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	Nota di contenuto	Part 1. Introduction, motivation, and direction for Advanced Mathematical Science for Mobility Society, together with the project between Toyota Motor Corporation and Kyoto University -- Chapter 1. Advanced Mathematical Science for Mobility Society -- Part 2. Mathematical models of flow Chapter. 2. Analysis of many-body particle systems by geometry and box-ball-system theory -- Chapter 3. Discrete Integrable Systems, LR transformations and Box-Ball Systems -- Part 3. Mathematical methods for huge data and network analysis -- Chapter 4. Eigenvalue Analysis in Mobility Data -- Chapter 5. Application of tensor network formalism for processing tensor data -- Chapter 6. Machine Learning Approach to Mobility Analysis -- Chapter 7. Graph optimization problems and algorithms for DAG-type blockchains -- Part 4. Algorithm for mobility society -- Chapter 8. Control and optimization of one-way car-sharing systems -- Chapter

9. Algorithms for future mobility society Chapter 10. Mechanism Design for Mobility.

Sommario/riassunto	This open access book presents the mathematical methods for huge data and network analysis. The automotive industry has made steady progress in technological innovations under the names of Connected Autonomous-Shared-Electric (CASE) and Mobility as a Service (MaaS). Needless to say, mathematics and informatics are important to support such innovations. As the concept of cars and movement itself is diversifying, they are indispensable for grasping the essence of the future mobility society and building the foundation for the next generation. Based on this idea, Research unit named "Advanced Mathematical Science for Mobility Society" was established at Kyoto University as a base for envisioning a future mobility society in collaboration with researchers led by Toyota Motor Corporation and Kyoto University. This book contains three main contents. 1. Mathematical models of flow 2. Mathematical methods for huge data and network analysis 3. Algorithm for mobility society The first one discusses mathematical models of pedestrian and traffic flow, as they are important for preventing accidents and achieving efficient transportation. The authors mainly focus on global dynamics caused by the interaction of particles. The authors discuss many-body particle systems in terms of geometry and box-ball systems. The second one consists of four chapters and deals with mathematical technologies for handling huge data related to mobility from the viewpoints of machine learning, numerical analysis, and statistical physics, which also includes blockchain techniques. Finally, the authors discuss algorithmic issues on mobility society. By making use of car-sharing service as an example of mobility systems, the authors consider how to construct and analyze algorithms for mobility system from viewpoints of control, optimization, and AI.