

Special Issue

Emerging Innovations in Hyperspectral Imaging: Experimental Technologies, Chemometrics, and AI

Message from the Guest Editor

In optical spectral sensing and imaging, spatial information is combined with spectroscopy to create versatile tools for science and industry. Progress is increasingly driven by experimental advances in hyperspectral imaging (HSI). Improvements in detector sensitivity, optical components, and illumination concepts have enabled faster acquisition, higher resolution, and more robust setups. Compact, application-specific HSI modules are moving from laboratory prototypes to field-ready and clinical systems. New hardware developments—such as miniaturized spectrographs, tunable filters, and integrated sensor chips—extend the applicability of HSI to real-time quality control, biomedical diagnostics, and environmental monitoring. Chemometrics and artificial intelligence (AI) provide essential tools for extracting meaningful information, supporting the transition of HSI from experimental systems to routine analytical solutions. This Special Issue focuses on the applications and technological evolution of spectral imaging, highlighting experimental breakthroughs in sensors and imaging setups, advanced data analysis methods, and cross-disciplinary case studies.

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Deadline for manuscript submissions

31 December 2026



Sensors

an Open Access Journal
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Impact Factor 3.5
CiteScore 8.2
Indexed in PubMed



mdpi.com/si/254637

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Sensors is a leading journal devoted to fast publication of the latest achievements of technological developments and scientific research in the huge area of physical, chemical and biochemical sensors, including remote sensing and sensor networks. Both experimental and theoretical papers are published, including all aspects of sensor design, technology, proof of concept and application. Sensors organizes Special Issues devoted to specific sensing areas and applications each year.

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