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Geospatial Data & Technologies Everywhere

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ABSTRACT

Geospatial data and technologies have become deeply embedded in almost every aspect of modern life, boosting advances in urban planning, autonomous navigation, environmental monitoring, precision agriculture, disaster management, location-based services, digital twin generation, etc. In the past years we have seen an unprecedented growth in the availability, (geometric/spectral/temporal) resolution and diversity of geospatial data sources, ranging from high-resolution satellite imagery and aerial LiDAR to hyperspectral images and crowdsourced geodata. Moreover sensor and data fusion approaches integrate multi-modal information into coherent spatial insights.

Together with this data explosion, artificial intelligence (AI) methods are transforming the way geospatial information is processed and analyzed, with GeoAI one of the most used interdisciplinary words. Deep learning has revolutionized feature extraction from geodata, enabling automated object detection, LULC classification or semantic enrichment of point clouds at scales and accuracies previously unattainable. Large language models (LLMs) facilitate interaction with geospatial data through natural language queries whereas Cloud-based services and edge computing ensure that data can be accessed and processed in real time.

The presentation will review how geospatial technologies are nowadays truly ubiquitous, with a clear convergence of AI, geodata and spatial computing, supporting and expanding technical capabilities but also reshaping how the geospatial community could support societies, vulnerable areas, carbon accounting, climate change mitigation, disaster response, etc. Challenges and open issues for the research community will also be presented.

KEYWORDS: Mapping, Photogrammetry, LiDAR, AI, GeoAI

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