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Graph Theory with Applications to Algorithms and Computer Science Infinite Study

Total Domination in Graphs gives a clear understanding of this topic to any interested reader who has a modest background in graph theory. This book provides and explores the fundamentals of

total domination in graphs. Some of the topics featured include the interplay between total domination in graphs and transversals in hypergraphs, and the association with total domination in graphs and diameter-2-critical graphs. Several proofs are included in this text which enables readers to acquaint themselves with a toolbox of proof techniques and ideas with which to attack open problems in the field. This work is an excellent resource for students interested in beginning their research in this field. Additionally, established researchers will find the book valuable to have as it contains the latest developments and open problems.

Total Domination in Graphs Independent Author

This book presents the refereed proceedings of the 12th Annual International Computing and Combinatorics Conference, COCOON 2006, held in Taipei, Taiwan, August 2006. The book offers 52 revised full papers presented together with abstracts of 2 invited talks. The papers are organized in topical sections on computational economics, finance, and management, graph algorithms, computational complexity and computability, quantum computing, computational biology and medicine, computational geometry, graph theory, and more.

Distances and Domination in Graphs Infinite Study

This volume comprises 16 contributions that present advanced topics in graph domination, featuring open problems, modern techniques, and recent results. The focus is on primary dominating sets such as paired domination, connected domination, restrained domination, dominating functions, Roman domination, and power domination. Additionally, surveys include known results with a sample of proof techniques for each parameter. Of extra benefit to the reader, the first chapter includes a glossary of commonly used terms; the second chapter provides an overview of models of domination from which the parameters are defined. The book is intended to provide a reference for established researchers in the fields of domination and graph theory and graduate students who wish to gain knowledge of the topics covered as well as an overview of the major accomplishments in the field and proof techniques used.

Domination Theory And Beyond CRC Press

This new edition illustrates the power of linear algebra in the study of graphs. The emphasis on matrix techniques is greater than in other texts on algebraic graph theory. Important matrices associated with graphs (for example, incidence, adjacency and Laplacian matrices) are treated in detail. Presenting a useful overview of selected topics in algebraic graph

theory, early chapters of the text focus on regular graphs, algebraic connectivity, the distance matrix of a tree, and its generalized version for arbitrary graphs, known as the resistance matrix. Coverage of later topics include Laplacian eigenvalues of threshold graphs, the positive definite completion problem and matrix games based on a graph. Such an extensive coverage of the subject area provides a welcome prompt for further exploration. The inclusion of exercises enables practical learning throughout the book. In the new edition, a new chapter is added on the line graph of a tree, while some results in Chapter 6 on Perron-Frobenius theory are reorganized. Whilst this book will be invaluable to students and researchers in graph theory and combinatorial matrix theory, it will also benefit readers in the sciences and engineering.

Domination in Graphs CRC Press

This book provides a timely overview of fuzzy graph theory, laying the foundation for future applications in a broad range of areas. It introduces readers to fundamental theories, such as Craine's work on fuzzy interval graphs, fuzzy analogs of Marczewski's theorem, and the Gilmore and Hoffman characterization. It also introduces them to the Fulkerson and Gross characterization and Menger's theorem, the applications of which will be discussed in a forthcoming book by the same authors. This book also discusses in detail important concepts such as connectivity, distance and saturation in fuzzy graphs. Thanks to the good balance between the basics of fuzzy graph theory and new findings obtained by the authors, the book offers an excellent reference guide for advanced undergraduate and graduate students in mathematics, engineering and computer science, and an inspiring read for all researchers interested in new developments in fuzzy logic and applied mathematics.

Research Trends in Graph Theory and Applications Springer

In this research book, there are some research chapters on "Domination Theory And Beyond". With researches on the basic properties, the research book starts to make Domination Theory And Beyond more understandable. Some studies and researches about neutrosophic graphs, are proposed as

book in the following by Henry Garrett (2022) which is indexed by Google Scholar and has more than 2498 readers in Scribd. It's titled "Beyond Neutrosophic Graphs" and published by Ohio: E-publishing: Educational Publisher 1091 West 1st Ave Grandview Heights, Ohio 43212 United State. This research book covers different types of notions and settings in neutrosophic graph theory and neutrosophic SuperHyperGraph theory. [Ref] Henry Garrett, (2022). "Beyond Neutrosophic Graphs", Ohio: E-publishing: Educational Publisher 1091 West 1st Ave Grandview Heights, Ohio 43212 United States. ISBN: 978-1-59973-725-6 (<http://fs.unm.edu/BeyondNeutrosophicGraphs.pdf>). Also, some studies and researches about neutrosophic graphs, are proposed as book in the following by Henry Garrett (2022) which is indexed by Google Scholar and has more than 3218 readers in Scribd. It's titled "Neutrosophic Duality" and published by Florida: GLOBAL KNOWLEDGE - Publishing House 848 Brickell Ave Ste 950 Miami, Florida 33131 United States. This research book presents different types of notions SuperHyperResolving and SuperHyperDominating in the setting of duality in neutrosophic graph theory and neutrosophic SuperHyperGraph theory. This research book has scrutiny on the complement of the intended set and the intended set, simultaneously. It's smart to consider a set but acting on its complement that what's done in this research book which is popular in the terms of high readers in Scribd. [Ref] Henry Garrett, (2022). "Neutrosophic Duality", Florida: GLOBAL KNOW- LEDGE - Publishing House 848 Brickell Ave Ste 950 Miami, Florida 33131 United States. ISBN: 978-1-59973-743-0 (<http://fs.unm.edu/NeutrosophicDuality.pdf>). \section{Background} There are some researches covering the topic of this research. In what follows, there are some discussion and literature reviews about them. \ \ First article is titled "properties of SuperHyperGraph and neutrosophic SuperHyperGraph" in \textbf{[Ref.]} \cite{HG1} by Henry Garrett (2022). It's first step toward the research on neutrosophic SuperHyperGraphs. This research article is published on the journal "Neutrosophic Sets and Systems" in issue 49 and the pages 531-561. In this research article, different types of notions like dominating, resolving, coloring, Eulerian(Hamiltonian) neutrosophic path, n-

Eulerian(Hamiltonian) neutrosophic path, zero forcing number, zero forcing neutrosophic- number, independent number, independent neutrosophic- number, clique number, clique neutrosophic-number, matching number, matching neutrosophic-number, girth, neutrosophic girth, 1-zero-forcing number, 1-zero- forcing neutrosophic-number, failed 1-zero-forcing number, failed 1-zero-forcing neutrosophic-number, global- offensive alliance, t- offensive alliance, t-defensive alliance, t-powerful alliance, and global- powerful alliance are defined in SuperHyperGraph and neutrosophic SuperHyperGraph. Some Classes of SuperHyperGraph and Neutrosophic SuperHyperGraph are cases of research. Some results are applied in family of SuperHyperGraph and neutrosophic SuperHyperGraph. Thus this research article has concentrated on the vast notions and introducing the majority of notions. \ \ The seminal paper and groundbreaking article is titled "neutrosophic co-degree and neutrosophic degree alongside chromatic numbers in the setting of some classes related to neutrosophic hypergraphs" in \textbf{[Ref.]} \cite{HG2} by Henry Garrett (2022). In this research article, a novel approach is implemented on SuperHyperGraph and neutrosophic SuperHyperGraph based on general forms without using neutrosophic classes of neutrosophic SuperHyperGraph. It's published in prestigious and fancy journal is entitled "Journal of Current Trends in Computer Science Research (JCTCSR)" with abbreviation "J Curr Trends Comp Sci Res" in volume 1 and issue 1 with pages 06-14. The research article studies deeply with choosing neutrosophic hypergraphs instead of neutrosophic SuperHyperGraph. It's the breakthrough toward independent results based on initial background. \ \ The seminal paper and groundbreaking article is titled "Super Hyper Dominating and Super Hyper Resolving on Neutrosophic Super Hyper Graphs and Their Directions in Game Theory and Neutrosophic Super Hyper Classes" in \textbf{[Ref.]} \cite{HG3} by Henry Garrett (2022). In this research article, a novel approach is implemented on SuperHyperGraph and neutrosophic SuperHyperGraph based on fundamental SuperHyperNumber and using neutrosophic SuperHyperClasses of neutrosophic SuperHyperGraph. It's published in prestigious and fancy journal is entitled "Journal of Mathematical Techniques and Computational

Mathematics(JMTCM)" with abbreviation ``J Math Techniques Comput Math" in volume 1 and issue 3 with pages 242-263. The research article studies deeply with choosing directly neutrosophic SuperHyperGraph and SuperHyperGraph. It's the breakthrough toward independent results based on initial background and fundamental SuperHyperNumbers. \ In some articles are titled ``0039 | Closing Numbers and Super-Closing Numbers as (Dual)Resolving and (Dual)Coloring alongside (Dual)Dominating in (Neutrosophic)n-SuperHyperGraph" in \textbf{Ref.} \cite{HG4} by Henry Garrett (2022), ``0049 | (Failed)1-Zero-Forcing Number in Neutrosophic Graphs" in \textbf{Ref.} \cite{HG5} by Henry Garrett (2022), ``Extreme SuperHyperClique as the Firm Scheme of Confrontation under Cancer's Recognition as the Model in The Setting of (Neutrosophic) SuperHyperGraphs" in \textbf{Ref.} \cite{HG6} by Henry Garrett (2022), ``Uncertainty On The Act And Effect Of Cancer Alongside The Foggy Positions Of Cells Toward Neutrosophic Failed SuperHyperClique inside Neutrosophic SuperHyperGraphs Titled Cancer's Recognition" in \textbf{Ref.} \cite{HG7} by Henry Garrett (2022), ``Neutrosophic Version Of Separates Groups Of Cells In Cancer's Recognition On Neutrosophic SuperHyperGraphs" in \textbf{Ref.} \cite{HG8} by Henry Garrett (2022), ``The Shift Paradigm To Classify Separately The Cells and Affected Cells Toward The Totality Under Cancer's Recognition By New Multiple Definitions On the Sets Polynomials Alongside Numbers In The (Neutrosophic) SuperHyperMatching Theory Based on SuperHyperGraph and Neutrosophic SuperHyperGraph" in \textbf{Ref.} \cite{HG9} by Henry Garrett (2022), ``Breaking the Continuity and Uniformity of Cancer In The Worst Case of Full Connections With Extreme Failed SuperHyperClique In Cancer's Recognition Applied in (Neutrosophic) SuperHyperGraphs" in \textbf{Ref.} \cite{HG10} by Henry Garrett (2022), ``Neutrosophic Failed SuperHyperStable as the Survivors on the Cancer's Neutrosophic Recognition Based on Uncertainty to All Modes in Neutrosophic SuperHyperGraphs" in \textbf{Ref.} \cite{HG11} by Henry Garrett (2022), ``Extremism of the Attacked Body Under the Cancer's Circumstances Where Cancer's Recognition Titled (Neutrosophic) SuperHyperGraphs" in

\textbf{Ref.} \cite{HG12} by Henry Garrett (2022), ``(Neutrosophic) 1-Failed SuperHyperForcing in Cancer's Recognitions And (Neutrosophic) SuperHyperGraphs" in \textbf{Ref.} \cite{HG13} by Henry Garrett (2022), ``Neutrosophic Messy-Style SuperHyperGraphs To Form Neutrosophic SuperHyperStable To Act on Cancer's Neutrosophic Recognitions In Special ViewPoints" in \textbf{Ref.} \cite{HG14} by Henry Garrett (2022), ``Neutrosophic 1-Failed SuperHyperForcing in the SuperHyperFunction To Use Neutrosophic SuperHyperGraphs on Cancer's Neutrosophic Recognition And Beyond" in \textbf{Ref.} \cite{HG15} by Henry Garrett (2022), ``(Neutrosophic) SuperHyperStable on Cancer's Recognition by Well-SuperHyperModelled (Neutrosophic) SuperHyperGraphs " in \textbf{Ref.} \cite{HG16} by Henry Garrett (2022), ``Neutrosophic Messy-Style SuperHyperGraphs To Form Neutrosophic SuperHyperStable To Act on Cancer's Neutrosophic Recognitions In Special ViewPoints" in \textbf{Ref.} \cite{HG12} by Henry Garrett (2022), ``Basic Notions on (Neutrosophic) SuperHyperForcing And (Neutrosophic) SuperHyperModeling in Cancer's Recognitions And (Neutrosophic) SuperHyperGraphs" in \textbf{Ref.} \cite{HG17} by Henry Garrett (2022), ``Neutrosophic Messy-Style SuperHyperGraphs To Form Neutrosophic SuperHyperStable To Act on Cancer's Neutrosophic Recognitions In Special ViewPoints" in \textbf{Ref.} \cite{HG18} by Henry Garrett (2022), ``(Neutrosophic) SuperHyperModeling of Cancer's Recognitions Featuring (Neutrosophic) SuperHyperDefensive SuperHyperAlliances" in \textbf{Ref.} \cite{HG19} by Henry Garrett (2022), ``(Neutrosophic) SuperHyperAlliances With SuperHyperDefensive and SuperHyperOffensive Type-SuperHyperSet On (Neutrosophic) SuperHyperGraph With (Neutrosophic) SuperHyperModeling of Cancer's Recognitions And Related (Neutrosophic) SuperHyperClasses" in \textbf{Ref.} \cite{HG20} by Henry Garrett (2022), ``SuperHyperGirth on SuperHyperGraph and Neutrosophic SuperHyperGraph With SuperHyperModeling of Cancer's Recognitions" in \textbf{Ref.} \cite{HG21} by Henry Garrett (2022), ``Some SuperHyperDegrees and Co-SuperHyperDegrees on Neutrosophic SuperHyperGraphs and SuperHyperGraphs Alongside Applications in Cancer's Treatments" in

Ref. \cite{HG22} by Henry Garrett (2022), ``SuperHyperDominating and SuperHyperResolving on Neutrosophic SuperHyperGraphs And Their Directions in Game Theory and Neutrosophic SuperHyperClasses" in  $\text{Ref.}$  \cite{HG23} by Henry Garrett (2022), ``SuperHyperMatching By (R-)Definitions And Polynomials To Monitor Cancer's Recognition In Neutrosophic SuperHyperGraphs" in Ref. \cite{HG24} by Henry Garrett (2023), ``The Focus on The Partitions Obtained By Parallel Moves In The Cancer's Extreme Recognition With Different Types of Extreme SuperHyperMatching Set and Polynomial on (Neutrosophic) SuperHyperGraphs" in  $\text{Ref.}$  \cite{HG25} by Henry Garrett (2023), ``Extreme Failed SuperHyperClique Decides the Failures on the Cancer's Recognition in the Perfect Connections of Cancer's Attacks By SuperHyperModels Named (Neutrosophic) SuperHyperGraphs" in Ref. \cite{HG26} by Henry Garrett (2023), ``Indeterminacy On The All Possible Connections of Cells In Front of Cancer's Attacks In The Terms of Neutrosophic Failed SuperHyperClique on Cancer's Recognition called Neutrosophic SuperHyperGraphs" in  $\text{Ref.}$  \cite{HG27} by Henry Garrett (2023), ``Perfect Directions Toward Idealism in Cancer's Neutrosophic Recognition Forwarding Neutrosophic SuperHyperClique on Neutrosophic SuperHyperGraphs" in Ref. \cite{HG28} by Henry Garrett (2023), ``Demonstrating Complete Connections in Every Embedded Regions and Sub-Regions in the Terms of Cancer's Recognition and (Neutrosophic) SuperHyperGraphs With (Neutrosophic) SuperHyperClique" in  $\text{Ref.}$  \cite{HG29} by Henry Garrett (2023), ``Different Neutrosophic Types of Neutrosophic Regions titled neutrosophic Failed SuperHyperStable in Cancer's Neutrosophic Recognition modeled in the Form of Neutrosophic SuperHyperGraphs" in Ref. \cite{HG30} by Henry Garrett (2023), ``Using the Tool As (Neutrosophic) Failed SuperHyperStable To SuperHyperModel Cancer's Recognition Titled (Neutrosophic) SuperHyperGraphs" in  $\text{Ref.}$  \cite{HG31} by Henry Garrett (2023), ``Neutrosophic Messy-Style SuperHyperGraphs To Form Neutrosophic SuperHyperStable To Act on Cancer's Neutrosophic Recognitions In Special ViewPoints" in Ref. \cite{HG32} by Henry Garrett (2023), ``(Neutrosophic) SuperHyperStable on Cancer's Recognition by Well-SuperHyperModelled (Neutrosophic) SuperHyperGraphs" in  $\text{Ref.}$  \cite{HG33} by Henry Garrett (2023), ``Neutrosophic 1-Failed SuperHyperForcing in the SuperHyperFunction To Use Neutrosophic SuperHyperGraphs on Cancer's Neutrosophic Recognition And Beyond" in Ref. \cite{HG34} by Henry Garrett (2022), ``(Neutrosophic) 1-Failed SuperHyperForcing in Cancer's Recognitions And (Neutrosophic) SuperHyperGraphs" in  $\text{Ref.}$  \cite{HG35} by Henry Garrett (2022), ``Basic Notions on (Neutrosophic) SuperHyperForcing And (Neutrosophic) SuperHyperModeling in Cancer's Recognitions And (Neutrosophic) SuperHyperGraphs" in Ref. \cite{HG36} by Henry Garrett (2022), ``Basic Neutrosophic Notions Concerning SuperHyperDominating and Neutrosophic SuperHyperResolving in SuperHyperGraph" in  $\text{Ref.}$  \cite{HG37} by Henry Garrett (2022), ``Initial Material of Neutrosophic Preliminaries to Study Some Neutrosophic Notions Based on Neutrosophic SuperHyperEdge (NSHE) in Neutrosophic SuperHyperGraph (NSHG)" in Ref. \cite{HG38} by Henry Garrett (2022), there are some endeavors to formalize the basic SuperHyperNotions about neutrosophic SuperHyperGraph and SuperHyperGraph. \ Some studies and researches about neutrosophic graphs, are proposed as book in Ref. \cite{HG39} by Henry Garrett (2022) which is indexed by Google Scholar and has more than 2732 readers in Scribd. It's titled ``Beyond Neutrosophic Graphs" and published by Ohio: E-publishing: Educational Publisher 1091 West 1st Ave Grandview Heights, Ohio 43212 United State. This research book covers different types of notions and settings in neutrosophic graph theory and neutrosophic SuperHyperGraph theory. \ Also, some studies and researches about neutrosophic graphs, are proposed as book in Ref. \cite{HG40} by Henry Garrett (2022) which is indexed by Google Scholar and has more than 3504 readers in Scribd. It's titled ``Neutrosophic Duality" and published by Florida: GLOBAL KNOWLEDGE - Publishing House 848 Brickell Ave Ste 950 Miami, Florida 33131 United States. This research book presents different types of notions SuperHyperResolving and SuperHyperDominating in the setting of duality in neutrosophic graph theory

and neutrosophic SuperHyperGraph theory. This research book has scrutiny on the complement of the intended set and the intended set, simultaneously. It's smart to consider a set but acting on its complement that what's done in this research book which is popular in the terms of high readers in Scribd. --

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Strong Domination Number of Some Cycle Related Graphs MDPI

Concise, well-written text illustrates development of graph theory and application of its principles in methods both formal and abstract. Practical examples explain theory's broad range, from behavioral sciences, information theory, cybernetics, and other areas, to mathematical disciplines such as set and matrix theory. 1966 edition. Includes 109 black-and-white illustrations.

Domination in Graphs Springer Nature

An applications-oriented text detailing the latest research in graph theory and computer science. Leading contributors cover such important topics as: tiling problems and graph factors; partitioning the nodes of a graph; diameter vulnerability in networks; edge-disjoint Hamiltonian cycles; the chromatic number of graphs in a switching sequence; and more.

Domination Games Played on Graphs Infinite Study

This concise monograph present the complete history of the domination game and its variants up to the most recent developments and will stimulate research on closely related topics, establishing a key reference for future developments. The crux of the discussion surrounds new methods and ideas that were developed within the theory, led by the imagination strategy, the Continuation Principle, and the discharging method of Bujtás, to prove results about domination game invariants. A toolbox of proof techniques is provided for the reader to obtain results on the domination game and its variants. Powerful proof methods such as the imagination strategy are presented. The Continuation Principle is developed, which provides a much-used monotonicity property of the game domination number. In addition, the reader is exposed to the discharging method of Bujtás. The power of this method was shown by improving the known upper bound, in terms of a graph's order, on the (ordinary) domination number of graphs with minimum degree between 5 and 50. The book is intended primarily for students in graph theory as well as established graph theorists and it can be enjoyed by

anyone with a modicum of mathematical maturity. The authors include exact results for several families of graphs, present what is known about the domination game played on subgraphs and trees, and provide the reader with the computational complexity aspects of domination games. Versions of the games which involve only the “slow” player yield the Grundy domination numbers, which connect the topic of the book with some concepts from linear algebra such as zero-forcing sets and minimum rank. More than a dozen other related games on graphs and hypergraphs are presented in the book. In all these games there are problems waiting to be solved, so the area is rich for further research. The domination game belongs to the growing family of competitive optimization graph games. The game is played by two competitors who take turns adding a vertex to a set of chosen vertices. They collaboratively produce a special structure in the underlying host graph, namely a dominating set. The two players have complementary goals: one seeks to minimize the size of the chosen set while the other player tries to make it as large as possible. The game is not one that is either won or lost. Instead, if both players employ an optimal strategy that is consistent with their goals, the cardinality of the chosen set is a graphical invariant, called the game domination number of the graph. To demonstrate that this is indeed a graphical invariant, the game tree of a domination game played on a graph is presented for the first time in the literature.

Domination in Graphs Theory and Applications CRC Press

In this paper, the concepts of cardinality, complete bipartite, dominating set, domination number, independence number and total domination number of Single Valued Neutrosophic Graph are introduced and some properties are investigated. Also the concept of edge domination in Single Valued Neutrosophic Graph has also been discussed.

Fundamentals of Domination in Graphs Springer Nature

The connected dominating set has been a classic subject studied in graph theory since 1975. Since the 1990s, it has been found to have important

applications in communication networks, especially in wireless networks, as a virtual backbone. Motivated from those applications, many papers have been published in the literature during last 15 years. Now, the connected dominating set has become a hot research topic in computer science. In this book, we are going to collect recent developments on the connected dominating set, which presents the state of the art in the study of connected dominating sets. The book consists of 16 chapters. Except the 1st one, each chapter is devoted to one problem, and consists of three parts, motivation and overview, problem complexity analysis, and approximation algorithm designs, which will lead the reader to see clearly about the background, formulation, existing important research results, and open problems. Therefore, this would be a very valuable reference book for researchers in computer science and operations research, especially in areas of theoretical computer science, computer communication networks, combinatorial optimization, and discrete mathematics.

Fuzzy Graph Theory Springer

This textbook covers a diversity of topics in graph and network theory, both from a theoretical standpoint, and from an applied modelling point of view. Mathematica® is used to demonstrate much of the modelling aspects. Graph theory and model building tools are developed in tandem with effective techniques for solving practical problems via computer implementation. The book is designed with three primary readerships in mind. Individual syllabi or suggested sequences for study are provided for each of three student audiences: mathematics, applied mathematics/operations research, and computer science. In addition to the visual appeal of each page, the text contains an abundance of gems. Most chapters open with real-life problem descriptions which serve as motivation for the theoretical development of the subject matter. Each chapter concludes with three different sets of exercises. The first set of exercises are standard and geared toward the more mathematically inclined reader. Many of these are routine exercises, designed to test understanding of the material in the text, but some are more challenging. The second set of exercises is earmarked for the computer technologically savvy reader and offer computer exercises using

Mathematica. The final set consists of larger projects aimed at equipping those readers with backgrounds in the applied sciences to apply the necessary skills learned in the chapter in the context of real-world problem solving.

Additionally, each chapter offers biographical notes as well as pictures of graph theorists and mathematicians who have contributed significantly to the development of the results documented in the chapter. These notes are meant to bring the topics covered to life, allowing the reader to associate faces with some of the important discoveries and results presented. In total, approximately 100 biographical notes are presented throughout the book. The material in this book has been organized into three distinct parts, each with a different focus. The first part is devoted to topics in network optimization, with a focus on basic notions in algorithmic complexity and the computation of optimal paths, shortest spanning trees, maximum flows and minimum-cost flows in networks, as well as the solution of network location problems. The second part is devoted to a variety of classical problems in graph theory, including problems related to matchings, edge and vertex traversal, connectivity, planarity, edge and vertex coloring, and orientations of graphs. Finally, the focus in the third part is on modern areas of study in graph theory, covering graph domination, Ramsey theory, extremal graph theory, graph enumeration, and application of the probabilistic method.

Domination and Edge Domination in Single Valued Neutrosophic Graph
Courier Corporation

For a long time computer scientists have distinguished between fast and slow algorithms. Fast (or good) algorithms are the algorithms that run in polynomial time, which means that the number of steps required for the algorithm to solve a problem is bounded by some polynomial in the length of the input. All other algorithms are slow (or bad). The running time of slow algorithms is usually exponential. This book is about bad algorithms. There are several reasons why we are interested in exponential time algorithms. Most of us believe that there are many natural problems which cannot be solved by polynomial time algorithms. The most famous and oldest family of hard problems is the family of NP complete problems. Most likely there are no polynomial time algorithms solving these hard problems and in the worst

case scenario the exponential running time is unavoidable. Every combinatorial problem is solvable in finite time by enumerating all possible solutions, i. e. by brute force search. But is brute force search always unavoidable? Definitely not. Already in the nineteen sixties and seventies it was known that some NP complete problems can be solved significantly faster than by brute force search. Three classic examples are the following algorithms for the TRAVELLING SALESMAN problem, MAXIMUM INDEPENDENT SET, and COLORING.

The Theory of Graphs Springer

The contributions in this volume are divided into three sections: theoretical, new models and algorithmic. The first section focuses on properties of the standard domination number $\gamma(G)$, the second section is concerned with new variations on the domination theme, and the third is primarily concerned with finding classes of graphs for which the domination number (and several other domination-related parameters) can be computed in polynomial time.

Studies in Graph Theory: Support Domination in Graphs and Related Concepts Springer

Neutrosophic graph (NG) is a powerful tool in graph theory, which is capable of modeling many real-life problems with uncertainty due to unclear, varying, and indeterminate information. Meanwhile, the fuzzy graphs (FGs) and intuitionistic fuzzy graphs (IFGs) may not handle these problems as efficiently as NGs. It is difficult to model uncertainty due to imprecise information and vagueness in real-world scenarios. Many real-life optimization problems are modeled and solved using the well-known fuzzy graph theory.

Edge-Domination In SuperHyperGraphs Cambridge Scholars Publishing

This volume explains the general theory of hypergraphs and presents in-depth coverage of fundamental and advanced topics: fractional matching, fractional coloring, fractional edge coloring, fractional arboricity via matroid methods, fractional isomorphism, and more. 1997 edition.

Domination in Graphs: Core Concepts Archers & Elevators Publishing House

In this paper, we obtain the domination number, the total domination number and the independent domination number in the neighborhood graph. We also investigate these parameters of domination on the join and the corona of two neighborhood graphs.

From Domination to Coloring Springer

This book presents a compendium of the 10 articles published in the recent Special Issue "Distance and Domination in Graphs". The works appearing herein deal with several topics on graph theory that relate to the metric and dominating properties of graphs. The topics of the gathered publications deal with some new open lines of investigations that cover not only graphs, but also digraphs. Different variations in dominating sets or resolving sets are appearing, and a review on some networks' curvatures is also present.

Space-Efficient Data Structures, Streams, and Algorithms MDPI

This book is in honor of the 80th birthday of Stephen Hedetniemi. It describes advanced material in graph theory in the areas of domination, coloring, spanning cycles and circuits, and distance that grew out of research topics investigated by Stephen Hedetniemi. The purpose of this book is to provide background and principal results on these topics, along with some related problems and conjectures, for researchers in these areas. The most important features deal with material, results, and problems that researchers may not be aware of but may find of interest. Each chapter contains results, methods and information that will give readers the necessary background to investigate each topic in more detail.

Computing and Combinatorics Springer

In graph theory, the concept of domination is essential in a variety of domains. It has broad applications in diverse fields such as coding theory,

computer network models, and school bus routing and facility location problems. If a fuzzy graph fails to obtain acceptable results, neutrosophic sets and neutrosophic graphs can be used to model uncertainty correlated with indeterminate and inconsistent information in arbitrary real-world scenario.

In this study, we consider the concept of domination as it relates to single-valued neutrosophic incidence graphs (SVNIGs). Given the importance of domination and its utilization in numerous fields, we propose the application of dominating sets in SVNIG with valid edges. We present some relevant definitions such as those of valid edges, cardinality, and isolated vertices in SVNIG along with some examples. Furthermore, we also show a few significant sets connected to the dominating set in an SVNIG such as independent and irredundant sets. We also investigate a relationship between the concepts of dominating sets and domination numbers as well as irredundant and independence sets in SVNIGs. Finally, a real-life deployment of domination in SVNIGs is investigated in relation to COVID-19 vaccination locations as a practical application.