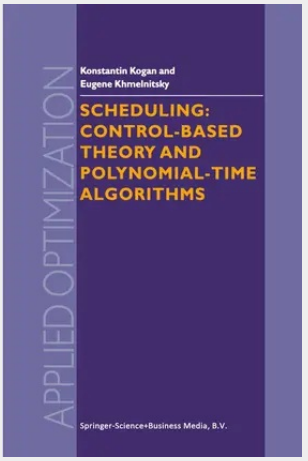
Kogan / Khmelnitsky

Scheduling: Control-Based Theory and Polynomial-Time Algorithms

This book presents a first attempt to systematically collect, classify and solve various continuous-time scheduling problems. The classes of problems distinguish scheduling by the number of machines and products, production constraints and performance measures. Although such classes are usually considered to be a prerogative of only combinatorial scheduling literature, the scheduling methodology suggested in this book is based on two mathematical tools - optimal control and combinatorics. Generally considered as belonging to two totally different areas of research and application, these seemingly irreconcilable tools can be integrated in a unique solution approach with the advantages of both. This new approach provides the possibility of developing effective polynomial-time algorithms to solve the generic scheduling problems. This book is aimed at a student audience - final year undergraduates as well as master and Ph.D. students, primarily in Operations Research, Management, Industrial Engineering and Control Systems. Indeed, some of the material in the book has formed part of the content of undergraduate and graduate courses taught at the Industrial Engineering Department of Tel-Aviv University, the Logistics Department of Bar-Ilan University and the Technology Management Department of Rolon Center for Technological Education, Israel. The book is also useful for practicing engineers interested in planning, scheduling and optimization methods. Since the book addresses the theory and design of computer-based scheduling algorithms, applied mathematicians and computer software specialists engaged in developing scheduling software for industrial engineering and management problems will find that the methods developed here can be embedded very efficiently in large applications.



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