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IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing

Special Issue on
"Challenges and Recent Progress in Remote Sensing of Nighttime Light"

Satellite-recorded city light at night is able to reflect human acitvities, socioecnomic dynamics and light pollution. Remote sensing of nighttime light was orginated in 1970s, and it has rapidly grown since time series DMSP/OLS products were published by NOAA in 2010. In the last decade, the on-orbit satellites recording nighttime light are becoming highly diversed, with new satellites including Suomi-NPP, NOAA-20, NOAA-21, FY-3E, Luojia-1, SDGSAT-1, Yangwang-1 as well as commercial satellites such as EROS-B and Jilin-1. These satellites provide a variety night-time light images at different spatial resolutions with some of them owning multi-spectral bands. Thereby, the application of nighttime light images have expanded from mapping urbanization to much broader domains such as estimating regional economy, monitoring fishery, evaluating disasters and mapping light pollution. With more kinds of data with rich information, challenges in exploring these information from nighttime light remote sensing are more obivious. For example, mechanism behind uncertainty of daily nighttime light data need more clarficiation although the angular effect of nighttime light has been discovered. It is also interesting to see deep learning has been adopted to explore knowledge from the data at different spatial resolutions, while limited training samples from economic statistics may make the learning process less reliable. In sum, we can infer that the remote sensing of nighttime light is still developed in early stages, and theories and techniques are urgently needed for improving data quality and different application fields. As a result, this special issue aims at sharing research ideas with solid analysis to promote the advances of nighttime light remote sensing.

The broad topics include (but not limited to)
1) Characteristics of new emerging images of nighttime light such as SDGSAT-1 and data acquired by drones, balloons as well as in-situ camera.
2) Preprocessing nighttime light data such as radiometric calibration, denoising and super resolution reconstruction.
3) New techniques, such as deep learning and econometric models, in data mining of nighttime light data.
4) Application of nighttime light data in tracking Sustainable Development Goals (SDGs) such as erdicatication of poverty, electrification and economic growth.
5) Application of nightime light data in monitoring light pollution at night.
6) Exploring multispectral/hyperspectral images of nighttime light.
7) New methodology of nightime light data in human activity multidimensional representation in the process of urbanization.

Schedule
Jun 1, 2024, Submission system opening
Jan 31, 2025, Submission system closing

Format
All submissions will be peer reviewed according to the IEEE Geoscience and Remote Sensing Society guidelines. Submitted articles should not have been published or be under review elsewhere. Submit your manuscript on http://mc.manuscriptcentral.com/jstars, using the Manuscript Central interface and select the **"Challenges and Recent Progress in Remote Sensing of Nighttime Light"** special issue manuscript type. Prospective authors should consult the site https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=xxxxxx for guidelines and information on paper submission. All submissions must be formatted using the IEEE standard format (double column, single spaced). Please visit http://www.ieee.org/publications_standards/publications/authors/author_templates.html to download a template for transactions. Please note that since Jan. 1, 2024, IEEE J-STARS, as a fully open-access journal, is charging a flat publication fee $1,496 per paper.

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