

Digital Manufacturing And Design Innovation Institute

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Securing Advanced Manufacturing in the United States National Academies of Sciences, Engineering, and Medicine 2017-11-11 The Manufacturing USA initiative seeks to reinforce U.S.-based advanced manufacturing through partnerships among industry, academia, and government. Started in 2012 and established with bipartisan support by the Revitalize American Manufacturing and Innovation Act of 2014, the initiative envisages a nationwide network of research centers for manufacturing innovation. As of May 2017, 14 manufacturing innovation institutes had been established to facilitate the movement of early-stage research into proven capabilities ready for adoption by U.S. manufacturers. To better understand the role and experiences of the Manufacturing USA institutes to date, a committee of the Innovation Policy Forum of the National Academies of Sciences, Engineering, and Medicine convened a workshop on May 23, 2017 drawing together institute directors and manufacturing policy experts along with leaders from industry, academia, and government. Participants addressed the role of the manufacturing institutes in increasing advanced manufacturing in the United States, examined selected foreign programs designed to support advanced manufacturing, and reviewed recent assessments of existing institutes. This publication summarizes the presentations and discussions from the workshop.

Advanced Manufacturing William B. Bonvillian 2018-01-12 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.

Additive Manufacturing of High-performance Metals and Alloys Igor Shishkovsky 2018-07-11 Freedoms in material choice based on combinatorial design, different directions of process optimization, and computational tools are a significant advantage of additive manufacturing technology. The combination of additive and information technologies enables rapid prototyping and rapid manufacturing models on the design stage, thereby significantly accelerating the design cycle in mechanical engineering. Modern and high-demand powder bed fusion and directed energy deposition methods allow obtaining functional complex shapes and functionally graded structures. Until now, the experimental parametric analysis remains as the main method during AM optimization. Therefore, an additional goal of this book is to introduce readers to new modeling and material's optimization approaches in the rapidly changing world of additive manufacturing of high-performance metals and alloys.

Product Configurators Fabio Schillaci 2017-11-09 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

Machine Learning and Data Science Prateek Agrawal 2022-08-09 MACHINE LEARNING AND DATA SCIENCE Written and edited by a team of experts in the field, this collection of papers reflects the most up-to-date and comprehensive current state of machine learning and data science for industry, government, and academia. Machine learning (ML) and data science (DS) are very active topics with an extensive scope, both in terms of theory and applications. They have been established as an important emergent scientific field and paradigm driving research evolution in such disciplines as statistics, computing science and intelligence science, and practical transformation in such domains as science, engineering, the public sector, business, social science, and lifestyle. Simultaneously, their applications provide important challenges that can often be addressed only with innovative machine learning and data science algorithms. These algorithms encompass the larger areas of artificial intelligence, data analytics, machine learning, pattern recognition, natural language understanding, and big data manipulation. They also tackle related new scientific challenges, ranging from data capture, creation, storage, retrieval, sharing, analysis, optimization, and visualization, to integrative analysis across heterogeneous and interdependent complex resources for better decision-making, collaboration, and, ultimately, value creation.

The Tesla Way Michael Valentin 2019-08-03 Tesla disrupts the automotive industry by creating many innovative pieces that fit together. Its marketing, production, sales and technology strategies are all notably different from its competitors. The Tesla Way is an elongated case study looking at Tesla's business model and how this can be applied to existing manufacturing and production strategies in other companies. The author also includes case studies from Michelin, Mass and other consumer goods manufacturing companies. The Tesla Way will look at the origins of Tesla, its journey to success, new business models and what will come next. The author includes a mixture of the theory behind the Tesla business model and its applications, examining the combination between the manufacturing world and the digital world. He has also

interviewed a cross-section of Tesla's current employees in both the USA and France. At the end of each chapter an interview with a CEO or top manager of an industrial firm is featured: among others, the stories of Luxor Lighting, ThyssenKrupp, Bosch or Kimberley Clarke. There are also insightful questions for managers. Online supporting resources include sample templates for analyzing efficiency of processes on the factory floor. Internet of Things. IoT Infrastructures Benny Mandler 2016-11-17 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, SaSelIoT, 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.

Learning to Love Data Science Mike Barlow 2015-10-27 Until recently, many people thought big data was a passing fad. "Data science" was an enigmatic term. Today, big data is taken seriously, and data science is considered downright sexy. With this anthology of reports from award-winning journalist Mike Barlow, you'll appreciate how data science is fundamentally altering our world, for better and for worse. Barlow paints a picture of the emerging data space in broad strokes. From new techniques and tools to the use of data for social good, you'll find out how far data science reaches. With this anthology, you'll learn how: Analysts can now get results from their data queries in near real time Indie manufacturers are blurring the lines between hardware and software Companies try to balance their desire for rapid innovation with the need to tighten data security Advanced analytics and low-cost sensors are transforming equipment maintenance from a cost center to a profit center CIOs have gradually evolved from order takers to business innovators New analytics tools let businesses go beyond data analysis and straight to decision-making Mike Barlow is an award-winning journalist, author, and communications strategy consultant. Since launching his own firm, Cumulus Partners, he has represented major organizations in a number of industries.

Guide to Computing Fundamentals in Cyber-Physical Systems Dietmar P.F. Möller 2016-04-14 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.

The Next Production Revolution Implications for Governments and Business OECD 2017-05-10 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...

Revitalize American Manufacturing and Innovation Act of 2014 United States. Congress. House. Committee on Science, Space, and Technology (2011) 2014

Advances in Structural and Multidisciplinary Optimization Axel Schumacher 2017-12-04 The volume includes papers from the WSCMO

conference in Braunschweig 2017 presenting research of all aspects of the optimal design of structures as well as multidisciplinary design optimization where the involved disciplines deal with the analysis of solids, fluids or other field problems. Also presented are practical applications of optimization methods and the corresponding software development in all branches of technology.

Innovative Design of Manufacturing Yongxiang Lu 2020-05-20 With the implementation of the strategic plan “Made in China 2025” as its guideline and “the study of formulation of executive summary of innovative design in the manufacturing industry” as the main theme, this book provides an in-depth interpretation of innovative design from three perspectives – why, what and how. Chapter One, “The Necessity of Developing Innovative Design,” focuses on why innovative design should be developed, and Chapter Two, “Concept And Connotation of Innovative Design,” explains what innovative design is, while Chapters Three to Seven systematically and comprehensively discuss how to develop innovative design and how to improve innovative design skills in various contexts, including key industries, business, personnel training, platform building, and supporting measures. Lastly, Chapter Eight “Cases of Innovative Design” explores the value of innovative design and innovative design-driven industrial transformation. By analyzing several design-driven companies, such as China Railway Rolling Stock Corporation, Haier Group and GAG Trumpchi, and the role of corporate innovative development as well as typical examples of major innovative design projects, it offers readers insights and inspiration.

The Design of Urban Manufacturing Robert N. Lane 2020-03-31 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.

Profitability, Productivity, and Sustainability Dennis N. Onyama 2021-06-17 This book presents an in-depth study of how the drive to optimize organizational performance can be significantly improved by investigating the causal relationships between profitability, productivity, and sustainability (PPS). This is presented through an assessment of a triple combined therapy that studies the interplay between Organizational DNA, Strategic Alignments for Value, and their implications for Sustainability. Through this approach, this volume seeks to answer critical mind-searching questions and provide useful guides as to how some firms are able to sustainably create higher value or wealth, especially through corporate entrepreneurship, or via the creation of new business models than others. In tackling the three elements of profitability, productivity, and sustainability, this book also provides greater insight through an in-depth study of the pervasively unresolved and disturbing issues surrounding the prospects of increasing the chances of success for entrepreneurial start-off ventures, making it of value to researchers, academics, and students in the fields of organizational studies, strategy, and sustainability.

Triennial Review of the National Nanotechnology Initiative National Academies of Sciences, Engineering, and Medicine 2016-12-12 Nanoscale science, engineering, and technology, often referred to simply as "nanotechnology," is the understanding, characterization, and control of matter at the scale of nanometers, the dimension of atoms and molecules. Advances in nanotechnology promise new materials and structures that are

the basis of solutions, for example, for improving human health, optimizing available energy and water resources, supporting a vibrant economy, raising the standard of living, and increasing national security. Established in 2001, the National Nanotechnology Initiative (NNI) is a coordinated, multiagency effort with the mission to expedite the discovery, development, and deployment of nanoscale science and technology to serve the public good. This report is the latest triennial review of the NNI called for by the 21st Century Nanotechnology Research and Development Act of 2003. It examines and comments on the mechanisms in use by the NNI to advance focused areas of nanotechnology towards advanced development and commercialization and on the physical and human infrastructure needs for successful realization in the United States of the benefits of nanotechnology development.

Digital @ Scale Anand Swaminathan 2017-06-01 A blueprint for reinventing the core of your business Value in the next phase of the digital era will go to those companies that don't just try digital but also scale it. Digital@Scale examines what it takes for companies to break through the gravitational pull of their legacy organizations and capture the full value of digital. Digging into more than fifty detailed case studies and years of McKinsey experience and data, the authors, along with a group of expert contributors, show how companies can move beyond incremental change to transform the business where the greatest value is generated—at its core. The authors provide practical insights into the three pillars of digital transformations that successfully scale: reinventing the business model, building out a business architecture from the customer back into the organization, and establishing an 'amoeba' IT and organizational foundation that learns and evolves. This is the ideal guide for all leaders who recognize the power and promise of a digital transformation.

Women in Industrial and Systems Engineering Alice E. Smith 2019-09-13 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.

Proceedings of the 3rd World Congress on Integrated Computational Materials Engineering (ICME) Warren Poole 2016-12-05 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.

Globalization of Defense Materials and Manufacturing National Academies of Sciences, Engineering, and Medicine 2018-11-02 Emerging economies, social and political transitions, and new ways of doing business are changing the world dramatically. To be the leader in this competitive climate, a defense manufacturing enterprise will require up-to-date capabilities, which include improvements in materials processing,

among other things. Also, national and international efforts to mitigate environmentally harmful effects of industrial processes and to improve decision making for handling and disposing of industrial contaminants adds additional requirements for any future efforts. The objective of retaining high-value materials-related manufacturing as a key national competitive capability implies a number of factors. The value of specific manufacturing capabilities could be defined not only in terms of criticality to defense systems but also in relation to technology and knowledge content, importance as a supplier to other industries, and importance to U.S. exports. Requested by Department of Defense (DoD) communities, the National Academies of Sciences, Engineering, and Medicine held a workshop in March 2015 to further explore materials and manufacturing processes. The participants explored changes in the global R&D landscape, technology awareness mechanisms—both DoD's mechanisms and other models—and collaboration models and issues in R&D. This publication summarizes the presentations and discussions from the workshop.

Proceedings of the 4th International Conference on the Industry 4.0 Model for Advanced Manufacturing Laszlo Monostori 2019-04-30 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.

Building a Network for Manufacturing Innovation United States. Congress. House. Committee on Science, Space, and Technology (2011). Subcommittee on Research and Technology 2013

Made in Chicago Austin Weber 2019-03-04 For much of the 20th century, the Chicagoland area was a manufacturing mecca due to its central geographic location and ready access to rail and water transportation. The city and suburbs mass-produced a wide range of products, including appliances, bicycles, electronics, furniture, globes, pianos, pinball machines, radios, railroad cars, sporting goods, telephones, televisions, typewriters, tools, toys, tractors, and watches. This book traces the origins of manufacturing in Chicago and explores the city's proud history of making steel and shaping metal. It also provides extensive coverage of the golden age of manufacturing in the region, including Chicago's unique contribution to the arsenal of democracy during World War II. The nostalgic journey includes stops at famous Chicago companies from the past, such as Bell & Howell, International Harvester, Pullman, Schwinn, Stewart Warner, Sunbeam, Western Electric, and Zenith.

Strategic Long-Term Participation by DoD in Its Manufacturing USA Institutes National Academies of Sciences, Engineering, and Medicine 2019-07-01 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.

Workforce Education William B. Bonvillian 2021-02-02 A roadmap for how we can rebuild America's working class by transforming workforce education and training. The American dream promised that if you worked hard, you could move up, with well-paying working-class jobs providing a gateway to an ever-growing middle class. Today, however, we have increasing inequality, not economic convergence. Technological advances are putting quality jobs out of reach for workers who lack the proper skills and training. In *Workforce Education*, William Bonvillian and Sanjay Sarma offer a roadmap for rebuilding America's working class. They argue that we need to train more workers more quickly, and they describe innovative methods of workforce education that are being developed across the country.

Architectural Research Addressing Societal Challenges Manuel Jorge Rodrigues Couceiro da Costa 2019-08-08 The escalating interdependency of nations drives global geopolitics to shift ever more quickly. Societies seem unable to control any change that affects their cities, whether positively or negatively. Challenges are global, but solutions need to be implemented locally. How can architectural research contribute to the future of our changing society? How has it contributed in the past? The theme of the 10th EAAE/ARCC International Conference, "Architectural Research Addressing Societal Challenges", was set to address these questions. This book, *Architectural Research Addressing Societal Challenges*, includes reviewed papers presented in June 2016, at the 10th EAAE/ARCC International Conference, which was held at the facilities of the Faculty of Architecture of the University of Lisbon. The papers have been further divided into the following five sub-themes: a Changing Society; In Transit – Global Migration; Renaturalization of the City; Emerging Fields of Architectural Practice; and Research on Architectural Education. The EAAE/ARCC International Conference, held under the aegis of the EAAE and of the ARCC, is a conference organized every other year, in collaboration with one of the member schools/ universities of those associations, alternatively in North America or in Europe.

DIY MEMS Deborah Munro 2019-11-25 This book describes the future of microscopically small medical devices and how to locate a lab to start conducting your own do-it-yourself microelectromechanical systems (MEMS) research in one of the many national, international, government, and other regional open use facilities, where you can quickly begin designing and fabricating devices for your applications. You will learn specific, tangible information on what MEMS are and how a device is fabricated, including what the main types of equipment are in these facilities. The book provides advice on working in a cleanroom, soft materials, collaboration, intellectual property and privacy issues, regulatory compliance, and how to navigate other issues that may arise. This book is primarily aimed at researchers and students who work at universities without MEMS facilities, and small companies who need access to MEMS resources.

Energy Efficiency: Innovations: Driving Prosperity, Slashing Emissions Henry Kelly 2020-11-06 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.

The Palgrave Handbook of Political Economy Ivano Cardinale 2018-08-16 This book is a major contribution to the study of political economy. With chapters ranging from the origins of political economy to its most exciting research fields, this handbook provides a reassessment of political economy as it stands today, whilst boldly gesturing to where it might head in the future. This handbook transcends the received dichotomy

between political economy as an application of rational choice theory or as the study of the causes of societies' material welfare, outlining a broader field of study that encompasses those traditions. This book will be essential reading for academics, researchers, students, and anyone looking for a comprehensive reassessment of political economy.

Broad-based Innovation Policy for All Regions and Cities OECD 2020-10-15 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.

Department of Defense Authorization for Appropriations for Fiscal Year 2015 and the Future Years Defense Program, Senate Hrg. 113-465, PT.5, March 11: April 1, 8, 2014, 113-2 2015

Handbook on the Geographies of Innovation Richard Shearmur 2016-11-25

Architecting Robust Co-Design of Materials, Products, and Manufacturing Processes Anand Balu Nellippallil 2020-06-13 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).

Handbook of Research of Internet of Things and Cyber-Physical Systems Amit Kumar Tyagi 2022-06-09 This new volume discusses how integrating IoT devices and cyber-physical systems can help society by providing multiple efficient and affordable services to users. It covers the various applications of IoT-based cyber-physical systems, such as satellite imaging in relation to climate change, industrial control systems, e-healthcare applications, security uses, automotive and traffic monitoring and control, urban smart city planning, and more. The authors also outline the methods, tools, and algorithms for IoT-based cyber-physical systems and explore the integration of machine learning, blockchain, and Internet of Things-based cloud applications. With the continuous emerging new technologies and trends in IoT technology and CPS, this volume will be a helpful resource for scientists, researchers, industry professionals, faculty and students, and others who wish to keep abreast of new developments and new challenges for sustainable development in Industry 4.0.

Small Business Management Timothy S. Hatten 2018-11-29 Now with SAGE Publishing, Timothy S. Hatten's Seventh Edition of Small Business Management equips students with the tools they need to navigate the important financial, legal, marketing, managerial, and operational decisions to help them create and maintain a sustainable competitive advantage in small business. Strong emphasis is placed on application with Experiential Learning Activities and application of technology and social media throughout. New cases, real-world examples, and illuminating features spotlight the diverse, innovative contributions of small business owners to the economy. Whether students dream of launching a new

venture, purchasing a franchise, managing a lifestyle business, or joining the family company, they will learn important best practices for competing in the modern business world. This title is accompanied by a complete teaching and learning package. Contact your SAGE representative to request a demo. Digital Option / Courseware SAGE Vantage is an intuitive digital platform that delivers this text's content and course materials in a learning experience that offers auto-graded assignments and interactive multimedia tools, all carefully designed to ignite student engagement and drive critical thinking. Built with you and your students in mind, it offers simple course set-up and enables students to better prepare for class. Learn more. Assignable Video with Assessment Assignable video (available with SAGE Vantage) is tied to learning objectives and curated exclusively for this text to bring concepts to life. Watch a sample video on advice for new business owners. LMS Cartridge Import this title's instructor resources into your school's learning management system (LMS) and save time. Don't use an LMS? You can still access all of the same online resources for this title via the password-protected Instructor Resource Site. Learn more.

A New Vision for Center-Based Engineering Research National Academies of Sciences, Engineering, and Medicine 2017-07-18 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.

Industrial Internet of Things Sabina Jeschke 2016-10-12 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.

Industrial Internet China Info & Comm Tech Grp Corp 2020-09-18 This book discusses the birth and background of the Industrial Internet, clarifying its definition and structure, and reviewing the related development trends in China and around the globe, mainly in terms of policies, networks, platforms, security, application and standards. Lastly, it provides insights into the integration of the Industrial Internet with a series of next-gen information technologies, such as time sensitive networking, 5G, edge computing, blockchain and artificial intelligence. Intended for researchers and industrial practitioners who have been following the evolution of and trends in the Industrial Internet, the book is also a valuable reference resource for practitioners, scholars, and technical and engineering managers at various levels and in various fields.

Innovation in Brazil Elisabeth B. Reynolds 2019-03-15 Since the early 2000s, state-led and innovation-focused strategies have characterized the

approach to development pursued in countries around the world, such as China, India, and South Korea. Brazil, the largest and most industrialized economy in Latin America, demonstrates both the opportunities and challenges of this approach. Over the course of nearly 20 years, the Brazilian government enacted various policies and programs designed to strengthen the country's capacity to innovate. It increased spending on science and technology, encouraged greater collaboration between industry and universities, and fostered the creation of new institutions whose primary aim was to facilitate greater private research and development (R&D) spending. In this book, the editors unite a diverse array of empirical contributions around a few key themes, including public policies, institutions and innovation ecosystems, and firms and industries, that collectively make the case for a new, forward-looking innovation agenda aimed at addressing persistent challenges and exploiting emerging opportunities in Brazil. Its conclusions offer valuable lessons for other developing and emerging economies seeking to accelerate innovation and growth in the modern age. With its interdisciplinary and wide-ranging contribution to the study of innovation, as well as attention to broader policy implications, this book will appeal to scholars and professionals alike.

Product Lifecycle Management (Volume 1) John Stark