

## Task 2. Computer vision. Sentinel-2 image matching

### IMPROVEMENTS

The implemented SIFT (Scale-Invariant Feature Transform) algorithm is used to find key points in images taking into account their invariance to scale and rotation. It involves constructing Gaussian pyramids of images, finding local extrema and estimating key points.

A model has been analysed to find similarities between structures. It is trained on image data of different architectural structures to detect and classify differences.

Below are options for improving the model:

- *Image processing using data augmentation:*  
Applying data augmentation techniques such as contrast modification, noise filtering or image enhancement can improve data preprocessing and model quality.
- *Learning Optimisation:*  
Performing optimisation of model hyperparameters, using more efficient optimisation algorithms and regularisation techniques to improve model training.
- *Utilising multi-resolution approaches:*  
Considering approaches that allow processing images of different sizes while preserving key feature information. For example, using pyramidal algorithms to handle different levels of image resolution.

### **Conclusion:**

Optimal conclusions tend to be that on a large dataset of satellite images, a good model will be able to perform well. It is necessary to take images from all 4 years of one region and create a very large dataset, so it is possible to achieve the desired result.