

IAF EARTH OBSERVATION SYMPOSIUM (B1)
Interactive Presentations - IAF EARTH OBSERVATION SYMPOSIUM (IP)

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MACHINE LEARNING APPLIED TO EARTH OBSERVATION DATA OF URBAN AREAS FOR
SOCIO-ECONOMIC DEVELOPMENT

Abstract

In the face of escalating urbanization and its accompanying challenges, our study harnesses the cutting-edge capabilities of Earth Observation (EO) technologies, particularly through the Copernicus and Landsat satellite constellations, to obtain timely, high-resolution insights into urban landscapes. By integrating these insights with socio-economic data, we employ advanced machine learning algorithms to dissect and comprehend the extensive datasets provided by EO. As part of an initiative with EuroMoonMars, our primary aim is to cultivate a comprehensive perspective on urban development patterns, thereby guiding more informed and effective urban planning initiatives.

Delving into the heart of urban sprawl, our research endeavours to forecast population growth trends and the ensuing demand for infrastructure and public amenities. We meticulously analyse the distribution of green spaces and water bodies in conjunction with temperature variations recorded by Landsat to identify optimal locations for new amenities. These amenities are envisioned to not only improve the urban microclimate but also elevate the overall quality of life for city dwellers.

Expanding the scope of our inquiry, this session will explore the multifaceted applications of EO data in fostering sustainable development, enhancing socio-economic outcomes, and catalysing commercial ventures. Through a blend of analytical rigor and innovative methodologies, we will unveil how EO data can be transformed into actionable intelligence, thereby serving a spectrum of stakeholders from policy makers to private enterprises.

Our discourse will extend to the examination of optimized satellite constellations, emphasizing the synergistic potential of these collective systems beyond the capabilities of solitary satellites. By articulating the socio-economic ramifications of EO data applications, we aim to illuminate the tangible benefits such as cost savings, economic stimulation, and societal welfare enhancements. We strive to find efficient solutions by delving into the economic considerations surrounding the investment in EO technologies, evaluating the cost-benefit dynamics and the broader societal impacts.

In essence, our study and the ensuing session are poised to offer a panoramic view of how EO data, when judiciously analysed and applied, can be a cornerstone in surmounting the challenges of sustainable urban development. By bridging the gap between advanced technological capabilities and pragmatic urban planning needs, we endeavour to pave the way for more resilient, sustainable, and liveable urban environments. We will demonstrate results for some European cities.