

# ***SOLUTION REPORT***

## ***1. Data mining:***

From Sentinel2 files **T36UXV\_20200406T083559\_TCI\_10m.jp2** and **Masks\_T36UXV\_20190427.shx** it was obtained image of the region of interest and mask of soil erosion in the same one.

## ***2. Data preparation:***

Obtained images of landscape and the soil erosion mask are sliced into small 128\*128 for processing.

## ***3. Model building:***

As the model for erosion detection implemented fast and precise Image Segmentation is built on Convolutional Networks U-Net.

## ***4. Future development:***

For modeling is used small amount of data and applying shifts, rotations, compressions to the original data to improve the quality of the modelling.

As can be seen from papers [1 - 5] improving precision of soil erosion detection is in developing the models of classification with increased accuracy. Combination of statistical models along with remote sensing and GIS can convert the multi-criteria decision-making models into powerful tools for soil erosion prediction [5]. As Sentinel2 instrument has 13 spectral bands: 443 nm– 2190 nm than using not only optical channel of it may provide more informativity and to improve prediction while soil erosion detection.

1. Integrated approach of RUSLE, GIS and ESA Sentinel-2 satellite data for post-fire soil erosion assessment in Basilicata region (Southern Italy) GEOMATICS, NATURAL HAZARDS AND RISK 2019, VOL. 10, NO. 1, 1563–1595  
<https://doi.org/10.1080/19475705.2019.1578271>
2. A Remote Sensing Based Method to Detect Soil Erosion in Forests Hanqiu Xu, Xiujuan Hu, Huade Guan, Bobo Zhang, MeiyaWang, Shanmu Chen and Minghua Chen Remote Sens. 2019, 11, 513; doi:10.3390/rs11050513
3. Proposing a Novel Predictive Technique for Gully Erosion Susceptibility Mapping in Arid and Semi-arid Regions (Iran) Alireza Arabameri, Artemi Cerda, Jesús Rodrigo-Comino, Biswajeet Pradhan, Masoud Sohrabi, Thomas Blaschke and Dieu Tien Bui Remote Sens. 2019, 11, 2577; doi:10.3390/rs11212577

4. Morphometric Analysis for Soil Erosion Susceptibility Mapping Using Novel GIS-Based Ensemble Model. Alireza Arabameri, John P. Tiefenbacher, Thomas Blaschke, Biswajeet Pradhan and Dieu Tien Bui Remote Sens. 2020, 12, 874; doi:10.3390/rs12050874
5. Application of deep learning with stratified K-fold for vegetation species discrimination in a protected mountainous region using Sentinel-2 image Efosa G. Adagbasa, Samuel A. Adelabu & Tom W. Okello  
<https://doi.org/10.1080/10106049.2019.1704070>