Recent Trends, Challenges, and Limitations of Explainable AI in Remote Sensing

Supplementary Material

1. EO tasks grouping

We have categorized related EO tasks into groups to provide a better overview. Here we provide a glossary of these groups and the tasks they include.

Agricultural Monitoring: All crop-related tasks, like crop yield prediction, crop type classification, irrigation scheme classification, and crop lodging detection.

Atmosphere Monitoring: The prediction of atmospheric phenomena, like air quality, aerosol optical depth, and dust storm indices.

Building Mapping: All tasks related to buildings and urban structures, like building footprint classification and building damage mapping.

Ecosystem Interactions: All interactions of the ecosystem with other systems, e.g., the atmosphere and the hydrosphere. This includes the ecosystem CO_2 exchange or the sun-induced fluorescence prediction.

Human Environment Interaction: The monitoring of human structures and the environment, like human footprint estimation, socioeconomic status estimation, or well-being prediction.

Hydrology Monitoring: Tasks related to hydrology, like runoff forecasting, water quality, streamflow prediction, and water segmentation, but excluding floods.

Landcover Mapping: The most common EO task includes mainly landcover classification but also related tasks like slum mapping.

Natural Hazard Monitoring: Monitoring of natural hazards, like landslides, wildfires, floods, earthquakes, and volcanos.

Soil Monitoring: Monitoring soil properties, like soil texture, respiration, moisture, and salinity.

Surface Temperature Prediction: The prediction of the Earth's surface temperature.

Target Mapping: Tasks related to the mapping of specific targets, like vehicles and objects.

Vegetation Monitoring: Monitoring of vegetation, excluding crops, like vegetation regeneration, tree monitoring, tree classification, and tree mapping.

Weather and Climate Prediction: Forecasting of weather and climate variables, like precipitation, temperature, and drought.

Other: All the tasks which did not fit into the other groups. This includes change detection, urban mobility, sea ice classification, mosquito modeling, and satellite product quality tasks.