EDITORIAL

Inaugural Editorial for the *Journal of Geoscience and Earth Observation*

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Dear Readers,

In the current era, geoscience and remote sensing technology are deeply intertwined, jointly reshaping our understanding of the Earth system. Geoscience is dedicated to exploring the Earth's structure, composition, evolution, and various natural processes, while remote sensing technology provides it with powerful observation tools ranging from macro to micro scales and from local to global scopes. In particular, the development of artificial intelligence has greatly promoted the transformation in the fields of remote sensing and geoscience. The two fields complement each other, collectively driving related research to new heights.

Over the past few decades, both geoscience and remote sensing fields have achieved groundbreaking progress. Globally, satellite technology has advanced by leaps and bounds, with high-resolution satellites emerging continuously. It greatly enhances our ability to observe the Earth's surface. Currently, optical satellites are generally capable of acquiring sub-meter resolution images, and some cutting-edge models even possess multi-spectral and short-wave infrared detection capabilities, enabling clear visualization of details such as land cover, urban expansion, and natural resource distribution. Advances in stereo mapping technology have made the construction of high-precision 3D Earth models a reality. Meanwhile, multi-sensor platforms integrating optical, microwave, and Light Detection and Ranging (LiDAR) technologies are constantly being iterated and updated. Synthetic Aperture Radar (SAR) satellites, with their unique advantage of all-weather and all-time observation, play an irreplaceable role in harsh weather and nighttime monitoring scenarios. These advanced technologies are widely applied in many critical fields such as ocean monitoring, disaster emergency response, and environmental protection.

Geoscience research has also achieved remarkable results in many aspects with the support of remote sensing technology. In the field of geology, researchers can clearly identify geological structures and determine rock types by analyzing remote sensing images, providing an efficient approach for mineral resource exploration. In hydrological research, remote sensing data can be used to monitor key parameters such as surface water extent, soil moisture,

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and evapotranspiration, helping to understand the water cycle process and providing strong support for water resource management. In global change research, remote sensing technology is even more indispensable—it can real-time monitor key indicators such as vegetation cover changes, ice sheet mass balance, and atmospheric greenhouse gas concentrations, providing a scientific basis for assessing the impacts of climate change and formulating response strategies.

These achievements not only demonstrate the value of the deep integration of remote sensing technology and geoscience, but also highlight the urgent need to build a professional academic platform and promote innovation and cooperation in the field.

1 Purpose of the Journal

The aim of *Journal of Geoscience and Earth Observation* (*JGEO*) is to highlight research that pushes the boundaries of innovation in remote sensing-enabled geoscience. It is also to foster a multidisciplinary dialogue that bridges the gap between cutting-edge remote sensing technologies and in-depth geoscience research. By featuring state-of-the-art research, case studies, theoretical advancements, and practical applications, *JGEO* will become a core platform for researchers and practitioners to exchange ideas, share research results, and collaborate in solving complex geoscience and remote sensing problems. By publishing high-quality, peer-reviewed papers, we will achieve:

Encourage Innovation: Encourage the research and development of new technologies, methods, and applications in the geoscience and remote sensing fields, accelerate the transformation of innovative achievements from laboratories to practical applications, and inject new vitality into geoscience research.

Enhance Interdisciplinary Collaboration: Break down the barriers between different disciplines within the geoscience and remote sensing fields, and actively build cooperation bridges with related disciplines such as computer science, environmental science, and engineering to promote interdisciplinary integration and provide new ideas for solving complex geoscience problems.

Promote Sustainable Development: Provide a solid scientific basis with geoscience and remote sensing for sustainable resource management, environmental protection, and climate change adaptation, promoting the harmonious coexistence of human society and the Earth's environment.

2 Scope and Directions

The *JGEO* aims to build a high-quality platform for gathering cutting-edge research results and promoting academic exchanges. Our scope encompasses a wide array of topics, including but not limited to sensor systems and instruments, data processing and intelligence analysis, remote sensing and geoscience applications (such as Earth surface processes monitoring and natural resource management), and geoscience modeling and simulation, etc.

2.1 Sensor Systems and Instrumentations

The contents include but are not limited to: Advanced Satellite and Airborne Sensors, Ground-Based and Mobile Sensors, Sensor Networks and Internet of Things (IoT) in Geoscience and etc.

2.2 Data Processing and Intelligence Analysis

The contents include, but are not limited to: remote sensing image processing (fundamental) , data fusion and integration, remote sensing image interpretation, geospatial big data analytics (algorithms and frameworks) and more.

2.3 Remote Sensing and Geoscience Applications

The contents encompass a wide range of topics, including but not limited to: earth surface processes (such as erosion, sedimentation, landslides, and coastal changes), climate change and environmental monitoring, natural resource management, and more.

2.4 Geoscience Modeling and Simulation

The contents mainly include, but are not limited to: geoscience modeling with (or without) remote sensing data (such as assimilation), uncertainty analysis in geoscience modeling, and more.

Call for Submissions: We sincerely invite researchers from around the world to submit original research papers, review articles, and short communications to *JGEO*. Your contributions will help shape the future of geoscience and remote sensing research and deepen humanity's understanding of the Earth system. For more information on submission guidelines, please visit our journal website: https://www.icck.org/jgeo.

Data Availability Statement

Not applicable.

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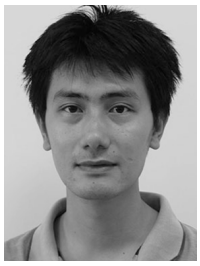
Conflicts of Interest

The author declares no conflicts of interest.

Ethical Approval and Consent to Participate

Not applicable.



Peng Liu received the M.S. and Ph.D. degrees in signal processing from the Chinese Academy of Sciences, Beijing, China, in 2004 and 2009, respectively. From May 2012 to May 2013, he was with the Department of Electrical and Computer Engineering, George Washington University, Washington, DC, USA, as a Visiting Scholar. He has long been engaged in research on intelligent information processing of remote sensing images. Focusing on practical applications, he has proposed effective solutions to key issues in remote sensing data acquisition, image classification, observation models, regularization methods, and multi-source information fusion. These research results have been applied to the ground processing systems of many satellites. He is among the first in the international community to propose the research concept of Active Deep Learning in the remote sensing field. He also proposed the bidirectional driven (data and models) frame in the field of remote sensing image fusion. He has published more than 100 academic papers, including IEEE TGRS, ISPRS PHOTO, IEEE JSTARS, IJDE, etc., and he has served as an associate editor for several well-known international journals.