

Method for obtaining NDVI from a single photo for very small areas

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GOAL OF THE STUDY

The goal of the development is to find an alternative method for obtaining NDVI reflective vegetation index from a single image.

METHODOLOGY OF THE INVESTIGATION

Open tools such as Python and its libraries (NumPy, Rasterio, OpenCV, Matplotlib) were used, which have accessible and efficient algorithms for extracting and visualizing the NDVI index to obtain NDVI values from images.

MAIN RESULTS FROM THE STUDY

The method offers a fast and visually understandable NDVI map, suitable for a preliminary assessment of vegetation health. Its main advantage is the speed and simplicity of implementation. Limitations include lower spatial resolution and omission of local anomalies between samples.

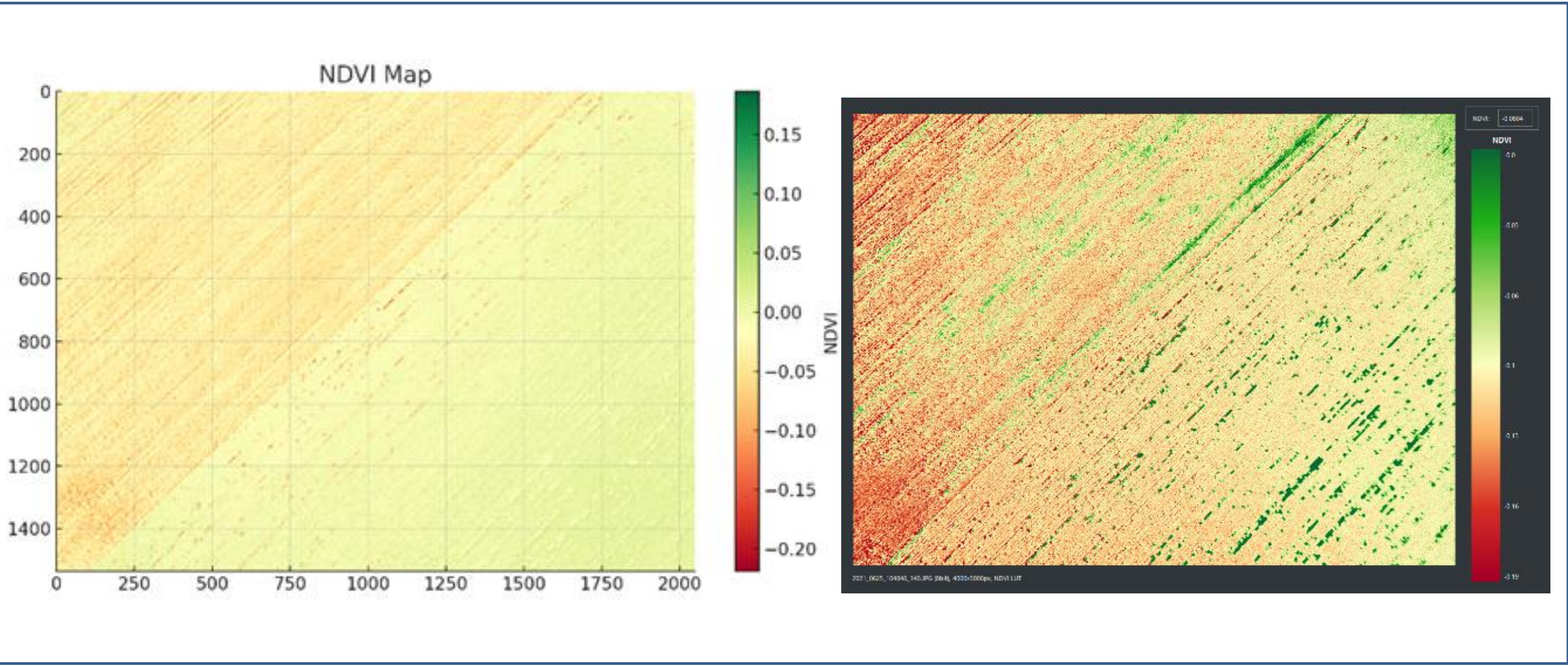


Fig. 1. Results obtained from image processing with Python (left), result of processing with MAPIR (right).

Table 1. TABLE I. DESCRIPTIVE STATISTICS			
Header 1	Mean	Std. Deviation	N
Mapir	46875.0000	70815.84124	256
Python	4424.9766	12252.92668	256

ANALYSIS OF THE RESULTS

One-factor linear regression was used. Statistics of the results obtained from the linear regression analysis of the histogram of the intensity obtained by the two methods are shown in Table 1.

The analysis performed checks the dependence between Python and Mapir for the coincidence of the result. The obtained results for regression statistics are presented in Table 3. It is visible that Multiple R 83.5% and R Square are 69.5%. This shows a strong dependence of the result.

RESULTS AND DISCUSSION

In turn, the method offers reliable and generalized results applicable to real agricultural strategies. The implementation of the NDVI index using Python and libraries such as Rasterio (for reading geospatial rasters), NumPy (for numerical operations) and Matplotlib (for visualization) highlights the potential of scientific open-source software in agroinformatics, demonstrating the flexibility of open source in modern precision agriculture.

CONCLUSIONS

The comparison of the obtained result is compared with the MAPIR software. It proves the correctness of the model used. The obtained correlation between the two methods is for Multiple R 83.5% and R Square are 69.5%, which proves the applicability of the method.

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