

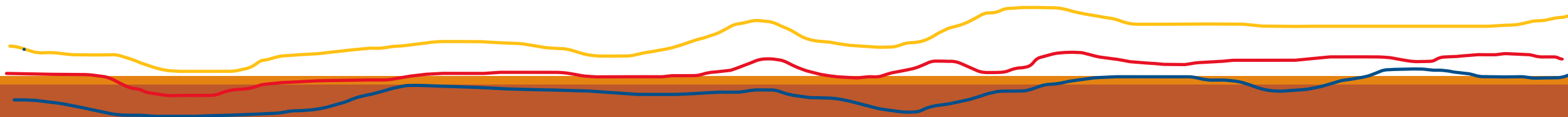
A concise application example...



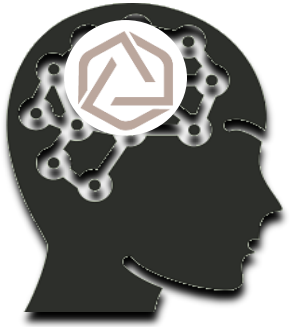
# Monitoring the situation of the coastline using A.I. **SophyAI.Space** platform

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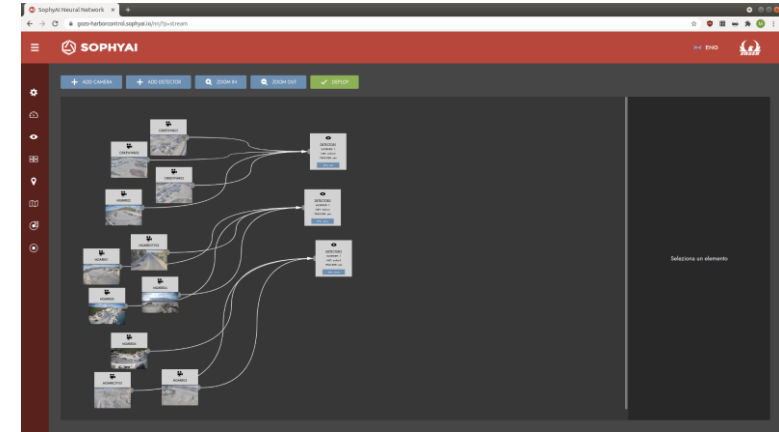
Patent N. 102018000009442



# An A.I. platform for processing and extracting data from satellite images



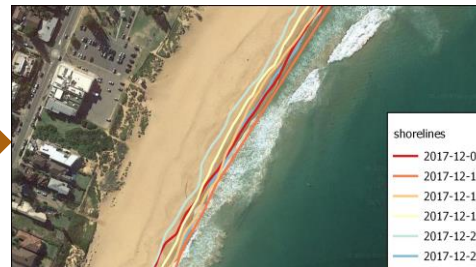
- Detects and Processes the features in the images
- Locates them in a Digital Twin of the area on any map
- Informs and "specializes" the Digital Twin via a specific workflow module



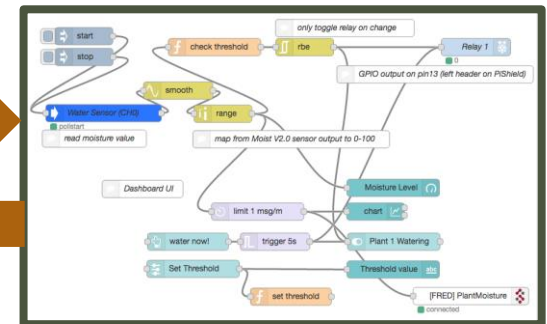
SENTINEL-2



RAW IMAGES



DIGITAL TWIN



WORKFLOW MODULE

## A valuable system for monitoring the status of the coastline that is unattended by survey infrastructure

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- ❑ SophyAI Space triggers an analysis of satellite images using artificial intelligence algorithms that perform a segmentation of the shoreline edge.
- ❑ It performs an image classification that allows a refinement of the segmentation into four distinct categories by making the shoreline detection specific to sand/water discrimination.
- ❑ A specific workflow module manages the results, georeferences them, and represents the coastline trend in time series that can be consulted on GIS



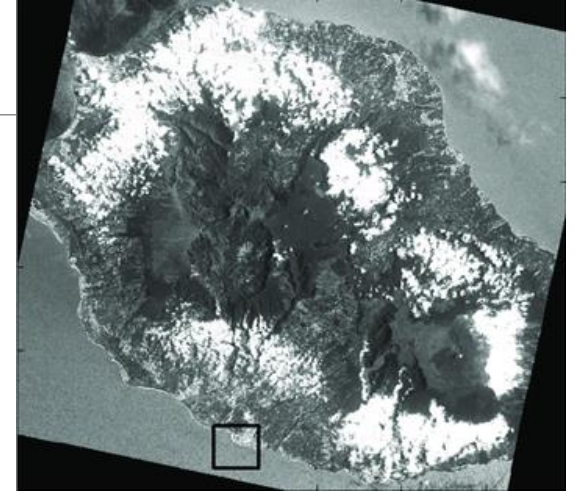
## A summary of its operation....

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It starts by running Cloud Masking algorithms on the image dataset so as to automatically discard, all images that exceed a certain cloud cover.

Next, the panchromatic image ( band covering the visible and near-infrared wavelengths) is analyzed for optimal sharpness.

Satellite images are already provided ortho rectified, so there is no need for geometric correction of their georeferencing.



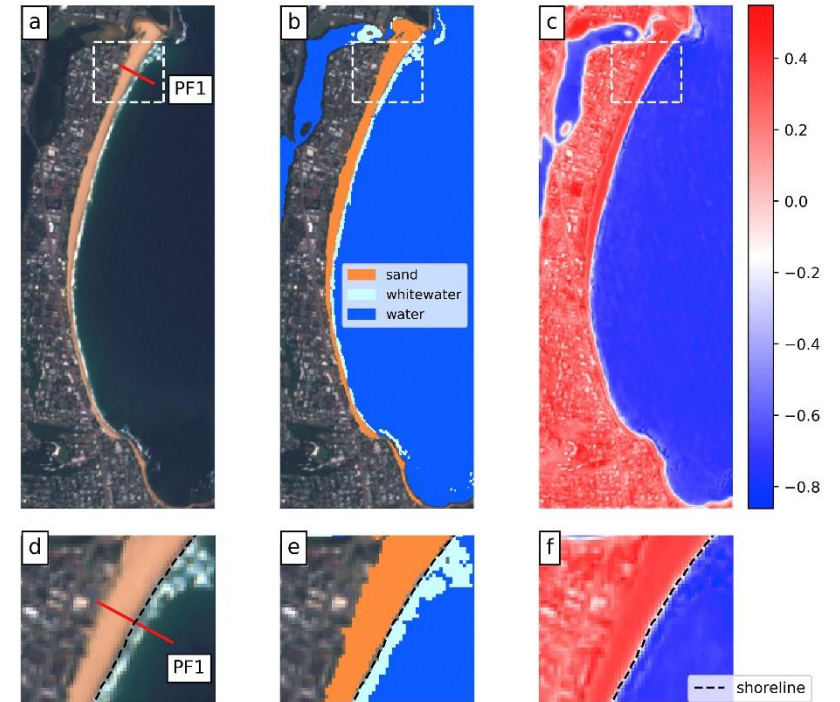
## A summary of its operation....

The shoreline detection algorithm that defines the coastline is then applied.

A further algorithm adds a subsequent classification of the images by differentiating four classes, three point identification classes and one unlabeled class:

- Sand
- Water
- White water ( the foam of waves breaking on the shoreline)

Unlabeled pixels ( other terrain features that, by not identifying the previous ones, indicate with high probability a rocky component if contiguous to the coastline)



Output of image classification. The boxes show the coast detected on the RGB, Classified and MNDWI image.

# SCHEMATIZATION OF THE ELABORATIVE PROCESS

