Estructuras Discretas

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Estructuras Discretas ***2023-07-23***

HARRELL ANDREW

Separated Representations and PGD-Based Model Reduction Springer Science & Business Media
Esta obra anima al lector a sumergirse en este apasionante mundo de las matemáticas finitas y particularmente a su estudio mediante el apoyo complementario de software. Bajo esta perspectiva, este libro brinda una alternativa asistida por computadora hacia la búsqueda de metodologías educativas más propicias, dentro de un escenario en las instituciones universitarias, donde el uso mediado de la tecnología se propone como una necesidad para alcanzar aprendizajes más significativos.
Discrete Probability and Algorithms Alpha Editorial
The theory presented in this book is developed constructively, is based on a few axioms encapsulating the notion of objects (points and sets) being apart, and encompasses both point-set topology and the theory of uniform spaces. While the classical-logic-based theory of proximity spaces provides some guidance for the theory of apartness, the notion of nearness/proximity does not embody enough algorithmic information for a deep constructive development. The use of constructive (intuitionistic) logic in this book requires much more technical ingenuity than one finds in classical proximity theory -- algorithmic information does not come cheaply -- but it often reveals distinctions that are rendered invisible by classical logic. In the first chapter the authors outline informal constructive logic and set theory, and, briefly, the basic notions and notations for metric and topological spaces. In the second they introduce axioms for a point-set apartness and then explore some of the consequences of those axioms. In particular, they examine a natural topology associated with an apartness space, and relations between various types of continuity of mappings. In the third chapter the authors extend the notion of

point-set (pre-)apartness axiomatically to one of (pre-)apartness between subsets of an inhabited set. They then provide axioms for a quasiuniform space, perhaps the most important type of set-set apartness space. Quasiuniform spaces play a major role in the remainder of the chapter, which covers such topics as the connection between uniform and strong continuity (arguably the most technically difficult part of the book), apartness and convergence in function spaces, types of completeness, and neat compactness. Each chapter has a Notes section, in which are found comments on the definitions, results, and proofs, as well as occasional pointers to future work. The book ends with a Postlude that refers to other constructive approaches to topology, with emphasis on the relation between apartness spaces and formal topology. Largely an exposition of the authors' own research, this is the first book dealing with the apartness approach to constructive topology, and is a valuable addition to the literature on constructive mathematics and on topology in computer science. It is aimed at graduate students and advanced researchers in theoretical computer science, mathematics, and logic who are interested in constructive/algorithmic aspects of topology. *Jenetian* Springer

En estos momentos el lector se estará preguntando ¿qué son las Matemáticas Discretas?, pero a menos de que haya cursado dicha asignatura, difícilmente podrá contestar esta pregunta de forma correcta. Lo inquietante no es el término matemáticas, sino “discretas”. De manera coloquial, alguien discreto es aquella persona que tiene reserva o prudencia. Primero definiremos qué son las matemáticas. Para tal fin nos hemos basado en el Diccionario de la Real Academia de la Lengua Española que la define como “la ciencia deductiva que estudia las propiedades de los entes abstractos, como números, figuras geométricas o símbolos y sus relaciones”. Ahora, para darnos una idea más clara del concepto “discreto” hay que considerar que todo fenómeno que ocurre en la naturaleza puede ser clasificado como uno de dos fenómenos: continuo o discreto. Para entender la diferencia entre ambos conceptos consideremos el siguiente ejemplo: Un fenómeno común, para la mayoría de nosotros, es manejar un automóvil. Resulta que en este acto se presentan los dos tipos de fenómenos. El continuo ocurre conforme se va incrementando la velocidad, pues se inicia en cero y se acelera paulatinamente hasta alcanzar una velocidad máxima. Desde esta perspectiva hay una infinidad de velocidades entre el valor inicial y el máximo; es decir, es posible tomar cualquier valor dentro de un rango previamente establecido y esto de una forma gradual. El discreto ocurre cuando se cambian las velocidades, pues únicamente se tiene una determinada cantidad de velocidades y solo se puede estar en una de ellas; es decir, primera, segunda, tercera, cuarta, reversa; nunca va a ocurrir que se cambie a la velocidad segunda con dos cuartos o tercera con un quinto. En este caso, se tiene una cantidad finita de valores dados y cuando se está en uno de ellos para cambiar a otro se hace de forma abrupta;

es decir, no es posible hacer un cambio gradual ni pausado. Lo mismo ocurre con las matemáticas, pues se puede dividir en dos grandes ramas: las continuas y las discretas.
Advances in Steiner Trees Iberoamericana Editorial
Many-valued logics were developed as an attempt to handle philosophical doubts about the "law of the excluded middle" in classical logic. This discussion, which began in the 1920s, has greatly expanded in recent years with the development of various logical systems including fuzzy and approximation logic. While acquainting the reader with the theoretical fundamentals, the text serves as a kind of compass, pointing out which logical system best answers a particular type of problem. Annotation copyright by Book News, Inc., Portland, OR
Discretization Methods and Iterative Solvers Based on Domain Decomposition CRC Press
This book shows how the Bayesian Approach (BA) improves well known heuristics by randomizing and optimizing their parameters. That is the Bayesian Heuristic Approach (BHA). The ten in-depth examples are designed to teach Operations Research using Internet. Each example is a simple representation of some impor tant family of real-life problems. The accompanying software can be run by remote Internet users. The supporting web-sites include software for Java, C++, and other lan guages. A theoretical setting is described in which one can discuss a Bayesian adaptive choice of heuristics for discrete and global optimization prob lems. The techniques are evaluated in the spirit of the average rather than the worst case analysis. In this context, "heuristics" are understood to be an expert opinion defining how to solve a family of problems of dis crete or global optimization. The term "Bayesian Heuristic Approach" means that one defines a set of heuristics and fixes some prior distribu tion on the results obtained. By applying BHA one is looking for the heuristic that reduces the average deviation from the global optimum. The theoretical discussions serve as an introduction to examples that are the main part of the book. All the examples are interconnected. Dif ferent examples illustrate different points of the general subject. How ever, one can consider each example separately, too.
Discrete Mathematics Days 2022 Pearson Educación
The design of approximation algorithms for spanning tree problems has become an exciting and important area of theoretical computer science and also plays a significant role in emerging fields such as biological sequence alignments and evolutionary tree construction. While work in this field remains quite active, the time has come to collect under
Generalized Notions of Continued Fractions Springer Science & Business Media
Spectral Theory of Random Matrices
Combinatorial Algebra: Syntax and Semantics Pearson Educación
This volume deals with problems of modern effective algorithms for the numerical solution of the most frequently occurring elliptic partial differential equations. From the point of view of implementation, attention is paid to algorithms for both classical sequential and parallel computer

systems. The first two chapters are devoted to fast algorithms for solving the Poisson and biharmonic equation. In the third chapter, parallel algorithms for model parallel computer systems of the SIMD and MIMD types are described. The implementation aspects of parallel algorithms for solving model elliptic boundary value problems are outlined for systems with matrix, pipeline and multiprocessor parallel computer architectures. A modern and popular multigrid computational principle which offers a good opportunity for a parallel realization is described in the next chapter. More parallel variants based in this idea are presented, whereby methods and assignments strategies for hypercube systems are treated in more detail. The last chapter presents VLSI designs for solving special tridiagonal linear systems of equations arising from finite-difference approximations of elliptic problems. For researchers interested in the development and application of fast algorithms for solving elliptic partial differential equations using advanced computer systems.

Semi-Infinite Programming CRC Press This Festschrift volume, published in honor of Kokichi Futatsugi, contains 31 invited contributions from internationally leading researchers in formal methods and software engineering. Prof. Futatsugi is one of the founding fathers of the field of algebraic specification and verification and is a leading researcher in formal methods and software engineering. He has pioneered and advanced novel algebraic methods and languages supporting them such as OBJ and CafeOBJ and has worked tirelessly over the years to bring such methods and tools in contact with software engineering practice. This volume contains contributions from internationally leading researchers in formal methods and software engineering.

Matemáticas discretas y combinatoria : una introducción con aplicaciones SIAM
La matemática discreta es la parte de las matemáticas que trata de estructuras finitas y numerables. Esta nueva rama de la ciencia matemática ha recibido un impulso decisivo gracias a los recientes progresos de la informática y las técnicas de computación

Spanning Trees and Optimization Problems CRC Press
• Example-driven approach • Suitable as supplementary reading for a graduate or advanced undergraduate course in dynamical systems

Matemáticas Discretas: con un enfoque desde la ingeniería y ciencias sociales. conceptos básicos Elsevier
La matemática discreta puede describirse como la rama de las matemáticas que estudia las estructuras cuyos conjuntos elementos están aislados entre sí. Algunos de los temas básicos de los que se ocupa esta área son las técnicas de enumeración, la teoría de conjuntos, las estructuras combinatorias, la teoría de grafos, las estructuras algebraicas aplicadas a la electrónica digital, las versiones discretas de la geometría, y la teoría de códigos. Esta área ha recibido un gran impulso en las últimas décadas gracias al desarrollo espectacular de la informática y las telecomunicaciones, por lo que actualmente es

una de las ramas de la matemática aplicada con más vitalidad. Este auge es debido también a personas como Stephen Wolfram (A New Kind of Science) que plantean que el universo está formado por puntos discretos que están unidos por caminos, que permiten a los objetos moverse por el espacio. La presente obra pretende estructurar un curso basado en el modelo de com-petencias que, al momento de finalizar este trabajo, es el esquema más am-pliamente difundido en las universidades de México. Las competencias que se pretenden transmitir son propias de prácticamente cualquier ingeniería tecnológica, por lo que cualquier estudiante de este tipo de carreras puede verse beneficiado del estudio de este material. Cada uno de los temas se expone basándose en los tiempos y ritmos de aprendizaje de las nuevas generaciones. Siempre que se ha podido, se han utilizado diversas técnicas de las que contempla la teoría pedagógica: expositiva, diálogo-discusión y vivencial. Cada capítulo representa una clase completa. Se comienza dando una introducción al problema, sus alcances, algunas de sus aplicaciones, ejemplos y, finalmente, ejercicios para que los participantes realicen en sus bitácoras de trabajo. El manual es auto contenido y puede estudiarse de manera autodidacta. No es necesario seguir el orden sugerido de las sesiones, aunque en algunos ca-sos se deberá revisar alguno de los temas previos. Se espera que el partici-pante ya haya llevado los cursos de álgebra superior y álgebra lineal, aunque esto no es del todo indispensable. En el caso de los facilitadores del conocimiento, es conveniente que al principio de cada sesión resuelvan las dudas sobre los ejercicios de la clase anterior. De esta manera se conseguirá que, desde el punto de vista constructivista, el aprendizaje del participante sea más significativo. Silvia Claudia Gavito Ticozzi Dra. en Ciencias Matemáticas por la Universidad Nacional Autónoma de MéxicoManuel Antonio López RamírezDr. en Ciencias Matemáticas por la Universidad Nacional Autónoma de México)Ciudad de MéxicoVerano de 2020

Matemáticas discretas
Springer Science & Business Media
This book presents an up-to-date set of contributions by the most influential authors on the Steiner Tree problem. The authors address the latest concerns of Steiner Trees for their computational complexity, design of algorithms, performance guaranteed heuristics, computational experimentation, and range of applications. Audience: The book is intended for advanced undergraduates, graduates and research scientists in Combinational Optimization and Computer Science. It is divided into two sections: Part I includes papers on the general geometric Steiner Tree problem in the plane and higher dimensions; Part II includes papers on the Steiner problem on graphs which has significant import to Steiner Tree applications.
Active Subspaces CRC Press
Cryptography plays a key role in ensuring the privacy and integrity of data and the security of computer networks. Introduction to Modern Cryptography provides a rigorous yet accessible

treatment of modern cryptography, with a focus on formal definitions, precise assumptions, and rigorous proofs. The authors introduce the core principles of modern cryptography, including the modern, computational approach to security that overcomes the limitations of perfect secrecy. An extensive treatment of private-key encryption and message authentication follows. The authors also illustrate design principles for block ciphers, such as the Data Encryption Standard (DES) and the Advanced Encryption Standard (AES), and present provably secure constructions of block ciphers from lower-level primitives. The second half of the book focuses on public-key cryptography, beginning with a self-contained introduction to the number theory needed to understand the RSA, Diffie-Hellman, El Gamal, and other cryptosystems. After exploring public-key encryption and digital signatures, the book concludes with a discussion of the random oracle model and its applications. Serving as a textbook, a reference, or for self-study, Introduction to Modern Cryptography presents the necessary tools to fully understand this fascinating subject.

Algorithms for Elliptic Problems UNMSM

Ancient times witnessed the origins of the theory of continued fractions. Throughout time, mathematical geniuses such as Euclid, Aryabhata, Fibonacci, Bombelli, Wallis, Huygens, or Euler have made significant contributions to the development of this famous theory, and it continues to evolve today, especially as a means of linking different areas of mathematics. This book, whose primary audience is graduate students and senior researchers, is motivated by the fascinating interrelations between ergodic theory and number theory (as established since the 1950s). It examines several generalizations and extensions of classical continued fractions, including generalized Lehner, simple, and Hirzebruch-Jung continued fractions. After deriving invariant ergodic measures for each of the underlying transformations on [0,1] it is shown that any of the famous formulas, going back to Khintchine and Levy, carry over to more general settings. Complementing these results, the entropy of the transformations is calculated and the natural extensions of the dynamical systems to [0,1]2 are analyzed. Features Suitable for graduate students and senior researchers Written by international senior experts in number theory Contains the basic background, including some elementary results, that the reader may need to know before hand, making it a self-contained volume

Estructuras discretas con Mathematica CRC Press

Domain decomposition methods provide powerful and flexible tools for the numerical approximation of partial differential equations arising in the modeling of many interesting applications in science and engineering. This book deals with discretization techniques on non-matching triangulations and iterative solvers with particular emphasis on mortar finite elements, Schwarz methods and multigrid techniques. New results on non-standard situations as mortar methods based on dual basis functions and vector field discretizations are

analyzed and illustrated by numerical results. The role of trace theorems, harmonic extensions, dual norms and weak interface conditions is emphasized. Although the original idea was used successfully more than a hundred years ago, these methods are relatively new for the numerical approximation. The possibilites of high performance computations and the interest in large- scale problems have led to an increased research activity.

Introduction to Nonparametric Detection with Applications Springer Science & Business Media

Provability, Computability and Reflection

Shape Optimization Problems Springer

A memorial conference for Leon Ehrenpreis was held at Temple University, November 15-16, 2010. In the spirit of Ehrenpreis's contribution to mathematics, the papers in this volume, written by prominent mathematicians, represent the wide breadth of subjects that Ehrenpreis traversed in his career, including partial differential equations, combinatorics, number theory, complex analysis and a bit of applied mathematics. With the exception of one survey article, the papers in this volume are all new results in the various fields in which Ehrenpreis worked . There are papers in pure analysis, papers in number theory, papers in what may be called applied mathematics such as population biology and parallel refractors and papers in partial differential equations. The mature mathematician will find new mathematics and the advanced graduate student will find many new ideas to explore.A biographical sketch of Leon Ehrenpreis by his daughter, a professional journalist, enhances the memorial tribute and gives the reader a glimpse into the life and career of a great mathematician.

Introduction to Modern Cryptography Springer

El congreso Discrete Mathematics Days (DMD20/22) tendrá lugar del 4 al 6 de julio de 2022, en la Facultad de Ciencias de la Universidad de Cantabria (Santander, España). Este congreso internacional se centra en avances dentro del campo de la Matemática discreta, incluyendo, de manera no exhaustiva: · Algoritmos y Complejidad · Combinatoria · Teoría de Códigos · Criptografía · Geometría Discreta y Computacional · Optimización Discreta · Teoría de Grafos · Problemas de localización discreta y temas relacionados Las ediciones anteriores de este evento se celebraros en Sevilla (2018) y Barcelona (2016), estos congresos heredan la tradición de las Jornadas de Matemática Discreta y Algorítmica (JMDA), el encuentro bienal en España en Matemática Discreta (desde 1998). Durante la celebración del congreso tendrán lugar cuatro conferencias plenarias, cuarenta y dos presentaciones orales y una sesión de once pósteres. Abstract The Discrete Mathematics Days (DMD20/22) will be held on July 4-6, 2022, at Facultad de Ciencias of the Universidad de Cantabria (Santander, Spain). The main focus of this international conference is on current topics in Discrete Mathematics, including (but not limited to): Algorithms and Complexity Combinatorics Coding Theory Cryptography Discrete and Computational Geometry Discrete Optimization Graph Theory Location and

Related Problems The previous editions were held in Sevilla in 2018 and in Barcelona in 2016, inheriting the tradition of the Jornadas de Matemática Discreta y Algorítmica (JMDA), the Spanish biennial meeting (since 1998) on Discrete Mathematics. The program consists on four plenary talks, 42 contributed talks and a poster session with 11 contributions.

Estructuras de matemáticas discretas para la computación

Springer Science & Business Media

The mathematical theory of computation has given rise to two important ap proaches to the informal notion of "complexity": Kolmogorov complexity, usu ally a complexity measure for a single object such as a string, a sequence etc., measures the amount of information necessary to describe the object. Compu tational complexity, usually a complexity measure for a set of objects, measures the compuational resources necessary to recognize or produce elements of the set. The relation between these two complexity measures has been considered for more than two decades, and may interesting and deep observations have been obtained. In March 1990, the Symposium on Theory and Application of Minimal Length Encoding was held at Stanford University as a part of the AAAI 1990 Spring Symposium Series. Some sessions of the symposium were dedicated to Kolmogorov complexity and its relations to the computational complexity the ory, and excellent expository talks were given there. Feeling that, due to the importance of the material, some way should be found to share these talks with researchers in the computer science community, I asked the speakers of those sessions to write survey papers based on their talks in the symposium. In response, five speakers from the sessions contributed the papers which appear in this book.