Research theme title:

Satellite technologies for autonomous systems and decision support

Description:

Satellite sources provide a vast array of data and information regarding earth's surface and the state of several of its components, spacing from vegetation to water bodies and critical infrastructures. Leveraging satellite big data through deep learning and statistical methods, the PhD student is expected to design systems able to automatically evaluate use-case dependent indicators, identified with the support of the sponsoring company Telespazio (e.g., fire and landslide risks, infrastructure health, water reservoir levels, deforestation trends, …), to be integrated into decision-support systems designed to enhance the situational awareness of expert operators. In order to better capture and model the evolution and response of the terrain to the decisions taken, the project will involve also the development of a digital twin of the monitored area based on real satellite data, so that predictive optimization strategies and simulations may be employed to better support decision makers.

Related Works:

McCuistion, J. D., & Birk, R. (2005). From observations to decision support: The new paradigm for satellite data. Acta Astronautica, 56(1-2), 5-8.

Mancini, A., Frontoni, E., & Zingaretti, P. (2019, June). Satellite and uav data for precision agriculture applications. In *2019 International Conference on Unmanned Aircraft Systems (ICUAS)* (pp. 491-497). IEEE.

Coen, J. L., & Schroeder, W. (2013). Use of spatially refined satellite remote sensing fire detection data to initialize and evaluate coupled weather-wildfire growth model simulations. *Geophysical Research Letters*, *40*(20), 5536-5541.

Hosting Institution:

University of Rome "La Sapienza"

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Type of scholarship:

DM 117/2023 – Project on PNRR (Italy's Recovery and Resilience Plan)

Study and research period outside the Hosting Institution:

Telespazio SpA