Special Issue Foreword
Remote Sensing of Urban Environment (I)

The Guest Editors: Xin Huang, Michael Ying Yang, and Rongjun Qin

With the continuous advance of urbanization, some severe urban environmental problems arise, such as urban congestion, air pollution, vegetation loss, lake shrinkage, urban heat island, land degradation, etc (Xie *et al.,* 2017; Yang *et al.,* 2017). Timely and accurate information about urban environment is essential for urban planning and management. Remote sensing technologies can help to monitor urban environment with up to date spatial information. In this special issue, ten papers focusing on application of remote sensing to urban environment are presented. The first five papers, addressing the urban remote sensing from the image processing methods point of view, are selected and published in the Special Issue (I), and the remaining ones are to appear in the Issue (II).

Within this foreword, we would like to conduct a summary about the content of the five papers in the Special Issue (I). The topics of data analysis and image processing in this issue, include image segmentation (Ming *et al.*, 2018), spatial feature extraction (Liang and Weng, 2018), high-spatial-resolution image classification (Simsek and Sertel, 2018), scene-based classification (Huang *et al.*, 2018), and change detection (Kun *et al.*, 2018). Based on these fundamental techniques and methods, diversity of tasks and applications such as urban landscape, land cover/use mapping, change detection, and urban scene understanding can be tackled to help monitoring urban environment. Among the papers of the special issue, four out of five contributions (Kun *et al.*, 2018; Huang *et al.*, 2018; Ming *et al.*, 2018; Simsek and Sertel, 2018) considered very high-resolution imagery, which indicates that subtle monitoring of urban environment have attracted much attention for its capabilities in exploiting rich spatial details.

The five articles are briefly reviewed below: Ming *et al.* discuss the coupling relationship between image segmentation and classification accuracy, providing guidance for parameters tuning in GEOBIA (Geographic Object-Based Image Analysis). Liang *et al.* assess the potential of integrating fractal texture with spectral information for urban landscape characterization. The fractal texture derived from a Landsat image was employed and its performances with different windows sizes were evaluated. Simsek and Sertel compare landscape metrics of two different cities by using SPOT 6/7 images-derived urban land cover/use maps produced by the object-based classification approach. They conduct classification by using thematic layers from OpenStreetMap, spectral indices, objects-based textural features. Huang *et al.* propose a framework to map tea gardens including three scene-based methods: bag-of-visual-words (BOVW) model, supervised latent Dirichlet allocation (sLDA), and unsupervised convolutional neural network (UCNN). Tan *et al.* present a heterogeneous ensemble algorithm which combing stacked generalization system with image segmentation. They demonstrate that their approach can integrate the advantages of both pixel-wise ensemble and object-oriented methods and improve the performance of change detection.

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