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Intelligent-Based Systems Engineering

22nd European Conference, EuroSPI 2015, Ankara, Turkey, September 30 -- October 2, 2015. Proceedings

Managing Complex Technical Projects

INCOSE Systems Engineering Handbook

23rd International Conference, CAiSE 2011, London, UK, June 20-24, 2011, Proceedings

A Systems Engineering Approach

Systems Engineering and Its Application to Industrial Product Development

Intelligent Control Systems with an Introduction to System of Systems Engineering

Architecting the Design Process

Systems Engineering Guidebook

Systems, Software and Services Process Improvement

Joint Proceedings of the AHFE 2018 International Conference on Human Factors in

Artificial Intelligence and Social Computing, Software and Systems Engineering, The

Human Side of Service Engineering and Human Factors in Energy, July 21–25, 2018,
Loews Sapphire Falls Resort at Universal Studios, Orlando, Florida, USA
System of Systems Engineering
Systems Engineering Practice
Systems Engineering and Analysis of Electro-Optical and Infrared Systems
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Curriculum Handbook with General Information Concerning ... for the United States
Air Force Academy
Innovations for the 21st Century
Intelligent Control Systems with an Introduction to System of Systems Engineering
Netcentric System of Systems Engineering with DEVS Unified Process
A Framework of Human Systems Engineering

System Engineering Analysis, Design, and Development
An Introduction to Auxiliary Electric Power Systems Engineering
Systems of Systems Engineering
Photovoltaic Systems Engineering, Third Edition
Systems of Systems
CAiSE 2021 International Workshops, Melbourne, VIC, Australia, June 28 – July 2,
2021, Proceedings
How Google Runs Production Systems
Proceedings of the IFIP TC8/WG8.5 Working Conference on Systems Engineering in
Public Administration, Luneburg, Germany, 3-5 March 1993
Systems Engineering in Public Administration
Applications and Case Studies

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TIMOTHY WALSH

Intelligent-Based Systems Engineering
Springer
In areas such as military, security,

aerospace, and disaster management, the need for performance optimization and interoperability among heterogeneous systems is increasingly important. Model-driven engineering, a paradigm in which the model becomes the actual software, offers a promising

approach toward systems of systems (SoS) engineering. However, model-driven engineering has largely been unachieved in complex dynamical systems and netcentric SoS, partly because modeling and simulation (M&S) frameworks are stove-piped and not designed for SoS composability. Addressing this gap, Netcentric System of Systems Engineering with DEVS Unified Process presents a methodology for realizing the model-driven engineering vision and netcentric SoS using DEVS Unified Process (DUNIP). The authors draw on their experience with Discrete Event Systems Specification (DEVS) formalism, System Entity Structure (SES) theory, and applying model-driven engineering in the context of a netcentric SoS. They describe formal

model-driven engineering methods for netcentric M&S using standards-based approaches to develop and test complex dynamic models with DUNIP. The book is organized into five sections: Section I introduces undergraduate students and novices to the world of DEVS. It covers systems and SoS M&S as well as DEVS formalism, software, modeling language, and DUNIP. It also assesses DUNIP with the requirements of the Department of Defense's (DoD) Open Unified Technical Framework (OpenUTF) for netcentric Test and Evaluation (T&E). Section II delves into M&S-based systems engineering for graduate students, advanced practitioners, and industry professionals. It provides methodologies to apply M&S principles to SoS design and reviews the development of

executable architectures based on a framework such as the Department of Defense Architecture Framework (DoDAF). It also describes an approach for building netcentric knowledge-based contingency-driven systems. Section III guides graduate students, advanced DEVS users, and industry professionals who are interested in building DEVS virtual machines and netcentric SoS. It discusses modeling standardization, the deployment of models and simulators in a netcentric environment, event-driven architectures, and more. Section IV explores real-world case studies that realize many of the concepts defined in the previous chapters. Section V outlines the next steps and looks at how the modeling of netcentric complex adaptive systems can be attempted using DEVS

concepts. It touches on the boundaries of DEVS formalism and the future work needed to utilize advanced concepts like weak and strong emergence, self-organization, scale-free systems, run-time modularity, and event interoperability. This groundbreaking work details how DUNIP offers a well-structured, platform-independent methodology for the modeling and simulation of netcentric system of systems.

22nd European Conference, EuroSPI 2015, Ankara, Turkey, September 30 -- October 2, 2015. Proceedings Software Systems Engineering

The U.S. Department of Energy now estimates a factor of 14 increase in grid-connected systems between 2009 and 2017, depending upon various factors

such as incentives for renewables and availability and price of conventional fuels. With this fact in mind, Photovoltaic Systems Engineering, Third Edition presents a comprehensive engineering basis for photovoltaic (PV) system design, so engineers can understand the what, why, and how associated with the electrical, mechanical, economic, and aesthetic aspects of PV system design. Building on the popularity of the first two editions, esteemed authors Roger Messenger and Jerry Ventre explore the significant growth and new ideas in the PV industry. They integrate their experience in system design and installation gained since publication of the last edition. Intellectual tools to help engineers and students to understand new technologies and ideas in this

rapidly evolving field The book educates about the design of PV systems so that when engineering judgment is needed, the engineer can make intelligent decisions based on a clear understanding of the parameters involved. This goal differentiates this textbook from the many design and installation manuals that train the reader how to make design decisions, but not why. The authors explain why a PV design is executed a certain way, and how the design process is actually implemented. In exploring these ideas, this cutting-edge book presents: An updated background of energy production and consumption
Mathematical background for understanding energy supply and demand
A summary of the solar

spectrum, how to locate the sun, and how to optimize the capture of its energy. Analysis of the components used in PV systems. Also useful for students, the text is full of additional practical considerations added to the theoretical background associated with mechanical and structural design. A modified top-down approach organizes the material to quickly cover the building blocks of the PV system. The focus is on adjusting the parameters of PV systems to optimize performance. The last two chapters present the physical basis of PV cell operation and optimization. Presenting new problems based upon contemporary technology, this book covers a wide range of topics—including chemistry, circuit analysis, electronics, solid state device theory, and economics—this book

will become a relied upon addition to any engineer's library.

Managing Complex Technical Projects CRC Press

This book constitutes the thoroughly refereed proceedings of the international workshops associated with the 33rd International Conference on Advanced Information Systems Engineering, CAiSE 2021, which was held during June 28-July 2, 2021. The conference was planned to take place in Melbourne, Australia, but changed to an online format due to the COVID-19 pandemic. The workshops included in this volume are: · BC4IS: 1st International Workshop on Blockchain for Information Systems · EMoBI : 3rd International Workshop on Ethics and Morality in Business Informatics · KET4DF : 3rd International Workshop on

Key Enabling Technology for Digital Factories · MOBA: 1st International Workshop on Model-driven Organizational and Business Agility · NeGIS: 2nd International Workshop on Next Generation Information Systems They focus on topics and trends ranging from blockchain technologies to digital factories, ethics, and business agility to the next generation of information systems. The 14 full papers and 1 short paper presented in this volume were carefully reviewed and selected from 33 submissions.

INCOSE Systems Engineering Handbook
Springer

Software Systems Engineering Wiley-Interscience

23rd International Conference, CAiSE 2011, London, UK, June 20-24, 2011,

Proceedings John Wiley & Sons
Introductory technical guidance for electrical engineers and construction managers interested in auxiliary electric power generating equipment and systems. Here is what is discussed: 1. INTRODUCTION 2. EMERGENCY POWER SYSTEMS 3. PRIME MOVERS 4. GENERATORS AND EXCITERS 5. SWITCHGEAR 6. OPERATION AND MAINTENANCE 7. LUBRICATING OIL PURIFICATION

A Systems Engineering Approach
Elsevier

A comprehensive overview of current developments and applications in biofuels production Process Systems Engineering for Biofuels Development brings together the latest and most cutting-edge research on the production

of biofuels. As the first book specifically devoted to process systems engineering for the production of biofuels, *Process Systems Engineering for Biofuels Development* covers theoretical, computational and experimental issues in biofuels process engineering. Written for researchers and postgraduate students working on biomass conversion and sustainable process design, as well as industrial practitioners and engineers involved in process design, modeling and optimization, this book is an indispensable guide to the newest developments in areas including: Enzyme-catalyzed biodiesel production Process analysis of biodiesel production (including kinetic modeling, simulation and optimization) The use of ultrasonification in biodiesel production

Thermochemical processes for biomass transformation to biofuels Production of alternative biofuels In addition to the comprehensive overview of the subject of biofuels found in the Introduction of the book, the authors of various chapters have provided extensive discussions of the production and separation of biofuels via novel applications and techniques.

Systems Engineering and Its Application to Industrial Product Development Cambridge University Press

Annotation The authors, who both teach electrical engineering at the U. of New South Wales, Australia, have written a text that will be useful for the undergraduate and graduate classroom. The philosophical aspects of the field are provided as an overview, with

descriptions of procedures, vocabulary, and standards. Systems engineering is then described, with sections on all stages of design, systems engineering management, tools, and applications. A chapter is included on the interrelationship between systems engineering and fields such as project management, quality management, and integrated logistics support management. Annotation copyrighted by Book News, Inc., Portland, OR

Intelligent Control Systems with an Introduction to System of Systems Engineering EOLSS Publications

From aeronautics and manufacturing to healthcare and disaster management, systems engineering (SE) now focuses on designing applications that ensure performance optimization, robustness,

and reliability while combining an emerging group of heterogeneous systems to realize a common goal. Use SoS to Revolutionize Management of Large Organizations, Factories, and Systems Intelligent Control Systems with an Introduction to System of Systems Engineering integrates the fundamentals of artificial intelligence and systems control in a framework applicable to both simple dynamic systems and large-scale system of systems (SoS). For decades, NASA has used SoS methods, and major manufacturers—including Boeing, Lockheed-Martin, Northrop-Grumman, Raytheon, BAE Systems—now make large-scale systems integration and SoS a key part of their business strategies, dedicating entire business units to this remarkably efficient approach. Simulate

Novel Robotic Systems and Applications
Transcending theory, this book offers a complete and practical review of SoS and some of its fascinating applications, including: Manipulation of robots through neural-based network control Use of robotic swarms, based on ant colonies, to detect mines Other novel systems in which intelligent robots, trained animals, and humans cooperate to achieve humanitarian objectives Training engineers to integrate traditional systems control theory with soft computing techniques further nourishes emerging SoS technology. With this in mind, the authors address the fundamental precepts at the core of SoS, which uses human heuristics to model complex systems, providing a scientific rationale for integrating independent,

complex systems into a single coordinated, stabilized, and optimized one. They provide readers with MATLAB® code, which can be downloaded from the publisher's website to simulate presented results and projects that offer practical, hands-on experience using concepts discussed throughout the book.

Architecting the Design Process tradition

This book deals in a concise format with the methods used to develop mathematical models for water and wastewater treatment. It provides a systematic approach to mass balances, transport and transformation processes, kinetics, stoichiometry, reactor hydraulics, residence time distribution, heterogeneous systems, and dynamic behaviour of reactors. In addition it

includes an introduction into parameter identification, error analysis, error propagation, process control, time series analysis, stochastic modelling and probabilistic design. Written as a textbook, it contains many solved practical applications.

Systems Engineering Guidebook John Wiley & Sons

The International Council on Systems Engineering (INCOSE) defines Systems Engineering as an interdisciplinary approach and means to enable the realization of successful systems. Researchers are using intelligence-based techniques to support the practices of systems engineering in an innovative way. This research volume includes a selection of contributions by subject experts to design better systems.

Systems, Software and Services Process Improvement CRC Press

Mastering the complexity of innovative systems is a challenging aspect of design and product development. Only a systematic approach can help to embed an increasing degree of smartness in devices and machines, allowing them to adapt to variable conditions or harsh environments. At the same time, customer needs have to be identified before they can be translated into consistent technical requirements. The field of Systems Engineering provides a method, a process, suitable tools and languages to cope with the complexity of various systems such as motor vehicles, robots, railways systems, aircraft and spacecraft, smart manufacturing systems, microsystems, and bio-inspired

devices. It makes it possible to trace the entire product lifecycle, by ensuring that requirements are matched to system functions, and functions are matched to components and subsystems, down to the level of assembled parts. This book discusses how Systems Engineering can be suitably deployed and how its benefits are currently being exploited by Product Lifecycle Management. It investigates the fundamentals of Model Based Systems Engineering (MBSE) through a general introduction to this topic and provides two examples of real systems, helping readers understand how these tools are used. The first, which involves the mechatronics of industrial systems, serves to reinforce the main content of the book, while the second describes an industrial

implementation of the MBSE tools in the context of developing the on-board systems of a commercial aircraft. [Joint Proceedings of the AHFE 2018 International Conference on Human Factors in Artificial Intelligence and Social Computing, Software and Systems Engineering, The Human Side of Service Engineering and Human Factors in Energy, July 21-25, 2018, Loews Sapphire Falls Resort at Universal Studios, Orlando, Florida, USA](#) Artech House

As technology presses forward, scientific projects are becoming increasingly complex. The international space station, for example, includes over 100 major components, carried aloft during 88 space flights which were organized by over 16 nations. The need for

improved system integration between the elements of an overall larger technological system has sparked further development of systems of systems (SoS) as a solution for achieving interoperability and superior coordination between heterogeneous systems. *Systems of Systems Engineering: Principles and Applications* provides engineers with a definitive reference on this newly emerging technology, which is being embraced by such engineering giants as Boeing, Lockheed Martin, and Raytheon. The book covers the complete range of fundamental SoS topics, including modeling, simulation, architecture, control, communication, optimization, and applications. Containing the contributions of pioneers at the forefront

of SoS development, the book also offers insight into applications in national security, transportation, energy, and defense as well as healthcare, the service industry, and information technology. System of systems (SoS) is still a relatively new concept, and in time numerous problems and open-ended issues must be addressed to realize its great potential. This book offers a first look at this rapidly developing technology so that engineers are better equipped to face such challenges. *System of Systems Engineering* John Wiley & Sons

A detailed and thorough reference on the discipline and practice of systems engineering The objective of the International Council on Systems Engineering (INCOSE) Systems

Engineering Handbook is to describe key process activities performed by systems engineers and other engineering professionals throughout the life cycle of a system. The book covers a wide range of fundamental system concepts that broaden the thinking of the systems engineering practitioner, such as system thinking, system science, life cycle management, specialty engineering, system of systems, and agile and iterative methods. This book also defines the discipline and practice of systems engineering for students and practicing professionals alike, providing an authoritative reference that is acknowledged worldwide. The latest edition of the INCOSE Systems Engineering Handbook: Is consistent with ISO/IEC/IEEE 15288:2015 Systems and

software engineering—System life cycle processes and the Guide to the Systems Engineering Body of Knowledge (SEBoK) Has been updated to include the latest concepts of the INCOSE working groups Is the body of knowledge for the INCOSE Certification Process This book is ideal for any engineering professional who has an interest in or needs to apply systems engineering practices. This includes the experienced systems engineer who needs a convenient reference, a product engineer or engineer in another discipline who needs to perform systems engineering, a new systems engineer, or anyone interested in learning more about systems engineering.

Systems Engineering Practice

Springer Nature

This book presents Systems Engineering

from a modern, multidisciplinary engineering approach, providing the understanding that all aspects of systems design, systems, software, test, security, maintenance and the full life-cycle must be factored in to any large-scale system design; up front, not factored in later. It lays out a step-by-step approach to systems-of-systems architectural design, describing in detail the documentation flow throughout the systems engineering design process. It provides a straightforward look and the entire systems engineering process, providing realistic case studies, examples, and design problems that will enable students to gain a firm grasp on the fundamentals of modern systems engineering. Included is a comprehensive design problem that

weaves throughout the entire text book, concluding with a complete top-level systems architecture for a real-world design problem.

Systems Engineering and Analysis of Electro-Optical and Infrared Systems

CRC Press

What makes some computers slow? Why do some digital systems operate reliably for years while others fail mysteriously every few hours? How can some systems dissipate kilowatts while others operate off batteries? These questions of speed, reliability, and power are all determined by the system-level electrical design of a digital system. Digital Systems Engineering presents a comprehensive treatment of these topics. It combines a rigorous development of the fundamental principles in each area with

real-world examples of circuits and methods. The book not only serves as an undergraduate textbook, filling the gap between circuit design and logic design, but can also help practising digital designers keep pace with the speed and power of modern integrated circuits. The techniques described in this book, once used only in supercomputers, are essential to the correct and efficient operation of any type of digital system. [Advances in Artificial Intelligence, Software and Systems Engineering](#) Springer Science & Business Media This book is a hands-on introduction to the basic concepts of systems engineering. The various examples, used to illustrate each of the discussed topics, help the reader to understand the concepts more easily. The book presents

a simple method called the I-CM (Interface-Component Model), which enables practical implementation when no other tools are available. "Systems Engineering for All" is intended for a general public of engineers and product designers without prior systems engineering experience. It is not an academic book.

Systems Engineering with Economics, Probability, and Statistics CRC Press

The primary purpose of systems engineering is to organize information and knowledge to assist those who manage, direct, and control the planning, development, production, and operation of the systems necessary to accomplish a given mission. However, this purpose can be compromised or defeated if information production and

organization becomes an end unto itself. Systems engineering was developed to help resolve the engineering problems that are encountered when attempting to develop and implement large and complex engineering projects. It depends upon integrated program planning and development, disciplined and consistent allocation and control of design and development requirements and functions, and systems analysis. The key thesis of this report is that proper application of systems analysis and systems engineering will improve the management of tank wastes at the Hanford Site significantly, thereby leading to reduced life cycle costs for remediation and more effective risk reduction. The committee recognizes that evidence for cost savings from

application of systems engineering has not been demonstrated yet.

Second Edition John Wiley & Sons
Explores the breadth and versatility of Human Systems Engineering (HSE) practices and illustrates its value in system development
A Framework of Human Systems Engineering: Applications and Case Studies offers a guide to identifying and improving methods to integrate human concerns into the conceptualization and design of systems. With contributions from a panel of noted experts on the topic, the book presents a series of Human Systems Engineering (HSE) applications on a wide range of topics: interface design, training requirements, personnel capabilities and limitations, and human task allocation. Each of the book's chapters present a

case study of the application of HSE from different dimensions of socio-technical systems. The examples are organized using a socio-technical system framework to reference the applications across multiple system types and domains. These case studies are based in real-world examples and highlight the value of applying HSE to the broader engineering community. This important book: Includes a proven framework with case studies to different dimensions of practice, including domain, system type, and system maturity Contains the needed tools and methods in order to integrate human concerns within systems Encourages the use of Human Systems Engineering throughout the design process Provides examples that cross traditional system engineering

sectors and identifies a diverse set of human engineering practices Written for systems engineers, human factors engineers, and HSI practitioners, A Framework of Human Systems Engineering: Applications and Case Studies provides the information needed for the better integration of human and systems and early resolution of issues based on human constraints and limitations.

Introduction to Systems Engineering for non-Systems Engineers Springer

The overwhelming majority of a software system's lifespan is spent in use, not in design or implementation. So, why does conventional wisdom insist that software engineers focus primarily on the design and development of large-scale computing systems? In this collection of

essays and articles, key members of Google's Site Reliability Team explain how and why their commitment to the entire lifecycle has enabled the company to successfully build, deploy, monitor, and maintain some of the largest software systems in the world. You'll learn the principles and practices that enable Google engineers to make systems more scalable, reliable, and efficient—lessons directly applicable to your organization. This book is divided into four sections: Introduction—Learn what site reliability engineering is and why it differs from conventional IT industry practices Principles—Examine the patterns, behaviors, and areas of concern that influence the work of a site reliability engineer (SRE) Practices—Understand the theory and

practice of an SRE's day-to-day work: building and operating large distributed computing systems Management—Explore Google's best practices for training, communication, and meetings that your organization can use Introduction to Social Systems Engineering John Wiley & Sons From aeronautics and manufacturing to healthcare and disaster management, systems engineering (SE) now focuses on designing applications that ensure performance optimization, robustness, and reliability while combining an emerging group of heterogeneous systems to realize a common goal. Use SoS to Revolutionize Management of Large Organizations, Factories, and Systems Intelligent Control Systems with

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robotic swarms, based on ant colonies, to detect mines Other novel systems in which intelligent robots, trained animals, and humans cooperate to achieve humanitarian objectives Training engineers to integrate traditional systems control theory with soft computing techniques further nourishes emerging SoS technology. With this in mind, the authors address the fundamental precepts at the core of SoS, which uses human heuristics to model complex systems, providing a scientific rationale for integrating independent, complex systems into a single coordinated, stabilized, and optimized one. They provide readers with MATLAB® code, which can be downloaded from the publisher's website to simulate presented results and

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