Zbl 1228.90001

Frank, András
Connections in combinatorial optimization. (English)
Oxford Lecture Series in Mathematics and Its Applications 38. Oxford: Oxford University Press. xxiii, 639 p. £ 75.00 (2011). ISBN 978-0-19-920527-1/hbk

The book under review presents a rich set of results related to combinatorial optimization. It does so by selecting several mostly very recent achievements and deeply analyses their application and highlights several surprising connections between diverse topics within combinatorial optimization. Primary focus is given on graph connectivities, matroid optimization and submodular functions. These are now widely applied and fast developing fields of combinatorial optimization. It offers a unified treatment of developments in the concepts and algorithmic methods of the area, starting from basic results on graphs, matroids and polyhedral combinatorics, through the advanced topics of connectivity issues of graphs and networks, to the abstract theory and applications of submodular optimization. Difficult theorems and algorithms are made accessible to graduate students in mathematics, computer science, operations research, informatics and communication.

The book is not only a rich source of elegant material for an advanced course in combinatorial optimization, but it also serves as a reference for established researchers by providing efficient tools for applied areas like infocommunication, electric networks and structural rigidity.

Readership: Besides being extremely useful to those who are interested in graph connectivities, matroid optimization and submodular functions, the book is also of great interest to anyone interested in general combinatorial optimization theory. It is written in highly scientific language and it is extraordinarily beneficial reading for graduates and researchers in mathematics, computer science, informatics, and communication that rely on methods of combinatorial optimization.

Vladimír Lacko (Košice)
Keywords : combinatorial optimization; discrete mathematics
Classification :
    ∗90-02 Research monographs (optimization)
    90C27 Combinatorial programming
    05C40 Connectivity