as SoC architecture, hardware accelerator, software development environment and reliability techniques for automobile vision systems. This book is aimed for the new and practicing engineers in automotive and chip-design industries to provide some overall guidelines for the development of automotive vision systems. It will also help graduate students understand and get started for the research work in this field.

Vehicular Networking Packt Publishing Ltd

Generic Tools, Specific Languages (GTSL) is an approach for developing tools and applications in a way that supports easier and more meaningful adaptation to specific domains. To achieve this goal, GTSL generalizes

programming language IDEs to domains traditionally not addressed by languages and IDEs. At its core, GTSL represents applications as documents/programs/models expressed with suitable languages. Application functionality is provided through an IDE that is aware of the languages and their semantics. The IDE provides editing support, and also directly integrates domain-specific analyses and execution services. Applications and their languages can be adapted to increasingly specific domains using language engineering; this includes developing incremental extensions to existing languages or creating additional, tightly integrated languages. Language workbenches act as the foundation on which such applications

are built. mbeddr is an extensible set of integrated languages for embedded software development built using the Generic Tools, Specific Languages approach.

ARCHITECTING DEPENDABLE SYSTEMS II

Springer Science & Business Media
This handbook incorporates new developments in automation. It also presents a widespread and well-structured conglomeration of new emerging application areas, such as medical systems and health, transportation, security and maintenance, service, construction and retail as well as production or logistics. The handbook is not only an ideal resource for automation experts but also

for people new to this expanding field.

PROCEEDINGS OF THE 21ST CONFERENCE ON FORMAL METHODS IN COMPUTER-AIDED DESIGN - FMCAD 2021

Springer Science & Business Media
The book includes contributions on the latest model-based methods for the development of personal and commercial vehicle control devices. The main topics treated are: application of simulation and model design to development of driver assistance systems; physical and database model design for engines, motors, powertrain, undercarriage and the whole vehicle; new simulation tools, methods and optimization processes; applications of simulation in function and software

development; function and software testing using HiL, MiL and SiL simulation; application of simulation and optimization in application of control devices; automation approaches at all stages of the development process.

Simulation and Testing for Vehicle Technology Springer

As embedded systems become more complex, designers face a number of challenges at different levels: they need to boost performance, while keeping energy consumption as low as possible, they need to reuse existent software code, and at the same time they need to take advantage of the extra logic available in the chip, represented by multiple processors working together. This book describes several strategies to achieve such different and interrelated

goals, by the use of adaptability. Coverage includes reconfigurable systems, dynamic optimization techniques such as binary translation and trace reuse, new memory architectures including homogeneous and heterogeneous multiprocessor systems, communication issues and NOCs, fault tolerance against fabrication defects and soft errors, and finally, how one can combine several of these techniques together to achieve higher levels of performance and adaptability. The discussion also includes how to employ specialized software to improve this new adaptive system, and how this new kind of software must be designed and programmed.

8th International Conference, MODELSWARD 2020, Valletta,

**Malta, February 25-27, 2020,
Revised Selected Papers** Createspace
Independent Pub

Of the workshop on multi-paradigm modeling : concepts and tools / Holger Giese, Tihamer Levendovszky and Hans Vangheluwe -- Think global, act local : implementing model management with domain-specific integration languages / Thomas Reiter, Kerstin Altmanninger and Werner Retschitzegger -- MoDELS 2006 doctoral symposium / Gabriela Arevalo and Robert Pettit -- Model driven security engineering for the realization of dynamic security requirements in collaborative systems / Muhammad Alam -- Educators' symposium at MoDELS 2006 / Ludwik Kuzniarz -- If you're not modeling, you're just programming : modeling throughout an undergraduate

software engineering program / James Vallino -- Teaching software modeling in a simulated project environment / Robert Szmurlo and Michal Smialek -- Repository for model driven development (ReMoDD) / Robert France, Jim Bieman and Betty H. C. Cheng -- UML 2 semantics symposium : formal semantics for UML / Manfred Broy, Michelle L. Crane, Juergen Dingel, Alan Hartman, Bernhard Rumpe and Bran Selic -- UML simulator based on a generic model execution engine / Andrei Kirshin, Dolev Dotan and Alan Hartman -- Queries and constraints : a comprehensive semantic model for UML2 / Ingolf H. Kruger and Massimiliano Menarini -- Analysis of UML activities with dynamic meta modeling techniques / Christian Soltenborn and Gregor

Engels.

Springer Handbook of Automation
Cambridge University Press

As software systems become ubiquitous, the issues of dependability become more and more critical. Given that solutions to these issues must be taken into account from the very beginning of the design process, it is appropriate that dependability is addressed at the architectural level. This book results from an effort to bring together the research communities of software architectures and dependability. Inspired by the ICSE 2003 Workshop on Software Architectures for Dependable Systems, the book focuses on topics relevant to improving the state of the art in architecting dependable systems. The 15 thoroughly reviewed papers originate

partly from the workshop; others were solicited in order to achieve complete coverage of all relevant aspects. The papers are organized into topical sections on architectures for dependability, fault-tolerance in software architectures, dependability analysis in software architectures, and industrial experience.

Proceedings of the 4th International Conference on Electrical and Information Technologies for Rail Transportation (EITRT) 2019 CRC Press

The new multimedia standards (for example, MPEG-21) facilitate the seamless integration of multiple modalities into interoperable multimedia frameworks, transforming the way people work and interact with multimedia data. These key technologies

and multimedia solutions interact and collaborate with each other in increasingly effective ways, contributing to the multimedia revolution and having a significant impact across a wide spectrum of consumer, business, healthcare, education, and governmental domains. Multimedia and Ubiquitous Engineering provides an opportunity for academic and industry professionals to discuss recent progress in the area of multimedia and ubiquitous environment including models and systems, new directions, novel applications associated with the utilization and acceptance of ubiquitous computing devices and systems.

Algorithm & SoC Design for Automotive Vision Systems Springer

This book reflects the latest research

trends, methods and experimental results in the field of electrical and information technologies for rail transportation, which covers abundant state-of-the-art research theories and ideas. As a vital field of research that is highly relevant to current developments in a number of technological domains, the subjects it covered include intelligent computing, information processing, Communication Technology, Automatic Control, etc. The objective of the proceedings is to provide a major interdisciplinary forum for researchers, engineers, academicians as well as industrial professionals to present the most innovative research and development in the field of rail transportation electrical and information technologies. Engineers and researchers

in academia, industry, and the government will also explore an insight view of the solutions that combine ideas from multiple disciplines in this field. The volumes serve as an excellent reference work for researchers and graduate students working on rail transportation, electrical and information technologies.

Designing and Optimizing System Software Springer Nature

This volume contains the lectures given in honor to Georg Färber as tribute to his contributions in the area of real-time and embedded systems. The chapters of many leading scientists cover a wide range of aspects, like robot or automotive vision systems or medical aspects.

Applied Software Architecture Shaker Verlag GmbH

This book constitutes the refereed proceedings of the Third International Conference on Embedded Software and Systems, ICESS 2007, held in Daegu, Korea, May 2007. The 75 revised full papers cover embedded architecture, embedded hardware, embedded software, HW-SW co-design and SoC, multimedia and HCI, pervasive/ubiquitous computing and sensor network, power-aware computing, real-time systems, security and dependability, and wireless communication.

Embedded Software and Systems
River Publishers

Unser Leben ist von Hardware geprägt: Sei es der USB-Stick, der Prozessor unserer Laptops oder die Sim-Karte unseres Smartphones. Doch wer sorgt

eigentlich dafür, dass diese Systeme vom ersten Entwurf an stabil und sicher funktionieren? Der Computer – mithilfe des Menschen. Das Ganze nennt sich CAD (computer-aided design=computerunterstütztes Entwerfen) und ist aus der modernen Industrielwelt nicht mehr wegzudenken. Doch wie lässt sich sicherstellen, dass eingesetzte Hardware und Computersysteme zuverlässig sind? Durch Formale Methoden: Das sind Techniken und Werkzeuge, mit denen man berechnet, ob etwa eine Systembeschreibung in sich konsistent ist oder Anforderungen richtig entworfen und implementiert wurden. Anders gesagt: Man kann damit die Sicherheit von Hardware und Software überprüfen. Wie das konkret aussehen kann,

interessiert auch die jährlich stattfindende Konferenz „Formal Methods in Computer-Aided Design (FMCAD)“. Unter der Leitung von Ruzica Piskac und Michael W. Whalen beschäftigte sich die 21. Tagung im Oktober 2021 mit den neuesten Forschungsergebnissen im Bereich der Formalen Methoden. Zu dieser Online-Tagung ist nun auch ein Konferenzband mit über 30 Beiträgen erschienen, die ein breites Spektrum der Formalen Methoden abdecken: angefangen bei der Verifikation von Hardware, nebenläufigen und verteilten Systemen und neuronalen Netzen bis hin zu maschinellem Lernen und Entscheidungsprozeduren. Der Band gewährt einen spannenden Einblick in bahnbrechende Methoden,

Technologien, theoretische Ergebnisse und Werkzeuge für Formale Logik in Rechensystemen und Systementwicklungen.

Generic Tools, Specific Languages

Automotive Software ArchitecturesAn Introduction

Learn to develop customized device drivers for your embedded Linux system About This Book Learn to develop customized Linux device drivers Learn the core concepts of device drivers such as memory management, kernel caching, advanced IRQ management, and so on. Practical experience on the embedded side of Linux Who This Book Is For This book will help anyone who wants to get started with developing their own Linux device drivers for embedded systems. Embedded Linux

users will benefit highly from this book. This book covers all about device driver development, from char drivers to network device drivers to memory management. What You Will Learn Use kernel facilities to develop powerful drivers Develop drivers for widely used I2C and SPI devices and use the regmap API Write and support devicetree from within your drivers Program advanced drivers for network and frame buffer devices Delve into the Linux irqdomain API and write interrupt controller drivers Enhance your skills with regulator and PWM frameworks Develop measurement system drivers with IIO framework Get the best from memory management and the DMA subsystem Access and manage GPIO subsystems and develop GPIO controller drivers In Detail Linux kernel is

a complex, portable, modular and widely used piece of software, running on around 80% of servers and embedded systems in more than half of devices throughout the World. Device drivers play a critical role in how well a Linux system performs. As Linux has turned out to be one of the most popular operating systems used, the interest in developing proprietary device drivers is also increasing steadily. This book will initially help you understand the basics of drivers as well as prepare for the long journey through the Linux Kernel. This book then covers drivers development based on various Linux subsystems such as memory management, PWM, RTC, IIO, IRQ management, and so on. The book also offers a practical approach on direct memory access and network device

drivers. By the end of this book, you will be comfortable with the concept of device driver development and will be in a position to write any device driver from scratch using the latest kernel version (v4.13 at the time of writing this book).
Style and approach A set of engaging examples to develop Linux device drivers

[2009 IEEE Conference on Emerging Technologies and Factory Automation](#)
Springer

In recent years the amount of software within automobiles has increased up to 100 Million LOC in modern day premium vehicles. Virtually all innovations in automotive engineering in the last decade include software components. Parallel to this increasing amount, testing becomes more vital. Automotive

software development follows restrictive guidelines in terms of coding standard, language limitations and processes. Traditionally testing is a core part of automotive development, but the raising number of features increases the time and money required to perform all tests. Repeating them multiple times due to programming errors might jeopardises a cars introduction on the market. SFP is a new approach to forecast bugs already at time of commit, thus to guide test engineers upon defining testing hotspots. This work reports on the first successful application using model driven and code generated automotive software as a case study and a success prediction rate up to 97% upon a bug or fault free commit. A compiled and published dataset is presented along

with analysis upon the used software metrics. Performance data achieved using different machine learning algorithms is given. An indepth analysis upon factors preventing CPFP is conducted. Further usage and practical application areas will conclude the work. Application & Rte University of Bamberg Press

This book presents deep analysis of machine control for different applications, focusing on its implementation in embedded systems. Necessary peripherals for various microcontroller families are analysed for machine control and software architecture patterns for high-quality software development processes in motor control units are described. Abundant figures help the reader to

understand the theoretical, simulation and practical implementation stages of machine control. Model-based design, used as a mathematical and visual approach to construction of complex control algorithms, code generation that eliminates hand-coding errors, and co-simulation tools such as Simulink, PSIM and finite element analysis are discussed. The simulation and verification tools refine, and retest the models without having to resort to prototype construction. The book shows how a voltage source inverter can be designed with tricks, protection elements, and space vector modulation. Practical Control of Electric Machines: Model-Based Design and Simulation is based on the author's experience of a wide variety of systems in domestic,

automotive and industrial environments, and most examples have implemented and verified controls. The text is ideal for readers looking for an insight into how electric machines play an important role in most real-life applications of control. Practitioners and students preparing for a career in control design applied in electric machines will benefit from the book's easily understood theoretical approach to complex machine control. The book contains mathematics appropriate to various levels of experience, from the student to the academic and the experienced professional. Advances in Industrial Control reports and encourages the transfer of technology in control engineering. The rapid development of control technology has an impact on all

areas of the control discipline. The series offers an opportunity for researchers to present an extended exposition of new work in all aspects of industrial control.

MODEL-BASED DESIGN AND SIMULATION

Springer

In this text, Smith and Nair take a new approach by examining virtual machines as a unified discipline and pulling together cross-cutting technologies. Topics include instruction set emulation, dynamic program translation and optimization, high level virtual machines (including Java and CLI), and system virtual machines for both single-user systems and servers.

[Develop customized drivers for embedded Linux](#) CRC Press

Time-Triggered Communication helps readers build an understanding of the conceptual foundation, operation, and application of time-triggered communication, which is widely used for embedded systems in a diverse range of industries. This book assembles contributions from experts that examine the differences and commonalities of the most significant protocols including: TTP, FlexRay, TTEthernet, SAFEbus, TTCAN, and LIN. Covering the spectrum, from low-cost time-triggered fieldbus networks to ultra-reliable time-triggered networks used for safety-critical applications, the authors illustrate the inherent benefits of time-triggered communication in terms of predictability, complexity management, fault-tolerance, and analytical dependability

modeling, which are key aspects of safety-critical systems. Examples covered include FlexRay in cars, TTP in railway and avionic systems, and TTEthernet in aerospace applications. Illustrating key concepts based on real-world industrial applications, this book: Details the underlying concepts and principles of time-triggered communication Explores the properties of a time-triggered communication system, contrasting its strengths and weaknesses Focuses on the core algorithms applied in many systems, including those used for clock synchronization, startup, membership, and fault isolation Describes the protocols that incorporate presented algorithms Covers tooling requirements and solutions for system integration,

including scheduling The information in this book is extremely useful to industry leaders who design and manufacture products with distributed embedded systems based on time-triggered communication. It also benefits suppliers of embedded components or development tools used in this area. As an educational tool, this material can be used to teach students and working professionals in areas including embedded systems, computer networks, system architectures, dependability, real-time systems, and automotive, avionics, and industrial control systems. *Embedded Systems Foundations of Cyber-Physical Systems* Springer Nature A Clear Outline of Current Methods for Designing and Implementing Automotive Systems Highlighting requirements,

technologies, and business models, the Automotive Embedded Systems Handbook provides a comprehensive overview of existing and future automotive electronic systems. It presents state-of-the-art methodological and technical solutions in the areas of in-vehicle architectures, multipartner development processes, software engineering methods, embedded communications, and safety and dependability assessment. Divided into four parts, the book begins with an introduction to the design constraints of automotive-embedded systems. It also examines AUTOSAR as the emerging de facto standard and looks at how key technologies, such as sensors and wireless networks, will facilitate the conception of partially and fully

autonomous vehicles. The next section focuses on networks and protocols, including CAN, LIN, FlexRay, and TTCAN. The third part explores the design processes of electronic embedded systems, along with new design methodologies, such as the virtual platform. The final section presents validation and verification techniques relating to safety issues. Providing domain-specific solutions to various technical challenges, this handbook serves as a reliable, complete, and well-documented source of information on automotive embedded systems.

[High-Performance and Time-Predictable Embedded Computing](#) Springer Science & Business Media

Despite its importance, the role of HdS is most often underestimated and the topic

is not well represented in literature and education. To address this, Hardware-dependent Software brings together experts from different HdS areas. By providing a comprehensive overview of general HdS principles, tools, and applications, this book provides adequate insight into the current technology and upcoming developments in the domain of HdS. The reader will find an interesting text book with self-contained introductions to the principles

of Real-Time Operating Systems (RTOS), the emerging BIOS successor UEFI, and the Hardware Abstraction Layer (HAL). Other chapters cover industrial applications, verification, and tool environments. Tool introductions cover the application of tools in the ASIP software tool chain (i.e. Tensilica) and the generation of drivers and OS components from C-based languages. Applications focus on telecommunication and automotive systems.

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