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Titolo	Optimal Trajectory Planning and Train Scheduling for Urban Rail Transit Systems // by Yihui Wang, Bin Ning, Ton van den Boom, Bart De Schutter
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Descrizione fisica	1 online resource (198 p.)
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Disciplina	711.75
Soggetti	Automatic control Transportation engineering Traffic engineering Regional planning City planning Transportation Control and Systems Theory Transportation Technology and Traffic Engineering Landscape/Regional and Urban Planning
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	Introduction -- Background: Train Operation and Scheduling -- Optimal Trajectory Planning for a Single Train -- Optimal Trajectory Planning for Multiple Trains -- OD-Independent Train Scheduling for an Urban Rail Transit Line -- OD-Dependent Train Scheduling for an Urban Rail Transit Line -- OD-Dependent Train Scheduling for an Urban Rail Transit Network -- Overview and Future Directions -- Appendix: A General Formulation of the Pseudospectral Method.
Sommario/riassunto	This book contributes to making urban rail transport fast, punctual and energy-efficient –significant factors in the importance of public transportation systems to economic, environmental and social requirements at both municipal and national levels. It proposes new methods for shortening passenger travel times and for reducing energy

consumption, addressing two major topics: (1) train trajectory planning: the authors derive a nonlinear model for the operation of trains and present several approaches for calculating optimal and energy-efficient trajectories within a given schedule; and (2) train scheduling: the authors develop a train scheduling model for urban rail systems and optimization approaches with which to balance total passenger travel time with energy efficiency and other costs to the operator. Mixed-integer linear programming and pseudospectral methods are among the new methods proposed for single- and multi-train systems for the solution of the nonlinear trajectory planning problem which involves constraints such as varying speed restrictions and maximum traction/braking force. Signaling systems and their effects are also accounted for in the trajectory planning model. Origin–destination passenger demand is included in the model formulation for train scheduling. Iterative convex programming and efficient bi-level approaches are utilized in the solution of the train-scheduling problem. In addition, the splitting rates and route choices of passengers are also optimized from the system point of view. The problems and solutions described in *Optimal Trajectory Planning and Train Scheduling for Urban Rail Transit Systems* will interest researchers studying public transport systems and logistics whether from an academic or practitioner background as well as providing a real application for anybody studying optimization theory and predictive control. *Advances in Industrial Control* aims to report and encourage the transfer of technology in control engineering. The rapid development of control technology has an impact on all areas of the control discipline. The series offers an opportunity for researchers to present an extended exposition of new work in all aspects of industrial control.
