

OSM Monitoring Tool

Graduate

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Initial Situation: The search & rescue organization Schutz & Rettung Zurich (SRZ) are taking different resources into account, when preparing an operation. One of these resources is OpenStreetMap (OSM) which is openly licensed and an alternative to the well-known Google Maps. For planning a rescue mission SRZ has to rely on the correctness of the underlying data of OSM. To efficiently track and monitor data changes a tool is needed to list and filter changesets in Switzerland. Changesets are grouped edits with a time-stamp whenever the data of OSM is edited. There exist many quality management tools in OSM but none of these are able to filter for specific features, called tags, directly on the data of OSM. This is an important requirement for the project and plays a key role in its use by the SRZ.

Approach / Technology: First we analysed existing tools, like one which has been created in a previous term thesis at OST as well as other popular tools like OpenStreetMap Changeset Analyzer (OSMCha). In order to deliver a well-rounded product, we drew inspiration from these tools and were able to incorporate some ideas into the design of this project. After considering all the available information, we started with a new greenfield implementation. The main focus was to create a tool that meets the requirements, has an extensible architecture and is made from the latest technologies. Our project "OSM Monitoring Tool" comprises a full stack web application and is split into three parts: The first part is the frontend (Javascript, Vue.js/Quasar/Leaflet) which enables the user to interact with the application. The second part is a database (PostgreSQL) for storing all the required data such as application specific information, as well as the complete history of the changeset data of OSM of Switzerland (tables changesets, users) and its underlying objects (tables nodes, ways, relations). The database is regularly updated with the latest changes via a background process. The third part of the application is the business layer (Python, Django). This layer is responsible for handling all requests from the frontend, processing the data and gathering the necessary information from the database. For an easy deployment every part of the application runs in separate Docker container and the entire application can be started with a couple commands.

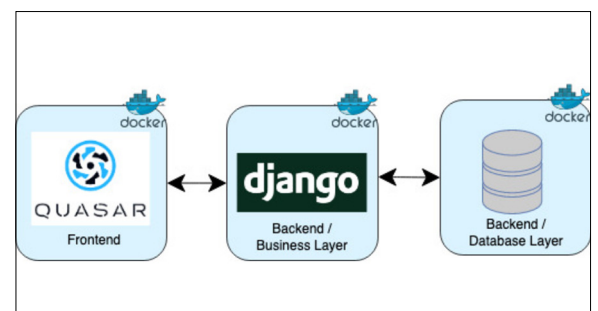
Result: As a result of our work, we have developed an application called "OSM Monitoring Tool", which allows monitoring changes in OSM in user defined ways. It consists of a web application with a map in the main window and links to some well-known external editors and tools. In a panel to the left a list of changesets is being displayed with their processing status (open, in process, closed) and which can be sorted chronologically or according to priority. A user can create named custom filters. A filter typically consists of a list of tags. Other filter criterias are user

name, creation/modification date, processing status, and geographic location, which can be defined by drawing a freeform geometry on a map. One of the unique features of our application is, that it acts on the underlying OSM objects - not only on the changesets. This allows a detailed filtering and increases the usability significantly. It is open source and the web design (color, logo) of the frontend can be easily customized. The SRZ has announced that their data curators will be using this tool in the near future.

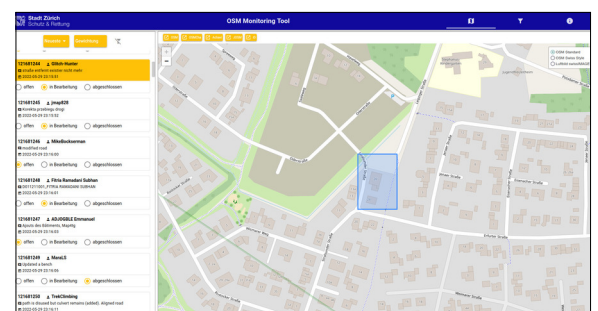
Control center of Schutz & Rettung Zürich in Kloten, from where emergency operations are planned and supported
https://www.gvz.ch/_file/426/_r1140x600cc/alarmierung-3.jpg



Application architecture overview with frontend and backend, including business and database layers, all in Docker
Own presentation



OSM Monitoring Tool showing changesets to the left and the editing perimeter (blue) of the selected changeset (yellow)
Own presentation



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Subject Area

Internet Technologies
and Applications,
Software