Interdisciplinary Master Thesis Opportunity: Development of Landsifier Library – Version 3

The **Scientific Computing** group at the Faculty of Computer Science, and the **Geohazards** Group at the Department of Geography and Regional Research are offering a joint Master thesis opportunity focused on the further development of the *Landsifier* Python library for landslide hazard research.

Background

The *Landsifier* library was originally developed by Dr. Kamal Rana:

- Version 1: Rana et al., NHESS 2022 based on earlier work Rana et al., GRL 2021
- Version 2: Includes additional functions developed by Dr Kushanav Bhuyan, as described in Bhuyan et al., Nat. Comm. 2024 → Landsifier v2 on PyPI

A master's student is currently finalizing a new manuscript that documents version 2 of the library and its expanded capabilities.

Meanwhile, new functionalities have been developed (see: Bhuyan et al., Eng. Geol. 2024) that are not yet integrated into the library. This opens the path for the next milestone in the tool's evolution.

Thesis Objective

We are seeking a **master's student (P1, P2, or Master Thesis)** who will:

- Review and improve newly developed functions from the recent publication (Bhuyan et al., Eng. Geol. 2024)
- Integrate these functions into the *Landsifier* library as Version 3
- Review and refactor existing scripts to ensure consistency and performance
- Document and validate the updated library
- Optionally: Contribute to a Brief Communication article (for *Natural Hazards and Earth System Sciences*) describing the 3rd version

Requirements

- Strong Python programming skills
- Interest or background in natural hazards, particularly landslides
- Experience with geospatial data (e.g., raster, shapefile) is a plus
- Familiarity with Git/GitHub, testing, and Python packaging is desirable
- Preferred start: WS 2025

Supervision & Support

- The student will work closely with both research groups under the co-supervision of Asst. Prof. Dr. Atakan Aral and Asst. Prof. Dr. Ugur Öztürk
- Support will be provided for potential scientific publication based on the thesis work.
- The student will be credited as a contributor to the *Landsifier* v3 release on PyPI and GitHub.

Application

If you are interested, please send the following to atakan.aral@univie.ac.at.

- A brief **motivation letter** (max. 1 page) outlining your background and interest
- Your **CV**
- Any **relevant programming samples** (e.g., GitHub profile or scripts)