Międzynarodowa Środowiskowa Szkoła Doktorska
przy Centrum Studiów Polarnych
w Uniwersytecie Śląskim w Katowicach

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No. of PhD project: IEDS/2022/US/01

Title of PhD project: ***Geohazards related to landslides in Poland and Vietnam – modelling and prediction***

The leading unit: Faculty of Natural Sciences University of Silesia in Katowice (WNP UŚ), Sosnowiec

Requirements

1. Master's degree in geomorphology, physical geography, meteorology, climatology, GIS and cartography, geology, geophysics, or related scientific discipline.
2. Good and practical knowledge of at least one programming language, R or Python, or strong willingness and ability to learn one of these programs.
3. Good knowledge of GIS software (SAGA GIS or QGIS) or a strong willingness and ability to learn one of these GIS platforms.
4. Good and practical knowledge of the English language (written and spoken).
5. High motivation and no formal contraindications for completing a scholarship in the Institute of Geology of the Vietnamese Academy of Sciences in Hanoi, Vietnam.
6. A potential candidate should be highly motivated to conduct an interdisciplinary study and have teamwork skills.
7. Documented scientific achievements in Earth sciences (preferred co-authorship of the paper published in one of the journals from the Journal Citation Reports) and experience presenting study results during conferences will be an additional advantage.

Task description

1. The analysis focused on comparing digital terrain models from the viewpoint of landslide susceptibility in Poland and Vietnam.
2. Preparation of digital elevation models based on LiDAR point clouds.
3. Analysis of relationships between landslide occurrence and potential triggering factors, i.e., the geology of bedrock, geomorphology, precipitation totals, etc.
4. Building digital terrain models representing pre-landslide relief and analyses of surface relief features before landsliding.
5. Building prediction models using machine learning techniques.
6. Construction of landslide probability maps for selected sites in Poland and Vietnam.
7. Preparation, organization, and realization of field campaigns and office work.
8. Preparation of scientific publications and conference presentations.

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9. Regular reporting of project advances.
10. Support of scientific mission and teaching activity of the Host institution.

Abstract

The scope of modelling and predicting geohazards related to landslides in Poland and Vietnam is still incomplete. The main reason for this situation is the lack of precise data, which would aid a thorough investigation of this scientific issue. The project aims to advance our knowledge on landslide geohazards in two areas of entirely different climate conditions, i.e., temperate and subtropical/tropical zones. The comparison will allow the evaluation of the climate impact, relief, and anthropopression on landslide geohazards. To reach the project aim following data types will be the subject of in-depth analysis: 1) climate time series, 2) digital elevation models, 3) land use and land cover data. Machine learning techniques will be applied to isolate the best potential predictors and models.

Other information

The work will be carried out under supervision of: dr hab. Łukasz Pawlik (https://www.biomorpho.us.edu.pl/), lukasz.pawlik@us.edu.pl, the University of Silesia in Katowice, Faculty of Natural Sciences, Institute of Earth Sciences and dr Paweł Kroh from the Institute of Geography of the Pedagogical University of Krakow, Poland, pawel.kroh@up.krakow.pl

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Information on the IEDS admissions: https://www.mssd.us.edu.pl/en/admission_2022_2023