Cloud Manufacturing Distributed Computing Technologies For Global And Sustainable Manufacturing Springer Series In Advanced Manufacturing

As a concept, Concurrent Engineering (CE) initiates processes with the goal of improving product quality, production efficiency and overall customer satisfaction. Services are becoming increasingly important to the economy, with more than 60% of the GDP in Japan, the USA, Germany and Russia deriving from service-based activities. The definition of a product has evolved from the manufacturing and supplying of goods only, to providing goods with added value, to eventually promoting a complete service business solution, with support from introduction into service and from operations to decommissioning. This book presents the proceedings of the 20th ISPE International Conference on Concurrent Engineering, held in Melbourne, Australia, in September 2013. The conference had as its theme Product and Service Engineering in a Dynamic World, and the papers explore research results, new concepts and insights covering a number of topics, including service engineering, cloud computing and digital manufacturing, knowledge-based engineering and sustainability in concurrent engineering.

Guide to Cloud Computing for Business and Technology Managers: From Distributed Computing to Cloudware Applications unravels the mystery of cloud computing and explains how it can transform the operating contexts of business enterprises. It provides a clear understanding of what cloud computing really means, what it can do, and when it is practical to use. Addressing the primary management and operation concerns of cloudware, including performance, measurement, monitoring, and security, this pragmatic book: Introduces the enterprise applications integration (EAI) solutions that were a first step toward enabling an integrated enterprise Details service-oriented architecture (SOA) and related technologies that paved the road for cloudware applications Covers delivery models like IaaS, PaaS, and SaaS, and deployment models like public, private, and hybrid clouds Describes Amazon, Google, and Microsoft cloudware solutions and services, as well as those of several other players Demonstrates how cloud computing can reduce costs, achieve business flexibility, and sharpen strategic focus Unlike customary discussions of cloud computing, Guide to Cloud Computing for Business and Technology Managers: From Distributed Computing to Cloudware Applications emphasizes the key differentiator—that cloud computing is able to treat enterprise-level services not merely as discrete stand-alone services, but as Internet-locatable, composable, and repackageable building blocks for generating dynamic real-world enterprise business processes.

Modern businesses are on the lookout for ventures that boost their profits and marketability. Certain new and innovative technological advances can help enterprises accomplish their ambitious goals while providing detailed information to assess all aspects of the business. Global Virtual Enterprises in Cloud Computing Environments is a collection of innovative studies on business processes, procedures, methods, strategy, management thinking, and utilization of technology in cloud computing environments. While highlighting topics including international business strategy, virtual reality, and intellectual capital, this book is ideally designed for corporate executives, research scholars, and students pursuing courses in the areas of management and big data applications seeking current research on effective open innovation strategies in global business.

The book establishes the concept of cloud manufacturing and describes the technological system behind it. The authors discuss key technologies such as resources sensation and access, service-oriented architecture, cloud service management and evaluation, and interface visualization. With abundant case studies, the book is an essential reference for researchers and engineers in manufacturing and information management.

International Conference, Industrial IoT 2016, GuangZhou, China, March 25-26, 2016, Revised Selected Papers

Resource Service Management in Manufacturing Grid System

Advances in Production Management Systems: Innovative Production Management Towards Sustainable Growth

Ambient Assisted Living

Guide to Cloud Computing for Business and Technology Managers

Distributed and Cloud Computing

Guide to Cloud Computing for Business and Technology Managers: From Distributed Computing to Cloudware Applications unravels the mystery of cloud computing and explains how it can transform the operating contexts of business enterprises. It provides a clear understanding of what cloud computing really means, what it can do, and when it is practical

In modern manufacturing business, the supply chain consists of multiple tiers of partners and suppliers. Collaboration exists both among departments within an enterprise, and among the stakeholders within the supply chains. Communication and interaction between these participants are difficult due to the heterogeneous Information and Communication Technology environment, which consists of different protocols, data formats, programming languages and platforms. To address the above issues, this research aims to develop a Cloud Manufacturing solution, namely, an Interoperable Cloud-based Manufacturing System (ICMS), to provide a manufacturing platform that integrates production services from design to manufacturing. Inspired by Cloud Computing technologies, the Cloud Manufacturing model provides an integration methodology to organise operational manufacturing tasks at a higher level. The STEP (STandard for Exchange of Product data) and STEP-NC (STandard for Exchange of Product data for Numerical Control) data models were enhanced to provide more complete data models for a fully developed Cloud Manufacturing service. The ICMS system has three layers; the Manufacturing Capability Layer, Virtual Service Layer and Application Layer. The Manufacturing Capability Layer integrates and virtualises existing manufacturing abilities in the Manufacturing Cloud. The Storage Cloud is also developed at this layer to maintain the mirrored image and dynamic status of manufacturing capabilities. The Virtual Service Layer is organised based on the Smart Cloud Manager mechanism. This mechanism is responsible for analysing original user requests and mapping them to the virtualised Cloud Manufacturing Service in the Manufacturing Capability Layer. The original needs of the user are met by an appropriate service provider in the Cloud, without knowledge of the provider's identity or its whereabouts. The Application Layer refers to the Cloud user domain. Different types of Cloud consumers are identified and assisted via different interaction environments. The outcome of the research is the development of an interoperable and distributed manufacturing environment, which provides a platform that can integrate existing and future manufacturing resources and abilities through Cloud Manufacturing Services. The system has been validated with capabilities, such as: (i) Smart Cloud Manager, able to take an original user request remotely and organise a series of Cloud services to fulfil the user request. It provides the neutral service establishment and organization mechanism for Cloud Manufacturing Paradigm; (ii) manufacturing resources, integrated in the Manufacturing Cloud and provided as a Cloud Service. Neutral data models compliant with international standards (e.g. STEP) were developed for the utilisation of Cloud Services. The current manufacturing recourses are integrated into the Cloud Manufacturing environment, and the current STEP standard is extended to the Cloud area. (iii) the software agent and Function Block technology, utilised during the development of service integration. The amalgamation of these technologies forms a universal integration methodology called Virtual Function Block; (iv) a novel data exchange mechanism, the Data Packet mechanism, developed to provide an appropriate amount and scope of data to the right person. Most of the research work in this thesis has been reported in eight research publications, i.e. four journal papers, one book chapter and three conference papers. Keywords: Cloud, Cloud Manufacturing, Interoperability, STEP, STEP-NC, Data Exchange, Virtual Function Block

In last decade, the paradigm of Cyber-Physical Systems (CPS) has integrated industrial manufacturing systems with Cloud Computing technologies for Cloud Manufacturing. Up to 2015, there were many CPS-based manufacturing systems that collected real-time machining data to perform remote monitoring, prognostics and health management, and predictive maintenance. However, these CPS-integrated and network ready machines were not directly connected to the elements of Cloud Manufacturing and required human-in-the-loop. Addressing this gap, we introduced a new paradigm of Cyber-Physical Manufacturing Cloud (CPMC) that bridges a gap between physical machines and virtual space in 2017. CPMC virtualizes machine tools in cloud through web services for direct monitoring and operations through Internet. Fundamentally, CPMC differs with contemporary modern manufacturing paradigms. For instance, CPMC virtualizes machining tools in cloud using remote services and establish direct Internet-based communication, which is overlooked in existing Cloud Manufacturing systems. Another contemporary, namely cyber-physical production systems enable networked access to machining tools. Nevertheless, CPMC virtualizes manufacturing resources in cloud and monitor and operate them over the Internet. This dissertation defines the fundamental concepts of CPMC and expands its horizon in different aspects of cloud-based virtual manufacturing such as Digital Twins and Virtual Production Lines. Digital Twin (DT) is another evolving concept since 2002 that creates as-is replicas of machining tools in cyber space. Up to 2018, many researchers proposed state-of-the-art DTs, which only focused on monitoring production lifecycle management through simulations and data driven analytics. But they overlooked executing manufacturing processes through DTs from virtual space. This dissertation identifies that DTs can be made more productive if they engage directly in direct execution of manufacturing operations besides monitoring. Towards this novel approach, this dissertation proposes a new operable DT model of CPMC that inherits the features of direct monitoring and operations from cloud. This research envisages and opens the door for future manufacturing systems where resources are developed as cloud-based DTs for remote and distributed manufacturing. Proposed concepts and visions of DTs have spawned the following fundamental researches. This dissertation proposes a novel concept of DT based Virtual Production Lines (VPL) in CPMC in 2019. It presents a design of a service-oriented architecture of DTs that virtualizes physical manufacturing resources in CPMC. Proposed DT architecture offers a more compact and integral service-oriented virtual representations of manufacturing resources. To re-configure a VPL, one requirement is to establish DT-to-DT collaborations in manufacturing clouds, which replicates to concurrent resource-to-resource collaborations in shop floors. Satisfying the above requirements, this research designs a novel framework to easily re-configure, monitor and operate VPLs using DTs of CPMC. CPMC publishes individual web services for machining tools, which is a traditional approach in the domain of service computing. But this approach overcrowds service registry databases. This dissertation introduces a novel fundamental service publication and discovery approach in 2020, OpenDT, which publishes DTs with collections of services. Experimental results show easier discovery and remote access of DTs while re-configuring VPLs. Proposed researches in this dissertation have received numerous citations both from industry and academia, clearly proving impacts of research contributions.

This compilation of up to date research and literature can be used as a textbook or reference for mechanical, manufacturing, and computer engineering graduate students and researchers for efficient utilization, deployment and development of distributed and Cloud manufacturing systems, services and applications.Following an introduction to the essential features of Cloud Computing, chapters cover a range of methods and applications such as the factors that actually affect adoption of the Cloud Computing technology in manufacturing companies and new geometrical simplification method to stream 3-Dimensional design and manufacturing data via the Internet.

Blockchain Technology

Towards a Cyber-physical Manufacturing Cloud Through Operable Digital Twins and Virtual Production Lines

Social, Legal, and Ethical Implications of IoT, Cloud, and Edge Computing Technologies

Experiments and Simulations in Advanced Manufacturing

Pervasive Cloud Computing Technologies: Future Outlooks and Interdisciplinary Perspectives

Proceedings of the FISITA 2012 World Automotive Congress

This book constitutes the refereed proceedings of the 6th IFIP WG 5.5/SOCOLNET Doctoral Conference on Computing, Electrical and Industrial Systems, DoCEIS 2015, held in Costa de Caparica, Portugal, in April 2015. The 54 revised full papers were carefully reviewed and selected from 119 submissions. The papers present selected results produced in engineering doctoral programs and focus on development and application of cloud-based engineering systems. Research results and ongoing work are presented, illustrated and discussed in the following areas: collaborative networks; cloud-based manufacturing; reconfigurable manufacturing; distributed computing and embedded systems; perception and signal processing; healthcare; smart monitoring systems; and renewable energy and energy-related management, decision support, simulation and power conversion.

Sustaining a competitive edge in today□s business world requires innovative approaches to product, service, and management systems design and performance. Advances in computing technologies have presented managers with additional challenges as well as further opportunities to enhance their business models. Business Transformation and Sustainability through Cloud System Implementation presents novel computing technologies designed for use in business and corporate environments, enabling managers and associates to make the most of the technologies at their disposal. This premier reference work seeks to alert firm management professionals and researchers to the potential risks and benefits associated with emerging technologies and guide firms on the proper selection, maintenance, and use of Web-based computing systems.

This compilation of up to date research and literature can be used as a textbook or reference for mechanical, manufacturing, and computer engineering graduate students and researchers for efficient utilization, deployment and development of distributed and Cloud manufacturing systems, services and applications.Global networks, which are the primary pillars of the modern manufacturing industry and supply chains, can only cope with the new challenges, requirements and demands when supported by new computing and Internet-based technologies. Cloud Manufacturing introduces a new paradigm for scalable service-oriented sustainable and globally distributed manufacturing systems.

This book provide latest research findings, innovative research results, methods and development techniques from both theoretical and practical perspectives related to P2P, grid, cloud and Internet computing as well as to reveal synergies among such large-scale computing paradigms. P2P, grid, cloud and Internet computing technologies have been very fast established as breakthrough paradigms for solving complex problems by enabling aggregation and sharing of an increasing variety of distributed computational resources at large scale. Grid computing originated as a paradigm for high performance computing, as an alternative to expensive supercomputers through different forms of large-scale distributed computing. P2P computing emerged as a new paradigm after client-server and web-based computing and has shown useful to the development of social networking, Business to Business (B2B), Business to Consumer (B2C), Business to Government (B2G), Business to Employee (B2E) and so on. Cloud computing has been defined as a "computing paradigm where the boundaries of computing are determined by economic rationale rather than technical limits." Cloud computing has fast become the computing paradigm with applicability and adoption in all application domains and providing utility computing at large scale. Finally, Internet computing is the basis of any large-scale distributed computing paradigms; it has very fast developed into a vast area of flourishing field with enormous impact on today's information societies serving thus as a universal platform comprising a large variety of computing forms such as grid, P2P, cloud and mobile computing.

A Systems Perspective on Industrial Information Integration

Foundations & Principles of Distributed Manufacturing

8. AAL-Kongress 2015,Frankfurt/M, April 29-30. April, 2015

From Parallel Processing to the Internet of Things

Industrial IoT Technologies and Applications

Proceedings of the 22nd ISPE Inc. International Conference on Concurrent Engineering, July 20-23, 2015

This book includes discussion on advance computer technologies suchas cloud computing, grid computing, and service computing. Inaddition, it furthers the theory and technology of gridtechnologies that is used in manufacturing, and accelerates thedevelopment of service-oriented manufacturing.

The International Conference on Industrial Engineering and Engineering Management is sponsored by the Chinese Industrial Engineering Institution, CMES, which is the only national-level academic society for Industrial Engineering. The conference is held annually as the major event in this arena. Being the largest and the most authoritative international academic conference held in China, it provides an academic platform for experts and entrepreneurs in the area of industrial engineering and management to exchange their research findings. Many experts in various fields from China and around the world gather together at the conference to review, exchange, summarize and promote their achievements in the fields of industrial engineering and engineering management. For example, some experts pay special attention to the current state of the application of related techniques in China as well as their future prospects, such as green product design, quality control and management, supply chain and logistics management to address the need for, amongst other things low-carbon, energy-saving and emission-reduction. They also offer opinions on the outlook for the development of related techniques. The proceedings offers impressive methods and concrete applications for experts from colleges and universities, research institutions and enterprises who are engaged in theoretical research into industrial engineering and engineering management and its applications. As all the papers are of great value from both an academic and a practical point of view, they also provide research data for international scholars who are investigating Chinese style enterprises and engineering management.

Global networks, which are the primary pillars of the modern manufacturing industry and supply chains, can only cope with the new challenges, requirements and demands when supported by new computing and Internet-based technologies. Cloud Manufacturing: Distributed Computing Technologies for Global and Sustainable Manufacturing introduces a new paradigm for scalable service-oriented sustainable and globally distributed manufacturing systems. The eleven chapters in this book provide an updated overview of the latest technological development and applications in relevant research areas. Following an introduction to the essential features of Cloud Computing, chapters cover a range of methods and applications such as the factors that actually affect adoption of the Cloud Computing technology in manufacturing companies and new geometrical simplification method to stream 3-Dimensional design and manufacturing data via the Internet. This is further supported case studies and real life data for Waste Electrical and Electronic Equipment (WEEE) remanufacturing. This compilation of up to date research and literature can be used as a textbook or reference for mechanical, manufacturing, and computer engineering graduate students and researchers for efficient utilization, deployment and development of distributed and Cloud manufacturing systems, services and applications.

Proceedings of the FISITA 2012 World Automotive Congress are selected from nearly 2,000 papers submitted to the 34th FISITA World Automotive Congress, which is held by Society of Automotive Engineers of China (SAE-China) and the International Federation of Automotive Engineering Societies (FISITA). This proceedings focus on solutions for sustainable mobility in all areas of passenger car, truck and bus transportation. Volume 11: Advanced Vehicle Manufacturing Technology focuses on: ·Applications of Aluminum, Magnesium and Zink Alloys , Composites ·Advanced Body Manufacturing Technology ·Body Corrosion Protection Technology ·Welding, Joining and Fastening ·Casting Technology ·Stamping Technology ·Paints, Polymers and Coatings ·Exterior Body Panels ·Advanced Process Management Above all researchers, professional engineers and graduates in fields of automotive engineering, mechanical engineering and electronic engineering will benefit from this book. SAE-China is a national academic organization composed of enterprises and professionals who focus on research, design and education in the fields of automotive and related industries. FISITA is the umbrella organization for the national automotive societies in 37 countries around the world. It was founded in Paris in 1948 with the purpose of bringing engineers from around the world together in a spirit of cooperation to share ideas and advance the technological development of the automobile.

6th IFIP WG 5.5/SOCOLNET Doctoral Conference on Computing, Electrical and Industrial Systems, DoCEIS 2015, Costa de Caparica, Portugal, April 13-15, 2015, Proceedings

Cybersecurity for Industry 4.0

Analysis for Design and Manufacturing

The 19th International Conference on Industrial Engineering and Engineering Management

Development of an Interoperable Cloud-based Manufacturing System

Handbook of Cloud Computing

This volume gathers the peer reviewed papers presented at the 4th edition of the International Workshop “Service Orientation in Holonic and Multi-agent Manufacturing – SOHOMA’14” organized and hosted on November 5-6, 2014 by the University of Lorraine, France in collaboration with the CIMR Research Centre of the University Politehnica of Bucharest and the TEMPO Laboratory of the University of Valenciennes and Hainaut-Cambrésis. The book is structured in six parts, each one covering a specific research line which represents a trend in future manufacturing: (1) Holonic and Agent-based Industrial Automation Systems; (2) Service-oriented Management and Control of Manufacturing Systems; (3) Distributed Modelling for Safety and Security in Industrial Systems; (4) Complexity, Big Data and Virtualization in Computing-oriented Manufacturing; (5) Adaptive, Bio-inspired and Self-organizing Multi-Agent Systems for Manufacturing and (6) Physical Internet Simulation, Modelling and Control. There is a clear orientation of the SOHOMA’14 workshop towards complexity, which is a common view of all six parts. There is need for a framework allowing the development of manufacturing cyber physical systems including capabilities for complex event processing and data analytics which are expected to move the manufacturing domain closer towards cloud manufacturing within contextual enterprises. Recent advances in sensor, communication and intelligent computing technologies made possible the Internet connectivity of the physical world: the Physical Internet, where not only documents and images are created, shared, or modified in the cyberspace, but also the physical resources and products interact over Internet and make decisions based on shared communication.

Explores cloud computing, breaking down the concepts, models, mechanisms, and architectures of this technology while allowing for the financial assessment of resources and how they compare to traditional storage systems.

This proceedings book presents selected peer-reviewed papers from the 9th International Workshop on ‘Service Oriented, Holonic and Multi-agent Manufacturing Systems for the Industry of the Future’ organized by Universitat Politècnica de València, Spain, and held on October 3–4, 2019. The SOHOMA 2019 Workshop aimed to foster innovation in the digital transformation of manufacturing and logistics by promoting new concepts and methods and solutions through service orientation in holonic and agent-based control with distributed intelligence. The book provides insights into the theme of the SOHOMA’19 Workshop – ‘Smart anything everywhere – the vertical and horizontal manufacturing integration, ’ addressing ‘Industry of the Future’ (IoF), a term used to describe the 4th industrial revolution initiated by a new generation of adaptive, fully connected, analytical and highly efficient robotized manufacturing systems. This global IoF model describes a new stage of manufacturing, that is fully automatized and uses advanced information, communication and control technologies such as industrial IoT, cyber-physical production systems, cloud manufacturing, resource virtualization, product intelligence, and digital twin, edge and fog computing. It presents the IoF interconnection of distributed manufacturing entities using a ‘system-of-systems’ approach, discussing new types of highly interconnected and self-organizing production resources in the entire value chain; and new types of intelligent decision-making support based on from real-time production data collected from resources, products and machine learning processing. This book is intended for researchers and engineers working in the manufacturing value chain, and specialists developing computer-based control and robotics solutions for the ‘Industry of the Future’. It is also a valuable resource for master’s and Ph.D. students in engineering sciences programs.

The adoption of cloud and IoT technologies in both the industrial and academic communities has enabled the discovery of numerous applications and ignited countless new research opportunities. With numerous professional markets benefiting from these advancements, it is easy to forget the non-technical issues that accompany technologies like these. Despite the advantages that these systems bring, significant ethical questions and regulatory issues have become prominent areas of discussion. Social, Legal, and Ethical Implications of IoT, Cloud, and Edge Computing Technologies is a pivotal reference source that provides vital research on the non-technical repercussions of IoT technology adoption. While highlighting topics such as smart cities, environmental monitoring, and data privacy, this publication explores the regulatory and ethical risks that stem from computing technologies. This book is ideally designed for researchers, engineers, practitioners, students, academicians, developers, policymakers, scientists, and educators seeking current research on the sociological impact of cloud and IoT technologies.

Service Oriented, Holonic and Multi-agent Manufacturing Systems for Industry of the Future

From Distributed Computing to Cloudware Applications

Proceedings of the 4th International Conference on the Industry 4.0 Model for Advanced Manufacturing

Applying Integration Techniques and Methods in Distributed Systems and Technologies

Business Transformation and Sustainability through Cloud System Implementation

Advances on P2P, Parallel, Grid, Cloud and Internet Computing

On the one side, Industrial competitiveness today means shorter product lifecycles, increased product variety, and shorter times to market and customized tangible products and services. To face these challenges, the manufacturing industry is forced to move from traditional management, control, and automation approaches towards industrial cyber-physical systems. On the other side, several emergent engineering approaches and related Information-Communication-Control-Technologies, such as Multi-Agent-Systems, Service-Oriented Architecture, Plug-and-Produce Systems, Cloud and Fog Technologies, Big Data and Analytics, among others, have been researched during the last years. The confluence of those results with the latest developments in Industrial Digitalization, Systems-of-Cyber-Physical-Systems Engineering, Internet-of-Things, Internet-of-Services, and Industry 4.0 is opening a new broad spectrum of innovation possibilities. The PERFoRM (Production-harmonizEd-Reconfiguration of Flexible Robots and Machinery) approach is one of them. It teaches the reader what it means when production machines and systems are digitalized and migrated into Industrial Cyber-Physical Systems and what happens when they are networked and start collaborating with each other and with the human, using the internet. After a Technology Trend Screening and beyond a comprehensive state-of-the-art analysis about Industrial Digitalization and Industry 4.0-compliant solutions, the book introduces methods, architectures, and technologies applicable in real industrial use cases, explained for a broad audience of researchers, practitioners, and industrialists.

Distributed systems intertwine with our everyday lives. The benefits and current shortcomings of the underpinning technologies are experienced by a wide range of people and their smart devices. With the rise of large-scale IoT and similar distributed systems, cloud bursting technologies, and partial outsourcing solutions, private entities are encouraged to increase their efficiency and offer unparalleled availability and reliability to their users. Applying Integration Techniques and Methods in Distributed Systems is a critical scholarly publication that defines the current state of distributed systems, determines further goals, and presents architectures and service frameworks to achieve highly integrated distributed systems and presents solutions to integration and efficient management challenges faced by current and future distributed systems. Highlighting topics such as multimedia, programming languages, and smart environments, this book is ideal for system administrators, integrators, designers, developers, researchers, and academicians.

Concurrent Engineering (CE) is based on the premise that different phases of a product's lifecycle should be conducted concurrently and initiated as early as possible within the Product Creation Process (PCP). It has become the substantive basic methodology in many industries, including automotive, aerospace, machinery, shipbuilding, consumer goods, process industry and environmental engineering. CE aims to increase the efficiency of the PCP and reduce errors in later phases while incorporating considerations for full lifecycle and through-life operations. This book presents the proceedings of the 22nd ISPE Inc. (International Society for Productivity Enhancement) International Conference on Concurrent Engineering (CE2015) entitled 'Transdisciplinary Lifecycle Analysis of Systems', and held in Delft, the Netherlands, in July 2015. It is the second in the series 'Advances in Transdisciplinary Engineering'. The book includes 63 peer reviewed papers and 2 keynote speeches arranged in 10 sections: keynote speeches; systems engineering; customization and variability management; production oriented design, maintenance and repair; design methods and knowledge-based engineering; multidisciplinary product management; sustainable product development; service oriented design; product lifecycle management; and trends in CE. Containing papers ranging from the theoretical and conceptual to the highly pragmatic, this book will be of interest to all engineering professionals and practitioners; researchers, designers and educators.

The primary purpose of this book is to capture the state-of-the-art in Cloud Computing technologies and applications. The book will also aim to identify potential research directions and technologies that will facilitate creation a global market-place of cloud computing services supporting scientific, industrial, business, and consumer applications. We expect the book to serve as a reference for larger audience such as systems architects, practitioners, developers, new researchers and graduate level students. This area of research is relatively recent, and as such has no existing reference book that addresses it. This book will be a timely contribution to a field that is gaining considerable research interest, momentum, and is expected to be of increasing interest to commercial developers. The book is targeted for professional computer science developers and graduate students especially at Masters level. As Cloud Computing is recognized as one of the top five emerging technologies that will have a major impact on the quality of science and society over the next 20 years, its knowledge will help position our readers at the forefront of the field.

Cloud Computing

The PERFoRM Approach

Proceedings of the 16th International Conference on P2P, Parallel, Grid, Cloud and Internet Computing (3PGCIC-2021)

Service Orientation in Holonic and Multi-agent Manufacturing

Cloud-Based Cyber-Physical Systems in Manufacturing

Global Virtual Enterprises in Cloud Computing Environments

Technology trends may come and go, but cloud computing technologies have been gaining consideration in the commercial world due to its ability to provide on-demand access to resources, control the software environment, and supplement existing systems. Pervasive Cloud Computing Technologies: Future Outlooks and Interdisciplinary Perspectives explores the latest innovations with cloud computing and the impact of these new models and technologies. This book will present case studies and research on the future of cloud computing technologies and its ability to increase connectivity of various entities of the world. It is an essential resource for technology practitioners, engineers, managers, and academics aiming to gain the knowledge of these novel and pervasive technologies.

In this book, leading authors in the field discuss developments of Ambient Assisted Living. The contributions have been chosen and invited at the 8th AAL Congress, Frankfurt/M. The meeting presents new technological developments which support the autonomy and independence of individuals with special needs. The 8th AAL Congress focusses its attention on technical assistance systems and their applications in homecare, health and care.

Cloud computing has become a significant technology trend. Experts believe cloud computing is currently reshaping information technology and the IT marketplace. The advantages of using cloud computing include cost savings, speed to market, access to greater computing resources, high availability, and scalability. Handbook of Cloud Computing includes contributions from world experts in the field of cloud computing from academia, research laboratories and private industry. This book presents the systems, tools, and services of the leading providers of cloud computing; including Google, Yahoo, Amazon, IBM, and Microsoft. The basic concepts of cloud computing and cloud computing applications are also introduced. Current and future technologies applied in cloud computing are also discussed. Case studies, examples, and exercises are provided throughout. Handbook of Cloud Computing is intended for advanced-level students and researchers in computer science and electrical engineering as a reference book. This handbook is also beneficial to computer and system infrastructure designers, developers, business managers, entrepreneurs and investors within the cloud computing related industry.

This book presents a detailed exploration of adaption and implementation, as well as a 360-degree view spectrum of blockchain technologies in real-world business applications. Blockchain is gaining momentum in all sectors. This book offers a collection of protocol standards, issues, security improvements, applicability, features, and types of cryptocurrency in processing and through 5G technology. The book covers the evolution of blockchain from fundamental theories to present forms. It offers diversified business applications with usable case studies and provides successful implementations in cloud/edge computing, smart city, and IoT. The book emphasizes the advances and cutting-edge technologies along with the different tools and platforms. The primary audience for this book includes industry experts, researchers, graduates and under graduates, practitioners, and business managers who are engaged in blockchain and IoT-related technologies.

Principles, Systems and Applications

Digitalized and Harmonized Industrial Production Systems

Proceedings

Elements of Manufacturing Networks, Cyber-Physical Production Systems and Smart Automation

Service management and scheduling in cloud manufacturing

Concepts, Methodologies, Tools, and Applications

This book gathers the proceedings of the 4th International Conference on the Industry 4.0 Model for Advanced Manufacturing (AMP 2019), held in Belgrade, Serbia, on 3–6 June 2019. The event marks the latest in a series of high-level conferences that bring together experts from academia and industry to exchange knowledge, ideas, experiences, research findings, and information in the field of manufacturing. The book addresses a wide range of topics, including: design of smart and intelligent products, developments in CAD/CAM technologies, rapid prototyping and reverse engineering, multistage manufacturing processes, manufacturing automation in the Industry 4.0 model, cloud-based products, and cyber-physical and reconfigurable manufacturing systems. By providing updates on key issues and highlighting recent advances in manufacturing engineering and technologies, the book supports the transfer of vital knowledge to the next generation of academics and practitioners. Further, it will appeal to anyone working or conducting research in this rapidly evolving field.

This book presents the latest advances in manufacturing from both the experimental and simulation point of view. It covers most aspects of manufacturing engineering, i.e. theoretical, analytical, computational and experimental studies. Experimental studies on manufacturing processes require funds, time and expensive facilities, while numerical simulations and mathematical models can improve the efficiency of using the research results. It also provides high level of prediction accuracy and the basis for novel research directions.

Cloud computing continues to emerge as a subject of substantial industrial and academic interest. Although the meaning and scope of “cloud computing” continues to be debated, the current notion of clouds blurs the distinctions between grid services, web services, and data centers, among other areas. Clouds also bring considerations of lowering the cost for relatively bursty applications to the fore. Cloud Computing: Principles, Systems and Applications is an essential reference/guide that provides thorough and timely examination of the services, interfaces and types of applications that can be executed on cloud-based systems. The book identifies and highlights state-of-the-art techniques and methods for designing cloud systems, presents mechanisms and schemes for linking clouds to economic activities, and offers balanced coverage of all related technologies that collectively contribute towards the realization of cloud computing. With an emphasis on the conceptual and systemic links between cloud computing and other distributed computing approaches, this text also addresses the practical importance of efficiency, scalability, robustness and security as the four cornerstones of quality of service. Topics and features: explores the relationship of cloud computing to other distributed computing paradigms, namely peer-to-peer, grids, high performance computing and web services; presents the principles, techniques, protocols and algorithms that can be adapted from other distributed computing paradigms to the development of successful clouds; includes a Foreword by Professor Mark Baker of the University of Reading, UK; examines current cloud-practical applications and highlights early deployment experiences; elaborates the economic schemes needed for clouds to become viable business models. This book will serve as a comprehensive reference for researchers and students engaged in cloud computing. Professional system architects, technical managers, and IT consultants will also find this unique text a

practical guide to the application and delivery of commercial cloud services. Prof. Nick Antonopoulos is Head of the School of Computing, University of Derby, UK. Dr. Lee Gillam is a Lecturer in the Department of Computing at the University of Surrey, UK.

Distributed and Cloud Computing: From Parallel Processing to the Internet of Things offers complete coverage of modern distributed computing technology including clusters, the grid, service-oriented architecture, massively parallel processors, peer-to-peer networking, and cloud computing. It is the first modern, up-to-date distributed systems textbook; it explains how to create high-performance, scalable, reliable systems, exposing the design principles, architecture, and innovative applications of parallel, distributed, and cloud computing systems. Topics covered by this book include: facilitating management, debugging, migration, and disaster recovery through virtualization; clustered systems for research or ecommerce applications; designing systems as web services; and social networking systems using peer-to-peer computing. The principles of cloud computing are discussed using examples from open-source and commercial applications, along with case studies from the leading distributed computing vendors such as Amazon, Microsoft, and Google. Each chapter includes exercises and further reading, with lecture slides and more available online. This book will be ideal for students taking a distributed systems or distributed computing class, as well as for professional system designers and engineers looking for a reference to the latest distributed technologies including cloud, P2P and grid computing. Complete coverage of modern distributed computing technology including clusters, the grid, service-oriented architecture, massively parallel processors, peer-to-peer networking, and cloud computing Includes case studies from the leading distributed computing vendors: Amazon, Microsoft, Google, and more Explains how to use virtualization to facilitate management, debugging, migration, and disaster recovery Designed for undergraduate or graduate students taking a distributed systems course—each chapter includes exercises and further reading, with lecture slides and more available online

Principles and Paradigms

Proceedings of SOHOMA 2019

Management System Innovation

Fundamentals, Applications, and Case Studies

Enterprise Integration and Information Architecture

Future Outlooks and Interdisciplinary Perspectives

The two volumes IFIP AICT 459 and 460 constitute the refereed proceedings of the International IFIP WG 5.7 Conference on Advances in Production Management Systems, APMS 2015, held in Tokyo, Japan, in September 2015. The 163 revised full papers were carefully reviewed and selected from 185 submissions. They are organized in the following topical sections: collaborative networks; globalization and production management; knowledge based production management; project management, engineering management, and quality management; sustainability and production management; co-creating sustainable business processes and ecosystems; open cloud computing architecture for smart manufacturing and cyber physical production systems; the practitioner's view on "innovative production management towards sustainable growth"; the role of additive manufacturing in value chain reconfiguration and sustainability; operations management in engineer-to-order manufacturing; lean production; sustainable system design for green products; cloud-based manufacturing; ontology-aided production - towards open and knowledge-driven planning and control; product-service lifecycle management: knowledge-driven innovation and social implications; and service engineering.

This book introduces readers to cybersecurity and its impact on the realization of the Industry 4.0 vision. It covers the technological foundations of cybersecurity within the scope of the Industry 4.0 landscape and details the existing cybersecurity threats faced by Industry 4.0, as well as state-of-the-art solutions with regard to both academic research and practical implementations. Industry 4.0 and its associated technologies, such as the Industrial Internet of Things and cloud-based design and manufacturing systems are examined, along with their disruptive innovations. Further, the book analyzes how these phenomena capitalize on the economies of scale provided by the Internet. The book offers a valuable resource for practicing engineers and decision makers in industry, as well as researchers in the design and manufacturing communities and all those interested in Industry 4.0 and cybersecurity.

In the increasingly competitive corporate sector, businesses must examine their current practices to ensure business success. By examining their social, financial, and environmental risks, obligations, and opportunities, businesses can re-design their operations more effectively to ensure prosperity. Sustainable Business: Concepts, Methodologies, Tools, and Applications is a vital reference source that explores the best practices that promote business sustainability, including examining how economic, social, and environmental aspects are related to each other in the company's management and performance. Highlighting a range of topics such as lean manufacturing, sustainable business model innovation, and ethical consumerism, this multi-volume book is ideally designed for entrepreneurs, business executives, business professionals, managers, and academics seeking current research on sustainable business practices.

The book presents a coherent description of distributed manufacturing, providing a solid base for further research on the subject as well as smart implementations in companies. It provides a guide for those researching and working in a range of fields, such as smart manufacturing, cloud computing, RFID tracking, distributed automation, cyber physical production and global design anywhere, manufacture anywhere solutions. Foundations & Principles of Distributed Manufacturing anticipates future advances in the fields of embedded systems, the Internet of Things and cyber physical systems, outlining how adopting these innovations could rapidly bring about improvements in key performance indicators, which could in turn generate competition pressure by rendering successful business models obsolete. In laying the groundwork for powerful theoretical models, high standards for the homogeneity and soundness of the suggested setups are applied. The book especially elaborates on the upcoming competition in online manufacturing operations and respective control procedures. By outlining encapsulation and evolving decision-making principles, Foundations & Principles of Distributed Manufacturing fully conceptualizes the view of manufacturing networks as sets of loosely coupled interacting smart factory objects. Moreover, the book provides concrete approaches to a number of future fields, where distributed manufacturing might be applied. Both researchers and professionals will profit from the authors' broad experience in Distributed Manufacturing and Fractal Enterprise implementations, where they initiated and completed a number of successful research projects: within the global Intelligent Manufacturing Systems (IMS) scheme, within the European Research Area frameworks as well as national contexts, and both in industry and at leading research institutions. This background ensures well-founded theory on one hand and valuable practical results on the other in a fascinating area that is still under intensive research. Readers will acquire essential insights as well as useful guidance for categorizing and specifying extended distributed manufacturing solutions and their professional implementations.

AMP 2019

Sustainable Business: Concepts, Methodologies, Tools, and Applications

Volume 11: Advanced Vehicle Manufacturing Technology

Cloud Manufacturing

20th ISPE International Conference on Concurrent Engineering

IFIP WG 5.7 International Conference, APMS 2015, Tokyo, Japan, September 7-9, 2015, Proceedings, Part II

The Cambridge Handbooks on Construction Robotics discuss progress in robot systems theory and demonstrate their integration using real systematic applications and projections for offsite as well as onsite building production. The series is intended to give professionals, researchers, lecturers, and students conceptual and technical skills and implementation strategies to manage, research or teach the implementation of advanced automation and robot-technology-based processes in construction. Robot-Oriented Design introduces the design, innovation and management methodologies that are key to the realization and implementation of the advanced concepts and technologies presented in the subsequent volumes. This book describes the efficient deployment of advanced construction and building technology. It is concerned with the coadaptation of construction products, processes, organization and management, and with automated/robotic technology, so that the implementation of modern technology becomes easier and more efficient. It is also concerned with technology and innovation management methodologies and the generation of life cycle-oriented views related to the use of advanced technologies in construction.

This book constitutes the thoroughly refereed post-conference proceedings of the International Conference on Industrial IoT Technologies and Applications, IoT 2016, held in GuangZhou, China, in March 2016. The volume contains 26 papers carefully reviewed and selected from 55 submissions focusing on topics such as big data, cloud computing, Internet of Things (IoT).

This book presents state-of-the-art research, challenges and solutions in the area of cloud-based cyber-physical systems (CPS) used in manufacturing. It provides a comprehensive review of the literature and an in-depth treatment of novel methodologies, algorithms and systems in the area of architecture design, cyber security, process planning, monitoring and control. The book features detailed descriptions of how to derive solutions in a cloud environment where physical machines can be supported by cyber decision systems when engaged in real operations. It presents a range of novel ideas and is characterized by a balanced approach in terms of scope vs. depth and theory vs. applications. It also takes into account the need to present intellectual challenges while appealing to a broad readership, including academic researchers, practicing engineers and managers, and graduate students. Dedicated to the topic of cloud-based CPS and its practical applications in manufacturing, this book benefits readers from all manufacturing sectors, from system design to lifecycle engineering and from process planning to machine control. It also helps readers to understand the present challenges and future research directions towards factories of the future, helping them to position themselves strategically for career development.

Enterprise solutions have emerged as promising tools for integrating and extending business processes across business functions. Supplying a clear and comprehensive introduction to the field, this book provides a detailed description of enterprise information integration—from the development of enterprise systems to extended enterprise information integration in supply chain environments. Enterprise Integration and Information Architecture: A Systems Perspective on Industrial Information Integration explains how to improve industrial information integration through the application of a systems approach. Describing how systems science is impacting current research in industrial information integration, it covers enterprise architecture, information architecture for enterprises, business process/work flow modeling, and enterprise information integration. Covering the emergence, growth, and extension of integrated enterprise systems, the book provides you with various perspectives of modern enterprise solutions. It introduces the critical concepts of ERP, industry-oriented enterprise resource planning, and entire resource planning. It also provides guidance on how to transition from extended enterprise integration in a supply chain environment to systems-based enterprise architecture, enterprise modeling, and enterprise modeling in a supply chain environment. The book proposes a new information architecture for enterprise and supply chain management. It presents modeling and integration information flows for enterprise information integration, together with the Internet of Things (IoT). It also explores the theory and methods of industrial information integration including integration approaches and enterprise application integration. Complete with numerous examples of extended enterprise integration in actual supply chain environments, the book illustrates the critical issues that arise in professional practice and also explores emerging trends in enterprise integration and its information architecture

Transdisciplinary Lifecycle Analysis of Systems

Distributed Computing Technologies for Global and Sustainable Manufacturing

Robot Oriented Design

Concepts, Technology & Architecture

Technological Innovation for Cloud-Based Engineering Systems