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*Petrica C. Pop*

# GENERALIZED NETWORK DESIGN PROBLEMS

MODELING AND OPTIMIZATION

DE GRUYTER SERIES IN  
DISCRETE MATHEMATICS AND APPLICATIONS



# Generalized Network Design Problems Generalized Network Design Problems

**K Payea**



## **Generalized Network Design Problems Generalized Network Design Problems:**

**Generalized Network Design Problems** Petrica C. Pop, 2012-10-30 Combinatorial optimization is a fascinating topic. Combinatorial optimization problems arise in a wide variety of important fields such as transportation, telecommunications, computer networking, location planning, distribution problems, etc. Important and significant results have been obtained on the theory, algorithms, and applications over the last few decades. In combinatorial optimization, many network design problems can be generalized in a natural way by considering a related problem on a clustered graph where the original problem's feasibility constraints are expressed in terms of the clusters, i.e., node sets instead of individual nodes. This class of problems is usually referred to as generalized network design problems (GNDPs) or generalized combinatorial optimization problems. The express purpose of this monograph is to describe a series of mathematical models, methods, propositions, algorithms developed in the last years on generalized network design problems in a unified manner. The book consists of seven chapters where, in addition to an introductory chapter, the following generalized network design problems are formulated and examined: the generalized minimum spanning tree problem, the generalized traveling salesman problem, the railway traveling salesman problem, the generalized vehicle routing problem, the generalized fixed charge network design problem, and the generalized minimum vertex biconnected network problem. The book will be useful for researchers, practitioners, and graduate students in operations research, optimization, applied mathematics, and computer science. Due to the substantial practical importance of some presented problems, researchers in other areas will find this book useful too. **Generalized**

**Network Design Problems** Corinne Feremans, 2002 Network design problems consist of identifying an optimal sub graph of a graph subject to side constraints. In generalized network design problems, the vertex set is partitioned into clusters and the feasibility conditions are expressed in terms of the clusters. Several applications of generalized network design problems arise in the fields of telecommunications, transportation, and biology. The aim of this review paper is to formally define generalized network design problems, to study their properties, and to provide some applications. The generalized problems studied are the minimum spanning tree problem, the travelling salesman problem, the minimum perfect matching problem, the minimum two edge connected spanning network, the minimum clique problem, the Steiner tree problem, and the shortest path problem. **Encyclopedia of Optimization** Christodoulos A. Floudas, Panos M. Pardalos, 2008-09-04 The goal of the

Encyclopedia of Optimization is to introduce the reader to a complete set of topics that show the spectrum of research, the richness of ideas, and the breadth of applications that has come from this field. The second edition builds on the success of the former edition with more than 150 completely new entries designed to ensure that the reference addresses recent areas where optimization theories and techniques have advanced. Particularly heavy attention resulted in health science and transportation with entries such as Algorithms for Genomics Optimization and Radiotherapy Treatment Design and Crew Scheduling. *Generalized Network Design Problems* Labbé, Martine, Corinne Feremans, Laporte, Gilbert, Centre for

Research on Transportation (Montréal, Québec),2002      *Hybrid Artificial Intelligence Systems* Marios Polycarpou,André C.P.L.F. de Carvalho,Jeng-Shyang Pan,Michał Woźniak,Héctor Quintián,Emilio Corchado,2014-05-21 This volume constitutes the proceedings of the 9th International Conference on Hybrid Artificial Intelligent Systems HAIS 2014 held in Salamanca Spain in June 2014 The 61 papers published in this volume were carefully reviewed and selected from 199 submissions They are organized in topical sessions on HAIS applications data mining and knowledge discovery video and image analysis bio inspired models and evolutionary computation learning algorithms hybrid intelligent systems for data mining and applications and classification and cluster analysis      **Hybrid Metaheuristics for Generalized Network Design**

**Problems** Bin Hu,2012 In this book we consider several generalized network design problems which belong to the family of NP hard combinatorial optimization problems In contrast to their classical counterparts the generalized versions are defined on graphs whose node sets are partitioned into clusters The goal is to find a subgraph which spans exactly one node from each cluster and also meets further constraints respectively Applicable methodologies for solving combinatorial optimization problems can roughly be divided into two mainstreams The first class consists of algorithms which aim to solve these problems to proven optimality provided that they are given enough run time and memory The second class are metaheuristics which compute approximate solutions but usually require significantly less run time By combining these two classes we are able to form collaboration algorithms that benefit from advantages of both sides Such approaches are considered for solving the generalized network design problems in this book      **Intelligent Computing & Optimization**

Pandian Vasant,Gerhard-Wilhelm Weber,José Antonio Marmolejo-Saucedo,Elias Munapo,J. Joshua Thomas,2022-10-20 This book of Springer Nature is another proof of Springer s outstanding and greatness on the lively interface of Smart Computational Optimization Green ICT Smart Intelligence and Machine Learning It is a Master Piece of what our community of academics and experts can provide when an Interconnected Approach of Joint Mutual and Meta Learning is supported by Modern Operational Research and Experience of the World Leader Springer Nature The 5th edition of International Conference on Intelligent Computing and Optimization took place at October 27 28 2022 via Zoom Objective was to celebrate Creativity with Compassion and Wisdom with researchers scholars experts and investigators in Intelligent Computing and Optimization across the planet to share knowledge experience innovation a marvelous opportunity for discourse and mutuality by novel research invention and creativity This proceedings book of ICO 2022 is published by Springer Nature Quality Label of wonderful      **Innovations in Smart Cities Applications Volume 7** Mohamed Ben Ahmed,Anouar

Abdelhakim Boudhir,Rani El Meouche,İsmail Rakıp Karaş,2024-03-19 Many cities in the developed world are undergoing a digital revolution and have placed the smart city on their list of priorities Smart cities use technological solutions such as Internet of Things AI 5G Big Data Cloud computing Smart Grid as well as all the emerging technologies of the digital era to improve the management and efficiency of the urban environment The aim is to make residents happier healthier smarter

and more prosperous and to make the city greener cleaner more sustainable more responsible more functional more resilient and more competitive Enhanced by extensive research studies and carried out under the guidance of international scientific experts in the field This book explores various papers related to smart cities including digital twins geo smart information systems education healthcare economy and digital business building and home automation environment and agriculture and information technologies and computer science *BICS 2008* Calin Enachescu, Barna Laszlo Iantovics, F. G. Filip, 2009-05-26 This book contains selected papers presented at the International Conference Bio Inspired Computational Methods Used for Difficult Problems Solving Development of Intelligent and Complex Systems BICS 2008 organized by the Romanian Academy Bucharest and Petru Major University of Tg Mures held on 5-7 November 2008 at Petru Major University of Tg Mures Romania The aim of this conference was to bring together researchers working in the main areas of Complex Systems Artificial Intelligence Intelligent Systems and Natural Computing for presenting their recent results and exchanging ideas The papers included in the book provide an introduction and also a state of the art to the bio inspired computer science The areas covered were those of natural computing such as evolutionary and neural computing as well as younger research directions such as DNA computing ant colony optimization with connections and applications to intelligent complex systems and to medical informatics Thus both directions of research from biology to informatics and from informatics to biology are illustrated *Generalized Networks*, 1966 **NATO Science Programme Yearbook Compendium, 1985-1989**, 1989 Network Architectures, Management, and Applications II S. J. Ben Yoo, Society of Photo-optical Instrumentation Engineers, 2005 Proceedings of SPIE present the original research papers presented at SPIE conferences and other high quality conferences in the broad ranging fields of optics and photonics These books provide prompt access to the latest innovations in research and technology in their respective fields Proceedings of SPIE are among the most cited references in patent literature **Approximation Algorithms for NP-hard Problems** Dorit S. Hochbaum, 1997 This is the first book to fully address the study of approximation algorithms as a tool for coping with intractable problems With chapters contributed by leading researchers in the field this book introduces unifying techniques in the analysis of approximation algorithms APPROXIMATION ALGORITHMS FOR NP HARD PROBLEMS is intended for computer scientists and operations researchers interested in specific algorithm implementations as well as design tools for algorithms Among the techniques discussed the use of linear programming primal dual techniques in worst case analysis semidefinite programming computational geometry techniques randomized algorithms average case analysis probabilistically checkable proofs and inapproximability and the Markov Chain Monte Carlo method The text includes a variety of pedagogical features definitions exercises open problems glossary of problems index and notes on how best to use the book **Government Reports Announcements & Index**, 1988 Topological Network Design in Telecommunication Systems Peter Kubat, J. MacGregor Smith, 2002 Aeronautical Engineering Review, 1957 *XIX General Assembly, Vancouver, Canada, August 9-22, 1987* International

Union of Geodesy and Geophysics. General Assembly, 1987      Dissertation Abstracts International , 1993-05      *34th Annual Symposium on Foundations of Computer Science* IEEE Computer Society. Technical Committee on Mathematical Foundations of Computing, 1993 Proceedings of the 34th Annual Symposium on Foundations of Computer Science held in Palo Alto California November 1993 The chronological presentation includes discussion of Carnap's modal logic power synchronization dynamic word problems No index Annotation copyright by Book News Inc Portland OR      Proceedings of the ...ACM Symposium on Theory of Computing , 2007

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