Doctoral research (PhD) programme in
Engineering for Innovation and Sustainable Development

University of Basilicata

School of Engineering

PhD Lecture

"Earth observation images and intelligent methods in developing building footprint inventories: a sustainable city planning lens"

Jagannath Aryal - University of Melbourne

Introduction by Beniamino Murgante

Discussants: Guido Masiello, Francesco Scorza, Dionysia Georgia Perperidou, Sabrina Lai, Giuliano Liuzzi, Dessislava Petrova-Antonova, Gerardo Carpentieri, Kh Md Nahiduzzaman, Maria Danese

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Newton Room, 2th floor
meet.google.com/jxb-gwex-ydm
School of Engineering, Campus Macchia Romana, Potenza

Abstract

Sustainable city planning and optimal land use design are becoming challenges considering environmental sustainability, urban growth, and citizen science. Earth observation images contribute significantly in preparing accurate inventories of buildings and their varieties in addressing such challenges. However, despite the efforts in designing and managing urban buildings from Earth Observation images, there is a clear gap in knowledge in developing the spatial ecosystem of existing urban building management.

This presentation draws a perspective by developing analytics on representative urban building footprint datasets with a focus on data quality issues. Issues such as the off-nadir imagery, omission/commission errors, and positional accuracy are considered in the analytics. These building footprint datasets are generated by the community for the public good and by the industry sectors for commercial benefits. The analytics supported in drawing perspective and the proposed spatial ecosystem ultimately help in developing an operational framework for urban infrastructure in sustainable city planning using Earth observation images and intelligent approaches.

Biography

Jagannath Aryal received his PhD degree in Optimisation and Systems Modelling. He is currently an Associate Professor in the Department of Infrastructure Engineering at The University of Melbourne.

He leads a research group on Earth Observation and AI. Professionally, he leads the GIS, digital analytics and remote sensing, area of practice of the Geospatial Council of Australia, the peak professional body representing the geospatial sector as a national chair. He is the program director of the Master of Digital Infrastructure Engineering and Graduate Certificate Degrees. He currently serves to the global remote sensing community as a leading academic and an Associate Editor of IEEE Transactions on Geoscience and Remote Sensing (TGRS) journal.

His research focuses on optimal utilisation of Earth Observation, geo-information, and geo-statistics to develop new methods in object recognition and geospatial situational awareness in disaster and emergency situations. Objects of interest derived from sensing technology (Ground / Satellite based) are applied in modelling and mapping various environmental systems taking sustainability and resilience into account.

His contributions on digital infrastructure engineering solutions are the results of his working experience from high impact educational institutions and professional bodies including The United Nations Environment Programme (UNEP), a leading global authority on the environment. His research collaboration on Earth Observation, geospatial engineering, and spatial analysis extend to the prominent UK/European universities (including the University of Cambridge; CNRS, France; University of Salzburg; University of Twente). He contributes as an editor of the Journal of Spatial Science (Taylor & Francis), and Remote Sensing (MDPI) and as a reviewer of the scientific journals for IEEE, Springer, and Elsevier.