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

Special Issue on
“Deep Generative Models for Multi-Sensor Image Fusion and Reconstruction for Earth observation and monitoring”

Multi-sensor systems in hyperspectral/multispectral and SAR imaging are crucial for expanding spectral coverage, improving spectral and spatial resolutions, providing flexibility for various applications, ensuring redundancy and reliability, and enabling real-time imaging capabilities. The fusion and reconstruction of multi-sensor images acquired from different sensors can capture a wider and shorter range of spectral information, enhance the accuracy of spectral analysis, adapt to specific requirements, mitigate sensor limitations, and enable dynamic data acquisition. These benefits enhance the potential for in-depth analysis and interpretation of multi-sensor data, making their configurations indispensable for numerous environmental applications, and hyperspectral/multispectral and SAR imagery become suitable to be successfully used in various fields of remote sensing.

However, the current approaches face challenges in accurately integrating the diverse spectral information and spatial details captured by different sensors. Additionally, the limited availability of ground truth data for training and evaluation further hinders the development of robust fusion and reconstruction techniques. Deep learning models play an important role in addressing these challenges and acts as a bridge to provide data intensive information. In particular, deep generative models such as variational autoencoders and Generative Adversarial Networks (GANs), have shown promise in capturing complex data distributions and generating high-quality images. By leveraging these models, it is possible to develop novel approaches for fusing and reconstructing multi-sensor images that better preserve spectral fidelity, spatial details, and statistical characteristics.

The broad topics include (but are not limited to):

- Remote sensing based applications of Deep Generative Models in Environmental, Land, Sea, Ocean Monitoring, Agriculture, etc.
- Deep generative approaches for enhanced hyper/multi-spectral image fusion and reconstruction.
- Deep Learning-Based Real-time Analysis of hyper/multi-spectral Time Series Data for environmental monitoring.
- Data Augmentation and enhancement to increase the benefits of Deep Learning in the creation of benchmark datasets.
- Domain Adaptation Techniques for hyper/multi-spectral Image Fusion
- Enhancement of spectral and spatial details through deep generative models.
- Generating long-term trends on environmental changes like Automated Dehazing, ocean and sea water monitoring, fire detection, etc.
- Generative Adversarial Networks for 3D Scene Reconstruction
- Graph-Based Approaches for Multispectral Image Fusion and Reconstruction
- Multi-exposure image fusion method based on GAN
- Multi-modal data fusion techniques using deep generative models for integrating remotely sensed data from different sensors.
- Transfer Learning Approaches for Hyperspectral/Multispectral Image Reconstruction
- User defined Conditional for Targeted Image Synthesis
- Deep generative models for multi/hyperspectral Image Synthesis
- Variational Autoencoders (VAE) for Hyperspectral Image segmentation and classification.

Schedule

Jul 1, 2024 - Submission system opening

Feb 28, 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 “**Deep Generative Models for Multi-Sensor Image Fusion and Reconstruction for Earth observation and monitoring**” special issue manuscript type. Prospective authors should consult the site <https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=9082768> 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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