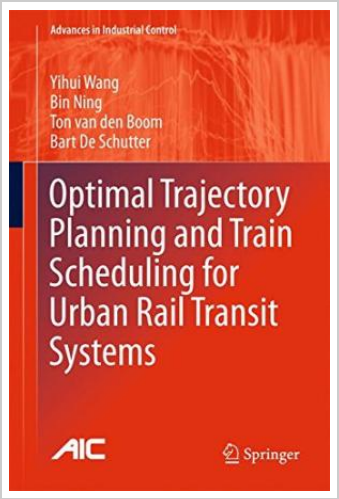

Optimal Trajectory Planning and Train Scheduling for Urban Rail Transit Systems

By Yihui Wang

Springer-Verlag Gmbh Mai 2016, 2016. Buch. Condition: Neu. Neuware - 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...

Reviews

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