

## Topic

In this project an alpine touring planning tool should be enhanced which allows the user to plan routes over alpine mountain terrain interactively and graphically in a web-based 3D viewing and editing application.

In particular, for winter tours the avalanche information available from SLF should be incorporated graphically into the 3D visualization.

## Assignment

On top of a web-based digital terrain elevation model geo-visualization framework, a 3D geo-viewer and track editor should be implemented capable of the following functionality:

1. Interactive cartographic- and satellite-image textured 2D and 3D map visualization.
2. Incorporate visualizations for avalanche risks and estimate danger zones based on the SLF avalanche information.
3. Design a UI for drawing and planning tracks on top of the 2D/3D terrain rendering.
4. Integrate intelligent automatic track drawing aids such as limiting track steepness.
5. Display various track statistics, such as slope, elevation, height profile while interactive editing as well as import/export of data to other GPS devices.
6. Include advanced track evaluation features based on the SLF avalanche risk guidelines.

At the beginning a thorough planning should be performed with requirements analysis and design options for the software and the graphical viewing and editing.

Review of other related tools such as:

- <https://whiterisk.ch/en>

- <https://www.skitouren guru.ch/>
- <https://www.slf.ch/en/>
- <https://map.geo.admin.ch>
- <https://alpinemaps.org>
- <https://terrender.ifi.uzh.ch/>

## Requirements

Interest in advanced 3D computer graphics topics and web development as well as UI design. Experience in OpenGL/WebGL.

## Work Load

- 20% theory

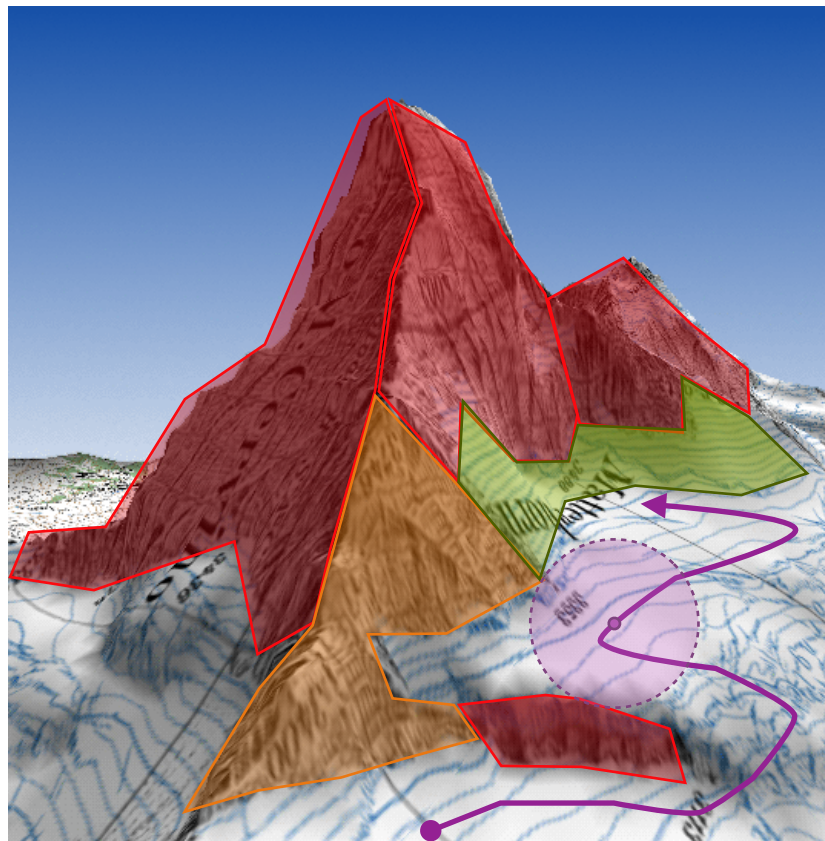
- 70% implementation
- 10% testing

## Project Type

This project can be done as Master thesis. Goals are adjusted depending on the project type.

## Supervision

Prof. Dr. Renato Pajarola  
Julian Croci (Assistant)



## Contact

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