

Preface

With the advancement of remote sensing technology, wide usage of GPS devices in vehicles and cell phones, popularity of mobile applications, crowd sourcing, and geographic information systems, as well as cheaper data storage devices, enormous geo-referenced data is being collected from broader disciplines ranging from business to science and engineering. The volume, velocity, and variety of such geo-reference data are exceeding the capability of traditional spatial computing platform (also called *Spatial big data* or SBD). Emerging spatial big data has transformative potential in solving many grand societal challenges such as water resource management, food security, disaster response, and transportation. However, significant computational challenges exist in analyzing SBD due to the unique spatial characteristics including spatial autocorrelation, anisotropy, heterogeneity, multiple scales, and resolutions. This book discusses the current techniques for spatial big data science, with a particular focus on classification techniques for earth observation imagery big data. Specifically, we introduce several recent spatial classification techniques such as spatial decision trees and spatial ensemble learning to illustrate how to address some of the above computational challenges. Several potential future research directions are also discussed.

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Spatial Big Data Science

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