Operations Research Analysis

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Operations Research CRC Press Economics and Operational Research explores the possible connections of the organization of human and material resources by concentrating on the interpretations of management decisions at various levels in the economy. This book discusses economics and mathematics as an analytical tool. Organized into 10 chapters, this book begins with an overview of how consumers manage their own budgets and how manufacturers select their production processes. This text then described generally how consumers and producers react to each other. Other chapters consider the problem of the transportation of goods through busy road networks and the efficiency attained through central planning. This book discusses as well the control of congestion that arises through decentralization and the construction of an overall planning model. The final chapter discusses the important aspects of national planning, wherein the collection of all consumers and producers makes up one large economic system. This book is a valuable resource for management and engineering personnel.

Intelligence Analysis **Springer Science & Business Media** **Using the neo-classical theory of production economics as the analytical framework, this book, first published in 2004, provides a unified and easily comprehensible, yet fairly rigorous, exposition of the core literature on data envelopment analysis (DEA) for readers based in different disciplines. The various DEA models are developed as nonparametric alternatives to the econometric models. Apart from the standard fare consisting of the basic input- and output-oriented DEA models formulated by Charnes, Cooper, and Rhodes, and Banker, Charnes, and Cooper, the book covers developments such as the directional distance function, free disposal hull (FDH) analysis, non-radial measures of efficiency, multiplier bounds, mergers and break-up of firms, and measurement of productivity change through the Malmquist total factor productivity index. The chapter on efficiency measurement using market prices provides the critical link between DEA and the neo-classical theory of a competitive firm. The book also covers several forms of stochastic DEA in detail.**

Operations Research and Management Science Handbook CRC Press Services requiring parts has become a $1.5 trillion business annually worldwide, creating a tremendous incentive to manage the logistics of these parts efficiently by making planning and operational decisions in a rational and rigorous manner. This book provides a broad overview of modeling approaches and solution methodologies for addressing service parts inventory problems found in high-powered technology and aerospace applications. The focus in this work is on the management of high cost, low demand rate service parts found in multi-echelon settings. The text may be used in a variety of courses for first-year graduate students or senior undergraduates, as well as for practitioners, requiring only a background in stochastic processes and optimization. It will serve as an excellent reference for key mathematical concepts and a guide to modeling a variety of multi-echelon service parts planning and operational problems.

Public Policy Analysis Springer Science & Business Media This edited volume is an introduction to diverse methods and applications in operations research focused on local populations and community-based organizations that have the potential to improve the lives of individuals and communities in tangible ways. The book's themes include: space, place and community; disadvantaged, underrepresented or underserved populations; international and transnational applications; multimethod, cross-disciplinary and comparative approaches and appropriate technology; and analytics. The book is comprised of eleven original submissions, a re-print of a 2007 article by Johnson and Smilowitz that introduces CBOR, and an introductory chapter that provides policy motivation, antecedents to CBOR in OR/MS, a theory of CBOR and a comprehensive review of the chapters. It is hoped that this book will provide a resource to academics and practitioners who seek to develop methods and applications that bridge the divide between traditional OR/MS rooted in mathematical models and newer streams in 'soft OR' that emphasize problem structuring methods, critical approaches to OR/MS and community engagement and capacity-building.

Community-Based Operations Research Springer Fuzzy Sets in Decision Analysis, Operations Research and Statistics includes chapters on fuzzy preference modeling, multiple criteria analysis, ranking and sorting methods, group decision-making and fuzzy game theory. It also presents optimization techniques such as fuzzy linear and non-linear programming, applications to graph problems and fuzzy combinatorial methods such as fuzzy dynamic programming. In addition, the book also accounts for advances in fuzzy data analysis, fuzzy statistics, and applications to reliability analysis. These topics are covered within four parts: Decision Making, Mathematical Programming, Statistics and Data Analysis, and Reliability, Maintenance and Replacement. The scope and content of the book has resulted from multiple interactions between the editor of the volume, the series editors, the series advisory board, and experts in each chapter area. Each chapter was written by a well-known researcher on the topic and reviewed by other experts in the area. These expert reviewers sometimes became co-authors because of the extent of their contribution to the chapter. As a result, twenty-five authors from twelve countries and four continents were involved in the creation of the 13 chapters, which enhances the international character of the project and gives an idea of how carefully the Handbook has been developed.

Handbook on Data Envelopment Analysis CRC Press Traditional policy analysis approaches are

characterized by a focus on system modeling and choosing among policy alternatives. While successful in many cases, this approach has been increasingly criticized for being technocratic and ignoring the behavioral and political dimensions of most policy processes. In recent decades, increased awareness of the multi-actor, multiple perspective, and poly-centric character of many policy processes has led to the development of a variety of different perspectives on the styles and roles of policy analysis, and to new analytical tools and approaches – for example, argumentative approaches, participative policy analysis, and negotiation support. As a result, the field has become multi-faceted and somewhat fragmented. Public Policy Analysis: New Developments acknowledges the variety of approaches and provides a synthesis of the traditional and new approaches to policy analysis. It provides an overview and typology of different types of policy analytic activities, characterizing them according to differences in character and leading values, and linking them to a variety of theoretical notions on policymaking. Thereby, it provides assistance to both end users and analysts in choosing an appropriate approach given a specific policy situation. By broadening the traditional approach and methods to include the analysis of actors and actor networks related to the policy issue at hand, it deepens the state of the art in certain areas. While the main focus of the book is on the cognitive dimensions of policy analysis, it also links the policy analysis process to the policymaking process, showing how to identify and involve all relevant stakeholders in the process, and how to create favorable conditions for use of the results of policy analytic efforts by the policy actors. The book has as its major objective to describe the state-of-the-art and the latest developments in ex-ante policy analysis. It is divided into two parts. Part I explores and structures policy analysis developments, the development and description of approaches to diagnose policy situations, design policy analytic efforts, and policy process conditions. Part II focuses on recent developments regarding models and modeling for policy analysis, placing modeling approaches in the context of the variety of conditions and approaches elaborated in Part I.

Foundations of Location Analysis National Academies Press

Analysis of queues is used in a variety of domains including call centers, web servers, internet routers, manufacturing and production, telecommunications, transportation, hospitals and clinics, restaurants, and theme parks. Combining elements of classical queueing theory with some of the recent advances in studying stochastic networks, this book covers a broad range of applications. It contains numerous real-world examples and industrial applications in all chapters. The text is suitable for graduate courses, as well as researchers, consultants and analysts that work on performance modeling or use queueing models as analysis tools.

Operations Research Cambridge University Press

Handbook of Operations Research in Natural Resources will be the first systematic handbook treatment of quantitative modeling natural resource problems, their allocated efficient use, and societal and economic impact. Andr é s Weintraub is the very top person in Natural Resource research. Moreover, he has an international reputation in OR and a former president of the International Federation of Operational Research Societies (IFORS). He has selected co-editors who are at the top of the sub-fields in natural resources: agriculture, fisheries, forestry, and mining. The book will cover these areas in terms with contributions from researchers on modeling natural research problems, quantifying data, developing algorithms, and discussing the benefits of research implementations. The handbook will include tutorial contributions when necessary. Throughout the book, technological advances and algorithmic developments that have been driven by natural resource problems will be called out and discussed.

Real-Time and Deliberative Decision Making World Scientific

For first courses in operations research, operations management Optimization in Operations Research, Second Edition covers a broad range of optimization techniques, including linear programming, network flows, integer/combinational optimization, and nonlinear programming. This dynamic text emphasizes the importance of modeling and problem formulation andhow to apply algorithms to real-world problems to arrive at optimal solutions. Use a program that presents a better teaching and learning experience-for you and your students. Prepare students for real-world problems: Students learn how to apply algorithms to problems that get them ready for their field. Use strong pedagogy tools to teach: Key concepts are easy to follow with the text's clear and continually reinforced learning path. Enjoy the text's flexibility: The text features varying amounts of coverage, so that instructors can choose how in-depth they want to go into different topics.

Methods for Conducting Military Operational Analysis Elsevier

This book is dedicated to operations research of broad applications, such as improving informational bases of performance measurement with grey relational analysis, application of lean methodologies in a neurosurgery high dependency unit, iteration algorithms in Markov decision processes with state-action-dependent discount factors and unbounded costs, financial feasibility analysis of Natura Rab business case study, and mathematical modeling of isothermal drying and its potential application in the design of the industrial drying regimes of clay products.Operations research is an important topic. In addition to its obvious benefits of winning a war, making most profit in a business endeavor, and constructing a correct mathematical model, it also provides a tool for efficient use of natural resources. Furthermore, both theory and practice of operations research and its related concepts are covered in the book, and a reader can benefit from this balanced coverage.

Fuzzy Sets in Decision Analysis, Operations Research and Statistics Springer

BASIC Business Analysis and Operations Research discusses how the Beginners All-purpose Symbolic Instruction Code (BASIC) can be utilized in business analysis. The book is comprised of seven chapters that tackle various topics about BASIC and business analysis. Chapters 1 and 2 provide an overview of BASIC and

Operations Research. Chapter 3 covers index numbers and provides an introduction to programming in structured BASIC. The book also presents programs for Data Fitting, and then describes how a simple program can be developed to include progressive complexity. The programs for a range of computational tasks are also presented. The book also tackles Markov chains in the context of policies for preventative maintenance. The text will be of great use to undergraduate students of management, computer, technology, and science.

Optimal Decision Making in Operations Research and Statistics Springer Science & Business Media

This Handbook has been developed as a comprehensive reference for researchers, students and practitioners. It reflects the state-of-the-art in Data Envelopment Analysis. It also represents a milestone in the progression of a continuously advancing methodology. which has extensive utility. Written by experts - who are the major research contributors to the topics covered - the Handbook is organized in three sections. The first section is a comprehensive examination of the basic DEA models and DEA extensions. The second section consists of a collection of coverages by persons experienced in applications to the areas of banking, education, sports, retailing, health care, etc. The final section is a review of current DEA software technology.

Data Envelopment Analysis Springer Science & Business Media

The book provides insights in the decision-making for implementing strategies in various spheres of real-world issues. It integrates optimal policies in various decisionmaking problems and serves as a reference for researchers and industrial practitioners. Furthermore, the book provides sound knowledge of modelling of real-world problems and solution procedure using the various optimisation and statistical techniques for making optimal decisions. The book is meant for teachers, students, researchers and industrialists who are working in the field of materials science, especially operations research and applied statistics.

Analysis and Algorithms for Service Parts Supply Chains Irwin Professional Publishing

Decision-making is an important task no matter the industry. Operations research, as a discipline, helps alleviate decision-making problems through the extraction of reliable information related to the task at hand in order to come to a viable solution. Integrating stochastic processes into operations research and management can further aid in the decision-making process for industrial and management problems. Stochastic Processes and Models in Operations Research emphasizes mathematical tools and equations relevant for solving complex problems within business and industrial settings. This research-based publication aims to assist scholars, researchers, operations managers, and graduate-level students by providing comprehensive exposure to the concepts, trends, and technologies relevant to stochastic process modeling to solve operations research problems.

Basic Business Analysis and Operations Research CRC Press

This handbook represents a milestone in the progression of Data Envelopment Analysis (DEA). Written by experts who are often major contributors to DEA theory, it includes a collection of chapters that represent the current state-of-the-art in DEA research. Topics include distance functions and their value duals, cross-efficiency measures in DEA, integer DEA, weight restrictions and production trade-offs, facet analysis in DEA, scale elasticity, benchmarking and context-dependent DEA, relations, super efficiency, treatment of undesirable measures, translation invariance, stochastic nonparametric envelopment of data, and global frontier index. Focusing only on new models/approaches of DEA, the book includes contributions from Juan Aparicio, Mette Asmild, Yao Chen, Wade D. Cook, Juan Du, Rolf F ä re, Julie Harrison, Raha Imanirad, Andrew Johnson, Chiang Kao, Abolfazl Keshvari, Timo Kuosmanen, Sungmook Lim, Wenbin Liu, Dimitri Margaritis, Reza Kazemi Matin, Ole B. Olesen, Jesus T. Pastor, Niels Chr. Petersen, Victor V. Podinovski, Paul Rouse, Antti Saastamoinen, Biresh K. Sahoo, Kaoru Tone, and Zhongbao Zhou.

Stochastic Processes and Models in Operations Research Springer Science & Business Media

"The aim of this book is to cover various aspects of the Production and Operations Analysis. Apart from the introduction to basic understanding of each topic, the book also provides insights to various conventional techniques as well as, various other mathematical and nature-based techniques extracted from the existing literature. Concepts like smart factories, intelligent manufacturing, and various techniques of manufacturing are also included. Various types of numerical examples are presented in each chapter and the descriptions done in lucid style with figures, point-wise descriptions, tables, pictures to facilitate easy understanding of the subject"--

Data Envelopment Analysis CRC Press

This volume presents recent methodological developments in data analysis and classification. It covers a wide range of topics, including methods for classification and clustering, dissimilarity analysis, consensus methods, conceptual analysis of data, and data mining and knowledge discovery in databases. The book also presents a wide variety of applications, in fields such as biology, micro-array analysis, cyber traffic, and bank fraud detection.

Operations Research Methodologies Springer

A single source guide to operations research (OR) techniques, this book covers emerging OR methodologies in a clear, concise, and unified manner. Building a bridge between theory and practice, it begins with coverage of fundamental models and methods such as linear, nonlinear, integer, and dynamic programming, networks, simulation, queuing, invento

Operations Research: Introduction to Models and Methods Taylor & Francis

This handbook focuses on Data Envelopment Analysis (DEA) applications in operations analytics which are fundamental tools and techniques for improving operation functions and attaining long-term competitiveness. In fact, the handbook demonstrates that DEA can be viewed as Data Envelopment Analytics. Chapters include a review of cross-efficiency evaluation; a case study on measuring the environmental performance of OECS countries; how to select a set of performance metrics in DEA with an application to American banks; a relational network model to take the operations of individual periods into account in measuring efficiencies; how the efficient frontier methods DEA and stochastic frontier analysis (SFA) can be used synergistically; and how to integrate DEA and multidimensional scaling. In other chapters, authors construct a dynamic three-stage network DEA model; a bootstrapping based methodology to evaluate returns to scale and convexity assumptions in DEA; hybridizing DEA

and cooperative games; using DEA to represent the production technology and directional distance functions to measure band performance; an input-specific Luenberger energy and environmental productivity indicator; and the issue of reference set by differentiating between the uniquely found reference set and the unary and maximal types of the reference set. Finally, additional chapters evaluate and compare the technological advancement observed in different hybrid electric vehicles (HEV) market segments over the past 15 years; radial measurement of efficiency for the production process possessing multi-components under different production technologies; issues around the use of accounting information in DEA; how to use DEA environmental assessment to establish corporate sustainability; a summary of research efforts on DEA environmental assessment applied to energy in the last 30 years; and an overview of DEA and how it can be utilized alone and with other techniques to investigate corporate environmental sustainability questions.

Design and Analysis of Simulation Experiments CRC Press

This is a new edition of Kleijnen ' s advanced expository book on statistical methods for the Design and Analysis of Simulation Experiments (DASE). Altogether, this new edition has approximately 50% new material not in the original book. More specifically, the author has made significant changes to the book ' s organization, including placing the chapter on Screening Designs immediately after the chapters on Classic Designs, and reversing the order of the chapters on Simulation Optimization and Kriging Metamodels. The latter two chapters reflect how active the research has been in these areas. The validation section has been moved into the chapter on Classic Assumptions versus Simulation Practice, and the chapter on Screening now has a section on selecting the number of replications in sequential bifurcation through Wald ' s sequential probability ration test, as well as a section on sequential bifurcation for multiple types of simulation responses. Whereas all references in the original edition were placed at the end of the book, in this edition references are placed at the end of each chapter. From Reviews of the First Edition: " Jack Kleijnen has once again produced a cutting-edge approach to the design and analysis of simulation experiments. " (William E. BILES, JASA, June 2009, Vol. 104, No. 486)