

Digital Manufacturing And Design Innovation Institute

The book introduces the reader to game-changing ways of building and utilizing Internet-based services related to design and manufacture activities through the cloud. In a broader sense, CBDM refers to a new product realization model that enables collective open innovation and rapid product development with minimum costs through social networking and negotiation platforms between service providers and consumers. It is a type of parallel and distributed system consisting of a collection of inter-connected physical and virtualized service pools of design and manufacturing resources as well as intelligent search capabilities for design and manufacturing solutions. Practicing engineers and decision makers will learn how to strategically position their product development operations for success in a globalized interconnected world.

This book presents selected papers from the 1st International Conference on Industry 4.0 and Advanced Manufacturing held at the Indian Institute of Science, Bangalore and includes deliberations from stakeholders in manufacturing and Industry 4.0 on the nature, needs, challenges, opportunities, problems, and solutions in these transformational areas. Special emphasis is placed on exploring avenues for creating a vision of, and enablers for, sustainable, affordable, and human-centric Industry 4.0. The book showcases cutting edge practice, research, and educational innovation in this crucial and rapidly evolving area. This book will be useful to researchers in academia and industry, and will also be useful to policymakers involved in creating ecosystems for implementation of Industry 4.0.

American cities are rediscovering the economic and social value of urban manufacturing. However, urban manufacturing is often invisible and poorly understood in terms of urban design, architecture, and policy. The Design of Urban Manufacturing brings a multidisciplinary approach to a new complex reality that urban manufacturing now sits squarely at the intersection of research, education, and neighborhood revitalization. Using cases studies from across North America and beyond, this book presents innovative approaches not only to the design of districts and buildings, but to the design of policy as well: the special roles that governments, local development corporations, and not-for-profit organizations all have to play in supporting manufacturing. This book presents current models for working neighborhoods where factories enable fine-grained, mixed-use communities and face-to-face contact while creatively solving the very real problems of goods movement and functional buildings. Design guidelines and policy recommendations are calibrated to different types of production districts. The Design of Urban Manufacturing is the essential resource for policy makers, designers, and students in urban design, planning, and urban and economic development.

Digital Twin Driven Smart Design draws on the latest industry practice and research to establish a basis for the implementation of digital twin technology in product design. Coverage of relevant design theory and methodology is followed by detailed discussions of key enabling technologies that are supported by cutting-edge case studies of implementation. This groundbreaking book explores how digital twin technology can bring improvements to different kinds of product design process, including functional, lean and green. Drawing on the work of researchers at the forefront of this technology, this book is the ideal guide for anyone interested in digital manufacturing or computer-aided design. Provides detailed case studies that explore key applications of digital twin technology in design practice Introduces the concept of using digital twins to create the virtual commissioning of design projects Presents a framework to help engineers incorporate digital twins into their product design process

This book provides a source of inspiration and a manual for designers, entrepreneurs and professionals who are looking into the practical application of product configurators. In this growing profession, there is a need for a book which focuses on the configuration process from a design perspective. The book delves into the practical application of configurators using case studies of selected firms that present their most significant works. It offers the reader tips, suggestions, technical details and critical issues which need to be considered, from experienced actors and pioneers worldwide, which include: Unfold, Belgium In-flexions, France Nervous System, USA Okinlab, Germany SkimLab, France Twikit, Belgium INDG, The Netherlands ZeroLight, United Kingdom 3Dimerce, The Netherlands 3DSource, USA Bagaar, Belgium MyCustomizer, Canada Combeeneration, Austria

Collaborative design has attracted much attention in the research community in recent years. With increasingly decentralized manufacturing systems and processes, more collaborative approaches and systems are needed to support distributed manufacturing operations.

"Collaborative Design and Planning for Digital Manufacturing" presents a focused collection of quality chapters on the state-of-the-art research efforts in the area of collaborative design and planning, as well as their practical applications towards digital manufacturing.

"Collaborative Design and Planning for Digital Manufacturing" provides both a broad-based review of the key areas of research in digital manufacturing, and an in-depth treatment of particular methodologies and systems, from collaborative design to distributed planning, monitoring and control. Recent development and innovations in this area provide a pool of focused research efforts, relevant to a wide readership from academic researchers to practicing engineers.

This book presents an in-depth review of the state of the art of cyber-physical systems (CPS) and their applications. Relevant case studies are also provided, to help the reader to master the interdisciplinary material. Features: includes self-test exercises in each chapter, together with a glossary; offers a variety of teaching support materials at an associated website, including a comprehensive set of slides and lecture videos; presents a brief overview of the study of systems, and embedded computing systems, before defining CPS; introduces the concepts of the Internet of Things, and ubiquitous (or pervasive) computing; reviews the design challenges of CPS, and their impact on systems and software engineering; describes the ideas behind Industry 4.0 and the revolutions in digital manufacturing, including smart and agile manufacturing, as well as cybersecurity in manufacturing; considers the social impact of the changes in skills required by the globalized, digital work environment of the future.

This book presents a diversity of innovative and impactful research in the field of industrial and systems engineering (ISE) led by women investigators. After a Foreword by Margaret L. Brandeau, an eminent woman scholar in the field, the book is divided into the following sections: Analytics, Education, Health, Logistics, and Production. Also included is a comprehensive biography on the historic luminary of industrial engineering, Lillian Moeller Gilbreth. Each chapter presents an opportunity to learn about the impact of the field of industrial and systems engineering and women's important contributions to it. Topics range from big data analysis, to improving cancer treatment, to sustainability in product design, to teamwork in engineering education. A total of 24 topics touch on many of the challenges facing the world today and these solutions by women researchers are valuable for their technical innovation and excellence and their non-traditional perspective. Found within each author's biography are their motivations for entering the field and how they view their contributions, providing inspiration and guidance to those entering industrial engineering.

Leaders are the most important element of an organization in regards to reaching organizational goals, motivating

followers to perform better, and creating an innovative work environment. To conform with successful corporate social responsibility implementations, social entrepreneurship practices have gained more importance with the development of digital technology. Leadership Styles, Innovation, and Social Entrepreneurship in the Era of Digitalization is a pivotal reference source that provides vital research on the application of business organizations operating in a global, complex environment. While highlighting topics such as business ethics, operations management, and social capital, this publication explores recent technological advances and the methods of the latest management skills and techniques. This book is ideally designed for human resources professionals, managers, leaders, executives, CEOs, specialists, consultants, researchers, students, and professors seeking current research on human resources management and management information systems in a digital society.

The future security, economic growth, and competitiveness of the United States depend on its capacity to innovate. Major sources of innovative capacity are the new knowledge and trained students generated by U.S. research universities. However, many of the complex technical and societal problems the United States faces cannot be addressed by the traditional model of individual university research groups headed by a single principal investigator. Instead, they can only be solved if researchers from multiple institutions and with diverse expertise combine their efforts. The National Science Foundation (NSF), among other federal agencies, began to explore the potential of such center-scale research programs in the 1970s and 1980s; in many ways, the NSF Engineering Research Center (ERC) program is its flagship program in this regard. The ERCs are "interdisciplinary, multi-institutional centers that join academia, industry, and government in partnership to produce transformational engineered systems and engineering graduates who are adept at innovation and primed for leadership in the global economy. To ensure that the ERCs continue to be a source of innovation, economic development, and educational excellence, A New Vision for Center-Based Engineering Research explores the future of center-based engineering research, the skills needed for effective center leadership, and opportunities to enhance engineering education through the centers.

Energy efficiency touches all parts of the economy and lies at the heart of all plausible strategies for addressing climate change. A fascinating range of new technologies and new business models have emerged in the past few years and are rapidly reshaping the field and driving efficiency improvements — many of them completely unexpected. This book provides a fresh look at energy efficiency written in a way that can be interesting to experts and serve as an entry point for novices. With chapters written by recognized experts in their fields of expertise, the book provides readers with a clear perspective on the state-of-the-art developments of both new technologies and new approaches to system design and operations in buildings, industry, transportation, and urban design. Strategies for electrification and optimization based on

data and powerful algorithms are also explored in depth. The discussion includes new mobility systems, smart buildings, reimagined industrial processes, new materials, and smart grid integration.

Competition from emerging and developing countries, challenges related to energy and water, the continuing increase in the global population and the obligation to be sustainable are all impacting developed countries such as the United States, France, etc. Manufacturing has been almost totally neglected by these developed countries and thus there is a strong need to review R&D and the development and industrialization processes. This is a prerequisite for maintaining and improving welfare and quality of life. The industrialization process can be defined as the process of converting research or laboratory experiments into a physical tool capable of producing a product of value for customers of specified markets. Such a process implies knowledge of BAT (best available techniques) in chemical engineering, plant design, production competitiveness, the proper utilization of tools (toolbox concept) such as value assessment, value engineering, eco-design, LCA (lifecycle analysis), process simulation, modeling, innovation and appropriate metrics usage. These are mandatory to ensure commercial success and covered by the authors of this book.

The two-volume set LNICST 169 and 170 constitutes the thoroughly refereed post-conference proceedings of the Second International Internet of Things Summit, IoT 360° 2015, held in Rome, Italy, in October 2015. The IoT 360° is an event bringing a 360 degree perspective on IoT-related projects in important sectors such as mobility, security, healthcare and urban spaces. The conference also aims to coach involved people on the whole path between research to innovation and the way through to commercialization in the IoT domain. This volume contains 62 revised full papers at the following four conferences: The International Conference on Safety and Security in Internet of Things, SaSeIoT, the International Conference on Smart Objects and Technologies for Social Good, GOODTECHS, the International Conference on Cloud, Networking for IoT systems, CN4IoT, and the International Conference on IoT Technologies for HealthCare, HealthyIoT.

This book explores various digital representation strategies that could change the future of wooden architectures by blending tradition and innovation. Composed of 61 chapters, written by 153 authors hailing from 5 continents, 24 countries and 69 research centers, it addresses advanced digital modeling, with a particular focus on solutions involving generative models and dynamic value, inherent to the relation between knowing how to draw and how to build. Thanks to the potential of computing, areas like parametric design and digital manufacturing are opening exciting new avenues for the future of construction. The book's chapters are divided into five sections that connect digital wood design to integrated approaches and generative design; to model synthesis and morphological comprehension; to lessons learned from nature and material explorations; to constructive wisdom and implementation-related challenges; and to parametric

transfigurations and morphological optimizations.

Legendary architecture practice SOM presents 40+ of their most transformative works in the sixth and latest volume, *SOM: Works by Skidmore, Owings & Merrill, 2009-2019*. Skidmore, Owings & Merrill (SOM) is one of the most influential architecture studios in the world, with a body of work that includes some of the most important buildings and urban designs of our time. *SOM: Works by Skidmore, Owings & Merrill, 2009-2019* is the sixth and latest volume in the series to cover every era of SOM's history, from the iconic Modernist works of the 1950s to the projects of today. Documenting SOM's global body of work—which ranges from a prototype for a biophilic breathing wall to the new headquarters for NATO in Brussels—*SOM: Works by Skidmore, Owings & Merrill, 2009-2019* demonstrates how SOM has come to hold its unparalleled position as a steward of international architecture. This new volume details SOM's approach to designing impactful, complex projects in a globalized world—an approach which marries a deep bench of global expertise with a commitment to honoring culture and people in the communities where SOM works. In this volume, explore SOM's mission to address the most urgent challenge of our time: climate change. Working in pursuit of a zero-carbon built world, SOM's designers are pioneering new approaches to adaptive reuse, cultivating emerging technologies including machine learning, inventing new tools to optimize building performance, and beyond. Organized chronologically, the monograph encompasses SOM's most significant projects of the past decade, across all building types and locations, highlighting the studio's unique ability to design and execute complex, technical, and efficient structures. The roster includes Burj Khalifa—the tallest building in the world, Manhattan Loft Gardens, a new vertical community in London, the twisting Ningbo Bank of China headquarters, the 'floating cube' new Federal Courthouse in Los Angeles, the master plan for the Cornell Tech Campus on Roosevelt Island, the reimagined Strand Theatre in San Francisco, Chicago's Optimo Hat Company Headquarters, Denver Union Station, and of course, One World Trade Center. Through in-depth essays, architecture writer and critic Sam Lubell dives into SOM's radically rigorous approach to design in today's complex world, exploring the unique ideas cultivated within the studio and how those ideas are transformed into transformative spaces across the globe. As with the previous five volumes in the series, renowned design studio Pentagram led the book's design in collaboration with SOM. Featuring 500 images, the book includes thorough profiles and never-before-published photographs, plans, and drawings of the studio's most recent works.

This book presents a collection of papers presented at the 3rd World Congress on Integrated Computational Materials Engineering (ICME), a specialty conference organized by The Minerals, Metals & Materials Society (TMS). This meeting convened ICME stakeholders to examine topics relevant to the global advancement of ICME as an engineering discipline. The papers presented in these proceedings are divided into six sections: (1) ICME Applications; (2) ICME

Building Blocks; (3) ICME Success Stories and Applications (4) Integration of ICME Building Blocks: Multi-scale Modeling; (5) Modeling, Data and Infrastructure Tools, and (6) Process Optimization. . These papers are intended to further the global implementation of ICME, broaden the variety of applications to which ICME is applied, and ultimately help industry design and produce new materials more efficiently and effectively.

This book develops the core system science needed to enable the development of a complex industrial internet of things/manufacturing cyber-physical systems (IIoT/M-CPS). Gathering contributions from leading experts in the field with years of experience in advancing manufacturing, it fosters a research community committed to advancing research and education in IIoT/M-CPS and to translating applicable science and technology into engineering practice. Presenting the current state of IIoT and the concept of cybermanufacturing, this book is at the nexus of research advances from the engineering and computer and information science domains. Readers will acquire the core system science needed to transform to cybermanufacturing that spans the full spectrum from ideation to physical realization.

The manufacturing industry will reap significant benefits from encouraging the development of digital manufacturing science and technology. Digital Manufacturing Science uses theorems, illustrations and tables to introduce the definition, theory architecture, main content, and key technologies of digital manufacturing science. Readers will be able to develop an in-depth understanding of the emergence and the development, the theoretical background, and the techniques and methods of digital manufacturing science. Furthermore, they will also be able to use the basic theories and key technologies described in Digital Manufacturing Science to solve practical engineering problems in modern manufacturing processes. Digital Manufacturing Science is aimed at advanced undergraduate and postgraduate students, academic researchers and researchers in the manufacturing industry. It allows readers to integrate the theories and technologies described with their own research works, and to propose new ideas and new methods to improve the theory and application of digital manufacturing science.

How to rethink innovation and revitalize America's declining manufacturing sector by encouraging advanced manufacturing, bringing innovative technologies into the production process. The United States lost almost one-third of its manufacturing jobs between 2000 and 2010. As higher-paying manufacturing jobs are replaced by lower-paying service jobs, income inequality has been approaching third world levels. In particular, between 1990 and 2013, the median income of men without high school diplomas fell by an astonishing 20% between 1990 and 2013, and that of men with high school diplomas or some college fell by a painful 13%. Innovation has been left largely to software and IT startups, and increasingly U.S. firms operate on a system of "innovate here/produce there," leaving the manufacturing sector behind. In this book, William Bonvillian and Peter Singer explore how to rethink innovation and revitalize America's declining manufacturing sector. They argue that advanced manufacturing, which employs such innovative technologies as 3-D printing, advanced material, photonics, and robotics in the production process, is the key. Bonvillian and Singer discuss transformative new production paradigms that could drive up efficiency and drive down costs, describe the new processes and business models that must accompany them, and explore alternative funding methods for

startups that must manufacture. They examine the varied attitudes of mainstream economics toward manufacturing, the post-Great Recession policy focus on advanced manufacturing, and lessons from the new advanced manufacturing institutes. They consider the problem of “startup scaleup,” possible new models for training workers, and the role of manufacturing in addressing “secular stagnation” in innovation, growth, the middle classes, productivity rates, and related investment. As recent political turmoil shows, the stakes could not be higher.

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 explores systems-based, co-design, introducing a “Decision-Based, Co-Design” (DBCD) approach for the co-design of materials, products, and processes. In recent years there have been significant advances in modeling and simulation of material behavior, from the smallest atomic scale to the macro scale. However, the uncertainties associated with these approaches and models across different scales need to be addressed to enable decision-making resulting in designs that are robust, that is, relatively insensitive to uncertainties. An approach that facilitates co-design is needed across material, product design and manufacturing processes. This book describes a cloud-based platform to support decisions in the design of engineered systems (CB-PDSIDES), which feature an architecture that promotes co-design through the servitization of decision-making, knowledge capture and use templates that allow previous solutions to be reused. Placing the platform in the cloud aids mass collaboration and open innovation. A valuable reference resource on all areas related to the design of materials, products and processes, the book appeals to material scientists, design engineers and all those involved in the emerging interdisciplinary field of integrated computational materials engineering (ICME).

To effectively mature and transition DoD manufacturing science and technology advances into production, DoD must have access to a robust and responsive U.S. industrial base which is often driven by advanced manufacturing technologies. The Manufacturing USA institutes are considered crucial and game-changing catalysts that are bringing together innovative ecosystems in various technology and market sectors critical to DoD and the nation. Since 2012, DoD has invested \$600 million directly in its

Manufacturing USA institutes with the understanding that the initial federal investment included (1) core funding and (2) one-time, start-up funding to establish the institutes within a period of 5 to 7 years. As the institutes now begin to reach year five, DoD is evaluating the effectiveness of the institutes in fulfilling their goals and the best on-going roles for the federal government, including on-going funding options, to ensure optimal benefit to U.S. competitiveness. This report reviews the role of DoD's investment to date in establishing its eight institutes as public-private partnerships and its engagement with each institute after it has matured beyond the start-up period.

What American Government Does represents a major contribution to the scholarly debate on the nature of the American state and the exercise of power in America.

The world progresses toward Industry 4.0, and manufacturers are challenged to successfully navigate this unique digital journey. To some, digitalization is a golden opportunity; to others, it is a necessary evil. But to optimist and pessimist alike, there is a widespread puzzlement over the practical details of digitalization. To many manufacturers, digital transformation is a vague and confusing concept they nevertheless must grapple with in order to survive the Fourth Industrial Revolution. The proliferation of digital manufacturing technologies adds to the confusion, leaving many manufacturers perplexed and unprepared, with little real insight into how emerging technologies can help them sustain a competitive edge in their markets. This book effectively conveys Siemens's knowledge and experience through a concept called "Smart Digital Manufacturing," a stepwise approach to realizing the promise of the Fourth Industrial Revolution. The Smart Digital Manufacturing roadmap provides guidance and enables low-risk, high-reward adoption of new manufacturing software technologies through a series of tipping-point investment decisions that result in optimized manufacturing performance. The book provides readers with a clear understanding of what digital technology has to offer them, and how and when to invest in these essential components of tomorrow's factories. René Wolf is Senior Vice President of Manufacturing Operations Management Software for Siemens Digital Industries Software, a business unit of the Siemens Digital Factory Division. Raffaello Lepratti is Vice President of Business Development and Marketing for Siemens Digital Industries Software.

The development and management of technologies and operations are key to the success of all types of manufacturing business. This book presents the proceedings of the 17th International Conference on Manufacturing Research (ICMR 2019), held in Belfast, UK, on 10 – 12 September 2019. ICMR has been the UK's main manufacturing research conference for 34 years and an international conference since 2003. It brings together researchers, academics and industrialists to share their vision, knowledge and experience and discuss emerging trends and new challenges in manufacturing research. The conference theme of ICMR2019 was smart manufacturing, and the book includes the 82 papers presented at the conference (representing an acceptance rate of 69%). These have been divided into 13 parts, which cover topics ranging from robot automation and machining processes, additive manufacturing, composite manufacturing, design methods, to information management, quality control, production optimization and product lifecycle management. Providing an overview of current trends and developments, the book will be of

interest to researchers and engineers in the relevant area of manufacturing processes, design and production management. This publication summarises the main findings of a series of high-level expert workshops, organised with support by the European Commission, to deepen the understanding how OECD countries can move towards a broad-based form of innovation policy for regions and cities. Weaknesses in technology and knowledge diffusion are weighing on productivity growth and innovation in OECD countries, particularly in firms that are distant from the technological frontier (global or national). This in turn weakens their capacity to meet future challenges and undermines inclusive growth.

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.

Development in information and communication technologies has led to the advancement of business and enabled enterprises to produce on a global scale. Productivity is a key function in maintaining a competitive advantage in today's market. The internet of things has rapidly become prevalent in the productivity efforts of businesses. Understanding these technologies and how to implement them into current business practices is vital for researchers and practitioners. Internet of Things (IoT) Applications for Enterprise Productivity is a collection of innovative research on the advancing methods productivity efforts of business through the implementation of the internet of things. While highlighting topics including employee motivation, enterprise productivity, and supply chain tracking, this book is ideally designed for manufacturing professionals, industrialists, engineers, managers, practitioners, academicians, and students seeking current research on enterprise production systems and its transformation using internet of things technologies.

This book addresses the emerging paradigm of data-driven engineering design. In the big-data era, data is becoming a strategic asset for global manufacturers. This book shows how the power of data can be leveraged to drive the engineering design process, in particular, the early-stage design. Based on novel combinations of standing design methodology and the emerging data science, the book presents a collection of theoretically sound and practically viable design frameworks, which are intended to address a variety of critical design activities including conceptual design, complexity management, smart customization, smart product design, product service integration, and so forth. In addition, it includes a number of detailed case studies to showcase the application of data-driven engineering design. The book concludes with a set of promising research questions that warrant further

investigation. Given its scope, the book will appeal to a broad readership, including postgraduate students, researchers, lecturers, and practitioners in the field of engineering design.

The scientific theme of the book concerns “Manufacturing as a Service (MaaS)” which is developed in a layered cloud networked manufacturing perspective, from the shop floor resource sharing model to the virtual enterprise collaborative model, by distributing the cost of the manufacturing infrastructure - equipment, software, maintenance, networking - across all customers. MaaS is approached in terms of new models of service-oriented, knowledge-based manufacturing systems optimized and reality-aware, that deliver value to customer and manufacturer via Big data analytics, Internet of Things communications, Machine learning and Digital twins embedded in Cyber-Physical System frameworks. From product design to after-sales services, MaaS relies on the servitization of manufacturing operations such as: Design as a Service, Predict as a Service or Maintain as a service. The general scope of the book is to foster innovation in smart and sustainable manufacturing and logistics systems and in this context to promote concepts, methods and solutions for the digital transformation of manufacturing through service orientation in holonic and agent-based control with distributed intelligence. The book’s readership is comprised by researchers and engineers working in the manufacturing value chain area who develop and use digital control solutions in the ‘Industry of the Future’ vision. The book also addresses to master and Ph.D. students enrolled in Engineering Sciences programs.

This publication examines the opportunities and challenges, for business and government, associated with technologies bringing about the “next production revolution”. These include a variety of digital technologies (e.g. the Internet of Things and advanced robotics), industrial...

Optimization of Manufacturing Systems Using the Internet of Things extends the IoT (Internet of Things) into the manufacturing field to develop an IoMT (Internet of Manufacturing Things) architecture with real-time traceability, visibility, and interoperability in production planning, execution, and control. This book is essential reading for anyone interested in the optimization and control of an intelligent manufacturing system. As modern manufacturing shop-floors can create bottlenecks in the capturing and collection of real-time field information, and because paper-based manual systems are time-consuming and prone to errors, this book helps readers understand how to alleviate these issues, assisting them in their decision-making on shop-floors.. Includes case studies in implementing IoTs for data acquisition, monitoring, and assembly in manufacturing. Helps manufacturers to tackle the growing complexities and uncertainties of manufacturing systems in globalized business environments Acts as an introduction to using IoT for readers across industrial and manufacturing engineering

This book constitutes the refereed proceedings of the 13th IFIP WG 5.1 International Conference on Product Lifecycle Management, PLM 2016, held in Columbia, SC, USA, in July 2016. The 57 revised full papers presented were carefully reviewed and selected from 77 submissions. The papers are organized in the following topical sections: knowledge sharing, re-use and preservation; collaborative development architectures; interoperability and systems integration; lean product development and the role of PLM; PLM and innovation; PLM tools; cloud computing and PLM tools; traceability and performance; building information

modeling; big data analytics and business intelligence; information lifecycle management; industry 4.0; metrics, standards and regulation; and product, service and systems.

This book serves as an accelerated learning tool for students of Additive Manufacturing. The author presents key aspects of the subject in the form of questions and answers, so learners in a variety of contexts can find answers quickly to their specific question. Solutions to a variety of current, challenging problems are presented, clarified with examples, illustrations and copious references for more thorough investigation of the specific topic. Offers a unique, accelerated learning tool for students of Additive Manufacturing, presenting the subject in the form of questions and answers; Provides solutions to today's challenging problems in additive manufacturing, using examples, illustrations and references; Includes coverage of various aspects of additive manufacturing, such as materials, design, applications, post-process and digital manufacturing.

This book develops a general theory of managerial decision making on the basis of a few elementary postulates. It employs logic as the method of reasoning, systems science in general and the systemic YoYo Model in particular, as the intuitive playground. By doing so, the authors take individually background-based guesswork out of processes of decision making. All established conclusions are expected to be generally employable in real-life applications. At the same time, the book is user friendly to a wide range of audience, coincides with people's intuition, and provides applicable results and insights for practical purposes.

New title in the successful folding architecture series. Ties in with fast growing interest in rapid prototyping.

This book contains a collection of scientific chapters addressing the emerging trends in IT and telecommunications, as well as the issues that accompany them in business. It addresses issues in cyber applications, ICT solutions and innovative cyber know-how, and demonstrates how high-tech IT communications resources can be used to improve business production, sales and service strategies, supply chains and logistics. The book is based on articles from ICCMIT'20, extending their approach to specific chapters. The chapters cover issues such as financial management, technological upgrades, Industry 4.0 and the trend towards sustainable development. It utilizes examples of technologically advanced enterprises developing under Industry 4.0 assumptions at the stage of digital transformation, which integrate digital technologies and business processes. In addition, this book discusses issues related to cyber risk management and the implementation of a number of safeguards for digitized enterprises. Enterprises that orient themselves towards technological innovations find that they can reach customers faster, are more effectively managed and can achieve a competitive advantage over other businesses. This book will be a great aid to professionals in such companies, both in IT departments and in the management team.

Broad coverage of digital product creation, from design to manufacture and process optimization This book addresses the need to provide up-to-date coverage of current CAD/CAM usage and implementation. It covers, in one source, the entire design-to-manufacture process, reflecting the industry trend to further integrate CAD and CAM into a single, unified process. It also updates the computer aided design theory and methods in modern manufacturing systems and examines the most advanced computer-aided tools used in digital manufacturing. Computer Aided Design and Manufacturing consists of three parts. The first part on

Computer Aided Design (CAD) offers the chapters on Geometric Modelling; Knowledge Based Engineering; Platforming Technology; Reverse Engineering; and Motion Simulation. The second part on Computer Aided Manufacturing (CAM) covers Group Technology and Cellular Manufacturing; Computer Aided Fixture Design; Computer Aided Manufacturing; Simulation of Manufacturing Processes; and Computer Aided Design of Tools, Dies and Molds (TDM). The final part includes the chapters on Digital Manufacturing; Additive Manufacturing; and Design for Sustainability. The book is also featured for being uniquely structured to classify and align engineering disciplines and computer aided technologies from the perspective of the design needs in whole product life cycles, utilizing a comprehensive Solidworks package (add-ins, toolbox, and library) to showcase the most critical functionalities of modern computer aided tools, and presenting real-world design projects and case studies so that readers can gain CAD and CAM problem-solving skills upon the CAD/CAM theory. Computer Aided Design and Manufacturing is an ideal textbook for undergraduate and graduate students in mechanical engineering, manufacturing engineering, and industrial engineering. It can also be used as a technical reference for researchers and engineers in mechanical and manufacturing engineering or computer-aided technologies.

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