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Scheduling

Theory, Algorithms, and Systems

Sixth Edition

Springer

Preface to the Sixth Edition

The first edition of this book appeared in the Fall of 1994 and was adopted in that semester as a textbook for Masters level scheduling courses at several universities, including Columbia University and the University of Michigan at Ann Arbor. Since then the book has been used as a text for scheduling courses at dozens of universities worldwide, including Dortmund, Georgia Tech, Graz, National Chiao Tung, POSTECH, Purdue, Siena, Tehran Polytechnic, Tsinghua, and Waterloo. It has been translated in Chinese and in Farsi.

Since the release of the first edition in 1994, the scheduling field has seen many new developments that are of interest to theoreticians and practitioners alike. Clearly, new editions of the book, with extensions in different directions, were to be expected. However, the basic general setup and structure of the book has not changed over the years. It still consists of three main parts: Deterministic Models, Stochastic Models, and Scheduling in Practice. There are also four Appendixes that present the basics of mathematical programming, dynamic programming, constraint programming, and complexity theory, as well as three Appendixes that provide overviews of the complexity statuses of several classes of deterministic scheduling problems, of the tractability of a variety of stochastic scheduling problems, and of the latest developments in scheduling system designs and implementations.

Since its introduction in 1994 this book has undergone a number of expansions, with extensions in areas that have aroused interest in academia as well as in industry. These extensions have included over the years multi-objective scheduling, batch scheduling, and proportionate flow shop scheduling. The additions in this sixth edition include deterministic flow shop models with reentry (i.e., scheduling models that are of interest to the semiconductor manufacturing industry), stochastic models with due date related objective functions, Fixed Parameter Tractability (FPT) of deterministic scheduling problems, as well as more discussions regarding recent scheduling system implementations. The latest updates of the various tables in Appendixes E, F, and G have been extensive.

Part I of the book (Deterministic Models) can still be used as the basis for a course in deterministic scheduling at a Senior or Masters level in an Engineering school or in an Applied Mathematics department. Parts I and II together (Deterministic and Stochastic Models) can be used as a basis for a Masters or PhD level course in an engineering or a business school.

A solution manual is still available. However, because of specific requests made by several of the faculty who have contributed to the contents of this manual, it can only be sent out to instructors who actually teach a course at an established university. There is also a fair amount of supplementary material available, closely related to the content of the book (e.g., PowerPoint presentations, scheduling cases, etc.), that can be downloaded from the author's homepage at wp.nyu.edu/michaelpinedo/books/

This edition has benefited greatly from comments and suggestions made by many colleagues, including Alessandro Agnetis (University of Siena), Joseph Cheriyan (University of Waterloo), Sabrina Gobbato (Cybertec), Hans Kellerer (Graz University), Alice Kirchner (Cybertec), Kangbok Lee (Pohang University of Science and Technology), Bertrand Lin (National Chiao Tung University), Dvir Shabtay (Ben-Gurion University of the Negev), Tae-Sun Yu (Pukyong National University), and JinJiang Yuan (Zhenzhou University). Their feedback is very much appreciated. Also, without the technical help of Haotian Song (Zhejiang University), Donna Chernyk (Springer), and Jayanthi Narayanaswamy (Springer), it would not have been possible to come out with this new edition.

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