GEO-SPATIAL INFORMATION SCIENCE, 2017
VOL. 20, NO. 4, 297–298
https://doi.org/10.1080/10095020.2017.1404273

Taylor & Francis
Taylor & Francis Group

EDITORIAL

Information extraction from remote sensing imagery

Various platforms, such as satellite, aircraft, ground-based, some emerging aspects (e.g. internet) have resulted in a dramatic improvement in the capabilities of earth observations (EO). The numerous remote sensing data promote an enhanced possibility to assess, monitor, and predict the dynamics of land-covers, anthropologic processes, and influence to the environments. Nonetheless, the properties of the data acquired by such diverse sources pose challenges to the processing methodologies, and hence, development of a series of new methods for the analysis of remote sensing images is required. The aim of this special issue of *Geospatial Information Science* is to develop new ideas and technologies to facilitate the utility of remote sensing data and to further explore its potential in various applications.

This special section includes six papers that cover topics mainly on spatial analysis, mathematical morphology, image fusion, multi-domain feature exaction and fusion, object-oriented image analysis, detection and classification. These papers discuss various applications (e.g. urban mapping, pollution retrieval, traffic engineering, detection of leaf structures and shoreline) using crowd-sourcing geographic data, airborne/close-range/long-wave-infrared hyperspectral, multi-spectral high-spatial, ground-based sun–sky radiometer data.

There are two papers dealing with airborne remote sensing image processing and interpretation. "Urban land-use classification by combining high-resolution optical and long-wave infrared images" designs a two-level classification approach that combines the pixel-wised information fusion by simultaneously considering spectral-based, spectral-spatial-based, multiple features classification, and the objected-based approach based on multi-resolution segmentation, to examine the utility of the long-wave infrared image as a complementary spectral source for urban mapping using very high spatial resolution images. "A new kernel method for hyperspectral image feature extraction" proposes a local homogeneous segment-based non-linear optimized kernel minimum noise fraction algorithm for feature extraction, thus enabling better performances on urban hyperspectral image feature extraction and the post-applications, such as classification, object detection.

Three papers focus on information extraction techniques based on the data acquired from ground-based platforms. In "Retrieval of Brown Carbon based on the aerosol complex refractive indices in the winter of Wuhan", a set of complex refractive indices made use of the fact that Brown Carbon shows strong spectral dependence on UV light absorption corresponding to higher imaginary index values at 440 nm. The method is utilized to retrieve the columnar content of Brown Carbon and monitors pollutant status during the 2011 winter of Wuhan. In "Detection of leaf structures in close-range hyperspectral images using morphological fusion", it is the first attempt that detects leaf structures in a close-range hyperspectral fusion manner. In the proposed work, leaf information can be extracted by a unified image fusion framework, which couples the spatial details exploited by morphological processing from high spatial color image and spectral energy extracted by the principle component analysis. In "Detecting vehicle traffic patterns in urban environments using taxi trajectory intersection points", based on taxi car trajectory data and open street map, the proposed method extracts vehicle trajectories intersection points for selected rush hours to detect specific traffic patterns (e.g. the occurrence and the propagation of traffic congestion).

In addition, in "A novel mathematical morphology-based algorithm for shoreline extraction from satellite images", a set of mathematical morphology driven operations are utilized to design a semi-automatic shoreline detection algorithm for satellite image, and the advantages include faster processing, single-band adaptability, and the desirable preservation of actual shape and size.

In summary, this selection of papers sheds a spotlight into the field of recent remote sensing information extraction. We believe that these contributions will further stimulate research in this dynamic research field that is changing dramatically. We also hope that these researches will attract the attention of publics beyond the confines of geospatial information analysis, so that this exciting research area may expand further. Finally, we would like to take this opportunity to sincerely thank all the authors and reviewers for their efforts and contributions to this special issue.

Prof. Xin Huang
School of Remote Sensing and Information Engineering, Wuhan University, China
xhuang@whu.edu.cn

Dr. Jiayi Li
School of Remote Sensing and Information Engineering, Wuhan University, China
zjjerica@163.com

Dr. Wenzhi Liao
TELIN-IPI-IMEC, Ghent University, Belgium
wenzhi.liao@telin.ugent.be

Prof. Jocelyn Chanussot
Grenoble Institute of Technology, France
jocelyn.chanussot@gipsa-lab.grenoble-inp.fr