

E-learning on Time Series Analysis in Remote Sensing and Geoinformatics for Understanding Human-Environment Interactions – a concept

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The increasing global driver of digitalization in both research and scientific education demands for new initiatives developing and offering of online teaching and e-learning content in various geographic domains. Pan-European collaborations make it possible to connect minds and build new innovative teaching and learning settings following open education principles. This supports the agenda of sustainable development goals in terms of goal 4 “quality education” (Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all).

In the field of remote sensing and geoinformatics, many open digital resources already exist and data sets from various sensor systems are continuously collected. Thus, in the era of digital Earth, geospatial big data and the free access to high quality satellite missions (such as Copernicus Sentinels) there is a high demand for knowledge and skills related to processing and analysis of times series, which make it possible to quantify changes and interpret dynamics of the Earth surface.

Within the project *E-TRAINEE - E-learning course on Time Series Analysis in Remote Sensing for Understanding Human-Environment Interactions*, we develop four modules tackling recent challenges related to 1) fundamentals in remote sensing time series analysis, 2) satellite multispectral image time series analysis, 3) 3D/4D geographic point cloud time series analysis, and 4) airborne imaging spectroscopy time series analysis. The learning content will be organized and published via a git repository and plugins for automatic website generation and export functionality (e.g., to teaching platforms such as Moodle). Modules contain theoretical parts and exercises, whereas data sets will be published under a Creative Commons license. Processing requirements for the course are covered exclusively by open source programming languages and software, such as Python, R-statistics, GRASS GIS, QGIS and SAGA GIS.

The project aims at increasing the literacy of remote sensing and geoinformatics analysis as key tools in geography to support research in human-(engineering)-environment interaction. The modules will be implemented in the Master curricula of the four partner universities, Charles University, Heidelberg University, University of Innsbruck, and University of Warsaw being prevalently partners of 4EU+ European University Alliance. It will enable the students and all interested parties (including external practitioners and researchers) to better exploit the potential of remote sensing time series and, thereby, improve the quantification and interpretation capabilities in geographic studies.

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