Topics in Structural Graph Theory

Some applications of graph theory in the theory of electrical networks marking 94 years since its first appearance, this book provides an annotated translation of Sainte-Laguë's seminal monograph Les réseaux (ou graphes), drawing attention to its fundamental principles and ideas. Sainte-Laguë's 1926 monograph appeared only in French, but in the 1990s H. Gropp published a number of English papers describing several aspects of the book. He expressed his hope that an English translation might sometime be available to the mathematics community. In the 10 years following the appearance of Les réseaux (ou graphes), the development of graph theory continued, culminating in the publication of the first full book on the theory of finite and infinite graphs in 1936 by Dénes Kőnig. This remained the only well-known text until Claude Berge's 1958 book on the theory and applications of graphs. By 1960, graph theory had emerged as a significant mathematical discipline of its own. This book will be of interest to graph theorists and mathematical historians.

Topics in Topological Graph Theory

This volume deals with a variety of problems involving cycles in graphs and circuits in digraphs. Leading researchers in this area present here 3 survey papers and 42 papers containing new results. There is also a collection of unsolved problems.

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Topics in Topological Graph Theory

This volume contains the accounts of the principal survey papers presented at GRAPHS and ORDER, held at Banff, Canada from May 18 to May 31, 1984. This conference was supported by grants from the N.A.T.O. Advanced Study Institute programme, the Natural Sciences and Engineering Research Council of Canada and the University of Calgary. We are grateful for all of this considerable support.
Almost fifty years ago the first Symposium on Lattice Theory was held in Charlottesville, U.S.A. On that occasion the principal lectures were delivered by G. Birkhoff, O. Ore and M.H. Stone. In those days the theory of ordered sets was thought to be a vigorous relative of group theory. Some twenty-five years ago the Symposium on Partially Ordered Sets and Lattice Theory was held in Monterey, U.S.A. Among the principal speakers at that meeting were R.P. Dilworth, B. Jonsson, A. Tarski and G. Birkhoff. Lattice theory had turned inward: it was concerned primarily with problems about lattices themselves. As a matter of fact the problems that were then posed have, by now, in many instances, been completely solved.

Discrete Geometry, Combinatorics and Graph Theory This book provides an up-to-date and rapid introduction to an important and currently active topic in graph theory. The author leads the reader to the forefront of research in this area. Complete and easily readable proofs of all the main theorems, together with numerous examples, exercises and open problems are given. The book is suitable for use as a textbook or as seminar material for advanced undergraduate and graduate students. The references are comprehensive and so it will also be useful for researchers as a handbook.

Graph Drawing

Topics in Chromatic Graph Theory

Graph Theory in Paris Games provide mathematical models for interaction. Numerous tasks in computer science can be formulated in game-theoretic terms. This fresh and intuitive way of thinking through complex issues reveals underlying algorithmic questions and clarifies the relationships between different domains. This collection of lectures, by specialists in the field, provides an excellent introduction to various aspects of game theory relevant for applications in computer science that concern program design, synthesis, verification, testing and design of multi-agent or distributed systems. Originally devised for a Spring School organised by the GAMES Networking Programme in 2009, these lectures have since been revised and expanded, and range from tutorials concerning fundamental notions and methods to more advanced presentations of current research topics. This volume is a valuable guide to current research on game-based methods in computer science for undergraduate and graduate students. It will also interest researchers working in mathematical logic, computer science and game theory.

Handbook of Combinatorics Graph Theory is a part of discrete mathematics characterized by the fact of an extremely rapid development during the last 10 years. The number of graph theoretical paper as well as the number of graph theorists increase very strongly. The main purpose of this book is to show the reader the variety of graph theoretical methods and the relation to combinatorics and to give him a survey on a lot of new results, special methods, and interesting informations. This book, which grew out of contributions given by about 130 authors in honour to the 70th birthday of Gerhard Ringel, one of the pioneers in graph theory, is meant to serve as a source of open problems, reference and guide to the extensive literature and as stimulant to further research on graph theory and combinatorics.

Lecture notes in pure and applied mathematics

50 years of Combinatorics, Graph Theory, and Computing Chromatic graph theory is a thriving area that uses various ideas of ‘colouring’ (of vertices, edges, and so on) to explore aspects of graph theory. It has links with other areas of mathematics, including topology, algebra and geometry, and is increasingly used in such areas as computer networks, where colouring algorithms form an important feature. While other books cover portions of the material, no other title has such a wide scope as this one, in which acknowledged international experts in the field provide a broad survey of the subject. All fifteen chapters have been carefully edited, with uniform notation and terminology applied throughout. Bjarne Toft (Odense, Denmark),
widely recognized for his substantial contributions to the area, acted as academic consultant. The book serves as a valuable reference for researchers and graduate students in graph theory and combinatorics and as a useful introduction to the topic for mathematicians in related fields.

Topics in Combinatorics and Graph Theory The combination of fast, low-latency networks and high-performance, distributed tools for mathematical software has resulted in widespread, affordable scientific computing facilities. Practitioners working in the fields of computer communication networks, distributed computing, computational algebra and numerical analysis have been brought together to contribute to this volume and explore the emerging distributed and parallel technology in a scientific environment. This collection includes surveys and original research on both software infrastructure for parallel applications and hardware and architecture infrastructure. Among the topics covered are switch-based high-speed networks, ATM over local and wide area networks, network performance, application support, finite element methods, eigenvalue problems, invariant subspace decomposition, QR factorization and Todd-Coxeter coset enumeration.

Lecture Notes on Graph Theory In its second edition, expanded with new chapters on domination in graphs and on the spectral properties of graphs, this book offers a solid background in the basics of graph theory. Introduces such topics as Dirac's theorem on k-connected graphs and more.

Lectures in Game Theory for Computer Scientists Graph Theory (as a recognized discipline) is a relative newcomer to Mathematics. The first formal paper is found in the work of Leonhard Euler in 1736. In recent years the subject has grown so rapidly that in today's literature, graph theory papers abound with new mathematical developments and significant applications. As with any academic field, it is good to step back occasionally and ask Where is all this activity taking us?, What are the outstanding fundamental problems?, What are the next important steps to take?. In short, Quo Vadis, Graph Theory?. The contributors to this volume have together provided a comprehensive reference source for future directions and open questions in the field.

Graph Theory Singapore 1983 There is no other book with such a wide scope of both areas of algebraic graph theory.

The Zeroth Book of Graph Theory In the ten years since the publication of the best-selling first edition, more than 1,000 graph theory papers have been published each year. Reflecting these advances, Handbook of Graph Theory, Second Edition provides comprehensive coverage of the main topics in pure and applied graph theory. This second edition—over 400 pages longer than its predecessor—incorporates 14 new sections. Each chapter includes lists of essential definitions and facts, accompanied by examples, tables, remarks, and, in some cases, conjectures and open problems. A bibliography at the end of each chapter provides an extensive guide to the research literature and pointers to monographs. In addition, a glossary is included in each chapter as well as at the end of each section. This edition also contains notes regarding terminology and notation. With 34 new contributors, this handbook is the most comprehensive single-source guide to graph theory. It emphasizes quick accessibility to topics for non-experts and enables easy cross-referencing among chapters.

Graph Theory In July 2004, a conference on graph theory was held in Paris in memory of Claude Berge, one of the pioneers of the field. The event brought together many prominent specialists on topics such as perfect graphs and matching theory, upon which Claude Berge's work has had a major impact. This volume includes contributions to these and other topics from many of the participants.

Topics in Algebraic Graph Theory The rapidly expanding area of structural graph theory uses ideas of connectivity to explore various aspects of graph theory and vice versa. It has links with other areas of mathematics, such as design theory and is increasingly used in such areas as computer
networks where connectivity algorithms are an important feature. Although other books cover parts of this material, none has a similarly wide scope. Ortrud R. Oellermann (Winnipeg), internationally recognised for her substantial contributions to structural graph theory, acted as academic consultant for this volume, helping shape its coverage of key topics. The result is a collection of thirteen expository chapters, each written by acknowledged experts. These contributions have been carefully edited to enhance readability and to standardise the chapter structure, terminology and notation throughout. An introductory chapter details the background material in graph theory and network flows and each chapter concludes with an extensive list of references.

Thirty Essays on Geometric Graph Theory Lecture Notes on GRAPH THEORY By Tero Harju

Fractional Graph Theory This text offers the most comprehensive and up-to-date presentation available on the fundamental topics in graph theory. It develops a thorough understanding of the structure of graphs, the techniques used to analyze problems in graph theory and the uses of graph theoretical algorithms in mathematics, engineering and computer science. There are many new topics in this book that have not appeared before in print: new proofs of various classical theorems, signed degree sequences, criteria for graphical sequences, eccentric sequences, matching and decomposition of planar graphs into trees. Scores in digraphs appear for the first time and include new results due to Pirzada. The climax of the book is a new proof of the famous four colour theorem due to Dharwadker.

Lecture Notes on GRAPH THEORY 50 Years of Combinatorics, Graph Theory, and Computing advances research in discrete mathematics by providing current research surveys, each written by experts in their subjects. The book also celebrates outstanding mathematics from 50 years at the Southeastern International Conference on Combinatorics, Graph Theory & Computing (SEICCGTC). The conference is noted for the dissemination and stimulation of research, while fostering collaborations among mathematical scientists at all stages of their careers. The authors of the chapters highlight open questions. The sections of the book include: Combinatorics; Graph Theory; Combinatorial Matrix Theory; Designs, Geometry, Packing and Covering. Readers will discover the breadth and depth of the presentations at the SEICCGTC, as well as current research in combinatorics, graph theory and computer science. Features: Commemorates 50 years of the Southeastern International Conference on Combinatorics, Graph Theory & Computing with research surveys Surveys highlight open questions to inspire further research Chapters are written by experts in their fields Extensive bibliographies are provided at the end of each chapter

Graph Theory Concisely written, gentle introduction to graph theory suitable as a textbook or for self-study Graph-theoretic applications from diverse fields (computer science, engineering, chemistry, management science) 2nd ed. includes new chapters on labeling and communications networks and small worlds, as well as expanded beginner's material Many additional changes, improvements, and corrections resulting from classroom use

The Seventh European Conference on Combinatorics, Graph Theory and Applications

Handbook of Graph Theory, Second Edition Algorithmic Graph Theory and Perfect Graphs provides an introduction to graph theory through practical problems. This book presents the mathematical and algorithmic properties of special classes of perfect graphs. Organized into 12 chapters, this book begins with an overview of the graph theoretic notions and the algorithmic design. This text then examines the complexity analysis of computer algorithm and explains the differences between computability and computational complexity. Other chapters consider the parameters and properties of a perfect graph and explore the class of perfect graphs known as comparability graph or transitively orientable graphs. This book discusses as well the two characterizations of triangulated graphs, one algorithmic and the other graph theoretic. The final chapter deals with the method of performing

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Gaussian elimination on a sparse matrix wherein an arbitrary choice of pivots may result in the filling of some zero positions with nonzeros. This book is a valuable resource for mathematicians and computer scientists.

Algorithmic Graph Theory and Perfect Graphs The book is based on the syllabus of Computer Science and Engineering Programme under A P J Abdul Kalam Technological University, Kerala.

Basic Graph Theory

Algebraic Graph Theory

Graph Theory and Applications Algorithmic graph theory has been expanding at an extremely rapid rate since the middle of the twentieth century, in parallel with the growth of computer science and the accompanying utilization of computers, where efficient algorithms have been a prime goal. This book presents material on developments on graph algorithms and related concepts that will be of value to both mathematicians and computer scientists, at a level suitable for graduate students, researchers and instructors. The fifteen expository chapters, written by acknowledged international experts on their subjects, focus on the application of algorithms to solve particular problems. All chapters were carefully edited to enhance readability and standardize the chapter structure as well as the terminology and notation. The editors provide basic background material in graph theory, and a chapter written by the book’s Academic Consultant, Martin Charles Golumbic (University of Haifa, Israel), provides background material on algorithms as connected with graph theory.

RECENT TRENDS IN GRAPH THEORY - PROCEEDINGS - 1ST NEW YORK CITY GRAPH THEORY CONFERENCE - LECTURE NOTES IN MATHEMATICS

Graph models are extremely useful for a large number of applications as they play an important role as structuring tools. They allow to model net structures – like roads, computers, telephones, social networks – instances of abstract data structures – like lists, stacks, trees – and functional or object oriented programming. The focus of this highly self-contained book is on homomorphisms and endomorphisms, matrices and eigenvalues.

Total Colourings of Graphs The use of topological ideas to explore various aspects of graph theory, and vice versa, is a fruitful area of research. There are links with other areas of mathematics, such as design theory and geometry, and increasingly with such areas as computer networks where symmetry is an important feature. Other books cover portions of the material here, but there are no other books with such a wide scope. This book contains fifteen expository chapters written by acknowledged international experts in the field. Their well-written contributions have been carefully edited to enhance readability and to standardize the chapter structure, terminology and notation throughout the book. To help the reader, there is an extensive introductory chapter that covers the basic background material in graph theory and the topology of surfaces. Each chapter concludes with an extensive list of references.

Cycles in Graphs In many applications of graph theory, graphs are regarded as geometric objects drawn in the plane or in some other surface. The traditional methods of "abstract" graph theory are often incapable of providing satisfactory answers to questions arising in such applications. In the past couple of decades, many powerful new combinatorial and topological techniques have been developed to tackle these problems. Today geometric graph theory is a burgeoning field with many striking results and appealing open questions. This contributed volume contains thirty original survey and research papers on important recent developments in geometric graph theory. The contributions were thoroughly reviewed and written by excellent researchers in this field.
Selected Topics from Algebraic Graph Theory This book constitutes the thoroughly refereed post-proceedings of the 7th China-Japan Conference on Discrete Geometry, Combinatorics and Graph Theory, CJCDGCGT 2005, held in Tianjin, China, as well as in Xi’an, China, in November 2005. The 30 revised full papers address all current issues in discrete algorithmic geometry, combinatorics and graph theory.

A Beginner’s Guide to Graph Theory A unified treatment of the most important results in the study of fractional graph concepts, this volume explores the various ways in which integer-valued concepts can be modified to derive nonintegral values. It begins with the general fractional theory of hypergraphs and presents in-depth coverage of fundamental and advanced topics. Subjects include fractional matching, fractional coloring, fractional edge coloring, fractional arboricity via matroid methods, and fractional isomorphism. The final chapter examines additional topics such as fractional domination, fractional intersection numbers, and fractional aspects of partially ordered sets. Challenging exercises reinforce the contents of each chapter, and the authors provide substantial references and bibliographic materials. A comprehensive reference for researchers, this volume also constitutes an excellent graduate-level text for students of graph theory and linear programming.

Lecture Notes in Graph Theory This undergraduate textbook provides an introduction to graph theory, which has numerous applications in modeling problems in science and technology, and has become a vital component to computer science, computer science and engineering, and mathematics curricula of universities all over the world. The author follows a methodical and easy to understand approach. Beginning with the historical background, motivation and applications of graph theory, the author first explains basic graph theoretic terminologies. From this firm foundation, the author goes on to present paths, cycles, connectivity, trees, matchings, coverings, planar graphs, graph coloring and digraphs as well as some special classes of graphs together with some research topics for advanced study. Filled with exercises and illustrations, Basic Graph Theory is a valuable resource for any undergraduate student to understand and gain confidence in graph theory and its applications to scientific research, algorithms and problem solving.

Quo Vadis, Graph Theory? Covers combinatorics in graph theory, theoretical computer science, optimization, and convexity theory, plus applications in operations research, electrical engineering, statistical mechanics, chemistry, molecular biology, pure mathematics, and computer science.

Graphs and Order

Fractional Graph Theory

A Textbook of Graph Theory This second volume in a two-volume series provides an extensive collection of conjectures and open problems in graph theory. It is designed for both graduate students and established researchers in discrete mathematics who are searching for research ideas and references. Each chapter provides more than a simple collection of results on a particular topic; it captures the reader’s interest with techniques that worked and failed in attempting to solve particular conjectures. The history and origins of specific conjectures and the methods of researching them are also included throughout this volume. Students and researchers can discover how the conjectures have evolved and the various approaches that have been used in an attempt to solve them. An annotated glossary of nearly 300 graph theory parameters, 70 conjectures, and over 600 references is also included in this volume. This glossary provides an understanding of parameters beyond their definitions and enables readers to discover new ideas and new definitions in graph theory. The editors were inspired to create this series of volumes by the popular and well-attended special sessions entitled “My Favorite Graph Theory Conjectures,” which they organized at past AMS meetings. These sessions were held at the winter AMS/MAA Joint Meeting in Boston, January 2012, the SIAM Conference on Discrete Mathematics in Halifax in June 2012, as well as the winter AMS/MAA Joint Meeting
in Baltimore in January 2014, at which many of the best-known graph theorists spoke. In an effort to aid in the creation and dissemination of conjectures and open problems, which is crucial to the growth and development of this field, the editors invited these speakers, as well as other experts in graph theory, to contribute to this series.

Topics in Algorithmic Graph Theory Graph Theory and Applications

GRAPH THEORY AND APPLICATIONS- PROCEEDINGS OF A CONFERENCE- LECTURE NOTES IN MATHEMATICS 303 Notes of a lecture delivered by the author at the Indian Statistical Institute, New Delhi.

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