



Analyzing open spatial data of the whole world

The Postpass Service

Perform efficient geodata analysis on worldwide spatial OpenStreetMap data with SQL based on a public PostgreSQL/PostGIS instance.

Challenge

OpenStreetMap (OSM) comprises a massive amount of worldwide geospatial data. Overpass is a well-known service for accessing OSM but it's default language Overpass QL is idiosyncratic and can't perform complex queries.

Overpass Turbo GUI

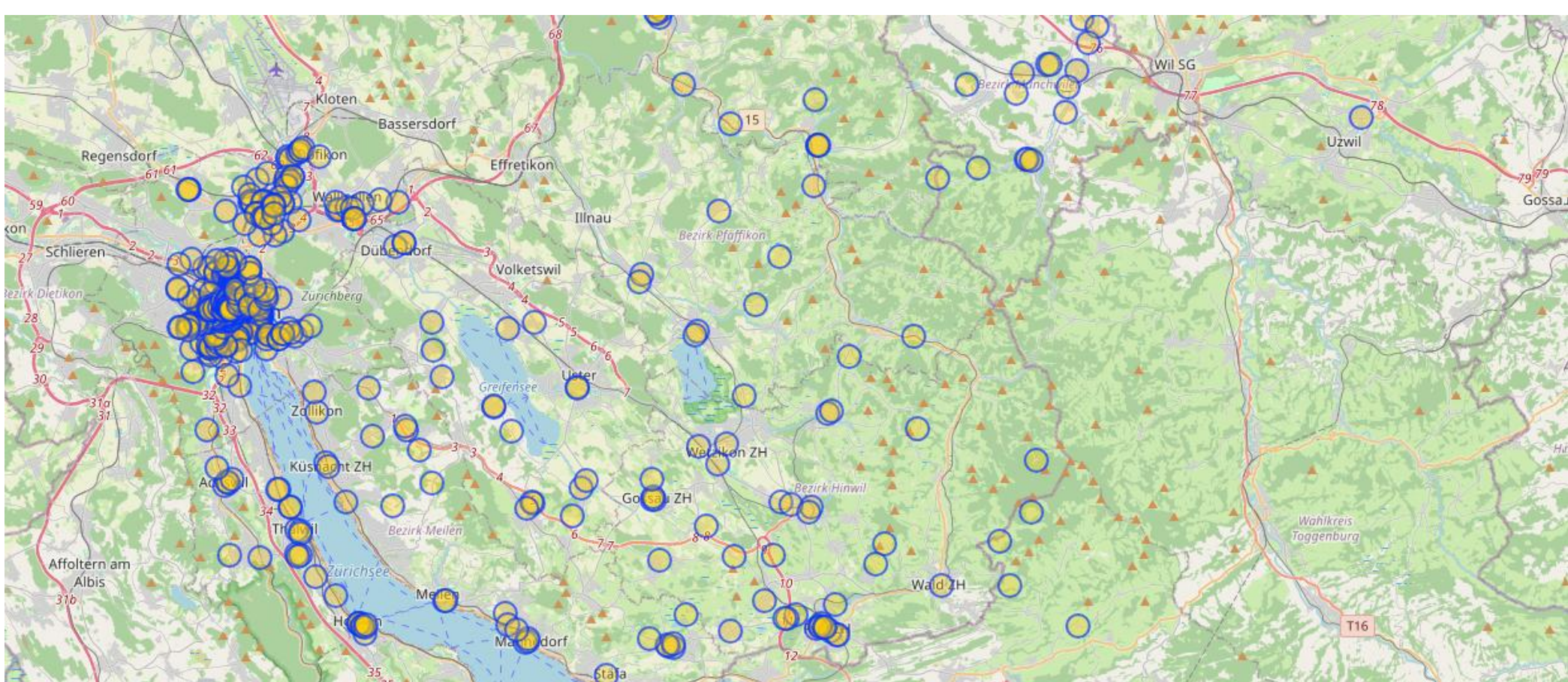


Figure 2: This is the map section from Overpass Turbo showing Italian restaurants as a result from an SQL query as shown in Figure 2.

Concept

The OSM data schema mapped to a GIS analysis-friendly post-relational schema with 7 tables and 7 view. This are the most used ones:

- Postpass_point for point entities
- Postpass_line for linestring entities
- Postpass_polygon for area entities
- Postpass_pointpolygon as a combined view

All tables have few common attributes:

- osm_id and osm_type
- tags containing OSM key-values (type JSONB)
- geom of type geometry with lat/lon (WGS84)

Solution

Like Overpass QL, Postpass offers standardized SQL with full spatial capabilities, delivering it in the Overpass Turbo GUI and as an API. To protect against overload, Postpass uses a clever dry run with EXPLAIN.

SQL Example

Query to get all Italian restaurants within bounding box of eastern Zurich:

```

{{data:sql,server=https://postpass.geofabrik.de/api/0.2/}}

WITH spatial_extent AS (
  SELECT ST_MakeEnvelope(
    8.4, 47.1, 9.5, 47.5, 4326
  ) AS geom
)

SELECT
  osm_id,
  tags->>'name' AS name,
  tags->>'cuisine' AS cuisine,
  ST_PointOnSurface(geom) AS geom
FROM postpass_pointpolygon
WHERE tags->>'amenity' = 'restaurant'
  AND string_to_array(tags->>'cuisine', ';') @> '{italian}'
  AND ST_Intersects(
    geom,
    (SELECT geom FROM spatial_extent)
  )

```

Figure 2: SQL query to combine spatial filtering and OSM tag filtering

Some useful spatial SQL queries

- Find restaurants intersecting Rapperswil lakefront areas with ST_Intersects.
- Find restaurants within a set distance of Rapperswil station using ST_DWithin.
- Create a central label point for each restaurant area using ST_PointOnSurface.
- Order restaurants by distance to Rapperswil station with ST_Distance.

