

Panoramax (v.2026-04-23b)

Open and federated street-level imagery



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<https://mnalis.com/OSM>

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Intro...

- if you see red asterisk (like this “^{*}”) and I jumped to next slide without expanding on it, ask me to explain, I *probably* just forgot
- in any case, feel free to ask questions at the end of the relevant slide, or at the end of presentation. Just raise your hand!

What is Panoramax?

- <https://osm.wiki/Panoramax>
- basically, it's Google StreetView TM crowdsourced alternative which is **not** evil / restricted
- Fully FOSS (both clients and servers) software stack to implement open alternative to it (AKA GeoVisio)
- Federated network of distributed servers providing said street-level imagery
- Tools/apps for community to collect that imagery and use it to improve OpenStreetMap (and more)
- Images and metadata available under open licenses and accessible using existing open standards

Why not Google Maps Street View?

- it may be “free as in beer” (at this time^{*}), but it is definitely not “free as in freedom”
- heavy restrictions on what you’re legally allowed to do with it:

https://www.google.com/intl/en_hr/help/terms_maps/

- forbidden to use in OpenStreetMap, any print purposes, offline use, navigation, interoperability, using it to augment other datasets, copying the data, commercial use, competing with Google services...

But what about ... ?

There exist other street-level services:

https://osm.wiki/Street-level_imagery_services, but:

- backend, upload clients and/or viewing clients are not FOSS (e.g. Mapilio, Kartaview, Mapillary ...)
- owned by big evil corps (e.g. Mapillary owned by Facebook/Meta), and many users are unwilling to volunteer to fund further #enshittification *
- too specialized (e.g. OpenTrailView, Wikimedia Commons)

Why “distributed”?

- splitting the hardware / hosting costs (**not sustainable** for single entity – OSM-FR is allowing worldwide imagery just for *testing purposes*)
- avoiding single **vendor lock-in**
- avoiding **SPOF**
- local community involvement
- speed / efficiency (local instances)
- interoperability (just change the base URL!)

Why “federated”

- interoperability
(e.g. <https://api.panoramax.xyz/api/instances>)
- ease for data consumers (check at one place, get the results from all other instances too)
- trivial to change instances (e.g. should they die or become hostile) without extra work to modify data consumers
- see [Fediverse](#)

Why “FOSS” / “open protocols”

- increases collaboration
- **Linus's law:** *"given enough eyeballs, all bugs are shallow"*
- *"scratching a developer's personal itch"*
- protects against enshittification / vendor lock-in
- existing tools / libraries can be easily reused

Why “open data”?

- ease of use, no need for complex and time intensive procedures (often involving lawyers)
- when users are free to use the data as they wish without barriers, many new and innovative solutions arise
- commons sharing benefits everyone
- that warm fuzzy feeling one gets by helping fellow humans without ulterior motives

Usages

- help with OSM mapping: sidewalks, cycleways, streetsigns, crossings, surfaces, smoothness, lanes, lit, bus stops, parking spaces, street furniture...; also POIs verification & details (e.g. 360° cameras, direct POI photos)
- [panoramax=*](#) tag for linking images to artworks, historic markers, POIs... (easier than [wikimedia_commons=*](#))
- traffic estimation / sightseeing (e.g. cycle route planning)
- AI (auto-recognition of streetsigns, new uses*)

Instances

- ideally, each country would have at least one server
- it is currently at 10 instances

(<https://api.panoramax.xyz/api/instances>)

- last one added being our OpenStreetMap Hrvatska *

<https://panoramax.osm-hr.org> (public OSM login, CC-BY-SA 4.0, allows ex-YU territories – disk space ~50 TB, similar laws and languages)

- meta-catalog on <https://api.panoramax.xyz/>

(“one ring to rule them all” [but not really])*

Capabilities

- instances can be locally customized (e.g. only accepting imagery for certain regions, disallowing restricted areas, different policies / logins, public or private contributions etc.)
- some are specific (e.g. panoramax.mapcomplete.org – no streets, only POI imagery)
- regular photos or 360°
- blurring of faces/license plates, detection of streetsigns
- reporting pictures containing unwanted data
- follow sequences (manually or automatically)
- filter by quality, user, dates etc...
- transport mode, custom tags

Hardware to contribute images?

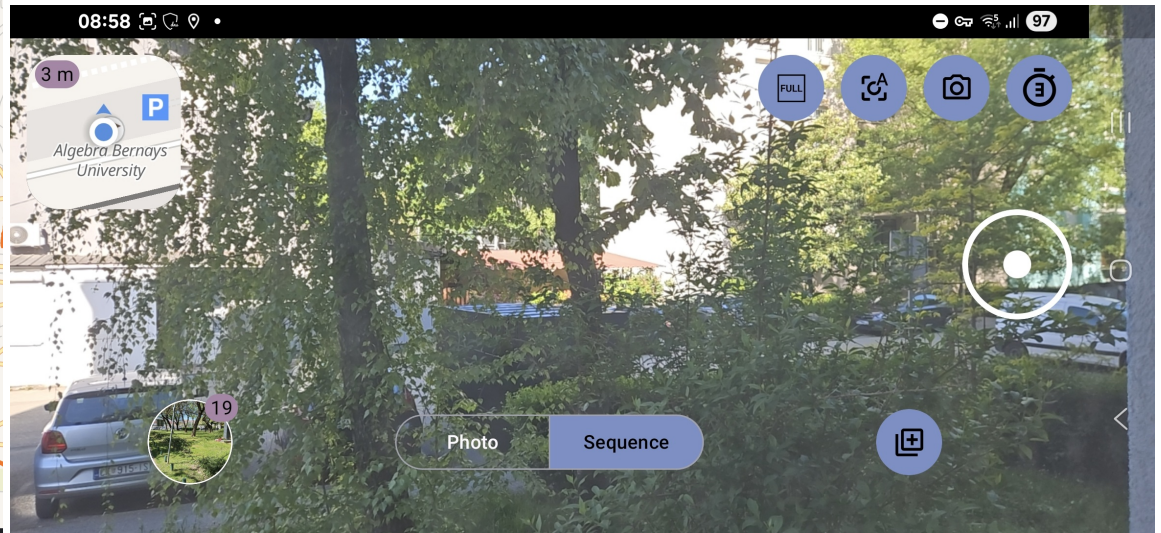
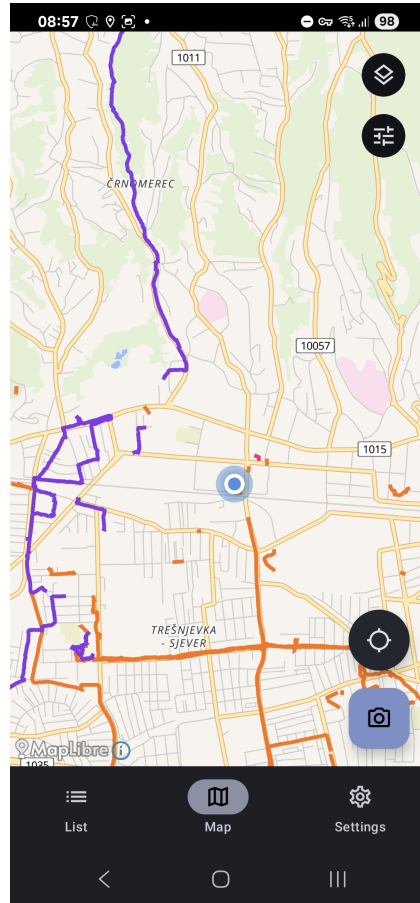
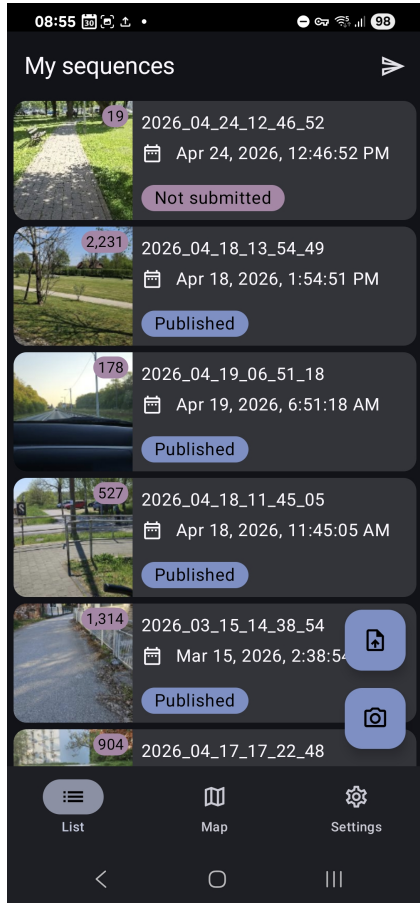
- just use your smartphone camera+GPS from hand !
- ... or mobile phone mounted on car's dashboard
- ... or action camera on bicycle helmet
- ... all the way to 360° and/or multiple cameras with GPS on specialized raised mounts



Software to contribute images?

- Instance web (web) - for single or few pics;
e.g. <https://panoramax.osm-hr.org/upload>
- Baba (Android+iOS): <https://osm.wiki/Baba>
- CLI (multiarch): <https://docs.panoramax.fr/cli/> (external cameras, OpenCamera, ...)
- Panoramax app (beta): <https://gitlab.com/panoramax/clients/mobile-app>
- Vespucci (Android - POI): <https://vespucci.io/>
- MapComplete (web, mobile web/app - POI): <https://mapcomplete.org/>
- better-osm-org (web userscript - POI): <https://osm.wiki/better-osm-org> (extra setting to enable)

Baba



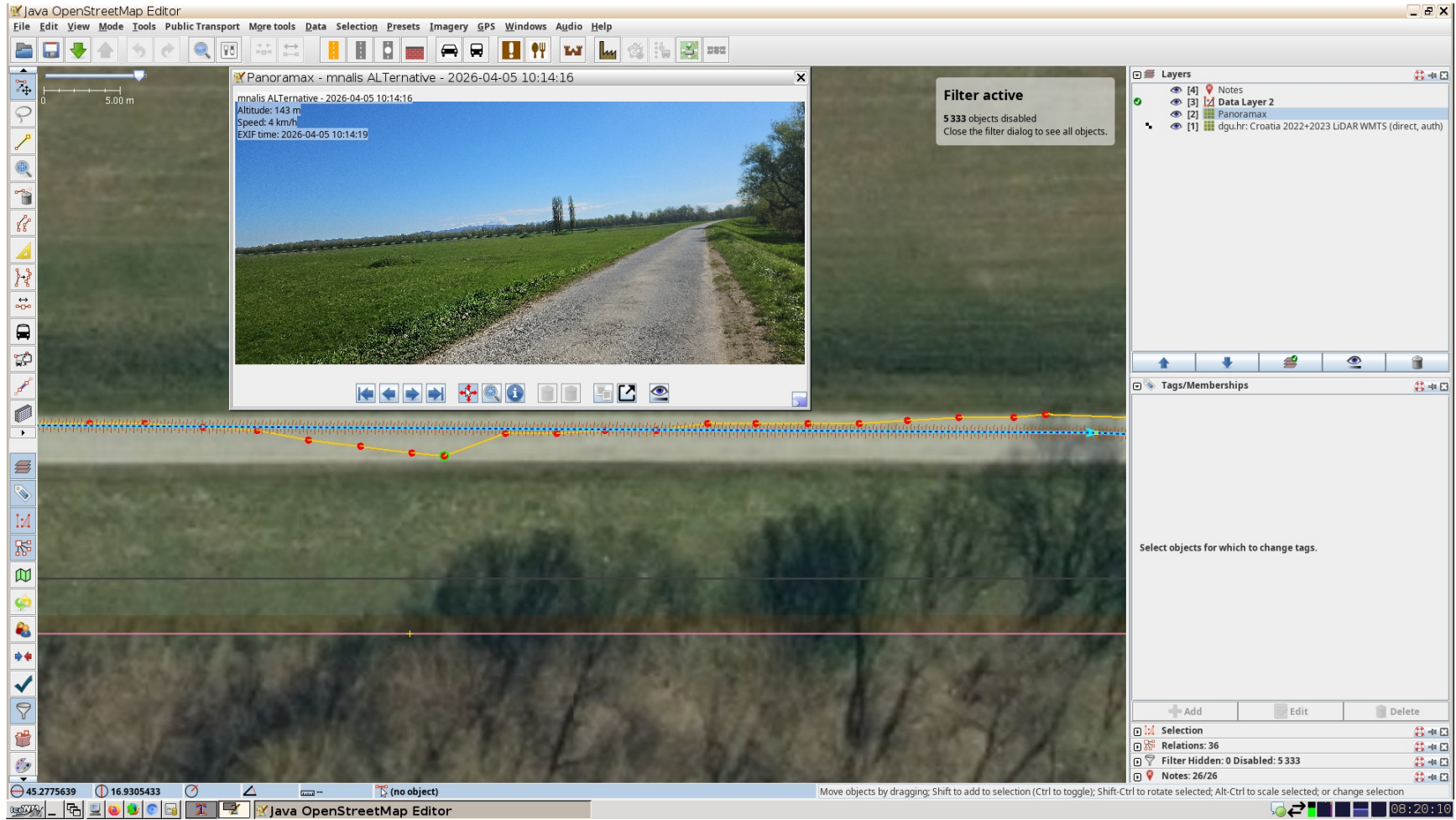
Software to use images?

- <https://api.panoramax.xyz> (web - all) (or instance directly)
- JOSM (java - all) <https://osm.wiki/JOSM>
- iD (web - all) <https://osm.wiki/iD>
- Vespucci (Android - all)
- MapComplete (web - POI)
- CoMaps (Android, iOS - POI)
- QGIS plugin
- STAC or WFS clients & more <https://osm.wiki/Panoramax#Client-side>

http://api.panoramax.xyz



JOSM



iD

iD | OpenStreetMap — Mozilla Firefox

File Edit View History Bookmarks Tools Help

id | OpenStreetMap

https://www.openstreetmap.org/edit?editor=id#map=19/45.774255/15.953216

news func CARNet Tomsoft doma mn_MapSwap dbg Mastodon about:processes note2node ShareViaHTTP

OpenStreetMap Uredi

Povijest Izvoz GNSS tragovi Korisnički dnevnik Zajednice Autorska prava Pomoć Doniraj O projektu

Matija Nalis

Traži elemente karte

Pretraži

Točka Linija Područje

Dodaj značajku

Provjeri

Podaci karte

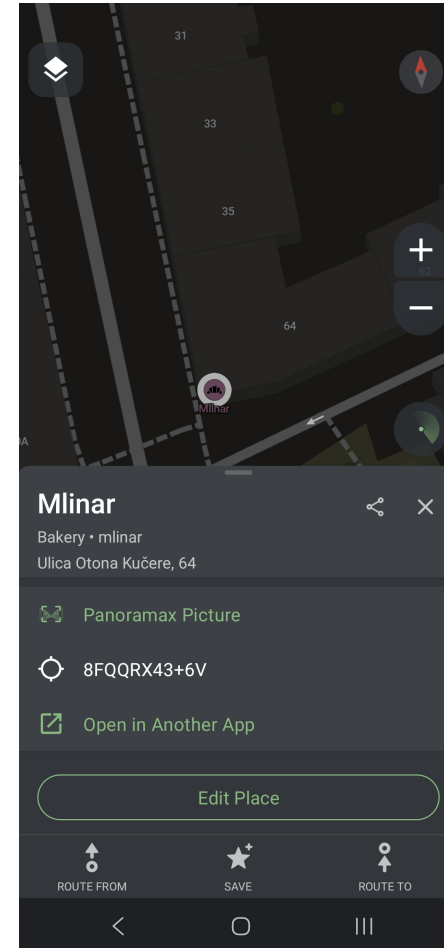
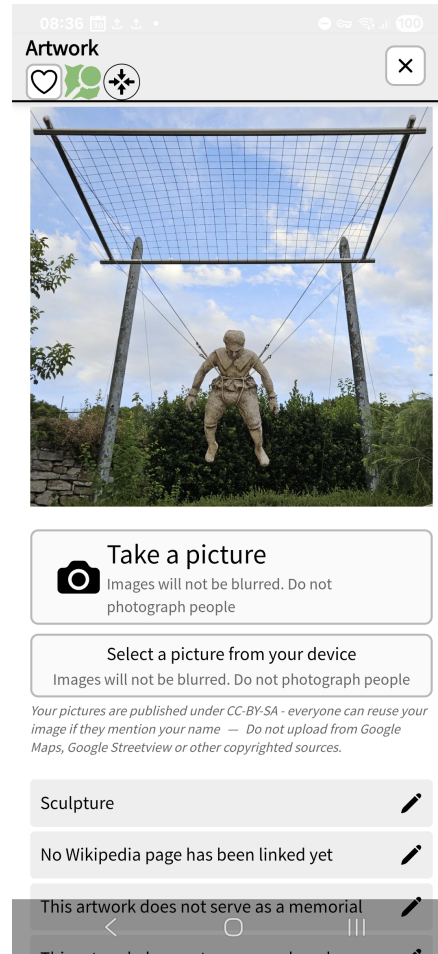
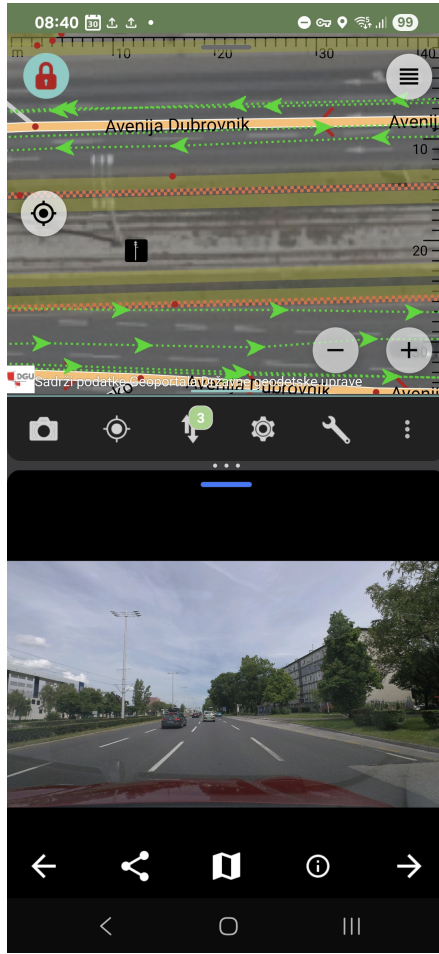
- Show History Panel
- Show Measurement Panel
- Photo Overlays**
 - Bing Streetside
 - Mapillary
 - Elementi karte
 - Traffic Signs
 - KartaView
 - Mapilio
 - Panoramax
 - Flat Photos
 - Panoramic Photos

30 m

Edits by Janjko, Badojo, Aranc, and 13 others 2.39.6

08:28:02

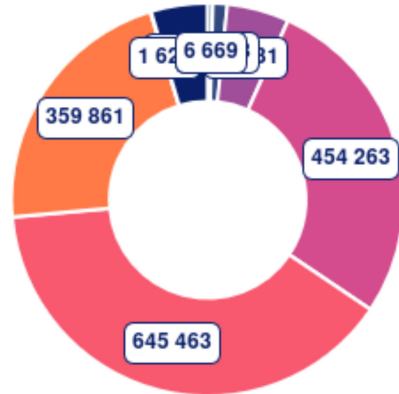
Vespucci, MapComplete, CoMaps...



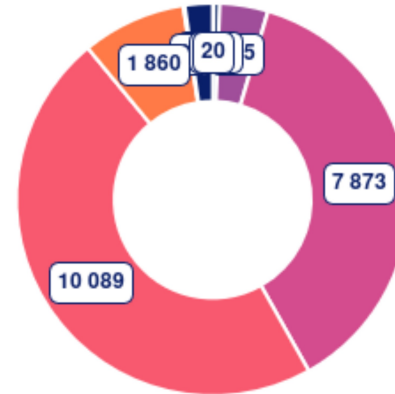
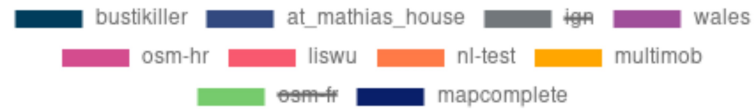
Stats (global and instance)

- <https://panoramax.fr/stats> (filtered here *)
- <https://panoramax.fr/leaderboard>

Number of photos per instance



Coverage in km per instance



Future

- hopefully even **more** instances!

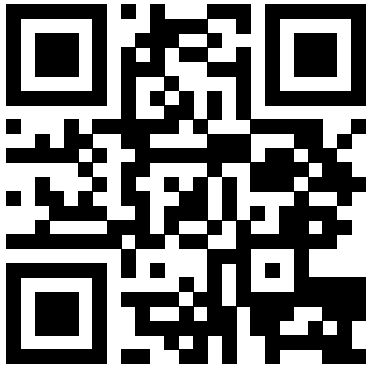
Please consider setting up your own (or asking others in your community and around if they're interested).

- more users contributing street-level imagery to existing instances
- my experience setting up the OSM-HR instance soon on:
<https://osm.org/user/Matija%20Nalis/diary>
(so feel free to subscribe, I post extremely rarely)

Attributions

- **Panoramax Logo**: By Adrien Pavie, CC BY-SA 4.0,
<https://commons.wikimedia.org/w/index.php?curid=140045157>
- multiple camera setup: Hbogner, CC BY-SA 4.0
<<https://creativecommons.org/licenses/by-sa/4.0>>, via Wikimedia Commons

Questions?



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