

A new web map for the MeinGrün app

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Abstract:

The starting point for developing a new map was defined by the requirements of the “MeinGrün” project¹ (can be translated as ‘my green’ project). The aim is the development of a mobile app, which enables routing to urban areas, including suggestions for attractive places for different activities. A specific map style was designed to communicate information related to green spaces effectively and to make users excited about the topic of the project.

Among other reasons, we also want to apply our knowledge on vector tile generation and use it in teaching. For the demonstration of our research on generalization, it is beneficial to offer a web map service because such a service allows illustrating developed methods and results. Finally, the experience enables us to train students in the design and development of customized styles for zoomable web maps.

The aim is to build a map service with several zoom levels up to small scales using data from OpenStreetMap and NaturalEarth. For better adaptivity, it is aimed to offer the map as vector and raster tiles with the same style. Besides, making high-resolution raster tiles available for retina displays is considered as well. The rationale is that everyone can choose the appropriate method of delivery for different contexts of application. These requirements result in some technological challenges: provide vector and raster tiles at the same time and style, keep the computation time for an update, and generation low. For providing and delivering up to date data, on-the-fly map generalization has been implemented, e.g., scale-dependent selection, simplification, and aggregation of various features.

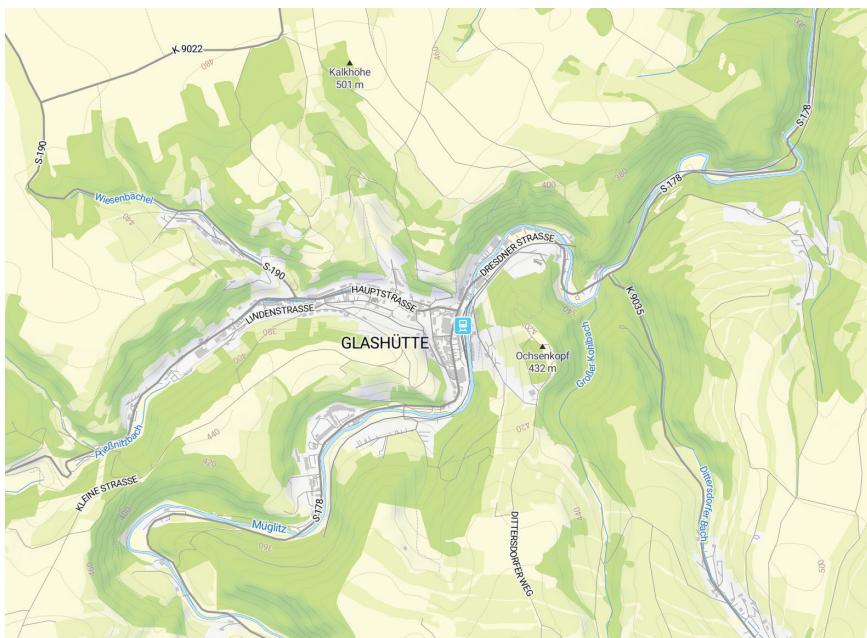


Figure 1: Example screenshot from our map style for the city of Glashütte in Germany.

¹ <https://meingruen.org/>

Figure 1 shows our result, a map in warm colors, and a reduced information load for serving a reference map. The visualization of roads with a simple line is unique, but this was also the intention of the applied research project: the production of something unique and easy rememberable for the “MeinGrün” project. The hill-shading uses raster tiles while all other map features work with vector tiles.

The data transformation from the OpenStreetMap format to the spatial PostgreSQL/PostGIS database has been applied with IMOSM, a well-documented and efficient tool. GDAL is used to import the NaturalEarth data and doing some processing steps. PostgreSQL and its spatial extension PostGIS serve in many web-mapping projects as a data store and offer a wide range of options for processing data. After specified queries are applied, the t_rex software generates the vector tiles from the database, which are then packed as MBtiles using mbutil. Finally, Tileserver GL is used to serve vector and raster tiles, including further necessary additions such as style, sprites, and glyphs.

To sum up, we already have a working service, which is available on our server² with an ongoing blog about the project. Still, it is a work on progress project that needs further research and development. For example, the integration of Wikipedia/Wikidata information for selecting place by their importance, transliteration of no-Latin place names for a world-wide coverage, and more and better labeling of features. Now the map extent is scale depended and covers at low zoom levels the whole world. In contrast, the higher zoom levels are only available in Dresden and Heidelberg to match the requirements of the “MeinGrün” project but will be extended in the future.

² <https://maptiles.geo.tu-dresden.de/>