

Introduction To Adaptive Autosar

This book provides a comprehensive introduction to embedded flash memory, describing the history, current status, and future projections for technology, circuits, and systems applications. The authors describe current main-stream embedded flash technologies including floating-gate 1Tr, floating-gate with split-gate (1.5Tr), and 1Tr/1.5Tr SONOS flash technologies and their successful creation of various applications. Comparisons of these embedded flash technologies and future projections are also provided. The authors demonstrate embedded applications for auto-motive, smart-IC cards, and low-power, representing the leading-edge technology developments for eFlash. The discussion also includes insights into future prospects of application-driven non-volatile memory technology in the advanced automotive system, such as ADAS (Advanced Driver Assistance System) and IoE (Internet of Everything). Trials on technology convergence and future prospects of embedded non-volatile memory in the new memory hierarchy are also described. Introduction to history of embedded flash memory technology for micro-controller products and how embedded flash innovations developed; Includes comprehensive and detailed descriptions of current main-stream embedded flash memory technologies, sub-system designs and architectures; Explains why embedded flash memory requirements are different from those of stand-alone flash memory and how to achieve specific goals with technology development and circuit designs; Describes a mature and stable floating-gate 1Tr cell technology in stand-alone flash memory products - that then introduces embedded-specific split-gate memory cell technologies based on floating-gate storage structure and charge-trapping SONOS technology and their eFlash sub-system designs; Describes automotive and smart-IC applications requirements and achievements in advanced eFlash beyond 4 Onm node.

This book is a compilation of the recent technologies and innovations in the field of automotive embedded systems with a special mention to the role of Internet of Things in automotive systems. The book provides easy interpretable explanations for the key concepts in automotive embedded systems. The authors illustrate various diagnostics over internet protocol and over-the-air update process, present advanced driver assistance systems, discuss various cyber security issues involved in connected cars, and provide new information about Autosar and Misra coding standards. The book is relevant to academics, professionals, and researchers.

In einer sich rasant verändernden Welt sieht sich die Automobilindustrie fast täglichmit neuen Herausforderungen konfrontiert: Der problematischer werdende Rufdes Dieselmotors, verunsicherte Verbraucher durch die in der Berichterstattungvermischte Themen des Feinstaubemissionen, zunehmendeKonkurrenz bei Elektroantrieben durch neue Wettbewerber, die immer schwierigerwerdende öffentlichkeitswirksame Darstellung, dass ein großer Unterschiedzwischen Prototypen, Kleinserien und einer wirklichen Großserie besteht.Dazu kommen noch die Fragen, wann die mit viel finanziellem Einsatz entwickeltenalternativen Antriebsformen tatsächlich einen Return of Invest erbringen, wer dienotwendige Ladeinfrastruktur für eine Massenmarkttauglichkeit der Elektromobilitätbauteile wird und wie sich das alles auf die Arbeitsplatzeauswirken wird.Für die Automobilindustrie ist es jetzt wichtiger denn je, sich den Herausforderungenaktiv zu stellen und innovative Lösungen unter Beibehaltung des hohenQualitätsanspruchs der OEMs in Serie zu entwickeln. Hauptthemen sind hierbeidie Elektromobilität mit höheren Energiedichten und niedrigeren Kosten der Batteriovorzantreiben und eine wirklich ausreichende standardisierte und zukunftssichereLadeinfrastruktur darzustellen, aber auch den Entwicklungspfad zu schadstofffreienund CO2-neutralen Verbrennungsmotor konsequent weiter zu gehen. Auch dasautomatisierte Fahren kann hier hilfreich sein, weil das Fahrzeugverhalten dann –im wahrsten Sinne des Wortes - kalkulierbarer wird.Dabei ist es für die etablierten Automobilhersteller strukturell nicht immer einfach,mit der rasanten Veränderungsgeschwindigkeit mitzuhalten. Hier haben Start-upseinen großen Vorteil: Ihre Organisationsstruktur erlaubt es, frische, unkonventionelleIdeen zügig umzusetzen und sehr flexibel zu sein. Schon heute werdenStart-ups gezielt gefördert, um neue Lösungen im Bereich von Komfort, Sicherheit,Effizienzund neuen Kundenschnittstellen zu finden. Neue Lösungsansätze,gepaart mit Investitionskraft und Erfahrungen, bieten neue Chancen auf dem Weg zur Elektromobilität, der Zukunft des Verbrennungsmotors und ganz allgemein für dasAuto der Zukunft.

Everything you need to know about AUTOSAR 4.0.3 can be found in the 13,620 pages of the AUTOSAR specifications. Then why do you need this book? Quite simply, because the official AUTOSAR documents are written as a specification and not as a guideline. Matters worse is that these documents are structured and formulated as requirements. This is perfect if you need to implement the AUTOSAR standard, but less so if you simply want to know how to use it. Furthermore, while PDF files are well-suited for search and compare with a handy book where you can easily add your own personal comments and attach nice little colored sticky notes. The AUTOSAR Compendium - Part 1 summarizes the first part of the AUTOSAR 4.0.3 specification, namely the Application Layer and the Configuration Layer. It explains all of the different attributes, their usage and logical connections with other parts of the specification. Moreover, it accelerates your work with AUTOSAR considerably by answering the most commonly posed questions. All this, enriched with practical examples, configuration, ARXML-code, generated RTE-code and actual C-code implementations. The Compendium is a priceless reference for software architects and software engineers who work with AUTOSAR each day. If you have questions that aren't answered in the book, let me know and I'll try to cover it with the next edition. For more information on this book, please visit: http://www.ar-compendium.com or e-mail the author: part1@ar-compendium.co

Learn how automotive Ethernet is revolutionizing in-car networking from the experts at the core of its development. Providing an in-depth account of automotive Ethernet, from its background and development, to its future prospects, this book is ideal for researchers and academics alike.

State of the Art and Future Trends

Software Engineering for Automotive Systems

Automated Driving

Basic Information, Components and Systems for Active Safety and Comfort

Real-Time Simulation Technologies: Principles, Methodologies, and Applications

36th IFIP TC 11 International Conference, SEC 2021, Oslo, Norway, June 22–24, 2021, Proceedings

Von der Assistenz zum automatisierten Fahren 2. Internationale ATZ-Fachtagung

This fundamental work explains in detail systems for active safety and driver assistance, considering both their structure and their function. These include the well-known standard systems such as Anti-lock braking system (ABS), Electronic Stability Control (ESC) or Adaptive Cruise Control (ACC). But it includes also new systems for protecting collisions protection, for changing the lane, or for convenient parking. The book aims at giving a complete picture focusing on the entire system. First, it describes the components which are necessary for assistance systems, such as sensors, actuators, mechatronic subsystems, and control elements. Then, it explains key features for the user-friendly design of human-machine interfaces between driver and assistance system. Finally, important characteristic features of driver assistance systems for particular vehicles are presented: Systems for commercial vehicles and motorcycles.

This comprehensive text/reference presents an in-depth review of the state of the art of automotive connectivity and cybersecurity with regard to trends, technologies, innovations, and applications. The text describes the challenges of the global automotive market, clearly showing where the multitude of innovative activities fit within the overall effort of cutting-edge automotive innovations, and provides an ideal framework for understanding the complexity of automotive connectivity and cybersecurity. Topics and features: discusses the automotive market, automotive research and development, and automotive electrical/electronic and software technology; examines connected cars and autonomous vehicles, and methodological approaches to cybersecurity to avoid cyber-attacks against vehicles; provides an overview on the automotive industry that introduces the trends driving the automotive industry towards smart mobility and autonomous driving; reviews automotive research and development, offering background on the complexity involved in developing new vehicle models; describes the technologies essential for the evolution of connected cars, such as cyber-physical systems and the Internet of Things; presents case studies on Car2Go and car sharing, car hailing and ridesharing, connected parking, and advanced driver assistance systems; includes review questions and exercises at the end of each chapter. The insights offered by this practical guide will be of great value to graduate students, academic researchers and professionals in industry seeking to learn about the advanced methodologies in automotive connectivity and cybersecurity.

AUTONOMOUS AND CONNECTED VEHICLES Discover the latest developments in autonomous vehicles and what the future holds for this exciting technology In Autonomous and Connected Vehicles, networking experts Dominique Paret and Hassina Rebaïne deliver a robust exploration of the major technological changes taking place in the field, and describe the different levels of autonomy possible with current technologies and the legal and regulatory contexts in which new autonomous vehicles will circulate. The book also includes discussions of the sensors, including infrared, ultrasound, cameras, lidar, and radar, used by modern autonomous vehicles. Readers will enjoy the intuitive descriptions of Advanced Driver Assistance Systems (ADAS), network architectures (CAN-FD, FlexRay, and Backbone Ethernet), and software that power current and future autonomous vehicles. The authors also discuss how ADAS can be fused with data flowing over newer and faster network architectures and artificial intelligence to create greater levels of autonomy. The book also includes: A thorough introduction to the buzz and hype surrounding autonomous and connected vehicles, including a brief history of the autonomous vehicle Comprehensive explorations of common issues affecting autonomous and connected vehicles, including regulatory guidelines, legislation, relevant norms and standards, and insurance issues Practical discussions of autonomous vehicle sensors, from DAS to ADAS and HADAS, and VA L3 to L5 In-depth examinations of networks and architecture, including discussions of data fusion, artificial intelligence, and hardware architecture in vehicles Perfect for graduate and undergraduate students in programs dealing with the intersection of wireless communication technologies and vehicles, Autonomous and Connected Vehicles is also a must-read reference for industry professionals and researchers seeking a one-stop reference for the latest developments in vehicle communications technology.

Without correct timing, there is no safe and reliable embedded software. This book shows how to consider timing early in the development process for embedded systems, how to solve acute timing problems, how to perform timing optimization, and how to address the aspect of timing verification. The book is organized in twelve chapters. The first three cover various basics of microprocessor technologies and the operating systems used therein. The next four chapters cover timing problems both in theory and practice, covering also various timing analysis techniques as well as special issues like multi- and many-core timing. Chapter 8 deals with aspects of timing optimization, followed by chapter 9 that highlights various methodological issues of the actual development process. Chapter 10 presents timing analysis in AUTOSAR in detail, while chapter 11 focuses on safety aspects and timing verification. Finally, chapter 12 provides an outlook on upcoming and future developments in software timing. The number of embedded systems that we encounter in everyday life is growing steadily. At the same time, the complexity of the software is constantly increasing. This book is mainly written for software developers and project leaders in industry. It is enriched by many practical examples mostly from the automotive domain, yet the vast majority of the book is relevant for any embedded software project. This way it is also well-suited as a textbook for academic courses with a strong practical emphasis, e.g. at applied sciences universities. Features and Benefits * Shows how to consider timing in the development process for embedded systems, how to solve timing problems, and how to address timing verification * Enriched by many practical examples mostly from the automotive domain * Mainly written for software developers and project leaders in industry

This book gathers selected papers presented at the Inventive Communication and Computational Technologies conference (ICICCT 2019), held on 29–30 April 2019 at Gnanamani College of Technology, Tamil Nadu, India. The respective contributions highlight recent research efforts and advances in a new paradigm called ISMAC (IoT in Social, Mobile, Analytics and Cloud contexts). Topics covered include the Internet of Things, Social Networks, Mobile Communications, Big Data Analytics, Bio-inspired Computing and Cloud Computing. The book is chiefly intended for academics and practitioners working to resolve practical issues in this area.

10th International Symposium on Leveraging Applications of Formal Methods, ISoLA 2021, Rhodes, Greece, October 17–29, 2021, Proceedings

28th European Conference, EuroSPI 2021, Krems, Austria, September 1–3, 2021, Proceedings

Hard Real-Time Computing Systems

Dynamically Reconfigurable Systems

Fahrerassistenzsysteme 2016

Models and Technologies for Smart, Sustainable and Safe Transportation Systems

The Zynq Book

This book introduces readers to the theory, design and applications of automotive transmissions. It covers multiple categories, e.g. AT, AMT, CVT, DCT and transmissions for electric vehicles, each of which has its own configuration and characteristics. In turn, the book addresses the effective design of transmission gear ratios, structures and control strategies, and other topics that will be of particular interest to graduate students, researchers and engineers. Moreover, it includes real-world solutions, simulation methods and testing procedures. Based on the author’s extensive first-hand experience in the field, the book allows readers to gain a deeper understanding of vehicle transmissions.

OpenVX is the computer vision API adopted by many high-performance processor vendors. It is quickly becoming the preferred way to write fast and power-efficient code on embedded systems. OpenVX Programming Guidebook presents definitive information on OpenVX 1.2 and 1.3, the Neural Network, and other extensions as well as the OpenVX Safety Critical standard. This book gives a high-level overview of the OpenVX standard, its design principles, and overall structure. It covers computer vision functions and the graph API, providing examples of usage for the majority of the functions. It is intended both for the first-time user of OpenVX and as a reference for experienced OpenVX developers. Get to grips with the OpenVX standard and gain insight why various options were chosen Start developing efficient OpenVX code instantly Understand design principles and use them to create robust code Develop consumer and industrial products that use computer vision to understand and interact with the real world

Der inhaltliche Schwerpunkt des Tagungsbands zur ATZlive-Veranstaltung " Fahrerassistenzsysteme 2016" liegt auf der noch vergleichsweise wenig ausgeprägten Disziplin IT-Security im und um das vernetzte Fahrzeug. Die Tagung ist eine unverzichtbare Plattform für den Wissens- und Gedankenaustausch von Forschern und Entwicklern aller Unternehmen und Institutionen, die dieses Ziel verfolgen.

Explores how the automotive industry can address the increased risks of cyberattacks and incorporate security into the software development lifecycle While increased connectivity and advanced software-based automotive systems provide tremendous benefits and improved user experiences, they also make the modern vehicle highly susceptible to cybersecurity attacks. In response, the automotive industry is investing heavily in establishing cybersecurity engineering processes. Written by a seasoned automotive expert with abundant international industry expertise, Building Secure Cars: Assuring the Software Development Lifecycle introduces readers to various types of cybersecurity activities, measures, and solutions that can be applied at each stage in the typical automotive development process. This book aims to assist auto industry insiders build more secure cars by incorporating key security measures into their software development lifecycle. Readers will learn to better understand common problems and pitfalls in the development process that lead to security vulnerabilities. To overcome such challenges, this book details how to apply and optimize various automated solutions, which allow software development and test teams to identify and fix vulnerabilities in their products quickly and efficiently. This book balances technical solutions with automotive technologies, making implementation practical. Building Secure Cars is:

- One of the first books to explain how the automotive industry can address the increased risks of cyberattacks, and how to incorporate security into the software development lifecycle
- An optimal resource to help improve software security with relevant organizational workflows and technical solutions
- A complete guide that covers introductory information to more advanced and practical topics
- Written by an established professional working at the heart of the automotive industry
- Fully illustrated with tables and visuals, plus real-life problems and suggested solutions to enhance the learning experience

This book is written for software development process owners, security policy owners, software developers and engineers, and cybersecurity teams in the automotive industry. All readers will be empowered to improve their organizations security postures by understanding and applying the practical technologies and solutions inside.

This book focuses on scheduling algorithms for parallel applications on heterogeneous distributed systems, and addresses key scheduling requirements – high performance, low energy consumption, real time, and high reliability – from the perspectives of both theory and engineering practice.

Further, it examines two typical application cases in automotive cyber-physical systems and cloud systems in detail, and discusses scheduling challenges in connection with resource costs, reliability and low energy. The book offers a comprehensive and systematic treatment of high-performance, low energy consumption, and high reliability issues on heterogeneous distributed systems, making it a particularly valuable resource for researchers, engineers and graduate students in the fields of computer science and engineering, information science and engineering, and automotive engineering, etc. The wealth of motivational examples with figures and tables make it easy to understand.

ICT Systems Security and Privacy Protection

7th IFIP TC 10 Working Conference, DIPES 2010, and 3rd IFIP TC 10 International Conference, BICC 2010, Held as Part of WCC 2010, Brisbane, Australia, September 20-23, 2010, Proceedings

Computer Safety, Reliability, and Security. SAFECOMP 2020 Workshops

chassis.tech plus

Adaptable Embedded Systems

Autonomous and Connected Vehicles

This book aims to teach the core concepts that make Self-driving vehicles (SDVs) possible. It is aimed at people who want to get their teeth into self-driving vehicle technology, by providing genuine technical insights where other books just skim the surface. The book tackles everything from sensors and perception to functional safety and cybersecurity. It also passes on some practical know-how and discusses concrete SDV applications, along with a discussion of where this technology is heading. It will serve as a good starting point for software developers or professional engineers who are eager to pursue a career in this exciting field and want to learn more about the basics of SDV algorithms. Likewise, academic researchers, technology enthusiasts, and journalists will also find the book useful. Key Features: Offers a comprehensive technological walk-through of what really matters in SDV development: from hardware, software, to functional safety and cybersecurity Written by an active practitioner with extensive experience in series development and research in the fields of Advanced Driver Assistance Systems (ADAS) and Autonomous Driving Covers theoretical fundamentals of state-of-the-art SLAM, multi-sensor data fusion, and other SDV algorithms. Includes practical information and hands-on material with Robot Operating System (ROS) and Open Source Car Control (OSCC). Provides an overview of the strategies, trends, and applications which companies are pursuing in this field at present as well as other technical insights from the industry.

This updated edition offers an indispensable exposition on real-time computing, with particular emphasis on predictable scheduling algorithms. It introduces the fundamental concepts of real-time computing, demonstrates the most significant results in the field, and provides the essential methodologies for designing predictable computing systems used to support time-critical control applications. Along with an in-depth guide to the available approaches for the implementation and analysis of real-time applications, this revised edition contains a close examination of recent developments in real-time systems, including limited preemptive scheduling, resource reservation techniques, overload handling algorithms, and adaptive scheduling techniques. This volume serves as a fundamental advanced-level textbook. Each chapter provides basic concepts, which are followed by algorithms, illustrated with concrete examples, figures and tables. Exercises and solutions are provided to enhance self-study, making this an excellent reference for those interested in real-time computing for designing and/or developing predictable control applications.

Featuring a foreword by Bob Metcalfe, inventor of Ethernet! Ethernet, the most widely-used local area networking technology in the world, is moving from the server rooms of automobile manufacturers to their vehicles. As the quantity and variety of electronic devices in cars continues to grow, Ethernet promises to improve performance and enable increasingly powerful and useful applications in vehicles. Now, from Intrepid Control Systems (www.intrepids.com) - a leader in the world of automotive networking and diagnostic tools - comes the first book to describe the technology behind the biggest revolution in automotive networking since the 1980s: Automotive Ethernet - The Definitive Guide describes the fundamentals of networking, data link and physical layers of industry-standard Ethernet variants, as well as the new (one twisted pair 100Base Ethernet) ITPCE or BroadR-Reach technology developed by Broadcom specifically for vehicle use. Topics covered include: in-vehicle networking requirements, comparing Ethernet to CAN and other existing networks (such as LIN, MOST, and FlexRay), TCP/UDP, IPv4/IPv6 and Diagnostics over IP (DoIP). Also covered are the Audio Video Bridging standards used to transport media over Ethernet: Stream Reservation Protocol or SRP (802.1Qat), Forward-Queueing and Time-Sensitive Streams or FQTSS (802.1Qav), Timing and Synchronization for Time-Sensitive Applications or gPTP (802.1as), and Transport Protocol for Time-Sensitive Applications or AVTP (IEEE 1722), and more. Automotive Ethernet: The Definitive Guide will also be available as an ebook for your Kindle!

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.

This book presents the state of the art, challenges and future trends in automotive software engineering. The amount of automotive software has grown from just a few lines of code in the 1970s to millions of lines in today’s cars. And this trend seems destined to continue in the years to come, considering all the innovations in electric/hybrid, autonomous, and connected cars. Yet there are also concerns related to onboard software, such as security, robustness, and trust. This book covers all essential aspects of the field. After a general introduction to the topic, it addresses automotive software development, automotive software reuse, E/E architectures and safety, C-ITS and security, and future trends. The specific topics discussed include requirements engineering for embedded software systems, tools and methods used in the automotive industry, software product lines, architectural frameworks, various related ISO standards, functional safety and safety cases, cooperative intelligent transportation systems, autonomous vehicles, and security and privacy issues. The intended audience includes researchers from academia who want to learn what the fundamental challenges are and how they are being tackled in the industry, and practitioners looking for cutting-edge academic findings. Although the book is not written as lecture notes, it can also be used in advanced master’s-level courses on software and system engineering. The book also includes a number of case studies that can be used for student projects.

Systems, Software and Services Process Improvement

Architectures, Design Methods and Applications

An Introduction

The Next Big Thing

Inventive Communication and Computational Technologies

Building Secure Cars

Principles and Applications

In chassis development, the three aspects of safety, vehicle dynamics and ride comfort are at the top of the list of challenges to be faced. Addressing this triad of challenges becomes even more complex when the chassis is required to interact with assistance systems and other systems for fully automated driving. What is more, new demands are created by the introduction of modern electric and electronic architectures. All these requirements must be met by the chassis, together with its subsystems, the steering, brakes, tires and wheels. At the same time, all physical relationships and interactions have to be taken into account.

Real-Time Simulation Technologies: Principles, Methodologies, and Applications is an edited compilation of work that explores fundamental concepts and basic techniques of real-time simulation for complex and diverse systems across a broad spectrum. Useful for both new entrants and experienced experts in the field, this book integrates coverage of detailed theory, acclaimed methodological approaches, entrenched technologies, and high-value applications of real-time simulation—all from the unique perspectives of renowned international contributors. Because it offers an accurate and otherwise unattainable assessment of how a system will behave over a particular time frame, real-time simulation is increasingly critical to the optimization of dynamic processes and adaptive systems in a variety of enterprises. These range in scope from the maintenance

of the national power grid, to space exploration, to the development of virtual reality programs and cyber-physical systems. This book outlines how, for these and other undertakings, engineers must assimilate real-time data with computational tools for rapid decision making under uncertainty. Clarifying the central concepts behind real-time simulation tools and techniques, this one-of-a-kind resource: Discusses the state of the art, important challenges, and high-impact developments in simulation technologies Provides a basis for the study of real-time simulation as a fundamental and foundational technology Helps readers develop and refine principles that are applicable across a wide variety of application domains As science moves toward more advanced technologies, unconventional design approaches, and unproven regions of the design space, simulation tools are increasingly critical to successful design and operation of technical systems in a growing number of application domains. This must-have resource presents detailed coverage of real-time simulation for system design, parallel and distributed simulations, industry tools, and a large set of applications.

This book constitutes the proceedings of the Workshops held in conjunction with SAFECOMP 2020, 39th International Conference on Computer Safety, Reliability and Security, Lisbon, Portugal, September 2020. The 26 regular papers included in this volume were carefully reviewed and selected from 45 submissions; the book also contains one invited paper. The workshops included in this volume are: DECSoS 2020: 15th Workshop on Dependable Smart Embedded and Cyber-Physical Systems and Systems-of-Systems. DepDevOps 2020: First International Workshop on Dependable Development-Operation Continuum Methods for Dependable Cyber-Physical Systems. USDAI 2020: First International Workshop on Underpinnings for Safe Distributed AI. WAISE 2020: Third International Workshop on Artificial Intelligence Safety Engineering. The workshops were held virtually due to the COVID-19 pandemic.

This book constitutes the refereed proceedings of the 36th IFIP TC 11 International Conference on Information Security and Privacy Protection, SEC 2021, held in Oslo, Norway, in June 2021.* The 28 full papers presented were carefully reviewed and selected from 112 submissions. The papers present novel research on theoretical and practical aspects of security and privacy protection in ICT systems. They are organized in topical sections on digital signatures; vulnerability management; covert channels and cryptography; application and system security; privacy; network security; machine learning for security; and security management. *The conference was held virtually.

Innovative and smart mobility systems are expected to make transportation systems more sustainable, inclusive, and safe. Because of changing mobility paradigms, transport planning and design require different methodological approaches. Over twelve chapters, this book examines and analyzes Mobility as a Service (MaaS), travel behavior, traffic control, intelligent transportation system design, electric, connected, and automated vehicles, and much more.

Automotive Systems and Software Engineering

Automobil- und Motorentchnik

Guide to Automotive Connectivity and Cybersecurity

Assuring the Automotive Software Development Lifecycle

Design, Theory and Applications

Applications

Key Technologies, Innovations, and Applications

Communication between vehicles and infrastructure will enable an entirely new way of managing traffic, reducing accidents, and increasing citizens' quality of life. Networking Vehicles to Everything provides a 360-degree overview of networking vehicle technology. This informational account also covers challenges, case considerations, current activities in standards, product implementation, and upcoming trends such as software reconfiguration, mmWave technology and advanced control theory tools. Readers will gain in-depth understanding of the main bodies and institutions developing and regulating the technology, current technological battles including in particular IEEE 802.11p and 3GPP LTE V2X technologies which compete for the top-spot in a multi-billion market, and will become aware of currently open technological questions and corresponding trends in terms of applications and markets for any type of vehicle.

Dynamically Reconfigurable Systems is the first ever to focus on the emerging field of Dynamically Reconfigurable Computing Systems. While programmable logic and design-time configurability are well elaborated and covered by various texts, this book presents a unique overview over the state of the art and recent results for dynamic and run-time reconfigurable computing systems. Reconfigurable hardware is not only of utmost importance for large manufacturers and vendors of microelectronic devices and systems, but also a very attractive technology for smaller and medium-sized companies. Hence, Dynamically Reconfigurable Systems also addresses researchers and engineers actively working in the field and provides them with information on the newest developments and trends in dynamic and run-time reconfigurable systems.

st This volume contains the proceedings of two conferences held as part of the 21 IFIP World Computer Congress in Brisbane, Australia, 20-23 September 2010. th The first part of the book presents the proceedings of DIPES 2010, the 7 IFIP Conference on Distributed and Parallel Embedded Systems. The conference, int- duced in a separate preface by the Chairs, covers a range of topics from specification and design of embedded systems through to dependability and fault tolerance. rd The second part of the book contains the proceedings of BICC 2010, the 3 IFIP Conference on Biologically-Inspired Collaborative Computing. The conference is concerned with emerging techniques from research areas such as organic computing, autonomic computing and self-adaptive systems, where inspiration for techniques - rives from exhibited behaviour in nature and biology. Such techniques require the use of research developed by the DIPES community in supporting collaboration over multiple systems. We hope that the combination of the two proceedings will add value for the reader and advance our related work.

This book constitutes contributions of the ISO/IEC JTC1 SC37 2021 associated events. Altogether, ISO/IEC JTC1 SC37 2021 comprises contributions from the proceedings originally foreseen for ISO/IEC JTC1 SC37 2021 collected in 4 volumes, LNCS 12476: Verification Principles, LNCS 12477: Engineering Principles, LNCS 12478: Applications, and LNCS 12479: Tools and Trends. The contributions included in this volume were organized in the following topical sections: 6th International School on Tool-Based Rigorous Engineering of Software Systems; Industrial Track;

Programming: What is Next; Software Verification Tools; Rigorous Engineering of Collective Adaptive Systems.

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.

Automotive Software Architectures

Introduction to Self-Driving Vehicle Technology

Proceedings of ICICCT 2019

Trends, Technologies, Innovations and Applications

Automotive Transmissions

Scheduling Parallel Applications on Heterogeneous Distributed Systems

Automotive Ethernet

Modern cars are more computerized than ever. Infotainment and navigation systems, Wi-Fi, automatic software updates, and other innovations aim to make driving more convenient. But vehicle technologies haven't kept pace with today's more hostile security environment, leaving millions vulnerable to attack. The Car Hacker's Handbook will give you a deeper understanding of the computer systems and embedded software in modern vehicles. It begins by examining vulnerabilities and providing detailed explanations of communications over the CAN bus and between devices and systems. Then, once you have an understanding of a vehicle's communication network, you'll learn how to intercept data and perform specific hacks to track vehicles, unlock doors, glitch engines, flood communication, and more. With a focus on low-cost, open source hacking tools such as Metasploit, Wireshark, Kayak, can-utils, and ChipWhisperer, The Car Hacker's Handbook will show you how to: -Build an accurate threat model for your vehicle -Reverse engineer the CAN bus to fake engine signals -Exploit vulnerabilities in diagnostic and data-logging systems -Hack the ECU and other firmware and embedded systems -Feed exploits through infotainment and vehicle-to-vehicle communication systems -Override factory settings with performance-tuning techniques -Build physical and virtual test benches to try out exploits safely If you're curious about automotive security and have the urge to hack a two-ton computer, make The Car Hacker's Handbook your first stop.

A Multi-Processor System-on-Chip (MPSoC) is the key component for complex applications. These applications put huge pressure on memory, communication devices and computing units. This book, presented in two volumes - Architectures and Applications - therefore celebrates the 20th anniversary of MPSoC, an interdisciplinary forum that focuses on multi-core and multi-processor hardware and software systems. It is this interdisciplinarity which has led to MPSoC bringing together experts in these fields from around the world, over the last two decades. Multi-Processor System-on-Chip 2 covers application-specific MPSoC design, including compilers and architecture exploration. This second volume describes optimization methods, tools to optimize and port specific applications on MPSoC architectures. Details on compilation, power consumption and wireless communication are also presented, as well as examples of modeling frameworks and CAD tools. Explanations of specific platforms for automotive and real-time computing are also included.

This book is about the Zynq-7000 All Programmable System on Chip, the family of devices from Xilinx that combines an application-grade ARM Cortex-A9 processor with traditional FPGA logic fabric. Catering for both new and experienced readers, it covers fundamental issues in an accessible way, starting with a clear overview of the device architecture, and an introduction to the design tools and processes for developing a Zynq SoC. Later chapters progress to more advanced topics such as embedded systems development, IP block design and operating systems. Maintaining a 'real-world' perspective, the book also compares Zynq with other device alternatives, and considers end-user applications. The Zynq Book is accompanied by a set of practical tutorials hosted on a companion website. These tutorials will guide the reader through first steps with Zynq, following on to a complete, audio-based embedded systems design.

This book introduces the concept of software architecture as one of the cornerstones of software in modern cars. Following a historical overview of the evolution of software in modern cars and a discussion of the main challenges driving that evolution, Chapter 2 describes the main architectural styles of automotive software and their use in cars' software. Chapter 3 details this further by presenting two modern architectural styles, i.e. centralized and federated software architectures. In Chapter 4, readers will find a description of the software development processes used to develop software on the car manufacturers' side. Chapter 5 then introduces AUTOSAR - an important standard in automotive software. Chapter 6 goes beyond simple architecture and describes the detailed design process for automotive software using Simulink, helping readers to understand how detailed design links to high-level design. ^ The new chapter 7 reports on how machine learning is exploited in automotive software e.g. for image recognition and how both on-board and off-board learning are applied. Next, Chapter 8 presents a method for assessing the quality of the architecture - ATAM (Architecture Trade-off Analysis Method) - and provides a sample assessment, while Chapter 9 presents an alternative way of assessing the architecture, namely by using quantitative measures and indicators. Subsequently Chapter 10 dives deeper into one of the specific properties discussed in Chapter 8 - safety - and details an important standard in that area, the ISO/IEC 26262 norm. Lastly, Chapter 11 presents a set of future trends that are currently emerging and have the potential to shape automotive software engineering in the coming years. This book explores the concept of software architecture for modern cars and is intended for both beginning and advanced software designers. ^ It mainly aims at two different groups of audience - professionals working with automotive software who need to understand concepts related to automotive architectures, and students of software engineering or related fields who need to understand the specifics of automotive software to be able to construct cars or their components. Accordingly, the book also contains a wealth of real-world examples illustrating the concepts discussed and requires no prior background in the automotive domain. Compared to the first edition, besides the two new chapters 3 and 7 there are considerable updates in chapters 5 and 8 especially.

Introduction to Self-Driving Vehicle TechnologyCRC Press

Multi-Processor System-on-Chip 2

The Car Hacker's Handbook

DECSoS 2020, DepDevOps 2020, USDAI 2020, and WAISE 2020, Lisbon, Portugal, September 15, 2020, Proceedings

The History of Time: A Very Short Introduction

Leveraging Applications of Formal Methods, Verification and Validation

Embedded Processing with the Arm Cortex-A9 on the Xilinx Zynq-7000 All Programmable Soc

Networking Vehicles to Everything

Get up to speed with the latest developments in Automotive Ethernet technology and implementation with this fully revised third edition.

Why do we measure time in the way that we do? Why is a week seven days long? At what point did minutes and seconds come into being? Why are some calendars lunar and some solar? The organisation of time into hours, days, months and years seems immutable and universal, but is actually far more artificial than most people realise. The French Revolution resulted in a restructuring of the French calendar, and the Soviet Union experimented with five and then six-day weeks. Leofranc Holford-Strevens explores these questions using a range of fascinating examples from Ancient Rome and Julius Caesar's imposition of the Leap Year, to the 1920s' project for a fixed Easter. ABOUT THE SERIES: The Very Short Introductions series from Oxford University Press contains hundreds of titles in almost every subject area. These pocket-sized books are the perfect way to get ahead in a new subject quickly. Our expert authors combine facts, analysis, perspective, new ideas, and enthusiasm to make interesting and challenging topics highly readable.

Software Engineering for Automotive Systems: Principles and Applications discusses developments in the field of software engineering for automotive systems. This reference text presents detailed discussion of key concepts including timing analysis and reliability, validation and verification of automotive systems, AUTOSAR architecture for electric vehicles, automotive grade Linux for connected cars, open-source architecture in the automotive software industry, and communication protocols in the automotive software development process. Aimed at senior undergraduate and graduate students in the fields of electrical engineering, electronics and communication engineering, and automobile engineering, this text: Provides the fundamentals of automotive software architectures. Discusses validation and verification of automotive systems. Covers communication protocols in the automotive software development process. Discusses AUTOSAR architecture for electric vehicles. Examines open-source architecture in the automotive software industry.

This volume constitutes the refereed proceedings of the 28th European Conference on Systems, Software and Services Process Improvement, EuroSPI 2021, held in Krems, Austria, in September 2021*. The 42 full papers and 9 short papers presented were carefully reviewed and selected from 100 submissions. The volume presents core research contributions and selected industrial contributions. Core research contributions: SPI and emerging software and systems engineering paradigms; SPI and team skills and diversity; SPI and recent innovations; SPI and agile; SPI and standards and safety and security norms; SPI and good/bad SPI practices in improvement; SPI and functional safety and cybersecurity; digitalisation of industry, infrastructure and e-mobility. Selected industrial contributions: SPI and emerging software and systems engineering paradigms; SPI and recent innovations; SPI and agile; SPI and standards and safety and security norms; SPI and good/bad SPI practices in improvement; SPI and functional safety and cybersecurity; digitalisation of industry, infrastructure and e-mobility; virtual reality. *The conference was partially held virtually due to the COVID-19 pandemic.

The main topics of this book include advanced control, cognitive data processing, high performance computing, functional safety, and comprehensive validation. These topics are seen as technological bricks to drive forward automated driving. The current state of the art of automated vehicle research, development and innovation is given. The book also addresses industry-driven roadmaps for major new technology advances as well as collaborative European initiatives supporting the evolution of automated driving. Various examples highlight the state of development of automated driving as well as the way forward. The book will be of interest to academics and researchers within engineering, graduate students, automotive engineers at OEMs and suppliers, ICT and software engineers, managers, and other decision-makers.

Handbook of Driver Assistance Systems

A Guide for the Penetration Tester

Distributed, Parallel and Biologically Inspired Systems

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