

Opc Unified Architecture By Mahnke Wolfgang Leitner Stefan Helmut Damm Matthias 2010 Paperback

OPC2020 25th IEEE International Conference on Emerging Technologies and Factory Automation (ETFA)Network Data Analytics2019 IEEE International Conference on Industrial Cyber Physical Systems (ICPS)Advances in User AuthenticationOPC Unified ArchitectureArtificial Intelligence Techniques for Networked Manufacturing Enterprises ManagementFuture-Proof Software-SystemsBeginning Spring Boot 2Tagungsband des 2. Kongresses Montage Handhabung IndustrieroboterThe Common Information Model CIMIndustrial Cloud-Based Cyber-Physical SystemsSemantic Service Integration for Smart GridsIoT AutomationAdvances on Mechanics, Design Engineering and ManufacturingPro Spring BootCisco Unified Customer Voice PortalPro DjangoModel-Driven Software Engineering in PracticeJava SE 8 for the Really ImpatientSmart Grid Applications, Communications, and SecurityComputational Collective IntelligenceIndustrial AgentsComputational Collective IntelligenceSoftware LanguagesStandardization in Smart GridsCyber-security of SCADA and Other Industrial Control SystemsModern Data StrategyCollaborative Process Automation SystemsOPC Unified ArchitectureCollaborative Process Automation SystemsIntelligent Information and Database SystemsCyber-Physical Systems of SystemsOPC Fundamentals, Implementation and ApplicationIntelligent Information and Database SystemsModelling Foundations and ApplicationsContent-Based Image and Video RetrievalNew Horizons for a Data-Driven EconomyTechnological Innovation for the Internet of ThingsReal VR – Immersive Digital Reality

OPC

2020 25th IEEE International Conference on Emerging Technologies and Factory Automation (ETFA)

In this book readers will find technological discussions on the existing and emerging technologies across the different stages of the big data value chain. They will learn about legal aspects of big data, the social impact, and about education needs and requirements. And they will discover the business perspective and how big data technology can be exploited to deliver value within different sectors of the economy. The book is structured in four parts: Part I “The Big Data Opportunity” explores the value potential of big data with a particular focus on the European context. It also describes the legal, business and social dimensions that need to be addressed, and briefly introduces the European Commission’s BIG project. Part II “The Big Data Value Chain” details the complete big data lifecycle from a technical point of view, ranging from data acquisition, analysis, curation and storage, to data usage and exploitation. Next, Part III “Usage and Exploitation of Big

Data” illustrates the value creation possibilities of big data applications in various sectors, including industry, healthcare, finance, energy, media and public services. Finally, Part IV “A Roadmap for Big Data Research” identifies and prioritizes the cross-sectorial requirements for big data research, and outlines the most urgent and challenging technological, economic, political and societal issues for big data in Europe. This compendium summarizes more than two years of work performed by a leading group of major European research centers and industries in the context of the BIG project. It brings together research findings, forecasts and estimates related to this challenging technological context that is becoming the major axis of the new digitally transformed business environment.

Network Data Analytics

Cisco Unified Customer Voice Portal Building Unified Contact Centers Rue Green, CCIE® No. 9269 The definitive guide to deploying Cisco Unified Customer Voice Portal IVRs in any contact center environment Thousands of companies are replacing legacy ACD/TDM-based contact centers with pure IP-based unified contact center solutions. One of these solutions is quickly earning market leadership: Cisco Unified Customer Voice Portal (CVP). Now, one of the leading Cisco CVP experts brings together everything network and telephony professionals need to successfully implement production Interactive Voice Response (IVR) solutions with CVP: architectural guidelines, deployment best practices, detailed insights for design and sizing, and more. CCIE Rue Green guides you through designing unified contact centers with CVP, and deploying proven infrastructures to support your designs. The author first explains CVP’s architecture, outlining its key advantages and opportunities for integration and illuminating the design challenges it presents. Next, he guides you through addressing each of these challenges, covering all CVP components and tools and offering detailed insights available in no other book. Using this book’s detailed working configurations and examples, you can minimize configuration errors, reduce downtime, strengthen monitoring, and drive maximum value from any CVP-based unified call center solution. Rue Green, CCIE No. 9269 (Routing & Switching and Voice), CISSP, MCSE, MCITP is a Technical Leader for the Customer Collaboration Service Line within Cisco Advanced Services, where he focuses on unified contact center architectures and deployment methodologies. He currently acts in a delivery architect role for Unified CVP, Unified ICM, and Cisco Unified Communications Manager for Unified Contact Center Solutions. He has spent the last 21 years working within different roles related to the architecture, design, and implementation of large voice and data networks, including several years working with complex contact center solutions.

- Discover CVP’s powerful capabilities and advantages
- Understand how CVP’s components fit together into a unified architecture
- Utilize CVP native components: Call Server, VXML Server, Reporting Server, Operations Console Server, and Cisco Unified Call Studio
- Integrate non-native components such as IOS devices, Unified ICM, UCM, content load balancers, and third-party servers
- Choose the right deployment model for your organization
- Implement detailed call flows for Standalone, Call Director, Comprehensive, and VRU-only deployment models
- Design Unified CVP for high availability
- Efficiently deliver media via streaming, caching, and other techniques
- Address crucial sizing, QoS,

network latency, and security considerations · Successfully upgrade from older versions or H.323 platforms · Isolate and troubleshoot faults in native and non-native CVP components · Design virtualized Unified CVP deployments using UCS This IP communications book is part of the Cisco Press® Networking Technology Series. IP communications titles from Cisco Press help networking professionals understand voice and IP telephony technologies, plan and design converged networks, and implement network solutions for increased productivity.

2019 IEEE International Conference on Industrial Cyber Physical Systems (ICPS)

OPC stands for Openness, Productivity, and Collaboration, symbolizing the new possibilities opening up in automation technology. The main objective of the new OPC generation Unified Architecture is to facilitate global interoperability and to define an information and data-exchange mechanism that is service oriented, multivendor, and cross-platform capable - from the field device on the shop floor to the ERP system on the factory level. This book includes information on: - the birth, objectives, and fundamentals of OPC and OPC UA, - the technical specifications that currently exist and those that are in preparation, - the procedures for designing and implementing components, - a transparent presentation of the technology through application possibilities and examples, and - the outlook for the future of OPC and OPC UA. Important perspectives and updates in this new edition include - the new era and the exciting application possibilities developing with OPC UA, - the new OPC UA specifications, - the development of OPC products for Windows, Linux, and VxWorks, - companion standards like FDI (EDD, FDT), ADI, or PLCopen (IEC 61131-3), - new interoperability applications with SAP or Beckhoff Server embedded, and - migration strategies from Classic OPC to OPC UA. Fundamentals, implementation, and application of Classic OPC and OPC UA are discussed comprehensively in this book. CD-ROM: The included CD-ROM contains industrial OPC Server and OPC Client tools for evaluation, and also several demonstration programs for development, commissioning, testing, and for the simulation of OPC Clients and Servers. The OPC Toolbox is suitable for Windows NT/2000/XP/Vista, Windows 7, Windows CE, Linux, and VxWorks. Furthermore you will find videos and presentations of OPC UA.

Advances in User Authentication

Providing a comprehensive overview of the state-of-the-art in Collaborative Process Automation Systems (CPAS), this book discusses topics such as engineering, security, enterprise connectivity, advanced process control, plant asset management, and operator efficiency. Collaborating with other industry experts, the author covers the system architecture and infrastructure required for a CPAS, as well as important standards like OPC and the ISA-95 series of standards. This in-depth reference focuses on the differences between a CPAS and traditional automation systems. Implications on modern automation systems are outlined in theory and practice. This book is ideal for industrial engineers, as well as graduate students in control and automation.

OPC Unified Architecture

This two-volume set (LNAI 10448 and LNAI 10449) constitutes the refereed proceedings of the 9th International Conference on Collective Intelligence, ICCCI 2017, held in Nicosia, Cyprus, in September 2017. The 117 full papers presented were carefully reviewed and selected from 248 submissions. The conference focuses on the methodology and applications of computational collective intelligence, included: multi-agent systems, knowledge engineering and semantic web, social networks and recommender systems, text processing and information retrieval, data mining methods and applications, sensor networks and internet of things, decision support & control systems, and computer vision techniques.

Artificial Intelligence Techniques for Networked Manufacturing Enterprises Management

This book constitutes the refereed proceedings of the 4th IFIP WG 5.5/SOCOLNET Doctoral Conference on Computing, Electrical and Industrial Systems, DoCEIS 2013, held in Costa de Caparica, Portugal, in April 2013. The 69 revised full papers were carefully reviewed and selected from numerous submissions. They cover a wide spectrum of topics ranging from collaborative enterprise networks to microelectronics. The papers are organized in the following topical sections: collaborative enterprise networks; service orientation; intelligent computational systems; computational systems; computational systems applications; perceptual systems; robotics and manufacturing; embedded systems and Petri nets; control and decision; integration of power electronics systems with ICT; energy generation; energy distribution; energy transformation; optimization techniques in energy; telecommunications; electronics: devices design; electronics: amplifiers; electronics: RF applications; and electronics: applications.

Future-Proof Software-Systems

This book concisely introduces Java 8's most valuable new features, including lambda expressions (closures) and streams. If you're an experienced Java programmer, the author's practical insights and sample code will help you quickly take advantage of these and other Java language and platform improvements.

Beginning Spring Boot 2

Tagungsband des 2. Kongresses Montage Handhabung Industrieroboter

This book discusses how model-based approaches can improve the daily practice of software professionals. This is known as

Model-Driven Software Engineering (MDSE) or, simply, Model-Driven Engineering (MDE). MDSE practices have proved to increase efficiency and effectiveness in software development, as demonstrated by various quantitative and qualitative studies. MDSE adoption in the software industry is foreseen to grow exponentially in the near future, e.g., due to the convergence of software development and business analysis. The aim of this book is to provide you with an agile and flexible tool to introduce you to the MDSE world, thus allowing you to quickly understand its basic principles and techniques and to choose the right set of MDSE instruments for your needs so that you can start to benefit from MDSE right away. The book is organized into two main parts. The first part discusses the foundations of MDSE in terms of basic concepts (i.e., models and transformations), driving principles, application scenarios, and current standards, like the well-known MDA initiative proposed by OMG (Object Management Group) as well as the practices on how to integrate MDSE in existing development processes. The second part deals with the technical aspects of MDSE, spanning from the basics on when and how to build a domain-specific modeling language, to the description of Model-to-Text and Model-to-Model transformations, and the tools that support the management of MDSE projects. The second edition of the book features: a set of completely new topics, including: full example of the creation of a new modeling language (IFML), discussion of modeling issues and approaches in specific domains, like business process modeling, user interaction modeling, and enterprise architecture complete revision of examples, figures, and text, for improving readability, understandability, and coherence better formulation of definitions, dependencies between concepts and ideas addition of a complete index of book content In addition to the contents of the book, more resources are provided on the book's website <http://www.mdse-book.com>, including the examples presented in the book.

The Common Information Model CIM

With the advent of consumer-market Virtual Reality (VR) technology, the next revolution in visual entertainment is already on the horizon: real VR will enable us to experience live-action movies, sports broadcasts, concert videos, etc. in true visual (and aural) immersion. This book provides a comprehensive overview of the algorithms and methods that make it possible to immerse into real-world recordings. It brings together the expertise of internationally renowned experts from academia and industry who present the state of the art in this fascinating, interdisciplinary new research field. Written by and for scientists, engineers, and practitioners, this book is the definitive reference for anyone interested in finding out about how to import the real world into head-mounted displays.

Industrial Cloud-Based Cyber-Physical Systems

This book presents an in-depth description of the Arrowhead Framework and how it fosters interoperability between IoT devices at service level, specifically addressing application. The Arrowhead Framework utilizes SOA technology and the

concepts of local clouds to provide required automation capabilities such as: real time control, security, scalability, and engineering simplicity. Arrowhead Framework supports the realization of collaborative automation; it is the only IoT Framework that addresses global interoperability across multiplet SOA technologies. With these features, the Arrowhead Framework enables the design, engineering, and operation of large automation systems for a wide range of applications utilizing IoT and CPS technologies. The book provides application examples from a wide number of industrial fields e.g. airline maintenance, mining maintenance, smart production, electro-mobility, automative test, smart cities—all in response to EU societal challenges. Features Covers the design and implementation of IoT based automation systems. Industrial usage of Internet of Things and Cyber Physical Systems made feasible through Arrowhead Framework. Functions as a design cookbook for building automation systems using IoT/CPS and Arrowhead Framework. Tools, templates, code etc. described in the book will be accessible through open sources project Arrowhead Framework Wiki at forge.soa4d.org/ Written by the leading experts in the European Union and around the globe.

Semantic Service Integration for Smart Grids

This book gathers papers presented at the International Joint Conference on Mechanics, Design Engineering and Advanced Manufacturing (JCM 2016), held on 14-16 September, 2016, in Catania, Italy. It reports on cutting-edge topics in product design and manufacturing, such as industrial methods for integrated product and process design; innovative design; and computer-aided design. Further topics covered include virtual simulation and reverse engineering; additive manufacturing; product manufacturing; engineering methods in medicine and education; representation techniques; and nautical, aeronautics and aerospace design and modeling. The book is divided into eight main sections, reflecting the focus and primary themes of the conference. The contributions presented here will not only provide researchers, engineers and experts in a range of industrial engineering subfields with extensive information to support their daily work; they are also intended to stimulate new research directions, advanced applications of the methods discussed, and future interdisciplinary collaborations.

IoT Automation

Content-Based Image And Video Retrieval addresses the basic concepts and techniques for designing content-based image and video retrieval systems. It also discusses a variety of design choices for the key components of these systems. This book gives a comprehensive survey of the content-based image retrieval systems, including several content-based video retrieval systems. The survey includes both research and commercial content-based retrieval systems. Content-Based Image And Video Retrieval includes pointers to two hundred representative bibliographic references on this field, ranging from survey papers to descriptions of recent work in the area, entire books and more than seventy websites. Finally, the

book presents a detailed case study of designing MUSE—a content-based image retrieval system developed at Florida Atlantic University in Boca Raton, Florida.

Advances on Mechanics, Design Engineering and Manufacturing

Motivation for This Book The OPC Foundation provides specifications for data exchange in industrial automation. There is a long history of COM/DCOM-based specifications, most prominent OPC Data Access (DA), OPC Alarms and Events (A&E), and OPC Historical Data Access (HDA), which are widely accepted in the industry and implemented by almost every system targeting industrial automation. Now the OPC Foundation has released a new generation of OPC specifications called OPC Unified Architecture (OPC UA). With OPC UA, the OPC Foundation fulfills a technology shift from the retiring COM/DCOM technology to a service-oriented architecture providing data in a platform-independent manner via Web Services or its own optimized TCP-based protocol. OPC UA unifies the previous specifications into one single address space capable of dealing with current data, alarms and events and the history of current data as well as the event history. A remarkable enhancement of OPC UA is the Address Space Model by which vendors can expose a rich and extensible information model using object-oriented techniques. OPC UA scales well from intelligent devices, controllers, DCS, and SCADA systems up to MES and ERP systems. It also scales well in its ability to provide information; on the lower end, a model similar to Classic OPC can be used, providing only base information, while at the upper end, highly sophisticated models can be described, providing a large amount of metadata including complex type hierarchies.

Pro Spring Boot

For many, smart grids are the biggest technological revolutions since the Internet. They have the potential to reduce carbon dioxide emissions, increase the reliability of electricity supply, and increase the efficiency of our energy infrastructure. Smart Grid Applications, Communications, and Security explains how diverse technologies play hand-in-hand in building and maintaining smart grids around the globe. The book delves into the communication aspects of smart grids, provides incredible insight into power electronics, sensing, monitoring, and control technologies, and points out the potential for new technologies and markets. Extensively cross-referenced, the book contains comprehensive coverage in four major parts: Part I: Applications provides a detailed introduction to smart grid applications—spanning the transmission, distribution, and consumer side of the electricity grid Part II: Communications discusses wireless, wireline, and optical communication solutions—from the physical layers up to sensing, automation, and control protocols running on the application layers Part III: Security deals with cybersecurity—sharpening the awareness of security threats, reviewing the ongoing standardization, and outlining the future of authentication and encryption key management Part IV: Case Studies and Field Trials presents self-contained chapters of studies where the smart grid of tomorrow has already been put into practice With contributions from

major industry stakeholders such as Siemens, Cisco, ABB, and Motorola, this is the ideal book for both engineering professionals and students.

Cisco Unified Customer Voice Portal

The first successful finished Smart Grid Prototype Projects deliver new requirements and best practices to meet them. These solutions will be the base for the upcoming norms and standards in the near future. This domain is not only part of one Standard developing Organization (SDO), but also of many different organizations like ITU, ISO, IEC and additionally for the electro mobility part the SAE. This results in many standards which are based on different aspects. Furthermore the European mirror organizations (ETSI, CEN, CENELEC) as well as the German mirror groups of these groups are involved, which are delivering further rules and adaptation for the local market. Because of this diversity of organizations involved, it is difficult for the local companies (which includes energy utility, manufacturer and software producer specialized on integration) to identify the relevant trends, standardization groups and technologies necessary. With the EU Mandate M490 to CEN/CENELEC and TESI and the Commission being a driving force (e.g. <ftp://ftp.cenelec.eu/CENELEC/Smartgrid/SmartGridFinalReport.pdf> and <http://www.cenelec.eu/aboutcenelec/whatwedo/technologysectors/smartgrids.html>) standardization becomes more and more important – but it's complex and not easy to be understood. Here at OFFIS, we provide training but we are always asked for textbooks on our trainings. Based on our modules for the SG trainings, we would estimate the following chapters to be relevant to SG stakeholders in standardization (roughly 16-20 pages per chapter).

Pro Django

Django is the leading Python web application development framework. Learn how to leverage the Django web framework to its full potential in this advanced tutorial and reference. Endorsed by Django, Pro Django more or less picks up where The Definitive Guide to Django left off and examines in greater detail the unusual and complex problems that Python web application developers can face and how to solve them. Provides in-depth information about advanced tools and techniques available in every Django installation Runs the gamut from the theory of Django's internal operations to actual code that solves real-world problems for high-volume environments Goes above and beyond other books, leaving the basics behind Shows how Django can do things even its core developers never dreamed possible

Model-Driven Software Engineering in Practice

Artificial Intelligence Techniques for Networked Manufacturing Enterprises Management addresses prominent concepts and

applications of AI technologies in the management of networked manufacturing enterprises. The aim of this book is to align latest practices, innovation and case studies with academic frameworks and theories, where AI techniques are used efficiently for networked manufacturing enterprises. More specifically, it includes the latest research results and projects at different levels addressing quick-response system, theoretical performance analysis, performance and capability demonstration. The role of emerging AI technologies in the modelling, evaluation and optimisation of networked enterprises' activities at different decision levels is also covered. Artificial Intelligence Techniques for Networked Manufacturing Enterprises Management is a valuable guide for postgraduates and researchers in industrial engineering, computer science, automation and operations research.

Java SE 8 for the Really Impatient

Motivation for This Book The OPC Foundation provides specifications for data exchange in industrial automation. There is a long history of COM/DCOM-based specifications, most prominent OPC Data Access (DA), OPC Alarms and Events (A&E), and OPC Historical Data Access (HDA), which are widely accepted in the industry and implemented by almost every system targeting industrial automation. Now the OPC Foundation has released a new generation of OPC specifications called OPC Unified Architecture (OPC UA). With OPC UA, the OPC Foundation fulfills a technology shift from the retiring COM/DCOM technology to a service-oriented architecture providing data in a platform-independent manner via Web Services or its own optimized TCP-based protocol. OPC UA unifies the previous specifications into one single address space capable of dealing with current data, alarms and events and the history of current data as well as the event history. A remarkable enhancement of OPC UA is the Address Space Model by which vendors can expose a rich and extensible information model using object-oriented techniques. OPC UA scales well from intelligent devices, controllers, DCS, and SCADA systems up to MES and ERP systems. It also scales well in its ability to provide information; on the lower end, a model similar to Classic OPC can be used, providing only base information, while at the upper end, highly sophisticated models can be described, providing a large amount of metadata including complex type hierarchies.

Smart Grid Applications, Communications, and Security

Der MHI e.V. ist ein Netzwerk leitender Universitätsprofessoren aus dem deutschsprachigen Raum, die sowohl grundlagenorientiert als auch anwendungsnahe in der Montage, Handhabung und Industrierobotik erfolgreich forschend tätig sind. Die Gründung der Gesellschaft erfolgte im Frühjahr 2012. Der MHI e.V. hat derzeit 20 Mitglieder, die über ihre Institute und Lehrstühle zurzeit ca. 1.000 Wissenschaftler repräsentieren. Die übergeordnete Zielsetzung des MHI e.V. ist die Förderung der Zusammenarbeit von deutschsprachigen Wissenschaftlerinnen und Wissenschaftlern untereinander, sowie mit der Industrie im Bereich Montage, Handhabung und Industrierobotik zur Beschleunigung der Forschung, Optimierung

der Lehre und zur Verbesserung der internationalen Wettbewerbsfähigkeit der deutschen Industrie in diesem Bereich. Das Kolloquium fokussiert auf einen akademischen Austausch auf hohem Niveau, um die gewonnenen Forschungsergebnisse zu verteilen, synergetische Effekte und Trends zu bestimmen, die Akteure persönlich zu verbinden und das Forschungsfeld sowie die MHI-Gemeinschaft zu stärken.

Computational Collective Intelligence

This book provides a comprehensive overview of the fundamental security of Industrial Control Systems (ICSs), including Supervisory Control and Data Acquisition (SCADA) systems and touching on cyber-physical systems in general. Careful attention is given to providing the reader with clear and comprehensive background and reference material for each topic pertinent to ICS security. This book offers answers to such questions as: Which specific operating and security issues may lead to a loss of efficiency and operation? What methods can be used to monitor and protect my system? How can I design my system to reduce threats? This book offers chapters on ICS cyber threats, attacks, metrics, risk, situational awareness, intrusion detection, and security testing, providing an advantageous reference set for current system owners who wish to securely configure and operate their ICSs. This book is appropriate for non-specialists as well. Tutorial information is provided in two initial chapters and in the beginnings of other chapters as needed. The book concludes with advanced topics on ICS governance, responses to attacks on ICS, and future security of the Internet of Things.

Industrial Agents

This book is dedicated to advances in the field of user authentication. The book covers detailed description of the authentication process as well as types of authentication modalities along with their several features (authentication factors). It discusses the use of these modalities in a time-varying operating environment, including factors such as devices, media and surrounding conditions, like light, noise, etc. The book is divided into several parts that cover descriptions of several biometric and non-biometric authentication modalities, single factor and multi-factor authentication systems (mainly, adaptive), negative authentication system, etc. Adaptive strategy ensures the incorporation of the existing environmental conditions on the selection of authentication factors and provides significant diversity in the selection process. The contents of this book will prove useful to practitioners, researchers and students. The book is suited to be used a text in advanced/graduate courses on User Authentication Modalities. It can also be used as a textbook for professional development and certification coursework for practicing engineers and computer scientists.

Computational Collective Intelligence

This book contains practical steps business users can take to implement data management in a number of ways, including data governance, data architecture, master data management, business intelligence, and others. It defines data strategy, and covers chapters that illustrate how to align a data strategy with the business strategy, a discussion on valuing data as an asset, the evolution of data management, and who should oversee a data strategy. This provides the user with a good understanding of what a data strategy is and its limits. Critical to a data strategy is the incorporation of one or more data management domains. Chapters on key data management domains—data governance, data architecture, master data management and analytics, offer the user a practical approach to data management execution within a data strategy. The intent is to enable the user to identify how execution on one or more data management domains can help solve business issues. This book is intended for business users who work with data, who need to manage one or more aspects of the organization's data, and who want to foster an integrated approach for how enterprise data is managed. This book is also an excellent reference for students studying computer science and business management or simply for someone who has been tasked with starting or improving existing data management.

Software Languages

Learn Spring Boot and how to build Java-based enterprise, web, and microservice applications with it. In this book, you'll see how to work with relational and NoSQL databases, build your first microservice, enterprise, or web application, and enhance that application with REST APIs. You'll also learn how to build reactive web applications using Spring Boot along with Spring Web Reactive. Then you'll secure your Spring Boot-created application or service before testing and deploying it. After reading and learning with Beginning Spring Boot 2, you'll have the skills and techniques to start building your first Spring Boot applications and microservices with confidence to take the next steps in your career journey. What You'll Learn Use Spring Boot autoconfiguration Work with relational and NoSQL databases Build web applications with Spring Boot Apply REST APIs using Spring Boot Create reactive web applications using Spring Web Reactive Secure your Spring Boot applications or web services Test and deploy your Spring Boot applications Who This Book Is For Experienced Java and Spring Framework developers who are new to the new Spring Boot micro-framework.

Standardization in Smart Grids

This book is open access under a CC BY 4.0 license. Technical Systems-of-Systems (SoS) – in the form of networked, independent constituent computing systems temporarily collaborating to achieve a well-defined objective – form the backbone of most of today's infrastructure. The energy grid, most transportation systems, the global banking industry, the water-supply system, the military equipment, many embedded systems, and a great number more, strongly depend on systems-of-systems. The correct operation and continuous availability of these underlying systems-of-systems are

fundamental for the functioning of our modern society. The 8 papers presented in this book document the main insights on Cyber-Physical System of Systems (CPSoSs) that were gained during the work in the FP7-610535 European Research Project AMADEOS (acronym for Architecture for Multi-criticality Agile Dependable Evolutionary Open System-of-Systems). It is the objective of this book to present, in a single consistent body, the foundational concepts and their relationships. These form a conceptual basis for the description and understanding of SoSs and go deeper in what we consider the characterizing and distinguishing elements of SoSs: time, emergence, evolution and dynamicity.

Cyber-security of SCADA and Other Industrial Control Systems

The aim of the IEEE Conference on Industrial Cyber Physical System is to provide a forum to exchange research and innovation results, lessons learned from industrial practices, and to bring together experts from the industry, governmental organizations, and academia focusing their work on research and innovation associated to new paradigms and technologies such as Cyber Physical Systems, Digital Economy, Industrie 4.0, and the Industrial Internet of Things, among others, pertaining (i) how Industrial Cyber Physical Components, Systems and Services are designed, implemented, deployed, and operated by the industry (ii) how they communicate and cooperate with each other as well as humans in real time, and (iii) how they are used in conjunction with the Internet of Services and real time analytics on Big Data, enhancing internal and cross organizational engineering, management, control, and automation functionalities for all stakeholders across a digitalized value chain

Modern Data Strategy

This book constitutes the refereed proceedings of the 8th European Conference on Modelling Foundations and Applications, held in Kgs. Lyngby, Denmark, in July 2012. The 20 revised full foundations track papers and 10 revised full applications track papers presented were carefully reviewed and selected from 81 submissions. Papers on all aspects of MDE were received, including topics such as architectural modelling and product lines, code generation, domain-specific modeling, metamodeling, model analysis and verification, model management, model transformation and simulation. The breadth of topics, as well as the high quality of the results presented in these accepted papers, demonstrate the maturity and vibrancy of the field.

Collaborative Process Automation Systems

This book identifies, defines and illustrates the fundamental concepts and engineering techniques relevant to applications of software languages in software development. It presents software languages primarily from a software engineering

perspective, i.e., it addresses how to parse, analyze, transform, generate, format, and otherwise process software artifacts in different software languages, as they appear in software development. To this end, it covers a wide range of software languages – most notably programming languages, domain-specific languages, modeling languages, exchange formats, and specifically also language definition languages. Further, different languages are leveraged to illustrate software language engineering concepts and techniques. The functional programming language Haskell dominates the book, while the mainstream programming languages Python and Java are additionally used for illustration. By doing this, the book collects and organizes scattered knowledge from software language engineering, focusing on application areas such as software analysis (software reverse engineering), software transformation (software re-engineering), software composition (modularity), and domain-specific languages. It is designed as a textbook for independent study as well as for bachelor's (advanced level) or master's university courses in Computer Science. An additional website provides complementary material, for example, lecture slides and videos. This book is a valuable resource for anyone wanting to understand the fundamental concepts and important engineering principles underlying software languages, allowing them to acquire much of the operational intelligence needed for dealing with software languages in software development practice. This is an important skill set for software engineers, as languages are increasingly permeating software development.

OPC Unified Architecture

This book focuses on software architecture and the value of architecture in the development of long-lived, mission-critical, trustworthy software-systems. The author introduces and demonstrates the powerful strategy of “Managed Evolution,” along with the engineering best practice known as “Principle-based Architecting.” The book examines in detail architecture principles for e.g., Business Value, Changeability, Resilience, and Dependability. The author argues that the software development community has a strong responsibility to produce and operate useful, dependable, and trustworthy software. Software should at the same time provide business value and guarantee many quality-of-service properties, including security, safety, performance, and integrity. As Dr. Furrer states, “Producing dependable software is a balancing act between investing in the implementation of business functionality and investing in the quality-of-service properties of the software-systems.” The book presents extensive coverage of such concepts as: Principle-Based Architecting Managed Evolution Strategy The Future Principles for Business Value Legacy Software Modernization/Migration Architecture Principles for Changeability Architecture Principles for Resilience Architecture Principles for Dependability The text is supplemented with numerous figures, tables, examples and illustrative quotations. Future-Proof Software-Systems provides a set of good engineering practices, devised for integration into most software development processes dedicated to the creation of software-systems that incorporate Managed Evolution.

Collaborative Process Automation Systems

This book presents cutting-edge emerging technologies and approaches in the areas of service-oriented architectures, intelligent devices and cloud-based cyber-physical systems. It provides a clear view on their applicability to the management and automation of manufacturing and process industries. It offers a holistic view of future industrial cyber-physical systems and their industrial usage and also depicts technologies and architectures as well as a migration approach and engineering tools based on these. By providing a careful balance between the theory and the practical aspects, this book has been authored by several experts from academia and industry, thereby offering a valuable understanding of the vision, the domain, the processes and the results of the research. It has several illustrations and tables to clearly exemplify the concepts and results examined in the text and these are supported by four real-life case-studies. We are witnessing rapid advances in the industrial automation, mainly driven by business needs towards agility and supported by new disruptive advances both on the software and hardware side, as well as the cross-fertilization of concepts and the amalgamation of information and communication technology-driven approaches in traditional industrial automation and control systems. This book is intended for technology managers, application designers, solution developers, engineers working in industry, as well as researchers, undergraduate and graduate students of industrial automation, industrial informatics and production engineering.

Intelligent Information and Database Systems

The scope of the research presented includes semantic-based integration of data services in smart grids achieved through following the proposed (S2)In-approach developed corresponding to design science guidelines. This approach identifies standards and specifications, which are integrated in order to build the basis for the (S2)In-architecture. A process model is introduced in the beginning, which serves as framework for developing the target architecture. The first step of the process stipulates to define requirements for smart grid ICT-architectures being derived from established studies and divided into two classes: architecture and non-functional requirements (NFR). Based on the architecture requirements, the following specifications have been basically selected: The IEC CIM representing a domain-specific data model, the OPC UA being a communication standard with special respects to information modeling, and WSMO as an approach to realize the concept of Semantic Web Services. The next step specifies to develop both, a semantic information model (integration of CIM and OPC UA) and semantic services (integration of CIM and WSMO). These two components are then combined to obtain the target architecture, which allows precise descriptions of services as well as their combination and semi-automatic execution. Finally, the NFR are considered in order to evaluate the architecture based on simulated, representative use cases.

Cyber-Physical Systems of Systems

In order to carry out data analytics, we need powerful and flexible computing software. However the software available for

data analytics is often proprietary and can be expensive. This book reviews Apache tools, which are open source and easy to use. After providing an overview of the background of data analytics, covering the different types of analysis and the basics of using Hadoop as a tool, it focuses on different Hadoop ecosystem tools, like Apache Flume, Apache Spark, Apache Storm, Apache Hive, R, and Python, which can be used for different types of analysis. It then examines the different machine learning techniques that are useful for data analytics, and how to visualize data with different graphs and charts. Presenting data analytics from a practice-oriented viewpoint, the book discusses useful tools and approaches for data analytics, supported by concrete code examples. The book is a valuable reference resource for graduate students and professionals in related fields, and is also of interest to general readers with an understanding of data analytics.

OPC Fundamentals, Implementation and Application

Within the Smart Grid, the combination of automation equipment, communication technology and IT is crucial. Interoperability of devices and systems can be seen as the key enabler of smart grids. Therefore, international initiatives have been started in order to identify interoperability core standards for Smart Grids. IEC 62357, the so called Seamless Integration Architecture, is one of these very core standards, which has been identified by recent Smart Grid initiatives and roadmaps to be essential for building and managing intelligent power systems. The Seamless Integration Architecture provides an overview of the interoperability and relations between further standards from IEC TC 57 like the IEC 61970/61968: Common Information Model - CIM. CIM has proven to be a mature standard for interoperability and engineering; consequently, it is a cornerstone of the IEC Smart Grid Standardization Roadmap. This book provides an overview on how the CIM developed, in which international projects and roadmaps is has already been covered and describes the basic use cases for CIM. This book has been written for both Power Engineers trying to get to know the EMS and business IT part of Smart Grid and for Computer Scientist finding out where ICT technology is applied in EMS and DMS Systems. The book is divided into two parts dealing with the theoretical foundations and a practical part describing tools and use cases for CIM.

Intelligent Information and Database Systems

OPC significa Openess, Productivity y Collaboration, que simboliza las nuevas posibilidades que se abren en la tecnología de automatización. Como plataforma de integración, las PC ofrecen nuevas perspectivas y oportunidades para OPC, tanto en términos técnicos como económicos. Los conceptos de cliente / servidor implementados con OPC ofrecen posibilidades de acceso estandarizadas y de múltiples proveedores. La nueva especificación OPC UA (arquitectura unificada) tiene como objetivo la interoperabilidad global y define una plataforma de interoperabilidad basada en servicios web.

Modelling Foundations and Applications

Industrial Agents explains how multi-agent systems improve collaborative networks to offer dynamic service changes, customization, improved quality and reliability, and flexible infrastructure. Learn how these platforms can offer distributed intelligent management and control functions with communication, cooperation and synchronization capabilities, and also provide for the behavior specifications of the smart components of the system. The book offers not only an introduction to industrial agents, but also clarifies and positions the vision, on-going efforts, example applications, assessment and roadmap applicable to multiple industries. This edited work is guided and co-authored by leaders of the IEEE Technical Committee on Industrial Agents who represent both academic and industry perspectives and share the latest research along with their hands-on experiences prototyping and deploying industrial agents in industrial scenarios. Learn how new scientific approaches and technologies aggregate resources such next generation intelligent systems, manual workplaces and information and material flow system Gain insight from experts presenting the latest academic and industry research on multi-agent systems Explore multiple case studies and example applications showing industrial agents in a variety of scenarios Understand implementations across the enterprise, from low-level control systems to autonomous and collaborative management units

Content-Based Image and Video Retrieval

ETFA focuses on the latest developments and new technologies in the field of industrial and factory automation The conference aims to exchange ideas with both industry leaders and a variety of experienced researchers, developers, and practitioners from several industries, research institutes, and academia

New Horizons for a Data-Driven Economy

Quickly and productively develop complex Spring applications and microservices - out of the box - with minimal fuss on things like configurations. This book will show you how to fully leverage the Spring Boot productivity suite of tools and how to apply them through the use of case studies. Pro Spring Boot is your authoritative hands-on practical guide for increasing your Spring Framework-based enterprise Java and cloud application productivity while decreasing development time using the Spring Boot productivity suite of tools. It's a no nonsense guide with case studies of increasing complexity throughout the book. This book is written by Felipe Gutierrez, a Spring expert consultant who works with Pivotal, the company behind the popular Spring Framework. What You Will Learn Write your first Spring Boot application Configure Spring Boot Use the Spring Boot Actuator Carry out web development with Spring Boot Build microservices with Spring Boot Handle databases and messaging with Spring Boot Test and deploy with Spring Boot Extend Spring Boot and its available plug-ins Who This

Book Is For Experienced Spring and Java developers seeking increased productivity gains and decreased complexity and development time in their applications and software services.

Technological Innovation for the Internet of Things

This two-volume set (LNAI 11683 and LNAI 11684) constitutes the refereed proceedings of the 11th International Conference on Computational Collective Intelligence, ICCCI 2019, held in Hendaye France, in September 2019. The 117 full papers presented were carefully reviewed and selected from 200 submissions. The papers are grouped in topical sections on: computational collective intelligence and natural language processing; machine learning in real-world data; distributed collective intelligence for smart manufacturing; collective intelligence for science and technology; intelligent management information systems; intelligent sustainable smart cities; new trends and challenges in education: the university 4.0; intelligent processing of multimedia in web systems; and big data streaming, applications and security.

Real VR - Immersive Digital Reality

Providing a comprehensive overview of the state-of-the-art in Collaborative Process Automation Systems (CPAS), this book discusses topics such as engineering, security, enterprise connectivity, advanced process control, plant asset management, and operator efficiency. Collaborating with other industry experts, the author covers the system architecture and infrastructure required for a CPAS, as well as important standards like OPC and the ISA-95 series of standards. This in-depth reference focuses on the differences between a CPAS and traditional automation systems. Implications on modern automation systems are outlined in theory and practice. This book is ideal for industrial engineers, as well as graduate students in control and automation.

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