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Nota di contenuto	Chapter 1. Introduction -- Part I: Predictive Cruise Control -- Chapter 2. Design of Predictive Cruise Control Using Road Information -- Chapter 3. Design of Predictive Cruise Control Using Road and Traffic Information -- Chapter 4. Design of Predictive Cruise Control for Safety Critical Vehicle Interactions -- Part II: Analysis of the Traffic Flow -- Chapter 5. Relationship Between the Traffic Flow and the Cruise Control From the Microscopic Point of View -- Chapter 6. Relationship Between the Traffic Flow and the Cruise Control from the Macroscopic Point of View -- Part III: Control Strategies -- Chapter 7. Control Strategy of the Ramp Metering in the Mixed Traffic Flow -- Chapter 8. MPC-Based Coordinated Control Design of the Ramp Metering -- Chapter 9. Data-driven Coordination Design of Traffic Control -- Chapter 10. Cruise Control Design in the Platoon System -- Chapter 11. Simulation and Validation of Predictive Cruise Control -- Appendices -- Index.

This book focuses on the design of a multi-criteria automated vehicle longitudinal control system as an enhancement of the adaptive cruise control system. It analyses the effects of various parameters on the average traffic speed and the traction force of the vehicles in mixed traffic from a macroscopic point of view, and also demonstrates why research and development in speed control and predictive cruise control is important. The book also summarises the main steps of the system's robust control design, from the modelling to its synthesis, and discusses both the theoretical background and the practical computation method of the control invariant sets. The book presents the analysis and verification of the system both in a simulation environment and under real-world conditions. By including the systematic design of the predictive cruise control using road and traffic information, it shows how optimization criteria can lead to multiobjective solutions, and the advanced optimization and control design methods required. The book focuses on a particular method by which the unfavourable effect of the traffic flow consideration can be reduced. It also includes simulation examples in which the speed design is performed, while the analysis is carried out in simulation and visualization environments. This book is a valuable reference for researchers and control engineers working on traffic control, vehicle control and control theory. It is also of interest to students and academics as it provides an overview of the strong interaction between the traffic flow and an individual vehicle cruising from both a microscopic and a macroscopic point of view.

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