Panoramax

The full FLOSS alternative for your ground level imagery

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What is Panoramax ?

A new digital **common** and non-for-profit project

- The **resource** : a large growing catalog of ground level photos
- The **rules** : open licences, open code, based on existing standards
- The **community** : public sector, OSM contributors, private sector...

→ **A new (open) way to share ground level photos !**

Why Panoramax ?

- A really full FLOSS alternative (code base is gitlab.com/geovisio)
- Independent of private interests, buyouts, etc.
- Open governance
- Decentralized service (instances + « federation »)
- Easy and full access to original pictures
- Based on existing open standards
- Extend existing opensource tools (Geovisio)

→ **Avoid single point of failure !**

Panoramax story...

- Original idea from OpenStreetMap France (back in 2012 !)
- In 2021 OSM-FR proposal (again) as « geo-common » to IGN
  - SOTM-FR presentation in 2022 → peertube.openstreetmap.fr
- Started with IGN one year ago (late 2022) as a « state startup »
  - Funded by public money (IGN)… 540k€ for the first year
  - Small agile team (~ 3 full time positions)
  - First releases in may/june 2023, based on Geovisio initiated by Géovélo
- Next year funding decided last monday :)

Panoramax team at IGN

Présentation de l'équipe

Ressources Déploiement

Camille SALOU
Intrapreneure
5% ☹

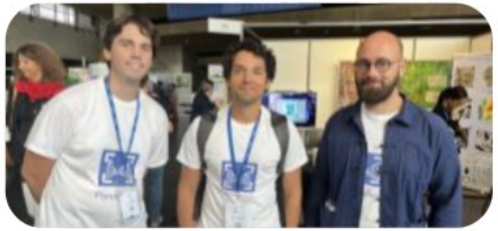
40%

Christian QUEST
Product Manager

Mathilde FERREY
Chargée de déploiement
60%

Panoramax, CI Fin de construction

Ressources Développement



Adrien PAVIE
Développeur Géomaticien
50%

Antoine DESBORDES
Développeur Back-end
80%

Jean ANDREANI
Développeur Front-end
60%

Bonus

Quentin GOUHOURY
stagiaire développeur
Stage 3 mois

Alain MARIA
développeur IGN
~20% sur 4mois

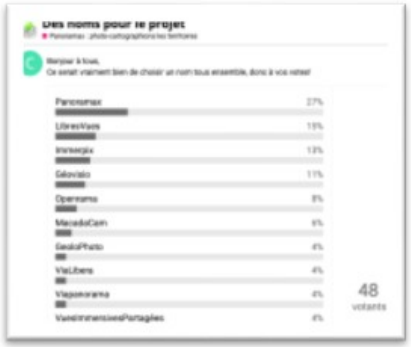
Anne PICHON
~10 j
UX/UI Designers

Charles PELOYE
~15 j

8 06/11/2023

Panoramax open governance

Une communauté créée

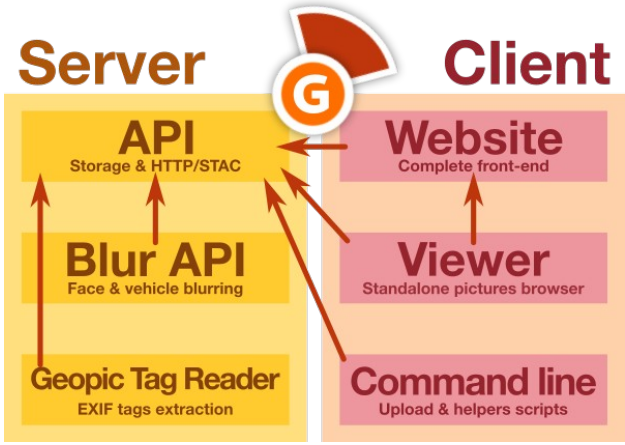


Une communauté lancée

- Avec des rendez-vous ritualisés : points d'échanges mensuels (16 participants en moyenne), GT CNIG, ateliers (gouvernance, licences)
- Les bases d'une future gouvernance esquissées
- Un site informatif vivant
- Un forum actif et des intervenants impliqués (75 messages par mois en moyenne sur la section dédiée)
- Une liste d'une centaine de contacts qui grandit chaque jour
- Une présence dans les grands événements (Géodatadays, State of the Map France et Europe, Open Source Expérience 2023 bientôt)

How does Panoramax work ?

- Panoramax instances
  - Photos storage
  - Local catalog of available photos
  - Upload API/UI + search/access API and viewer
- Panoramax blurring service
  - Independent, called by instances, can be shared
  - Detect faces and licence plates… and more ;)
- Panoramax meta-catalog



How does Panoramax instance work ?

- Photos storage : local or S3
  - pre-tiling of 360° pictures
  - Keeps all meta-data (EXIF and XMP tags)
- Local catalog of available photos (postgresql+python)
  - search/access API is based on STAC (Spatio Temporal Assets Catalog)
  - STAC is supported by major imagery actors (Airbus, Maxar, NASA...)
  - API provides interoperability with existing STAC code base
- Upload API/UI...

More about STAC → https://**stacspec.org/**

Upload photos to Panoramax

- Uploads
  - Web interface (drag & drop)
  - CLI tool (for mass upload)
  - API for any other code/script/app/tool
- Choice of instance
  - Currently 2 public instances open to uploads : IGN and OSM-FR
  - Different licences
  - Public sector should use panoramax.ign.fr (Open Licence requirement)

OSM France Panoramax instance

- Full bare metal
- Hosted in datacenter near Paris : 2 redundant 10G fibers
- Second hand hardware (only SSDs are new !)
  - Dell R7910 server / 256GB RAM / 28 CPU cores
  - 2 GTX1070 GPU for the blurring service
  - IBM storage bay (up to 60 x 3.5” HDD) – ZFS redundancy/caching
  - Currently 90TB of storage installed (18 HDD), 50 % used

→ **Total investment so far : 3000€**

DELL
DELL PRECISION
RACK 7910
DVD

3 6 9 12
2 5 8 11
1 4 7 10
Front

Panoramax AI / Computer Vision

- Collaborative annotation (using Label-Studio)
  - 3 « classes » : faces, licence plates and… road signs !
- Model trained using YOLOv8 and open for re-use ! (github)
- Multi-resolution detection : to detect nearby and far away objects
- Currently runs on 2 servers with 5 old GPUs (GTX1070)
- Blurring manipulates JPEG blocks → minimize quality loss
  - Unblur capabilities while maintaining anonymization (blurred parts can be preserved losslessly without any link to original picture)

Panoramax meta-catalog

- Harvests Panoramax instances catalogs and merges them
- Keeps only a copy of meta-data
- No copy of photos themselves
- Provides same API as an instance to search/access photos

→ **Seamless access to all pictures !**

Previewable at : **api.panoramax.xyz**

DEMO !!!

Panoramax for OSM contribution

- IGN and OSM-FR instance compatible licensing
  - IGN = Open License (same as CC-BY)
  - OSM-FR = CC-BY-SA + authorization to create ODbL or Open License data for non photographic derivates
- JOSM and iD (basic) integration
  - Panoramax viewer can recenter JOSM/iD view automatically
- Possible integration in OSM ecosystem tool
  - OSM based OAuth login on OSM-France instance
  - Vespucci, Organic Maps, OSMand, StreetComplete, etc...

Panoramax future...

- More instances !
  - OpenStreetMap Belgium on its way… more OSM local chapters ?
  - Some french local authorities plan to deploy their own instances
- More pictures...
  - Just received Strasbourg disks
  - Contact with Paris city and many other major cities in France
- Larger community / open governance
  - Register as a non-for-profit organization ?

Panoramax International Foundation

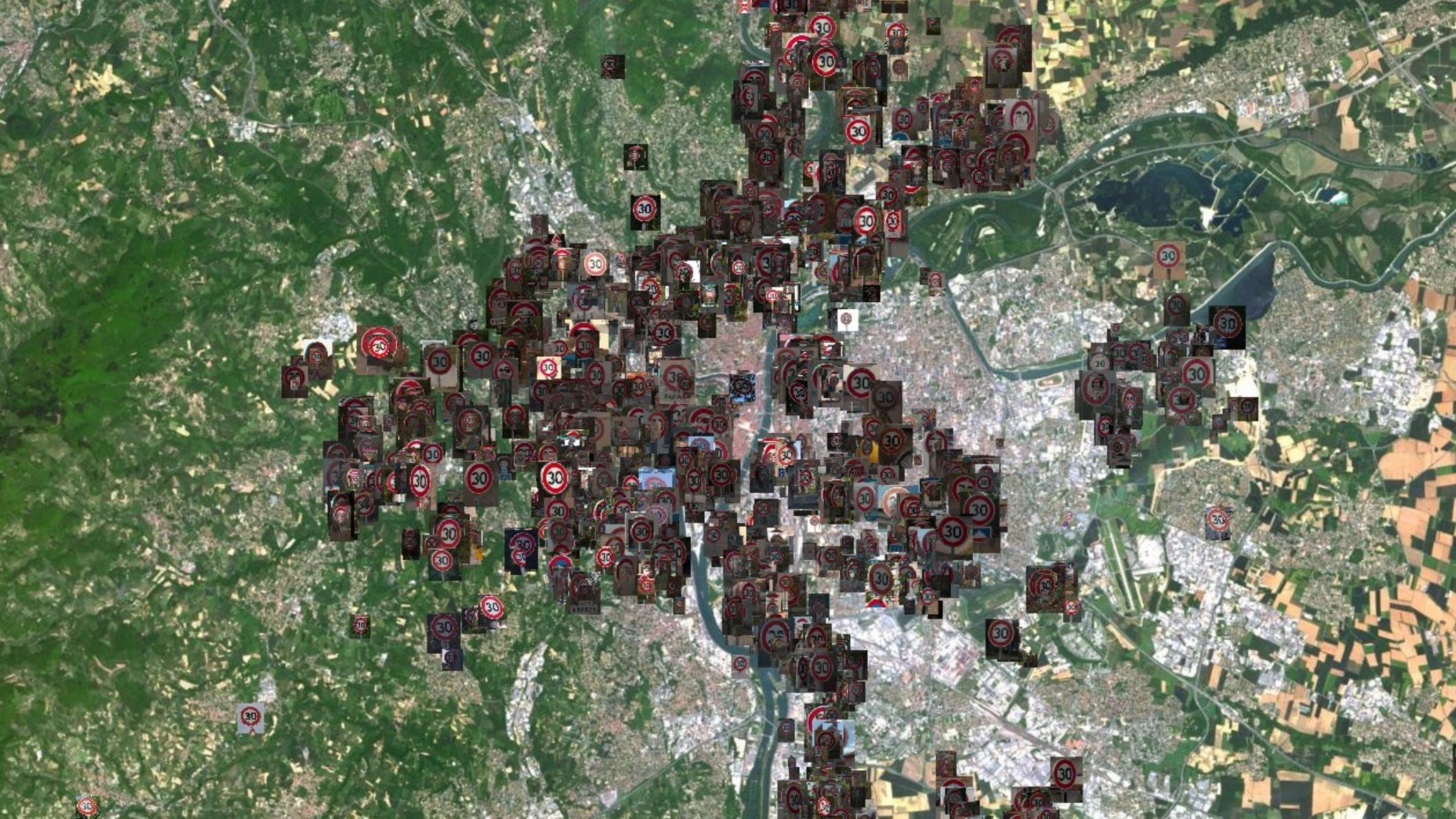
- Local Panoramax instances by local chapters
  - OSM Belgium on its way
  - OSM Switzerland thinking about it…
  - Who's next ?
- Equipment sharing for local OSM groups
  - OSM Belgium street level imagery project
  - OSM France invested in shared equipment

Panoramax public/state startup road map...

- Increase and simplify contribution
  - Dedicated mobile app ?
  - More tools and documentation
- Reinforce the software stack : scaling, more features, optimizations...
- Multiply photos re-use
  - Qgis plugin (by third party) and why not Esri ?
  - Object detection/classification… road signs are the first ones in the list !

Panoramax and IA / computer vision

- Blurring API also detects road signs
  - 3 millions of road signs detected and extracted from original photos
- Classification model already trained
  - 40000 photos in training dataset
  - 200+ types of road signs
  - Trained on french road sign, may need more training for others
- More detections to come
  - Collaborative annotation (Label-Studio)



Q & A !!!

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