Complexity and Approximation: Combinatorial Optimization Problems and Their Approximability Properties by Alberto M. Spaccamela

A Great Sequel To Garey And Johnson

This book documents the state of the art in combinatorial optimization, presenting approximate solutions of virtually all relevant classes of NP-hard optimization problems. The wealth of problems, algorithms, results, and techniques make it an indispensable source of reference for professionals. The text smoothly integrates numerous illustrations, examples, and exercises.

My Personal Review:
This book is a great sequel to Garey and Johnson. The appendix of this book gives a list of all NP optimisation problems together with their current approximability (or inapproximability results) in a Garey Johnson fashion. Developing approximation algorithms for NP hard problems is now a very active field in Mathematical Programming and Theoretical Computer Science. There have been a number of exciting developments like semidefinite programming, the Goemans Williamson algorithm for max cut, etc. On the other hand, from a theoretical computer science point of view, we now have a proof that many of these problems cannot have polynomial approximation algorithms unless P=NP.

This book provides an excellent introduction to both areas. A worthy supplement to Garey and Johnson, Papadimitrious books on combinatorial optimisation and computational complexity, Hochbaums book on approximation algorithms, Alon and Spencers book on the probabilistic method and finally Motwani and Raghavans book on randomised algorithms.

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