Pdf free The probabilistic method (PDF)

the leading reference on probabilistic methods in combinatorics now expanded and updated when it was first published in 1991 the probabilistic method became instantly the standard reference on one of the most powerful and widely used tools in combinatorics still without competition nearly a decade later this new edition brings you up to speed on recent developments while adding useful exercises and over 30 new material it continues to emphasize the basic elements of the methodology discussing in a remarkably clear and informal style both algorithmic and classical methods as well as modern applications the probabilistic method second edition begins with basic techniques that use expectation and variance as well as the more recent martingales and correlation inequalities then explores areas where probabilistic techniques proved successful including

discrepancy and random graphs as well as cutting edge topics in theoretical computer science a series of proofs or probabilistic lenses are interspersed throughout the book offering added insight into the application of the probabilistic approach new and revised coverage includes several improved as well as new results a continuous approach to discrete probabilistic problems talagrand s inequality and other novel concentration results a discussion of the connection between discrepancy and vc dimension several combinatorial applications of the entropy function and its properties a new section on the life and work of paul erdös the developer of the probabilistic method this update of the 1987 title of the same name is an examination of what is currently known about the probabilistic method written by one of its principal developers based on the notes from spencer s 1986 series of ten lectures this new edition contains an additional lecture the janson inequalities these inequalities allow accurate approximation of extremely small probabilities a new algorithmic approach to the lovasz local lemma

attributed to jozsef beck has been added to lecture 8 as well throughout the monograph spencer retains the informal style of his original lecture notes and emphasizes the methodology shunning the more technical best possible results in favor of clearer exposition the book is not encyclopedic it contains only those examples that clearly display the methodology the probabilistic method is a powerful tool in graph theory combinatorics and theoretical computer science it allows one to prove the existence of objects with certain properties e g colorings by showing that an appropriately defined random object has positive probability of having those properties over the past decade many major advances have been made in the field of graph coloring via the probabilistic method this monograph by two of the best on the topic provides an accessible and unified treatment of these results using tools such as the lovasz local lemma and talagrand s concentration inequality leave nothing to chance this cliche embodies the common belief that ran domness has no place in carefully planned methodologies every step should be spelled out

each i dotted and each t crossed in discrete mathematics at least nothing could be further from the truth introducing random choices into algorithms can improve their performance the application of proba bilistic tools has led to the resolution of combinatorial problems which had resisted attack for decades the chapters in this volume explore and celebrate this fact our intention was to bring together for the first time accessible discus sions of the disparate ways in which probabilistic ideas are enriching discrete mathematics these discussions are aimed at mathematicians with a good combinatorial background but require only a passing acquaintance with the basic definitions in probability e g expected value conditional probability a reader who already has a firm grasp on the area will be interested in the original research novel syntheses and discussions of ongoing developments scattered throughout the book some of the most convincing demonstrations of the power of these tech niques are randomized algorithms for estimating quantities which are hard to compute exactly one example is the

randomized algorithm of dyer frieze and kannan for estimating the volume of a polyhedron to illustrate these techniques we consider a simple related problem suppose s is some region of the unit square defined by a system of polynomial inequalities pi x y o the probabilistic method is the art of introducing probability to prove results that often do not involve randomness to begin with in this thesis we present four applications of this powerful technique which has become one of the cornerstones of modern combinatorics first we prove a new lower bound for online ramsey numbers giving for the first time an exponential separation between the lower bounds for classical and online ramsey numbers informally this means that it is quite difficult to adaptively find a monochromatic clique in an edge coloring of a large complete graph next we determine the growth rate of a certain off diagonal hypergraph ramsey number answering a question of erd□s and hajnal from 1972 this is the first nontrivial hypergraph ramsey number whose exponential order has been determined the proof introduces a new

random model for hypergraphs and relies heavily on the entropy method third we apply the entropy method to extremal graph theory proving tomescu s graph coloring conjecture from 1971 this determines the maximum number of proper k colorings of any graph with chromatic number k and n vertices in the proof we use an entropy inequality related to sequential importance sampling an estimation technique from statistics finally we present a result in probabilistic combinatorics outside graph theory an n permutation is called k universal if it contains every k permutation as a pattern and it is known that the shortest k universal permutation has length o k 2 it was suggested by alon that actually almost all n permutations are k universal for some n o k 2 and he proved that a random permutation of length o k 2 logk is k universal with high probability using a structure versus randomness approach we improve this bound to o k 2 loglogk almost closing the gap to the conjecture this third edition of the probabilistic method reflects the most recent developments in the field while maintaining

the standard of excellence that established this book as the leading reference on probabilistic methods in combinatorics maintaining its clear writing style illustrative examples and practical exercises this new edition emphasizes methodology enabling readers to use probabilistic techniques for solving problems in such fields as theoretical computer science mathematics and statistical physics this book begins with a description of tools applied in probabilistic arguments including basic techniques that use expectation and variance as well as the more recent applications of martingales and correlation inequalities next the authors examine where probabilistic techniques have been applied successfully exploring such topics as discrepancy and random graphs circuit complexity computational geometry and derandomization of randomized algorithms sections labeled the probabilistic lens offer additional insights into the application of the probabilistic approach and the appendix has been updated to include methodologies for finding lower bounds for large deviations the third edition also features a

new chapter on graph property testing which is a current topic that incorporates combinatorial probabilistic and algorithmic techniques an elementary approach using probabilistic techniques to the powerful szemeredi regularity lemma and its applications new sections devoted to percolation and liar games and a new chapter that provides a modern treatment of the erdos renyi phase transition in the random graph process written by two leading authorities in the field the probabilistic method third edition is an ideal reference for researchers in combinatorics and algorithm design who would like to better understand the use of probabilistic methods the book s numerous exercises and examples also make it an excellent textbook for graduate level courses in mathematics and computer science probabilistic technique is a nonconstructive method used to prove the existence of a specified type of mathematical object it works by showing that if one randomly selects objects from a specified class the probability that the result is of the given kind is strictly greater than zero the probabilistic method is

applied in various areas of mathematics such as number theory linear algebra and real analysis as well as computer science and information theory it is mainly used in combinatorics which deals primarily with counting both as a means and an end in obtaining results it also deals with some properties of finite structures it is used in various areas like logic statistical physics evolutionary biology computer science etc different approaches evaluations methodologies and advanced studies on probabilistic and combinatorial techniques have been included in this book it traces the progress of this field and highlights some of its key concepts and applications this book aims to equip students and experts with the advanced topics and upcoming models in this area 確率ロボティクス は 環境やシステムが持つ 不確実さ 予測不可能な事象 に確率統計を駆使して対処するのを特徴とする分野です 人の作業空間により近い位置への進出を期待される次世代のロボットでは この分野のアルゴリズム設計は有力な枠組みの1つとして注目を集めています また ロボットのみでなく 自動車の自動走行などへも応用可能な分野です 本書は学生 研究者 エンジニアなど ロボットの実装を行う全ての人に向けて書かれています 確率

ルゴリズムを ベイズ則とその拡張を数学的背景に 擬似コードによる実装例や実験結果を交えて詳細に解説 議論しています 確率の基本的な法則などの基礎的な解説もされており また 高度な数学の使用は極力避けられているため 技術的背景の異なる人にとっても理解しやすい内容になっています 確率ロボティクスを学ぶには必須の1冊 sebastian thrun wolfram burgard dieter foxらによる probabilistic robotics の日本語版 待望の復刊です in recent years there has been an upsurge of interest in using techniques drawn from probability to tackle problems in analysis these applications arise in subjects such as potential theory harmonic analysis singular integrals and the study of analytic functions this book presents a modern survey of these methods at the level of a beginning ph d student highlights of this book include the construction of the martin boundary probabilistic proofs of the boundary harnack principle dahlberg s theorem a probabilistic proof of riesz theorem on the hilbert transform and makarov s theorems on the support of harmonic measure the author assumes that a reader has some background in basic real analysis but the book includes proofs of all the results from probability theory and advanced

analysis required each chapter concludes with exercises ranging from the routine to the difficult in addition there are included discussions of open problems and further avenues of research the emphasis in this book is placed on general models markov chains random fields random graphs universal methods the probabilistic method the coupling method the stein chen method martingale methods the method of types and versatile tools chernoff s bound hoeffding s inequality holley s inequality whose domain of application extends far beyond the present text although the examples treated in the book relate to the possible applications in the communication and computing sciences in operations research and in physics this book is in the first instance concerned with theory the level of the book is that of a beginning graduate course it is self contained the prerequisites consisting merely of basic calculus series and basic linear algebra matrices the reader is not assumed to be trained in probability since the first chapters give in considerable detail the background necessary to understand

the rest of the book presents twenty three lessons including problems and exercises on the use of basic computer language on microcomputers such as apple pet atari and trs 80 本書は 離散数学の基礎を 具体的で豊富な例や図版 多くの演習問題を通して 初学者向けに親切 丁寧に解説している this book explains similarities in asymptotic behavior as the result of two basic properties shared by the structures the conditioning relation and the logarithmic condition the discussion is conducted in the language of probability enabling the theory to be developed under rather general and explicit conditions for the finer conclusions stein s method emerges as the key ingredient this 1997 work explores the role of probabilistic methods for solving combinatorial problems these methods not only provide the means of efficiently using such notions as characteristic and generating functions the moment method and so on but also let us use the powerful technique of limit theorems the basic objects under investigation are nonnegative matrices partitions and mappings of finite sets with special emphasis on permutations and graphs and

equivalence classes specified on sequences of finite length consisting of elements of partially ordered sets these specify the probabilistic setting of sachkov s general combinatorial scheme the author pays special attention to using probabilistic methods to obtain asymptotic formulae that are difficult to derive using combinatorial methods this was an important book describing many ideas not previously available in english the author has taken the chance to rewrite parts of the text and refresh the references where appropriate [illegible] sgd [illegible] cnn rnn [illegible] a self contained and coherent account of probabilistic techniques covering distance measures kernel rules nearest neighbour rules vapnik chervonenkis theory parametric classification and feature extraction each chapter concludes with problems and

exercises to further the readers understanding both research workers and graduate students will benefit from this wide ranging and up to date account of a fast moving field [illegible] em [illegible] mcmc [illegible] randomization and probabilistic techniques play an important role in modern computer science with applications ranging from combinatorial optimization and machine learning to communication networks and secure protocols this 2005 textbook is designed to accompany a one or two semester course for advanced undergraduates or beginning graduate students in computer science and applied

mathematics it gives an excellent introduction to the probabilistic techniques and paradigms used in the development of probabilistic algorithms and analyses it assumes only an elementary background in discrete mathematics and gives a rigorous yet accessible treatment of the material with numerous examples and applications the first half of the book covers core material including random sampling expectations markov s inequality chevyshev s inequality chernoff bounds the probabilistic method and markov chains the second half covers more advanced topics such as continuous probability applications of limited independence entropy markov chain monte carlo methods and balanced allocations with its comprehensive selection of topics along with many examples and exercises this book is an indispensable teaching tool probabilistic expert systems emphasizes the basic computational principles that make probabilistic reasoning feasible in expert systems the key to computation in these systems is the modularity of the probabilistic model shafer describes and compares the

principal architectures for exploiting this modularity in the computation of prior and posterior probabilities he also indicates how these similar yet different architectures apply to a wide variety of other problems of recursive computation in applied mathematics and operations research the field of probabilistic expert systems has continued to flourish since the author delivered his lectures on the topic in june 1992 but the understanding of join tree architectures has remained missing from the literature this monograph fills this void by providing an analysis of join tree methods for the computation of prior and posterior probabilities in belief nets these methods pioneered in the mid to late 1980s continue to be central to the theory and practice of probabilistic expert systems in addition to purely probabilistic expert systems join tree methods are also used in expert systems based on dempster shafer belief functions or on possibility measures variations are also used for computation in relational databases in linear optimization and in constraint satisfaction this book describes probabilistic expert systems in a more

rigorous and focused way than existing literature and provides an annotated bibliography that includes pointers to conferences and software also included are exercises that will help the reader begin to explore the problem of generalizing from probability to broader domains of recursive computation learn to use probabilistic techniques to solve problems in geotechnical engineering the book reviews the statistical theories needed to develop the methodologies and interpret the results next the authors explore probabilistic methods of analysis such as the first order second moment method the point estimate method and random set theory examples and case histories guide you step by step in applying the techniques to particular problems the first edition of this book appeared over three decades ago wiley interscience 1983 whereas the second one saw light on the verge of new millennium dover 1999 this is third corrected and expanded edition that appears in conjunction with its companion volume thus the reader is able to both get acquainted with the theoretical material and be able to master

some of the problems following chinese dictum i hear and i forget i see and i remember i do and i understand confucius the main idea of the book lies in the fact that three topics probabilistic strength of materials random vibrations and probabilistic buckling are presented in a single package allowing one to see the forest in between the trees indeed these three topics usually are presented in separate manners in different specialized books here the reader gets a feeling of true unity of the subject at large in order to appreciate that in the end what one wants is reliability of the structure in conjunction with its operating conditions as the author describes in the preface of the second edition this book was not conceived ab initio as a book that author strived to compose rather it was forced as it were upon me due to two reasons one was rather a surprising but understandable requirement in the venerable delft university of technology the netherlands to prepare the lecture notes for students with the view of reducing skyrocketing costs of acquisition of textbooks by the students the other one was an unusually

warm acceptance of the notes that the author prepared while at delft university of technology and later in haifa at the technion israel institute of technology by the legendary engineering scientist warner tjardus koiter 1914 1997 the energy necessary to prepare the second and third editions came from enthusiastic reviews that appeared in various sources author embraced the simplicity of exposition as the main virtue following isaac newton s view that truth is ever to be found in simplicity and not in the multiplicity and confusion of things graph searching games and probabilistic methods is the first book that focuses on the intersection of graph searching games and probabilistic methods the book explores various applications of these powerful mathematical tools to games and processes such as cops and robbers zombie and survivors and firefighting written in an engaging style the book is accessible to a wide audience including mathematicians and computer scientists readers will find that the book provides state of the art results techniques and directions in graph searching games especially from the point

of view of probabilistic methods the authors describe three directions while providing numerous examples which include playing a deterministic game on a random board players making random moves probabilistic methods used to analyze a deterministic game the stability of natural rock slopes is influenced by a wide spectrum of factors such as mechanical properties of bedrocks and spatial distribution of discontinuities their specific values are typically incomplete due mainly to the lack of effective and comprehensive methods to accurately characterize these factors especially those inside of the slopes the neutrosophic number is a useful tool to solve problems in indeterminate environment measurement plays a fundamental role both in physical and behavioral sciences as well as in engineering and technology it is the link between abstract models and empirical reality and is a privileged method of gathering information from the real world is it possible to develop a single theory of measurement for the various domains of science and technology in which measurement is involved this book takes

the challenge by addressing the following main issues what is the meaning of measurement how do we measure what can be measured a theoretical framework that could truly be shared by scientists in different fields ranging from physics and engineering to psychology is developed the future in fact will require greater collaboration between science and technology and between different sciences measurement which played a key role in the birth of modern science can act as an essential interdisciplinary tool and language for this new scenario a sound theoretical basis for addressing key problems in measurement is provided these include perceptual measurement the evaluation of uncertainty the evaluation of inter comparisons the analysis of risks in decision making and the characterization of dynamical measurement currently increasing attention is paid to these issues due to their scientific technical economic and social impact the book proposes a unified probabilistic approach to them which may allow more rational and effective solutions to be reached great care was taken to make the text as

accessible as possible in several ways firstly by giving preference to as interdisciplinary a terminology as possible secondly by carefully defining and discussing all key terms this ensures that a wide readership including people from different mathematical backgrounds and different understandings of measurement can all benefit from this work concerning mathematics all the main results are preceded by intuitive discussions and illustrated by simple examples moreover precise proofs are always included in order to enable the more demanding readers to make conscious and creative use of these ideas and also to develop new ones the book demonstrates that measurement which is commonly understood to be a merely experimental matter poses theoretical questions which are no less challenging than those arising in other apparently more theoretical disciplines statistical and probabilistic methods in actuarial science covers many of the diverse methods in applied probability and statistics for students aspiring to careers in insurance actuarial science and finance the book builds on students

existing knowledge of probability and statistics by establishing a solid and thorough understanding of

The Probabilistic Method

2004-04-05

the leading reference on probabilistic methods in combinatorics now expanded and updated when it was first published in 1991 the probabilistic method became instantly the standard reference on one of the most powerful and widely used tools in combinatorics still without competition nearly a decade later this new edition brings you up to speed on recent developments while adding useful exercises and over 30 new material it continues to emphasize the basic elements of the methodology discussing in a remarkably clear and informal style both algorithmic and classical methods as well as modern applications the probabilistic method second edition begins with basic techniques that use expectation and variance as well as the more recent martingales and correlation inequalities then explores areas where probabilistic techniques proved successful including discrepancy and random graphs as well as cutting edge

probabilistic lenses are interspersed throughout the book offering added insight into the application of the probabilistic approach new and revised coverage includes several improved as well as new results a continuous approach to discrete probabilistic problems talagrand s inequality and other novel concentration results a discussion of the connection between discrepancy and vc dimension several combinatorial applications of the entropy function and its properties a new section on the life and work of paul erdös the developer of the probabilistic method

Ten Lectures on the Probabilistic Method

1994-01-01

this update of the 1987 title of the same name is an examination of what is currently known about the probabilistic method written by one of its principal developers based on the notes from spencer s 1986 series of ten lectures this new

these inequalities allow accurate approximation of extremely small probabilities a new algorithmic approach to the lovasz local lemma attributed to jozsef beck has been added to lecture 8 as well throughout the monograph spencer retains the informal style of his original lecture notes and emphasizes the methodology shunning the more technical best possible results in favor of clearer exposition the book is not encyclopedic it contains only those examples that clearly display the methodology the probabilistic method is a powerful tool in graph theory combinatorics and theoretical computer science it allows one to prove the existence of objects with certain properties e g colorings by showing that an appropriately defined random object has positive probability of having those properties

Graph Colouring and the Probabilistic

Method

2013-06-29

over the past decade many major advances have been made in the field of graph coloring via the probabilistic method this monograph by two of the best on the topic provides an accessible and unified treatment of these results using tools such as the lovasz local lemma and talagrand s concentration inequality

Ten Lectures on the Probabilistic Method

1987

leave nothing to chance this cliche embodies the common belief that ran domness has no place in carefully planned methodologies every step should be spelled out each i dotted and each t crossed in discrete mathematics at least nothing could be further from the truth introducing random choices into algorithms can improve their performance the application

of proba bilistic tools has led to the resolution of combinatorial problems which had resisted attack for decades the chapters in this volume explore and celebrate this fact our intention was to bring together for the first time accessible discus sions of the disparate ways in which probabilistic ideas are enriching discrete mathematics these discussions are aimed at mathematicians with a good combinatorial background but require only a passing acquaintance with the basic definitions in probability e g expected value conditional probability a reader who already has a firm grasp on the area will be interested in the original research novel syntheses and discussions of ongoing developments scattered throughout the book some of the most convincing demonstrations of the power of these tech niques are randomized algorithms for estimating quantities which are hard to compute exactly one example is the randomized algorithm of dyer frieze and kannan for estimating the volume of a polyhedron to illustrate these techniques we consider a simple related problem suppose s is some region of the unit square defined by a

The Probabilistic Method and Random Graphs

2012

the probabilistic method is the art of introducing probability to prove results that often do not involve randomness to begin with in this thesis we present four applications of this powerful technique which has become one of the cornerstones of modern combinatorics first we prove a new lower bound for online ramsey numbers giving for the first time an exponential separation between the lower bounds for classical and online ramsey numbers informally this means that it is quite difficult to adaptively find a monochromatic clique in an edge coloring of a large complete graph next we determine the growth rate of a certain off diagonal hypergraph ramsey number answering a question of erd□s and hajnal from 1972 this is the first nontrivial hypergraph

ramsey number whose exponential order has been determined the proof introduces a new random model for hypergraphs and relies heavily on the entropy method third we apply the entropy method to extremal graph theory proving tomescu s graph coloring conjecture from 1971 this determines the maximum number of proper k colorings of any graph with chromatic number k and n vertices in the proof we use an entropy inequality related to sequential importance sampling an estimation technique from statistics finally we present a result in probabilistic combinatorics outside graph theory an n permutation is called k universal if it contains every k permutation as a pattern and it is known that the shortest k universal permutation has length o k 2 it was suggested by alon that actually almost all n permutations are k universal for some n o k 2 and he proved that a random permutation of length o k 2 logk is k universal with high probability using a structure versus randomness approach we improve this bound to o k 2 loglogk almost closing the gap to the conjecture

Probabilistic Methods for Algorithmic Discrete Mathematics

2013-03-14

this third edition of the probabilistic method reflects the most recent developments in the field while maintaining the standard of excellence that established this book as the leading reference on probabilistic methods in combinatorics maintaining its clear writing style illustrative examples and practical exercises this new edition emphasizes methodology enabling readers to use probabilistic techniques for solving problems in such fields as theoretical computer science mathematics and statistical physics this book begins with a description of tools applied in probabilistic arguments including basic techniques that use expectation and variance as well as the more recent applications of martingales and correlation inequalities next the authors examine where probabilistic techniques have been applied successfully

exploring such topics as discrepancy and random graphs circuit complexity computational geometry and derandomization of randomized algorithms sections labeled the probabilistic lens offer additional insights into the application of the probabilistic approach and the appendix has been updated to include methodologies for finding lower bounds for large deviations the third edition also features a new chapter on graph property testing which is a current topic that incorporates combinatorial probabilistic and algorithmic techniques an elementary approach using probabilistic techniques to the powerful szemeredi regularity lemma and its applications new sections devoted to percolation and liar games and a new chapter that provides a modern treatment of the erdos renyi phase transition in the random graph process written by two leading authorities in the field the probabilistic method third edition is an ideal reference for researchers in combinatorics and algorithm design who would like to better understand the use of probabilistic methods the book s numerous exercises and

examples also make it an excellent textbook for graduate level courses in mathematics and computer science

The Probabilistic Method in Combinatorics

2021

probabilistic technique is a nonconstructive method used to prove the existence of a specified type of mathematical object it works by showing that if one randomly selects objects from a specified class the probability that the result is of the given kind is strictly greater than zero the probabilistic method is applied in various areas of mathematics such as number theory linear algebra and real analysis as well as computer science and information theory it is mainly used in combinatorics which deals primarily with counting both as a means and an end in obtaining results it also deals with some properties of finite structures it is used in various areas like logic statistical physics evolutionary biology computer

and advanced studies on probabilistic and combinatorial techniques have been included in this book it traces the progress of this field and highlights some of its key concepts and applications this book aims to equip students and experts with the advanced topics and upcoming models in this area

Probabilistic Method, The. Wiley-Interscience Series in Discrete Mathematics and Optimization

2008

[illegible]

ルゴリズムを ベイズ則とその拡張を数学的背景に 擬似コードによる実装例

験結果を交えて詳細に解説 議論しています 確率の基本的な法則などの基礎的な解説もされており また 高度な数学の使用は極力避けられているため 技術的背景の異なる人にとっても理解しやすい内容になっています 確率ロボティクスを学ぶには必須の1冊 sebastian thrun wolfram burgard dieter foxらによる probabilistic robotics の日本語版 待望の復刊です

The Probabilistic Method and Tournaments

1998

in recent years there has been an upsurge of interest in using techniques drawn from probability to tackle problems in analysis these applications arise in subjects such as potential theory harmonic analysis singular integrals and the study of analytic functions this book presents a modern survey of these methods at the level of a beginning ph d student highlights of this book include the construction of the martin boundary probabilistic proofs of the boundary harnack

principle dahlberg s theorem a probabilistic proof of riesz theorem on the hilbert transform and makarov s theorems on the support of harmonic measure the author assumes that a reader has some background in basic real analysis but the book includes proofs of all the results from probability theory and advanced analysis required each chapter concludes with exercises ranging from the routine to the difficult in addition there are included discussions of open problems and further avenues of research

Probabilistic and Combinatorial Techniques: Advanced Problem Solving

2021-11-16

the emphasis in this book is placed on general models markov chains random fields random graphs universal methods the probabilistic method the coupling method the stein chen method martingale methods the method of types and versatile tools chernoff s bound hoeffding s inequality

beyond the present text although the examples treated in the book relate to the possible applications in the communication and computing sciences in operations research and in physics this book is in the first instance concerned with theory the level of the book is that of a beginning graduate course it is self contained the prerequisites consisting merely of basic calculus series and basic linear algebra matrices the reader is not assumed to be trained in probability since the first chapters give in considerable detail the background necessary to understand the rest of the book

The Probabilistic Method and the Regularity Lemma

2004

presents twenty three lessons including problems and exercises on the use of basic computer language on microcomputers such as apple pet atari and trs 80

確率ロボティクス

2015-04-02

本書は 離散数学の基礎を 具体的で豊富な例や図版 多くの演習問題を通して 初学者向けに親切 丁寧に解説している

Probabilistic Techniques in Analysis

1994-12-16

this book explains similarities in asymptotic behavior as the result of two basic properties shared by the structures the conditioning relation and the logarithmic condition the discussion is conducted in the language of probability enabling the theory to be developed under rather general and explicit conditions for the finer conclusions stein s method emerges as the key ingredient

Some Applications of the Probabilistic Method to Design Theory

1992

this 1997 work explores the role of probabilistic methods for solving combinatorial problems these methods not only provide the means of efficiently using such notions as characteristic and generating functions the moment method and so on but also let us use the powerful technique of limit theorems the basic objects under investigation are nonnegative matrices partitions and mappings of finite sets with special emphasis on permutations and graphs and equivalence classes specified on sequences of finite length consisting of elements of partially ordered sets these specify the probabilistic setting of sachkov s general combinatorial scheme the author pays special attention to using probabilistic methods to obtain asymptotic formulae that are difficult to derive using combinatorial methods this was an

important book describing many ideas not previously available in english the author has taken the chance to rewrite parts of the text and refresh the references where appropriate

Discrete Probability Models and Methods

2017-01-31

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Probabilistic Methods in the Theory of Numbers

1964-12-31

a self contained and coherent account of probabilistic techniques covering distance measures kernel rules nearest neighbour rules vapnik chervonenkis theory parametric classification and feature extraction each chapter concludes with problems and exercises to further the readers understanding both research workers and graduate students will benefit from this wide ranging and up to date account of a fast moving field

The Probabilistic Method

2001

[illegible]em[illegible]

ベイズ理論の適用範囲を広げた変分ベイズ法とmcmc法について触れ 次元や時系列の扱いといった話題を詳説する 最後に 複数のモデルを結合するブースティングなどの手法を説明する

□□□□□□□□

2002-12-22

randomization and probabilistic techniques play an important role in modern computer science with applications ranging from combinatorial optimization and machine learning to communication networks and secure protocols this 2005 textbook is designed to accompany a one or two semester course for advanced undergraduates or beginning graduate students in computer science and applied mathematics it gives an excellent introduction to the probabilistic techniques and paradigms used in the development of probabilistic algorithms and analyses it assumes only an elementary background in discrete mathematics and gives a rigorous yet accessible treatment of the material with numerous examples

and applications the first half of the book covers core material including random sampling expectations markov s inequality chevyshev s inequality chernoff bounds the probabilistic method and markov chains the second half covers more advanced topics such as continuous probability applications of limited independence entropy markov chain monte carlo methods and balanced allocations with its comprehensive selection of topics along with many examples and exercises this book is an indispensable teaching tool

Applications of the Probabilistic Method to Random Graphs

2005

probabilistic expert systems emphasizes the basic computational principles that make probabilistic reasoning feasible in expert systems the key to computation in these systems is the modularity of the probabilistic model shafer describes and compares the principal architectures for

exploiting this modularity in the computation of prior and posterior probabilities he also indicates how these similar yet different architectures apply to a wide variety of other problems of recursive computation in applied mathematics and operations research the field of probabilistic expert systems has continued to flourish since the author delivered his lectures on the topic in june 1992 but the understanding of join tree architectures has remained missing from the literature this monograph fills this void by providing an analysis of join tree methods for the computation of prior and posterior probabilities in belief nets these methods pioneered in the mid to late 1980s continue to be central to the theory and practice of probabilistic expert systems in addition to purely probabilistic expert systems join tree methods are also used in expert systems based on dempster shafer belief functions or on possibility measures variations are also used for computation in relational databases in linear optimization and in constraint satisfaction this book describes probabilistic expert systems in a more rigorous and focused way than

existing literature and provides an annotated bibliography that includes pointers to conferences and software also included are exercises that will help the reader begin to explore the problem of generalizing from probability to broader domains of recursive computation

Logarithmic Combinatorial Structures

2003

learn to use probabilistic techniques to solve problems in geotechnical engineering the book reviews the statistical theories needed to develop the methodologies and interpret the results next the authors explore probabilistic methods of analysis such as the first order second moment method the point estimate method and random set theory examples and case histories guide you step by step in applying the techniques to particular problems

Probabilistic Methods in combinatorics

1974

the first edition of this book appeared over three decades ago wiley interscience 1983 whereas the second one saw light on the verge of new millennium dover 1999 this is third corrected and expanded edition that appears in conjunction with its companion volume thus the reader is able to both get acquainted with the theoretical material and be able to master some of the problems following chinese dictum i hear and i forget i see and i remember i do and i understand confucius the main idea of the book lies in the fact that three topics probabilistic strength of materials random vibrations and probabilistic buckling are presented in a single package allowing one to see the forest in between the trees indeed these three topics usually are presented in separate manners in different specialized books here the reader gets a feeling of true unity of the subject at large in order to appreciate that in the end what one wants is reliability of the structure in

conjunction with its operating conditions as the author describes in the preface of the second edition this book was not conceived ab initio as a book that author strived to compose rather it was forced as it were upon me due to two reasons one was rather a surprising but understandable requirement in the venerable delft university of technology the netherlands to prepare the lecture notes for students with the view of reducing skyrocketing costs of acquisition of textbooks by the students the other one was an unusually warm acceptance of the notes that the author prepared while at delft university of technology and later in haifa at the technion israel institute of technology by the legendary engineering scientist warner tjardus koiter 1914 1997 the energy necessary to prepare the second and third editions came from enthusiastic reviews that appeared in various sources author embraced the simplicity of exposition as the main virtue following isaac newton s view that truth is ever to be found in simplicity and not in the multiplicity and confusion of things

Probabilistic Methods in Combinatorial Analysis

2013-11-21

graph searching games and probabilistic methods is the first book that focuses on the intersection of graph searching games and probabilistic methods the book explores various applications of these powerful mathematical tools to games and processes such as cops and robbers zombie and survivors and firefighting written in an engaging style the book is accessible to a wide audience including mathematicians and computer scientists readers will find that the book provides state of the art results techniques and directions in graph searching games especially from the point of view of probabilistic methods the authors describe three directions while providing numerous examples which include playing a deterministic game on a random board players making random moves probabilistic methods used to analyze

A Probabilistic Method for the Approximation of Discrete Time Dynamical Systems

1995

the stability of natural rock slopes is influenced by a wide spectrum of factors such as mechanical properties of bedrocks and spatial distribution of discontinuities their specific values are typically incomplete due mainly to the lack of effective and comprehensive methods to accurately characterize these factors especially those inside of the slopes the neutrosophic number is a useful tool to solve problems in indeterminate environment

On the Role of Non-uniform Smoothness Parameters and the Probabilistic Method in Applications of the Stein-Chen Method

1999

measurement plays a fundamental role both in physical and behavioral sciences as well as in engineering and technology it is the link between abstract models and empirical reality and is a privileged method of gathering information from the real world is it possible to develop a single theory of measurement for the various domains of science and technology in which measurement is involved this book takes the challenge by addressing the following main issues what is the meaning of measurement how do we measure what can be measured a theoretical framework that could truly be shared by scientists in different fields ranging from physics and engineering to psychology is developed the future in fact will require greater collaboration between science and

technology and between different sciences measurement which played a key role in the birth of modern science can act as an essential interdisciplinary tool and language for this new scenario a sound theoretical basis for addressing key problems in measurement is provided these include perceptual measurement the evaluation of uncertainty the evaluation of inter comparisons the analysis of risks in decision making and the characterization of dynamical measurement currently increasing attention is paid to these issues due to their scientific technical economic and social impact the book proposes a unified probabilistic approach to them which may allow more rational and effective solutions to be reached great care was taken to make the text as accessible as possible in several ways firstly by giving preference to as interdisciplinary a terminology as possible secondly by carefully defining and discussing all key terms this ensures that a wide readership including people from different mathematical backgrounds and different understandings of measurement can all benefit from this work

concerning mathematics all the main results are preceded by intuitive discussions and illustrated by simple examples moreover precise proofs are always included in order to enable the more demanding readers to make conscious and creative use of these ideas and also to develop new ones the book demonstrates that measurement which is commonly understood to be a merely experimental matter poses theoretical questions which are no less challenging than those arising in other apparently more theoretical disciplines

□□□□

2015-04-07

statistical and probabilistic methods in actuarial science covers many of the diverse methods in applied probability and statistics for students aspiring to careers in insurance actuarial science and finance the book builds on students existing knowledge of probability and statistics by establishing a solid and thorough understanding of

A Probabilistic Theory of Pattern Recognition

1997-02-20

パターン認識と機械学習

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Probability and Computing

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Probabilistic Expert Systems

1996-01-01

Probabilistic Methods in Geotechnical Engineering

2007-12-14

The Probabilistic Method

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The Probabilistic Method for Upper Bounds in Domination Theory

2010

Probabilistic Methods in Discrete

Mathematics

1993

A Probabilistic Method of Determining the Number of Local Minima of a Multivariable Function

1993

A Defense of a Probabilistic Method of Establishing Mathematical Truths

1995

Probabilistic Methods In The Theory Of Structures: Strength Of Materials, Random Vibrations, And Random Buckling

2017-03-23

Graph Searching Games and Probabilistic Methods

2017-11-28

Application of a Probabilistic Method Based on Neutrosophic Number in Rock

Slope Stability Assessment

2014-05-19

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2007-03-05

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