11th Iberian Grid Conference
Faro, 10th – 13th October 2022

Application of Artificial Intelligence in the study of Ecosystems

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EUROPEAN UNION
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Outline

- Project 1: Land use/cover mapping.
- Project 2: High mountain shrubs detection.
- Project 3: Diatoms recognition.
- Other ongoing projects.

Land use/cover mapping

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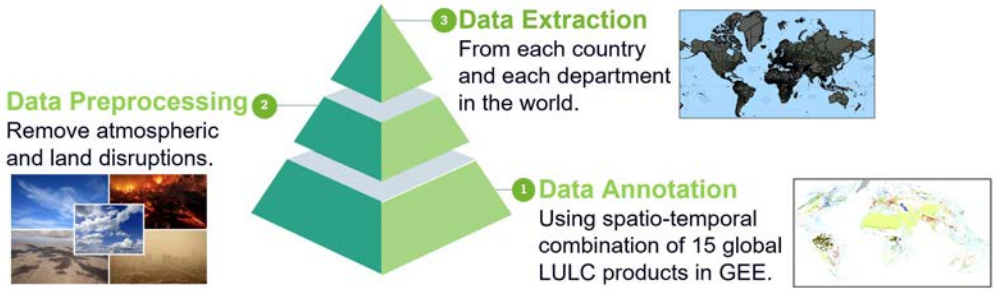
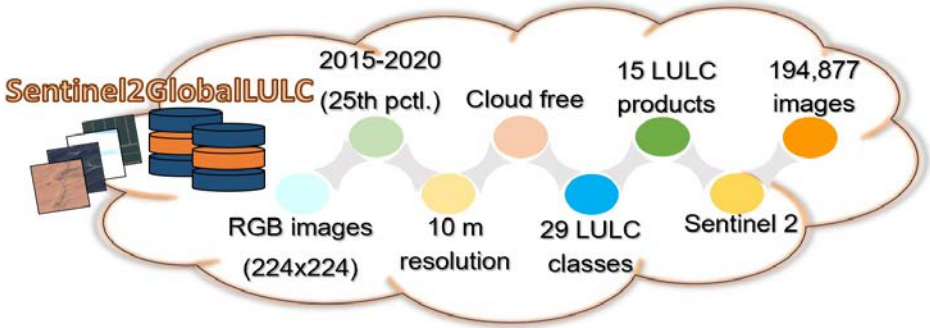
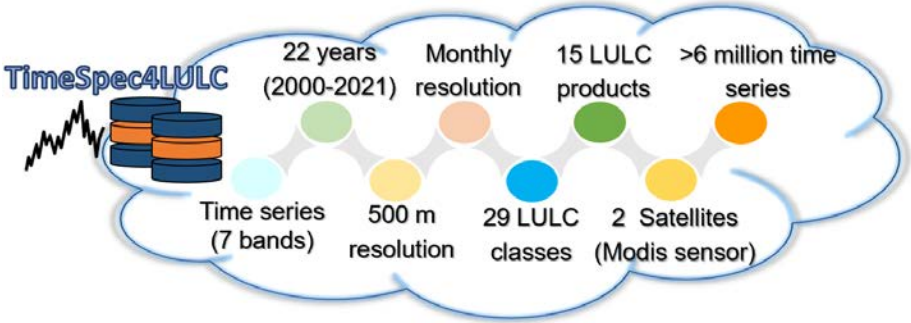
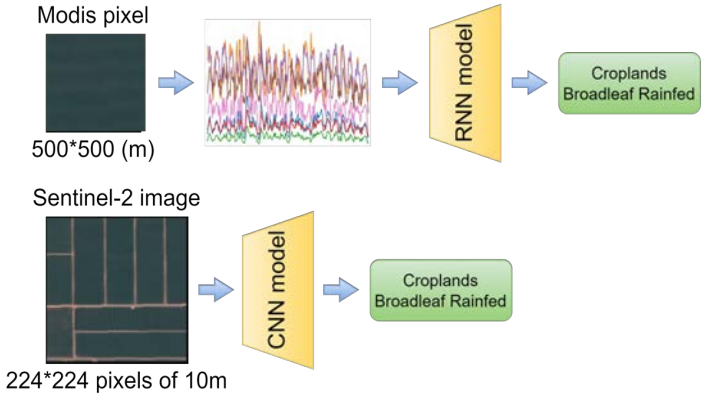
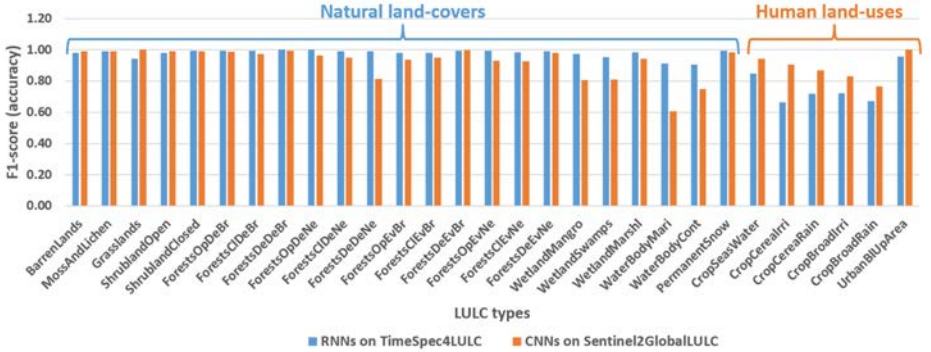






Land use/cover mapping





Natural land-covers were better classified by **RNNs** trained on TimeSpec4LULC multispectral MODIS time-series while **human land-uses** were better classified by **CNNs** trained on Sentinel2GlobalLULC VHR RGB snippets.

High mountain shrubs detection

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- Dataset of **900** digitized *Juniperus shrubs* from **six zones** along **5 decades** from 1977 to 2020 using orthophotography and Google Satellite images with metadata about: Morphotype and surrounding types, health status, and certainty.

- Dataset of **2000** annotated VHR satellite RGB images from Google Earth to recognize *Juniperus* shrubs.

- Dataset of **810** annotated VHR satellite RGB images from Google Erath to detect and segment *Juniperus* shrubs.

High mountain shrubs detection

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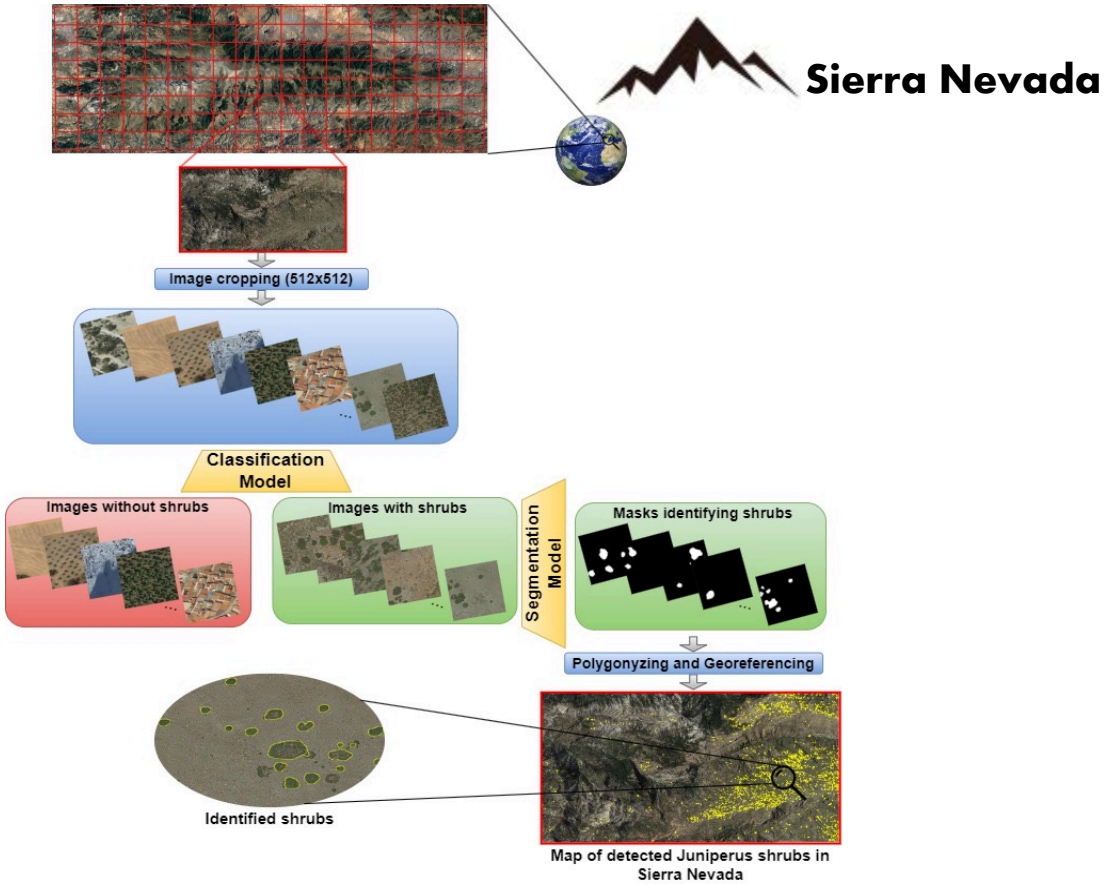
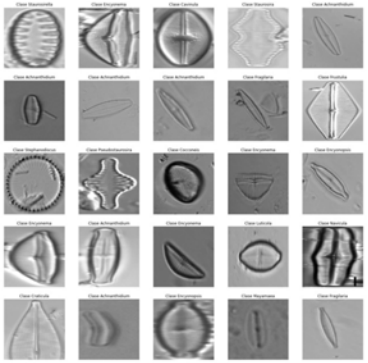
The combination of **classification** and **instance segmentation** models allowed to automatically map shrubs on remote sensing imagery.



Diatoms recognition

Creation of **DiatomNet** database:

- 22 diatom classes.
- 10650 images.
- Images with different qualities, resolutions, zooms, and light intensity.

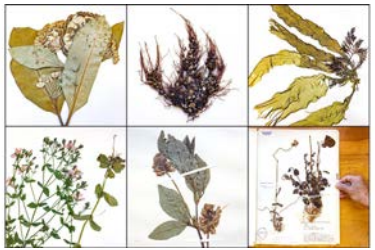


User-friendly interface for diatom recognition.

Other ongoing projects

Estimation of photosynthetic pigments concentration in high mountain lagoons.

Identification of herbarium species from images.



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Thanks for your attention!

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