

Urban Mapping

Building footprints has become the first product produced by our ML algorithms on a country-wide scale. We've completed all-over-Russia dataset counting more than 50M buildings. After that we've built the active learning framework for ML models to transfer technology and apply it to the new urban structures. Our benchmarks include countries in South America, Western Africa, South Asia and more. We enrich building footprints with building height estimates (max. error $\pm 4m$), measured by buildings shadows and walls in oblique imagery.



Active learning to transfer technology to the new urban structures

Active learning framework is designed for transferring ML models to new domains. It helps to reduce time for imagery labelling while iteratively increasing the quality.

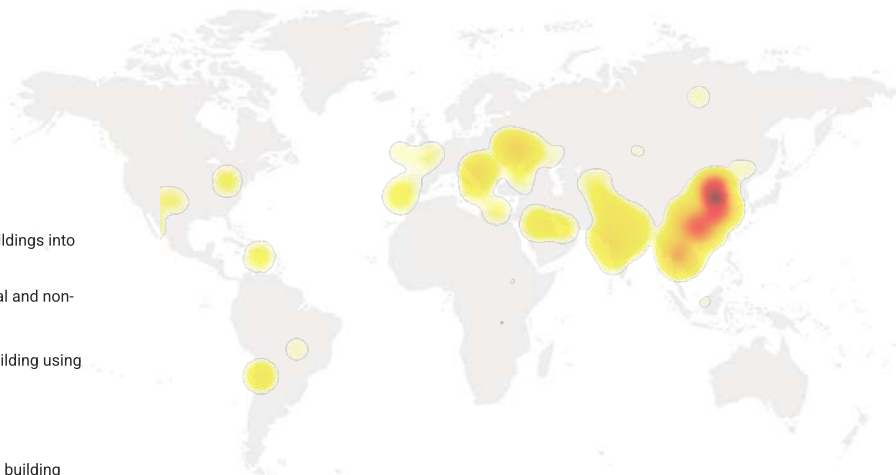
The framework's composed of the two main blocks.

Deep-learning models for image analysis:

- A segmentation model tuned on a selection of built-up areas
- An instance segmentation model that splits the blocks of densely built buildings into single houses
- A classification model that classifies the detected buildings into residential and non-residential
- A height prediction model for estimating the height of each multistorey building using similarity algorithms or its shadow length

A number of post-processing steps:

- Simplification: building footprints (LOD0) are simplified to several common building shapes (rectangle, L-shape, etc.)
- Re-alignment: aligning buildings with the nearest street after their simplification
- Splitting dense building blocks into single features.
- Merging with OpenStreetMap data (currently, we add the landuse class from OSM and optionally substitute the predicted feature with OSM one if their IoU is high enough)



Building & Construction

Images taken from satellites provide historical information and cover larger areas enabling to analyse the context.

It is considered to be the fastest and the most effective way to detect construction progress in large scale and update urban maps.

"Urban Mapping" is designed to provide a subscription for a specific sites or for a whole city area to monitor changes all around.

[Check the demo app](#) →



Data access and provisioning

We provide data in any common GIS format

We provide an API for custom-area requests (data is streamed as GeoJSON)

Coordinate system: WGS84

Projection: latitude/longitude

Mapflow service

Buildings footprints with heights, Mapflow-QGIS

Software

QGIS is recommended to interact with Mapflow and to connect to local PostGIS with internal geospatial layers

Data service

Mapbox API, Maxar Vivid, Maxar SecureWatch, 0.3 - 0.5 m/px

Data formats

GeoJSON, XYZ raster tiles