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Decision-making Under Uncertainty Investment Under Uncertainty **Essays on Economic Decisions Under Uncertainty** Economic Choice Under Uncertainty *Managerial Decisions Under Uncertainty* **Affective Decision Making Under Uncertainty** The Flaw of Averages Flexibility and Real Estate Valuation under Uncertainty **Virtual Power Plants and Electricity Markets Production Planning Problem Under Uncertainty** **Decision Making Under Uncertainty** **Dependability Modelling under Uncertainty** **Managing Water Under Uncertainty and Risk: United Nations World Water Development Report #4 (3 Vols.)** *Large-Scale System Analysis Under Uncertainty* **Economic Decisions Under Uncertainty** *Decision Making Under Uncertainty* **Monetary Policy under Uncertainty** **Trust as a Determinant of Consumer Behaviour under Uncertainty** *Guidebook for Supporting Decision Making Under Uncertainties* **Principles of Risk Analysis** *Marketing Decisions Under Uncertainty* **Design Decisions under Uncertainty with Limited Information** **Allocation under Uncertainty: Equilibrium and Optimality** *Optimal Monetary Policy under Uncertainty, Second Edition* *Economic Decisions Under Uncertainty* **Judgment Under Uncertainty** *System-Level Analysis and Design under Uncertainty* **Optimization Techniques for Problem Solving in Uncertainty** **Uncertainty in Complex Networked Systems** **Life-Cycle of Structures Under Uncertainty** *Investment under Uncertainty* **Optimal Control of PDEs under Uncertainty** *Optimization Under Uncertainty with Applications to Aerospace Engineering* **A Study of Business Decisions Under Uncertainty** **Decisions Under Uncertainty Modeling Environment-Improving Technological Innovations Under Uncertainty** **Optimization and Anti-Optimization of Structures Under Uncertainty** **Nonlinear Expectations and Stochastic Calculus under Uncertainty** **Finance and the Economics of Uncertainty** *Quantitative Techniques for Managerial Decisions*

Dependability Modelling under Uncertainty Nov 15 2021 Mechatronic design processes have become shorter and more parallelized, induced by growing time-to-market pressure. Methods that enable quantitative analysis in early design stages are required, should dependability analyses aim to influence the design. Due to the limited amount of data in this phase, the level of uncertainty is high and explicit modeling of these uncertainties becomes necessary. This work introduces new uncertainty-preserving dependability methods for early design stages. These include the propagation of uncertainty through dependability models, the activation of data from similar components for analyses and the integration of uncertain dependability predictions into an optimization framework. It is shown that Dempster-Shafer theory can be an alternative to probability theory in early design stage dependability predictions. Expert estimates can be represented, input uncertainty is propagated through the system and prediction uncertainty can be measured and interpreted. The resulting coherent methodology can be applied to represent the uncertainty in dependability models.

The Flaw of Averages Apr 20 2022 A must-read for anyone who makes business decisions that have a major financial impact. As the recent collapse on Wall Street shows, we are often ill-equipped to deal with uncertainty and risk. Yet every day we base our personal and business plans on uncertainties, whether they be next month's sales, next year's costs, or tomorrow's stock price. In *The Flaw of Averages*, Sam Savage known for his creative exposition of difficult subjects describes common avoidable mistakes in assessing risk in the face of uncertainty. Along the way, he shows why plans based on average assumptions are wrong, on average, in areas as diverse as healthcare, accounting, the War on Terror, and climate change. In his chapter on Sex and the Central Limit Theorem, he bravely grasps the literary third rail of gender differences. Instead of statistical jargon, Savage presents complex concepts in plain English. In addition, a tightly integrated web site contains numerous animations and simulations to further connect the seat of the reader's intellect to the seat of their pants. *The Flaw of Averages* typically results when someone plugs a single number into a spreadsheet to represent an uncertain future quantity. Savage finishes the book with a discussion of the emerging field of Probability Management, which cures this problem through a new technology that can pack thousands of numbers into a single spreadsheet cell. Praise for *The Flaw of Averages* "Statistical uncertainties are pervasive in decisions we make every day in business, government, and our personal lives. Sam Savage's lively and engaging book gives any interested reader the insight and the tools to deal effectively with those uncertainties. I highly recommend *The Flaw of Averages*." —William J. Perry, Former U.S. Secretary of Defense "Enterprise analysis under uncertainty has long been an academic ideal. . . . In this profound and entertaining book, Professor Savage shows how to make all this practical, practicable, and comprehensible." —Harry Markowitz, Nobel Laureate in Economics

Modeling Environment-Improving Technological Innovations Under Uncertainty Oct 22 2019 The issues of technology and uncertainty are very much at the heart of the policy debate of how much to control greenhouse gas emissions. The costs of doing so are present and high while the benefits are very much in the future and, most importantly, they are highly uncertain. Whilst there is broad consensus on the key elements of climate change science and agreement that near-term actions are needed to prevent dangerous anthropogenic interference with the climate system, there is little agreement on the costs and benefits of climate policy. The book looks at different ways of reconciling the needs for sustainability and equity with the costs of action now. Presenting a compendium of methodologies for evaluating the economic impact of technological innovation upon climate-change policy, this book describes mathematical models and their predictions. The goal is to provide a practitioner's guide for doing the science of economics and climate change. Because the assumptions motivating different problems in the economics of climate change have different complexities, a number of models are presented with varying levels of difficulty: reduced-form and structural, partial- and general-equilibrium, closed-form and computational. A unifying theme of these models is the incorporation of a number of price and quantity instruments and an analysis of their respective efficacies. This book presents models that contain structural uncertainty, i.e., uncertainty that economic agents respond to via their risk attitudes. The novelty of this book is to relate the effects of risk and risk attitudes to environment-improving technological innovation.

Affective Decision Making Under Uncertainty May 21 2022 This book is an exploration of the ubiquity of ambiguity in decision-making under uncertainty. It presents various essays on behavioral economics and behavioral finance that draw on the theory of Black Swans (Taleb 2010), which argues for a distinction between unprecedented events in our past and unpredictable events in our future. The defining property of Black Swan random events is that they are unpredictable, i.e., highly unlikely random events. In this text, Mandelbrot's (1972) operational definition of risky random unpredictable events is extended to Black Swan assets – assets for which the cumulative probability distribution or conditional probability distribution of random future asset returns is a power distribution. Ambiguous assets are assets for which the uncertainties of future returns are not risks. Consequently, there are two disjoint classes of Black Swan assets: Risky Black Swan assets and Ambiguous Black Swan assets, a new class of ambiguous assets with unpredictable random future outcomes. The text is divided into two parts, the first of which focuses on affective moods, introduces affective utility functions and discusses the ambiguity of Black Swans. The second part, which shifts the spotlight to affective equilibrium in asset markets, features chapters on affective portfolio analysis and Walrasian and Gorman Polar Form Equilibrium Inequalities. In order to gain the most from the book, readers should have completed the standard introductory graduate courses on microeconomics, behavioral finance, and convex optimization. The book is intended for advanced undergraduates, graduate students and post docs specializing in economic theory, experimental economics, finance, mathematics, computer science or data analysis.

Economic Choice Under Uncertainty Jul 23 2022

Finance and the Economics of Uncertainty Jul 19 2019 Finance and the Economics of Uncertainty explores the growing range of economic decisions that are conducted under uncertainty both on the personal level, as well as by large firms. Analyzes the allocation of risk in the context of the current literature, as well as emphasizes the role of information in decisions and prices. Includes end-of-chapter exercises that supply the necessary tools for a comprehensive understanding of the field.

Managing Water Under Uncertainty and Risk: United Nations World Water Development Report #4 (3 Vols.) Oct 14 2021 Released every three years since March 2003, the United Nations World Water Development Report (WWDR), a flagship UN-Water report published by UNESCO, has become the voice of the United Nations system in terms of the state, use and management of the world's freshwater resources. The report is primarily targeted at national decision-makers and water resource managers, but is also aimed at educating and informing a broader audience, from governments to the private sector and civil society. It underlines the important roles water plays in all social, economic and environmental decisions, highlighting policy implications across various sectors, from local and municipal to regional and international levels. Similarly to the first two editions, this report includes a comprehensive and up-to-date assessment of several key challenge areas, such as water for food, energy and human health, and governance challenges such as institutional reform, knowledge and capacity-building, and financing, each produced by individual UN agencies.

Allocation under Uncertainty: Equilibrium and Optimality Dec 04 2020

Marketing Decisions Under Uncertainty Feb 06 2021 Remarkable advance in quantitative marketing research in the last two decades, incorporating applied microeconomic theories, operations research and management applications, has brought the field of marketing alongside with finance, accounting and production to within an executive's reach for a sophisticated toolbox for decision making in an increasingly competitive and complex business environment. A quick look at *Marketing*, a recently published book edited by Eliashberg and Lilien would indicate even to the casual reader the extent of such methodological progress made by marketing scholars. Even in such an impressive and nearly exhaustive collection of topics, with the notable exception pointed out by the editors of applications of the scanner data, and in spite of the reference to it, an important omission is related to the issues of marketing decisions under conditions of uncertainty. It is fairly obvious to the marketing executive and academician alike to recognize the important role uncertainty plays in marketing decisions such as pricing, promotion, advertising, sales force management, and others. The major purpose of this study is to address certain major marketing decision variables within the general context of an uncertain environment. While there have been significant progresses in analyzing marketing behaviors in a stochastic environment, the sources scattered among different management and marketing journals; and to the extent that these issues are addressed at all, they have aimed mainly at each separate, specific topic at a time. Thus, our effort to bring these studies together in the same framework should facilitate our in-depth analysis of these important phenomena.

Optimization Techniques for Problem Solving in Uncertainty Jun 29 2020 When it comes to optimization techniques, in some cases, the available information from real models may not be enough to construct either a probability distribution or a membership function for problem solving. In such cases, there are various theories that can be used to quantify the uncertain aspects. *Optimization Techniques for Problem Solving in Uncertainty* is a scholarly reference resource that looks at uncertain aspects involved in different disciplines and applications. Featuring coverage on a wide range of topics including uncertain preference, fuzzy multilevel programming, and metaheuristic applications, this book is geared towards engineers, managers, researchers, and post-graduate students seeking emerging research in the field of optimization.

Optimal Monetary Policy under Uncertainty, Second Edition Nov 03 2020 This book provides a thorough survey of the model-based literature on optimal monetary in a stochastic setting. The survey begins with the literature of the 1970s which focused on the information problem in policy design and extends to the New Keynesian approach of the 1990s which centered on evaluating alternative targeting strategies. New to the second edition is consideration of research since the world financial crisis on the role of financial markets and institutions in the conduct of monetary policy.

Flexibility and Real Estate Valuation under Uncertainty Mar 19 2022 Provides a revolutionary conceptual framework and practical tools to quantify uncertainty and recognize the value of flexibility in real estate development This book takes a practical "engineering" approach to the valuation of options and flexibility in real estate. It presents simple simulation models built in universal spreadsheet software such as Microsoft Excel®. These realistically reflect the varying and erratic sources of uncertainty and price dynamics that uniquely characterize real estate. The text covers new analytic procedures that are valuable for existing properties and enable a new, more profitable perspective on the planning, design, operation, and evaluation of large-scale, multi-phase development projects. The book thereby aims to significantly improve valuation and investment decision making. *Flexibility and Real Estate Valuation under Uncertainty: A Practical Guide for Developers* is presented at 3 levels. First, it introduces and explains the concepts underlying the approach at a basic level accessible to non-technical and non-specialized readers. Its introductory and concluding chapters present the important "big picture" implications of the analysis for economics and valuation and for project design and investment decision making. At a second level, the book presents a framework, a roadmap for the prospective analyst. It describes the practical tools in detail, taking care to go through the elements of the approach step-by-step for clarity and easy reference. The third level includes more technical details and specific models. An Appendix discusses the technical details of real estate price dynamics. Associated web pages provide electronic spreadsheet templates for the models used as examples in the book. Some features of the book include: • Concepts and tools that are simple and accessible to a broad audience of practitioners; • An approach relevant for all development projects; • Complementarity with the author's *Commercial Real Estate Analysis & Investments*—the most-cited real estate investments textbook on the market.

Flexibility and Real Estate Valuation under Uncertainty: A Practical Guide for Developers is for everyone studying or concerned with the implementation of large-scale or multi-phase real estate development projects, as well as property investment and valuation more generally.

Decision Making Under Uncertainty Dec 16 2021 An introduction to decision making under uncertainty from a computational perspective, covering both theory and applications ranging from speech recognition to airborne collision avoidance. Many important problems involve decision making under uncertainty—that is, choosing actions based on often imperfect observations, with unknown outcomes. Designers of automated decision support systems must take into account the various sources of uncertainty while balancing the multiple objectives of the system. This book provides an introduction to the challenges of decision making under uncertainty from a computational perspective. It presents both the theory behind decision making models and algorithms and a collection of example applications that range from speech recognition to aircraft collision avoidance. Focusing on two methods for designing decision agents, planning and reinforcement learning, the book covers probabilistic models, introducing Bayesian networks as a graphical model that captures probabilistic relationships between variables; utility theory as a framework for understanding optimal decision making under uncertainty; Markov decision processes as a method for modeling sequential problems; model uncertainty; state uncertainty; and cooperative decision making involving multiple interacting agents. A series of applications shows how the theoretical concepts can be applied to systems for attribute-based person search, speech applications, collision avoidance, and unmanned aircraft persistent surveillance. Decision Making Under Uncertainty unifies research from different communities using consistent notation, and is accessible to students and researchers across engineering disciplines who have some prior exposure to probability theory and calculus. It can be used as a text for advanced undergraduate and graduate students in fields including computer science, aerospace and electrical engineering, and management science. It will also be a valuable professional reference for researchers in a variety of disciplines.

Decision-making Under Uncertainty Oct 26 2022 At the core of microeconomic theory lie the economics of uncertainty and the economics of games and decisions. This text for undergraduates and specialists in mathematical economics links game theory with decision-making under uncertainty

Optimization and Anti-Optimization of Structures Under Uncertainty Sep 20 2019 The volume presents a collaboration between internationally recognized experts on anti-optimization and structural optimization, and summarizes various novel ideas, methodologies and results studied over 20 years. The book vividly demonstrates how the concept of uncertainty should be incorporated in a rigorous manner during the process of designing real-world structures. The necessity of anti-optimization approach is first demonstrated, then the anti-optimization techniques are applied to static, dynamic and buckling problems, thus covering the broadest possible set of applications. Finally, anti-optimization is fully utilized by a combination of structural optimization to produce the optimal design considering the worst-case scenario. This is currently the only book that covers the combination of optimization and anti-optimization. It shows how various optimization techniques are used in the novel anti-optimization technique, and how the structural optimization can be exponentially enhanced by incorporating the concept of worst-case scenario, thereby increasing the safety of the structures designed in various fields of engineering. Contents: Optimization or Making the Best in the Presence of Certainty/Uncertainty General Formulation of Anti-Optimization Anti-Optimization in Static Problems Anti-Optimization in Buckling Anti-Optimization in Vibration Anti-Optimization via FEM-Based Interval Analysis Anti-Optimization and Probabilistic Design Hybrid Optimization with Anti-Optimization under Uncertainty or Making the Best Out of the Worst Readership: Graduate students, professionals and academics in the field of mechanical engineering. Keywords: Anti-Optimization; Structural Optimization; Convex Model; Worst-Case Scenario; Ellipsoidal Model; Worst Excitation; Worst Imperfection; Homology Design; Interval Analysis Key Features: This is the first book on optimization and anti-optimization Tackles two of the most important facets of engineering — safety and optimality — in a unified manner; the book may prove to be a turning point in both optimization and uncertainty studies by the suggested hybrid treatment Reviews: “Many applications to the optimal structural design are presented. Since some of the criteria are based on worst case scenarios, nested or two-stage optimization problems have to be considered. The book contains many examples and a large number of references.” Zentralblatt MATH *Large-Scale System Analysis Under Uncertainty* Sep 13 2021 Discover a comprehensive set of tools and techniques for analyzing the impact of uncertainty on large-scale engineered systems. Providing accessible yet rigorous coverage, it showcases the theory through detailed case studies drawn from electric power application problems, including the impact of integration of renewable-based power generation in bulk power systems, the impact of corrupted measurement and communication devices in microgrid closed-loop controls, and the impact of components failures on the reliability of power supply systems. The case studies also serve as a guide on how to tackle similar problems that appear in other engineering application domains, including automotive and aerospace engineering. This is essential reading for academic researchers and graduate students in power systems engineering, and dynamic systems and control engineering.

Trust as a Determinant of Consumer Behaviour under Uncertainty May 09 2021

Principles of Risk Analysis Mar 07 2021 In every decision problem there are things we know and things we do not know. Risk analysis science uses the best available evidence to assess what we know while it is carefully intentional in the way it addresses the importance of the things we do not know in the evaluation of decision choices and decision outcomes. The field of risk analysis science continues to expand and grow and the second edition of Principles of Risk Analysis: Decision Making Under Uncertainty responds to this evolution with several significant changes. The language has been updated and expanded throughout the text and the book features several new areas of expansion including five new chapters. The book’s simple and straightforward style—based on the author’s decades of experience as a risk analyst, trainer, and educator—strips away the mysterious aura that often accompanies risk analysis. Features: Details the tasks of risk management, risk assessment, and risk communication in a straightforward, conceptual manner Provides sufficient detail to empower professionals in any discipline to become risk practitioners Expands the risk management emphasis with a new chapter to serve private industry and a growing public sector interest in the growing practice of enterprise risk management Describes dozens of quantitative and qualitative risk assessment tools in a new chapter Practical guidance and ideas for using risk science to improve decisions and their outcomes is found in a new chapter on decision making under uncertainty Practical methods for helping risk professionals to tell their risk story are the focus of a new chapter Features an expanded set of examples of the risk process that demonstrate the growing applications of risk analysis As before, this book continues to appeal to professionals who want to learn and apply risk science in their own professions as well as students preparing for professional careers. This book remains a discipline free guide to the principles of risk analysis that is accessible to all interested practitioners. Files used in the creation of this book and additional exercises as well as a free student version of Palisade Corporation’s Decision Tools Suite software are available with the purchase of this book. A less detailed introduction to the risk analysis science tasks of risk management, risk assessment, and risk communication is found in Primer of Risk Analysis: Decision Making Under Uncertainty, Second Edition, ISBN: 978-1-138-31228-9.

Decisions Under Uncertainty Nov 22 2019 Publisher Description

Virtual Power Plants and Electricity Markets Feb 18 2022 This textbook provides a detailed analysis of operation and planning problems faced by virtual power plants participating in different electricity markets. The chapters address in-depth, topics such as: optimization, market power, expansion, and modelling uncertainty in operation and planning problems of virtual power plants. The book provides an up-to-date description of decision-making tools to address challenging questions faced by virtual power plants such as: How can virtual power plants optimize their participation in electricity markets? How can a virtual power plant exercise market power? How can virtual power plants be optimally expanded? How can uncertainty be efficiently modelled in the operation and planning problems of virtual power plants? The book is written in a tutorial style and modular format, and includes many illustrative examples to facilitate comprehension. It is intended for a diverse audience including advanced undergraduate and graduate students in the fields of electric energy systems, operations research, and economics. Practitioners in the energy sector will also benefit from the concepts and techniques presented in this book. In particular, this book: Provides students with the GAMS codes to solve the examples in the book; Provides a basis for the formulation of decision-making problems under uncertainty; Contains a blend of theoretical concepts and practical applications that are developed as working algorithms.

Uncertainty in Complex Networked Systems May 29 2020 The chapters in this volume, and the volume itself, celebrate the life and research of Roberto Tempo, a leader in the study of complex networked systems, their analysis and control under uncertainty, and robust designs. Contributors include authorities on uncertainty in systems, robustness, networked and network systems, social networks, distributed and randomized algorithms, and multi-agent systems—all fields that Roberto Tempo made vital contributions to. Additionally, at least one author of each chapter was a research collaborator of Roberto Tempo’s. This volume is structured in three parts. The first covers robustness and includes topics like time-invariant uncertainties, robust static output feedback design, and the uncertainty quartet. The second part is focused on randomization and probabilistic methods, which covers topics such as compressive sensing, and stochastic optimization. Finally, the third part deals with distributed systems and algorithms, and explores matters involving mathematical sociology, fault diagnoses, and PageRank computation. Each chapter presents exposition, provides new results, and identifies fruitful future directions in research. This book will serve as a valuable reference volume to researchers interested in uncertainty, complexity, robustness, optimization, algorithms, and networked systems.

System-Level Analysis and Design under Uncertainty Jul 31 2020 One major problem for the designer of electronic systems is the presence of uncertainty, which is due to phenomena such as process and workload variation. Very often, uncertainty is inherent and inevitable. If ignored, it can lead to degradation of the quality of service in the best case and to severe faults or burnt silicon in the worst case. Thus, it is crucial to analyze uncertainty and to mitigate its damaging consequences by designing electronic systems in such a way that they effectively and efficiently take uncertainty into account. We begin by considering techniques for deterministic system-level analysis and design of certain aspects of electronic systems. These techniques do not take uncertainty into account, but they serve as a solid foundation for those that do. Our attention revolves primarily around power and temperature, as they are of central importance for attaining robustness and energy efficiency. We develop a novel approach to dynamic steady-state temperature analysis of electronic systems and apply it in the context of reliability optimization. We then proceed to develop techniques that address uncertainty. The first technique is designed to quantify the variability of process parameters, which is induced by process variation, across silicon wafers based on indirect and potentially incomplete and noisy measurements. The second technique is designed to study diverse system-level characteristics with respect to the variability originating from process variation. In particular, it allows for analyzing transient temperature profiles as well as dynamic steady-state temperature profiles of electronic systems. This is illustrated by considering a problem of design-space exploration with probabilistic constraints related to reliability. The third technique that we develop is designed to efficiently tackle the case of sources of uncertainty that are less regular than process variation, such as workload variation. This technique is exemplified by analyzing the effect that workload units with uncertain processing times have on the timing-, power-, and temperature-related characteristics of the system under consideration. We also address the issue of runtime management of electronic systems that are subject to uncertainty. In this context, we perform an early investigation of the utility of advanced prediction techniques for the purpose of finegrained long-range forecasting of resource usage in large computer systems. All the proposed techniques are assessed by extensive experimental evaluations, which demonstrate the superior performance of our approaches to analysis and design of electronic systems compared to existing techniques.

A Study of Business Decisions Under Uncertainty Dec 24 2019 This dissertation will discuss the uncertainty encountered in the daily operations of businesses. The concepts will be developed by first giving an overview of probability and statistics as used in our everyday activities, such as the basic principles of probability, univariate and multivariate statistics, data clustering and mapping, as well as time sequence and spectral analysis. The examples used will be from the oil and gas exploration industry because the risks taken in this industry are normally quite large and are ideal for showing the application of the various techniques for minimizing risk. Subsequently, the discussion will deal with basic risk analysis, spatial and time variations of risk, geotechnical risk analysis, risk aversion and how it is affected by personal biases, and how to use portfolios to hedge risk together with the application of real options. Next, fractal analysis and its application to economics and risk analysis will be examined, followed by some examples showing the change in the Value at Risk under Fractal Brownian Motions. Finally, a neural network application is shown whereby some of these risks and risk factors will be combined to forecast the best possible outcome given a certain knowledge base. The chapters will discuss: Basic probability techniques and uncertainty principles Analysis and diversification for exploration projects The value and risk of information in the decision process Simulation techniques and modeling of uncertainty Project valuation and project risk return Modeling risk propensity or preference analysis of exploration projects Application of fractals to risk analysis Simultaneous prediction of strategic risk and decision attributes using multivariate statistics and neural networks"

Production Planning Problem Under Uncertainty Jan 17 2022 In this book, we developed a new planning problem to minimize the lost demands and thus maximize revenues. For the first time, we construct the production planning problem with interval numbers as uncertainty in both of the objective function and constrain. The book contains five chapters. Chapter I presents a survey on some important concepts of the production planning problem (PPP). Chapter II introduces two different models of PPP under uncertainty. Chapter III presents two different approaches of PPP. Chapter IV propose an optimization model for PPP having uncertain variable coefficients in both of objective function and constraints. Chapter V introduce the summary and conclusions of the book

Economic Decisions Under Uncertainty Aug 12 2021 The Fundamental Issues Involved Why do we need a theory of uncertainty? It is a fact that almost all man's economic decisions are made under conditions of uncertainty, but this fact alone does not provide a strong enough argument for making the effort necessary to generalize ordinary preference theory designed for a world of perfect certainty. In accordance with Occam's Razor, the mathematician may well welcome a generalization of assumptions even if it does not promise more than a restatement of known results. The economist, however, will only be well disposed towards making the effort if he can expect to achieve new insights and interesting results, for he is interested in the techniques necessary for the

generalization only as means to an end, not as ends in themselves. A stronger reason for developing a theory of uncertainty, therefore, seems to be the fact that there are kinds of economic activities to which the non-stochastic preference theory has no access or has access only through highly artificial constructions. Such activities include portfolio decisions of wealth holders, speculation, and insurance. These will be considered in detail in the last chapter of the book. The main purpose of this book, however, is not to apply a theory of uncertainty to concrete economic problems, the purpose rather is to formulate such a theory.

Managerial Decisions Under Uncertainty Jun 22 2022 How to improve decision-making skills in realistic situations and do it in a reasonably nonmathematical fashion. Develops practical techniques for deciding upon the best strategies in a variety of situations. Provides methods for reducing complex problems to easily-drawn decision diagrams (trees), supported by real-world examples. Includes detailed cases that employ the methods described in the text. Each chapter contains illustrative examples and exercises.

Nonlinear Expectations and Stochastic Calculus under Uncertainty Aug 20 2019 This book is focused on the recent developments on problems of probability model uncertainty by using the notion of nonlinear expectations and, in particular, sublinear expectations. It provides a gentle coverage of the theory of nonlinear expectations and related stochastic analysis. Many notions and results, for example, G-normal distribution, G-Brownian motion, G-Martingale representation theorem, and related stochastic calculus are first introduced or obtained by the author. This book is based on Shige Peng's lecture notes for a series of lectures given at summer schools and universities worldwide. It starts with basic definitions of nonlinear expectations and their relation to coherent measures of risk, law of large numbers and central limit theorems under nonlinear expectations, and develops into stochastic integral and stochastic calculus under G-expectations. It ends with recent research topic on G-Martingale representation theorem and G-stochastic integral for locally integrable processes. With exercises to practice at the end of each chapter, this book can be used as a graduate textbook for students in probability theory and mathematical finance. Each chapter also concludes with a section Notes and Comments, which gives history and further references on the material covered in that chapter. Researchers and graduate students interested in probability theory and mathematical finance will find this book very useful.

Life-Cycle of Structures Under Uncertainty Apr 27 2020 Life-cycle analysis is a systemic tool for efficient and effective service life management of deteriorating structures. In the last few decades, theoretical and practical approaches for life-cycle performance and cost analysis have been developed extensively due to increased demand on structural safety and service life extension. This book presents the state-of-the-art in life-cycle analysis and maintenance optimization for fatigue-sensitive structures. Both theoretical background and practical applications have been provided for academics, engineers and researchers. Concepts and approaches of life-cycle performance and cost analysis developed in recent decades are presented. The major topics covered include (a) probabilistic concepts of life-cycle performance and cost analysis, (b) inspection, monitoring and maintenance for fatigue cracks, (c) estimation of fatigue crack detection, (d) optimum inspection and monitoring planning, (e) multi-objective life-cycle optimization, and (f) decision making in life-cycle analysis. Life-cycle optimization covered in the book considers probability of fatigue crack detection, fatigue crack damage detection time, maintenance times, probability of failure, service life and total life-cycle cost. For the practical application and integration of recently developed approaches for inspection and maintenance planning, efficient and effective multi-objective optimization and decision making are presented. This book will help engineers engaged in civil and marine structures including students, researchers and practitioners with reliable and cost-effective maintenance planning of fatigue-sensitive structures, and to develop more advanced approaches and techniques in the field of life-cycle maintenance optimization and safety of structures under various aging and deteriorating conditions. Key Features: Provides the state-of-the-art in life-cycle cost analysis and optimization for fatigue-sensitive structures Provides a solid foundation of theoretical backgrounds and practical applications both for academics and practicing engineers and researchers Covers illustrative examples and recent development for optimum service life management Deals with various structures such as bridges and ships subjected to fatigue .

Optimal Control of PDEs under Uncertainty Feb 24 2020 This book provides a direct and comprehensive introduction to theoretical and numerical concepts in the emerging field of optimal control of partial differential equations (PDEs) under uncertainty. The main objective of the book is to offer graduate students and researchers a smooth transition from optimal control of deterministic PDEs to optimal control of random PDEs. Coverage includes uncertainty modelling in control problems, variational formulation of PDEs with random inputs, robust and risk-averse formulations of optimal control problems, existence theory and numerical resolution methods. The exposition focusses on the entire path, starting from uncertainty modelling and ending in the practical implementation of numerical schemes for the numerical approximation of the considered problems. To this end, a selected number of illustrative examples are analysed in detail throughout the book. Computer codes, written in MatLab, are provided for all these examples. This book is addressed to graduate students and researchers in Engineering, Physics and Mathematics who are interested in optimal control and optimal design for random partial differential equations.

Optimization Under Uncertainty with Applications to Aerospace Engineering Jan 25 2020 In an expanding world with limited resources, optimization and uncertainty quantification have become a necessity when handling complex systems and processes. This book provides the foundational material necessary for those who wish to embark on advanced research at the limits of computability, collecting together lecture material from leading experts across the topics of optimization, uncertainty quantification and aerospace engineering. The aerospace sector in particular has stringent performance requirements on highly complex systems, for which solutions are expected to be optimal and reliable at the same time. The text covers a wide range of techniques and methods, from polynomial chaos expansions for uncertainty quantification to Bayesian and Imprecise Probability theories, and from Markov chains to surrogate models based on Gaussian processes. The book will serve as a valuable tool for practitioners, researchers and PhD students.

Guidebook for Supporting Decision Making Under Uncertainties Apr 08 2021 This book provides much-needed guidance in making sound business decisions for the business leader or decision maker, especially investment appraisal practitioners such as strategic planners, business analysts, financial partners, and supply chain experts. By OC supply chainOCO, the authors mean the network of retailers, distributors, transporters, storage facilities and suppliers that participate in the sale, delivery and production of a particular product. The book begins with an introduction to the concept of decision making under uncertainty and the forces driving the business. A gap in the current knowledge is then discovered as it arises from an analysis of the profitability indicators that are currently being used. With hands-on experience in decision making within the supply chain environment, and coupled with leading-edge mathematical and business formulations, the authors propose how to enrich quantitative and qualitative decision-making measures. This further leads to a decision-making framework and process, supported by a ready-to-use tool (PADOVA). Sample Chapter(s). Chapter 1: Decision Under Uncertainty (163 KB). Contents: Decision Under Uncertainty; Critical Review of Accounting Performance Measures; Critical Review of Strategic Criteria; A Way Forward: Quantitative Decision Making Measures; A Way Forward: Qualitative Decision Making Measures; The Framework. Readership: Investment appraisal practitioners such as strategic planners, business analysts, financial partners, and supply chain experts alike; graduate-level students in business administration or operations management."

Economic Decisions Under Uncertainty Oct 02 2020 The Fundamental Issues Involved Why do we need a theory of uncertainty? It is a fact that almost all man's economic decisions are made under conditions of uncertainty, but this fact alone does not provide a strong enough argument for making the effort necessary to generalize ordinary preference theory designed for a world of perfect certainty. In accordance with Occam's Razor, the mathematician may well welcome a generalization of assumptions even if it does not promise more than a restatement of known results. The economist, however, will only be well disposed towards making the effort if he can expect to achieve new insights and interesting results, for he is interested in the techniques necessary for the generalization only as means to an end, not as ends in themselves. A stronger reason for developing a theory of uncertainty, therefore, seems to be the fact that there are kinds of economic activities to which the non-stochastic preference theory has no access or has access only through highly artificial constructions. Such activities include portfolio decisions of wealth holders, speculation, and insurance. These will be considered in detail in the last chapter of the book. The main purpose of this book, however, is not to apply a theory of uncertainty to concrete economic problems, the purpose rather is to formulate such a theory.

Judgment Under Uncertainty Sep 01 2020 Thirty-five chapters describe various judgmental heuristics and the biases they produce, not only in laboratory experiments, but in important social, medical, and political situations as well. Most review multiple studies or entire subareas rather than describing single experimental studies.

Quantitative Techniques for Managerial Decisions Jun 17 2019 This Book Is Designed To Serve As A Text For Management, Economics, Accountancy (Chartered And Cost Accountancy), And Commerce Students. The Book Covers Concepts, Illustrations And Problems In Statistics And Operations Research. Part I Deals With Statistical Techniques For Decision Making. Part Ii Studies Various Operations Research Techniques For Managerial Decisions. The Book Contains Illustrations And Problems, Drawn Extensively From Various Functional Areas Of Management, Viz., Production, Finance, Marketing And Personnel, Which Are Designed To Understand Real Life Decision Making Situations. In Order To Make The Book Self-Contained, All Relevant Mathematical Concepts And Their Applications Have Been Included. To Enhance The Understanding Of The Subject Matter By The Students Belonging To Different Disciplines, The Approach Adopted In This Book, Both In Statistics And Operations Research, Is Conceptual Rather Than Mathematical. Hence Complicated Mathematical Proofs Have Been Avoided. This Book Would Be An Ideal Reference To Executives, Computer Professionals, Industrial Engineers, Economic Planners And Social Scientists. The Other Books By The Same Authors Are: Operations Research For Management And Business Statistics.

Investment under Uncertainty Mar 27 2020 How should firms decide whether and when to invest in new capital equipment, additions to their workforce, or the development of new products? Why have traditional economic models of investment failed to explain the behavior of investment spending in the United States and other countries? In this book, Avinash Dixit and Robert Pindyck provide the first detailed exposition of a new theoretical approach to the capital investment decisions of firms, stressing the irreversibility of most investment decisions, and the ongoing uncertainty of the economic environment in which these decisions are made. In so doing, they answer important questions about investment decisions and the behavior of investment spending. This new approach to investment recognizes the option value of waiting for better (but never complete) information. It exploits an analogy with the theory of options in financial markets, which permits a much richer dynamic framework than was possible with the traditional theory of investment. The authors present the new theory in a clear and systematic way, and consolidate, synthesize, and extend the various strands of research that have come out of the theory. Their book shows the importance of the theory for understanding investment behavior of firms; develops the implications of this theory for industry dynamics and for government policy concerning investment; and shows how the theory can be applied to specific industries and to a wide variety of business problems.

Essays on Economic Decisions Under Uncertainty Aug 24 2022 Professor Dreze is a highly respected mathematical economist and econometrician. This book brings together some of his major contributions to the economic theory of decision making under uncertainty, and also several essays. These include an important essay on 'Decision theory under moral hazard and state dependent preferences' that significantly extends modern theory, and which provides rigorous foundations for subsequent chapters. Topics covered within the theory include decision theory, market allocation and prices, consumer decisions, theory of the firm, labour contracts, and public decisions.

Monetary Policy under Uncertainty Jun 10 2021 Oliver Sauter analyzes three aspects of monetary policy under uncertainty. First he shows that the terms risk and uncertainty are often wrongly used as synonyms despite their different meanings. The second aspect is the proper examination and incorporation of uncertainty into a monetary policy framework. The author undertakes systematization with a closer look at each identified form of uncertainty. Thirdly, he focuses on the quantification of uncertainty from two different perspectives, either from a market perspective or from a central bank perspective.

Investment Under Uncertainty Sep 25 2022 How should firms decide whether and when to invest in new capital equipment, additions to their workforce, or the development of new products? Why have traditional economic models of investment failed to explain the behavior of investment spending in the United States and other countries? In this book, Avinash Dixit and Robert Pindyck provide the first detailed exposition of a new theoretical approach to the capital investment decisions of firms, stressing the irreversibility of most investment decisions, and the ongoing uncertainty of the economic environment in which these decisions are made. In so doing, they answer important questions about investment decisions and the behavior of investment spending. This new approach to investment recognizes the option value of waiting for better (but never complete) information. It exploits an analogy with the theory of options in financial markets, which permits a much richer dynamic framework than was possible with the traditional theory of investment. The authors present the new theory in a clear and systematic way, and consolidate, synthesize, and extend the various strands of research that have come out of the theory. Their book shows the importance of the theory for understanding investment behavior of firms; develops the implications of this theory for industry dynamics and for government policy concerning investment; and shows how the theory can be applied to specific industries and to a wide variety of business problems.

Design Decisions under Uncertainty with Limited Information Jan 05 2021 Today's business environment involves design decisions with significant uncertainty. To succeed, decision-makers should replace deterministic methods with a risk-based approach that accounts for the decision maker's risk tolerance. In many problems, it is impractical to collect data because rare or one-time events are involved. Therefore, we need a

Decision Making Under Uncertainty Jul 11 2021 Introduction and basic concepts; Models and probability; Choices and preferences; Preference assessment procedures; Behavioral assumptions and limitations of decision analysis; Risk sharing and incentives; Choices with multiple attributes.

