

# Gaming and training environment for ski slopes

## Graduate



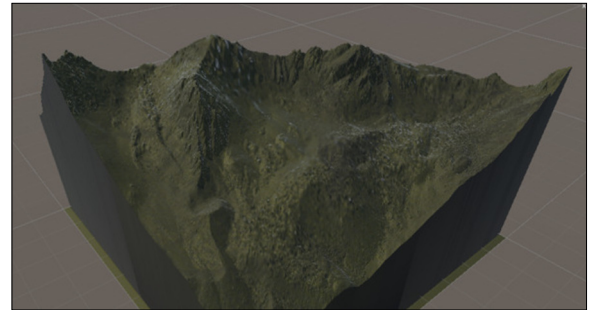
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**Initial Situation:** SwissTopo provides free Swiss height data with a mesh size of 0.5 m in 1 km<sup>2</sup> sized tiles. Slope and surface information can be gathered from other sources like OpenStreetMap in multiple export formats. Unity is a development environment with a wide variety of tools, a big community and a built-in physics engine. In the preliminary thesis module, one such tile was already read and generated as textured in game terrain.

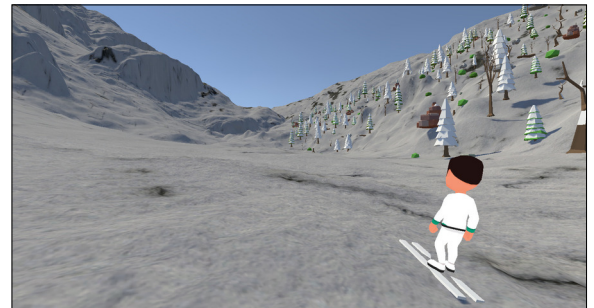
**Definition of Task:** The task is to build a skiing simulator in which athletes have a resource for test skiing slopes to get accustomed to the environment and to be able to work out strategies beforehand. This requires combining the aforementioned tools and data in a way that leads to a dynamically generated and physically believable environments, in which skiing on slopes of different skiing areas is made possible.

**Result:** Multiple tiles can be placed correctly by parsing the naming scheme of height data provided by SwissTopo. The terrains had to be rotated to address for a difference in coordinate systems of the output and input data. Because the data was incompatible for a 1:1 import, the tiles had to be placed with an overlap to prevent the need of interpolation. Area information for slopes and object placement is imported from OpenStreetMap via XML format. While slope waypoints can be placed directly, other area information is used to generate polygons above the terrain. This allows for identification of forests for example and thus placement of corresponding objects. It is possible to choose a spawning point on a Swiss map or to save that location for later use. Additionally, a selection of different slopes is provided, if any are present in the data. In relation to driving physics, the best results were achieved by using an altered car as framework.

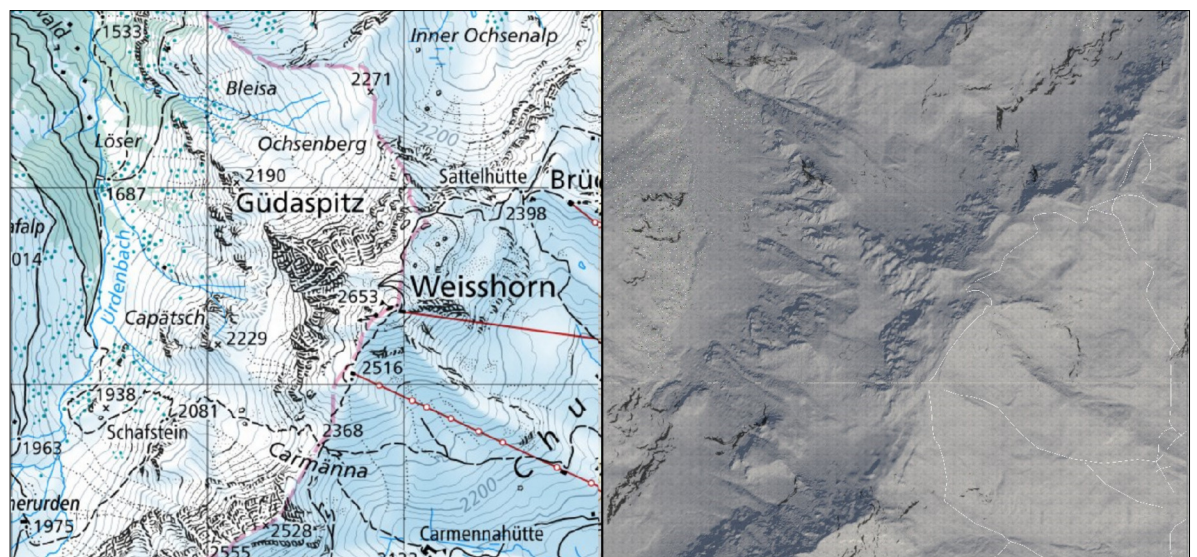
1 km<sup>2</sup> sized single tile generated in the preliminary thesis  
Own presentation



Skier with a forest in the background  
Own presentation



9 km<sup>2</sup> sized terrain comparison of a Swiss map on the left and in Unity on the right  
map.geo.admin.ch and own presentation



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**Subject Area**  
Computer Science