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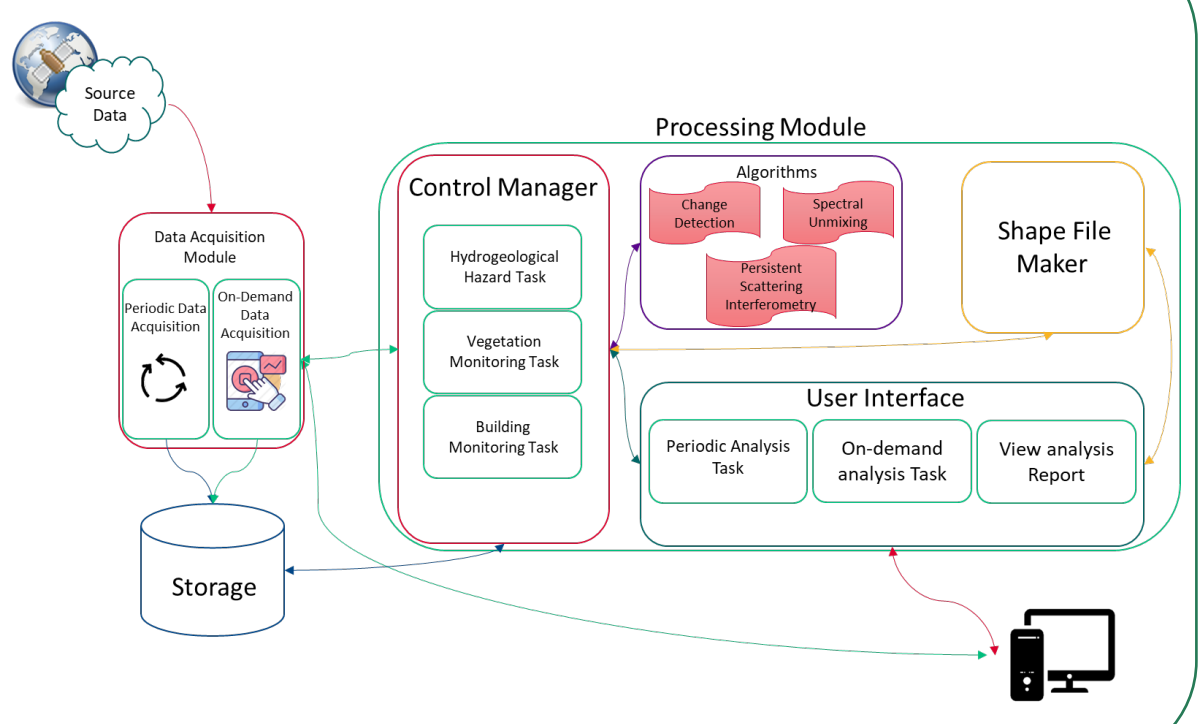
SUPERVISION OF RAILWAY AREAS BY SATELLITE IMAGES

RESEARCH PROJECT AND GOALS

The research project develop a system that increases the monitoring capacity on RFI railway infrastructure, in order to reduce the impact on circulation due to the presence of branches and trees which could, in the event of a fall, interfere with railway operation and create dangers to public safety. The system must ensure a **monitoring** of hydrogeological hazards, **identification** and, therefore, **prevention** of these, with the aim of ensuring efficiency and safety for traffic on its railway network. These hazards raise the need to develop satellite-based technologies capable to detect landslides, flooding, and other catastrophic events using **SAR** and **multispectral images** acquired from a satellite constellation.

THE DESIGNED SYSTEM

- **Data Acquisition Module**: Provides access to databases containing satellite images useful for carrying out the required analyzes. There are two methods of access (Periodic and On-Demand)
- **Algorithms**: The implementation of artificial vision algorithms suitable for meeting the functional requirements of the system in question.
- **Control Manager**: The software layer that coordinates the different modules of the system with each other to complete the required functionality.
- **User Interface**: It is the graphic interface where the user can take advantage of the features made available by the system.



EXPECTED RESULTS

Awareness that satellites can be a valuable support for the control and monitoring of railway infrastructure with both optical and interferometric sensors

"On Time" Monitoring

- Surface movements for the detection of landslides;
- Monitoring of known landslides;

- Vegetation growth alongside railway line
- Measure distances from the nearest rail track

- Presence of new buildings within 30 meters from the nearest rail track

- Control of rail tracks placed in difficult-to-reach areas

Control and Monitoring "On Demand"

- Flooding areas maps
- Flood risk scenarios

- Identification of vegetation type
- Tree height and encumbrance definition

- Monitoring of buildings already identified by other methods (art. 60 DPR 753/80)

- Checks under critical conditions

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