



CHERISH

Cultural Heritage

InSAR-based Surveillance for Hazards



Paris, France

Amsterdam - End of Phase 1 meeting
September 2nd 2025



Funded by the
European Union

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Who is eOnsight ?

eOnsight develops digital solutions to monitor
Infrastructures from Space using **AI, Data Analytics** and
Earth Observation technologies

Expertise

- Data Analytics, AI & Data Platform Integration
- Earth Observation & Satellite Data (InSAR)
- Software Development & User Experience (UX)

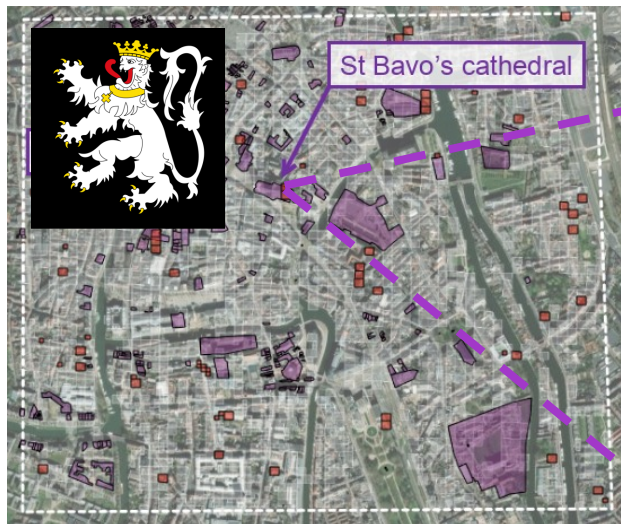
CHERISH : Key team members

Daniel KATZ	Co-Founder, CEO
Charles NGUYEN	Co-Founder, CTO
Marion ECHEVARD	Co-Founder, UX/UI Designer
Ioannis STASINOPOULOS	Data Scientist
Erwan CHEVRIER	Full-Stack Web Developer
Ahmed CHREIF	Project Manager





CHERISH: Cultural Heritage InSAR-based Surveillance for Hazards



This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No. 101131955.



The challenge: monitoring Cultural Heritage assets

- Europe's Cultural Heritage assets: identity, tourism, economy
- Increasingly exposed to ground motion hazards from various origins
- Current monitoring is expensive, fragmented, reactive

=> Need a scalable, proactive, city-wide solution



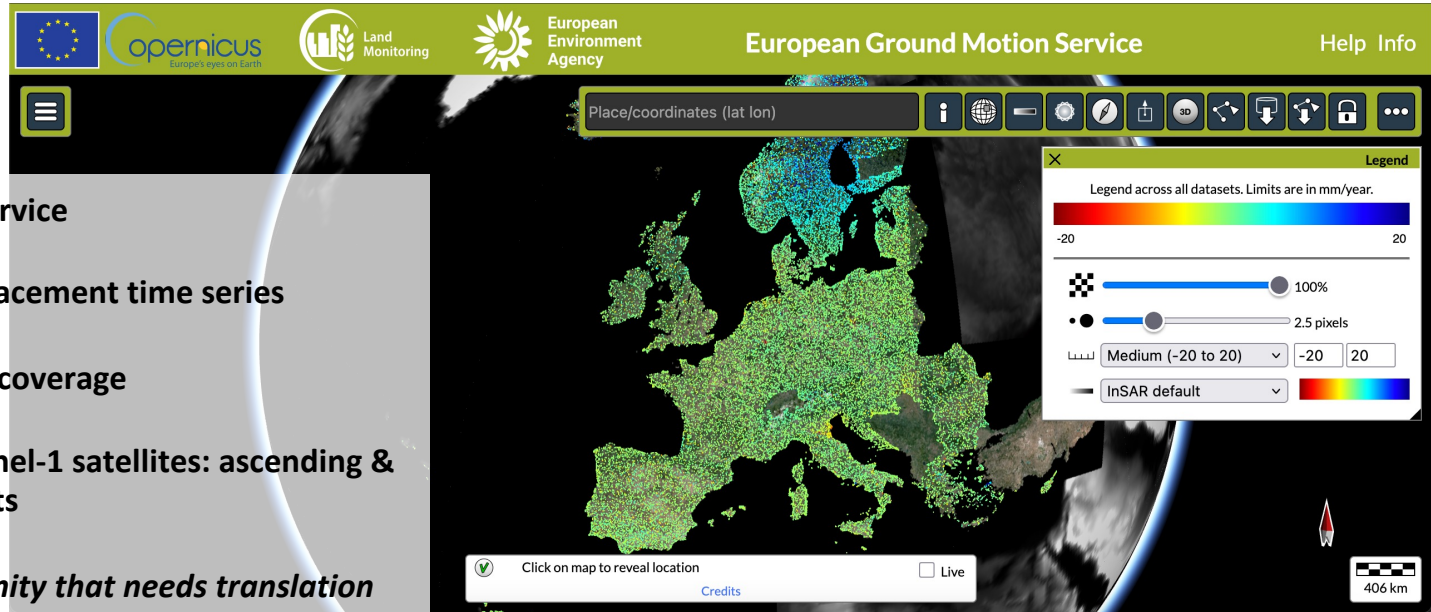
Roof of Monferran-Savès Church in Gers (France) collapsed in Jan. 2024.



The tool “made in Space” : European Ground Motion Service (EGMS)

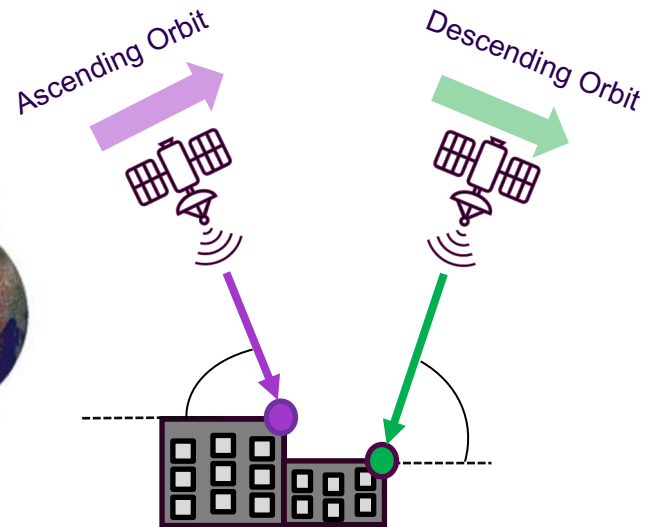
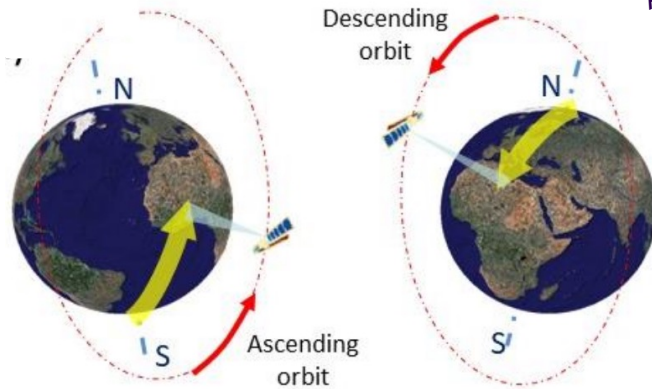


- free, open EU service
- Millions of displacement time series
- Full continental coverage
- Data from Sentinel-1 satellites: ascending & descending orbits
- *Unique opportunity that needs translation into usable insights*





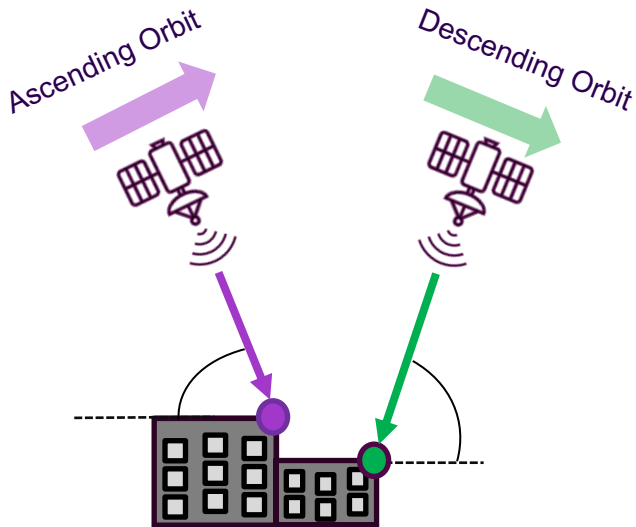
Satellite Radar Measurements



1 Satellite = 2 viewing angles



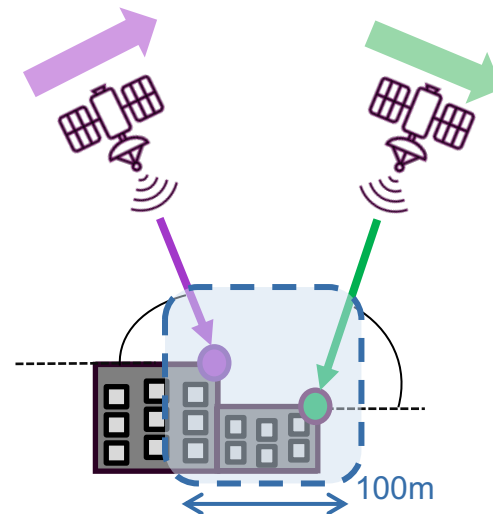
Satellite Radar Data & EGMS processing



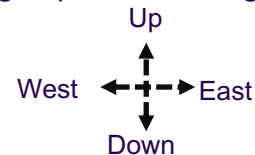
EGMS L2B dataset
Contains 2 separate sets of points



Displacement Measurement



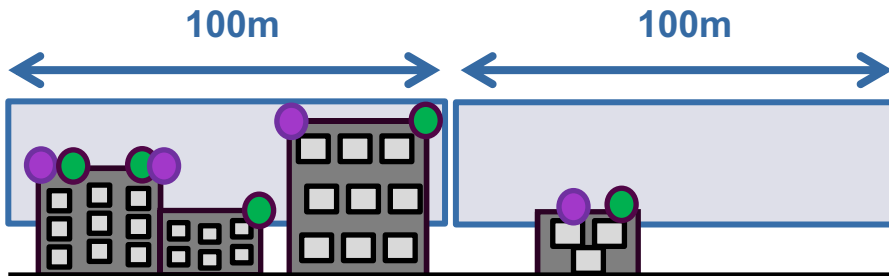
EGMS L3 dataset
Averages points to a regular 100m grid





EGMS limitations for Cultural Heritage assets

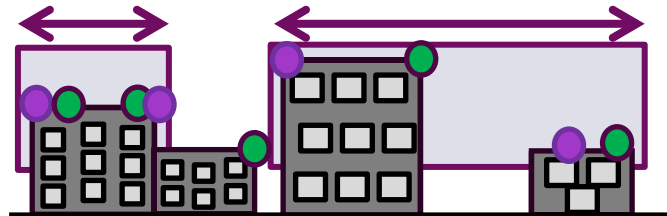
EGMS L3



- Fixed 100x100m grid not fitted to urban setting
- Not optimal to monitor individual Cultural Heritage assets

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Adaptive cell sizing



- ✓ generates an adaptive grid to aggregate the relevant level of information
 - ✓ Higher spatial resolution
 - ✓ Higher confidence in displayed information
- => Usable for individual Cultural Heritage assets



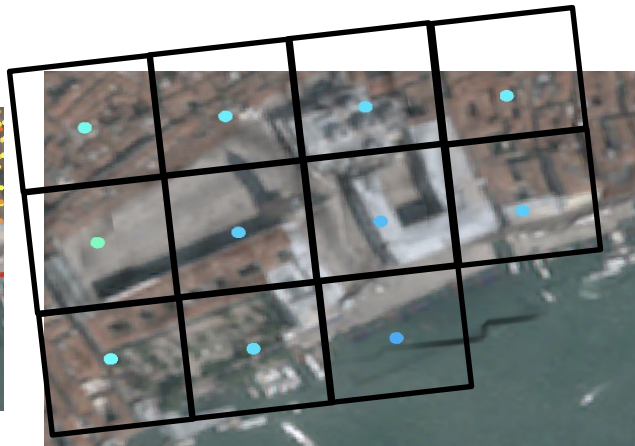
EGMS limitations for Cultural Heritage assets

St Mark's Square
& Doge's Palace (Venice)



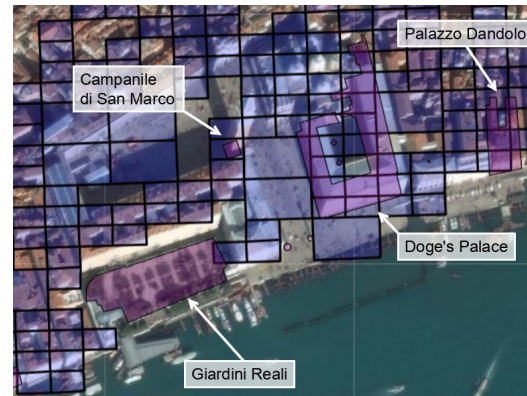
EGMS L2B Dataset

Dense but hard-to-interpret



EGMS L3 Dataset

- Interpretable but coarse-grained,
- Confidence level unclear (false impression of even significance),



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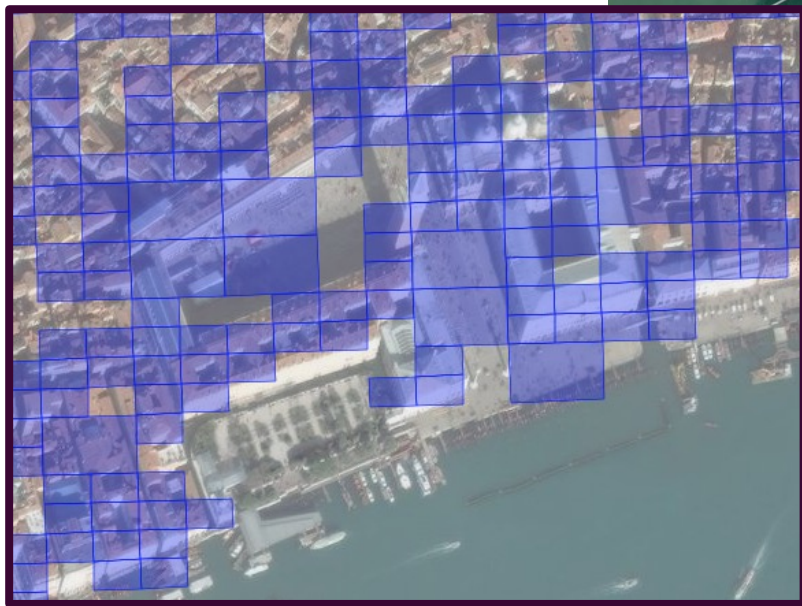
- Interpretable with relevant precision,
- Confidence level is displayed,

By focussing on individual assets, we revealed a gap between EGMS *L2B* and *L3* data.



CHERISH's innovative solution #1 : Adaptative cells (1/3)

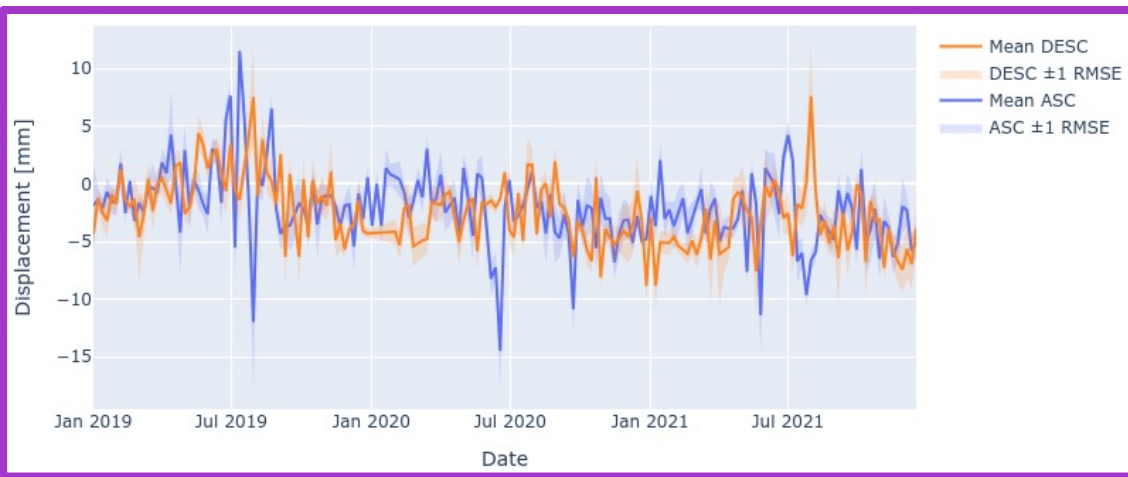
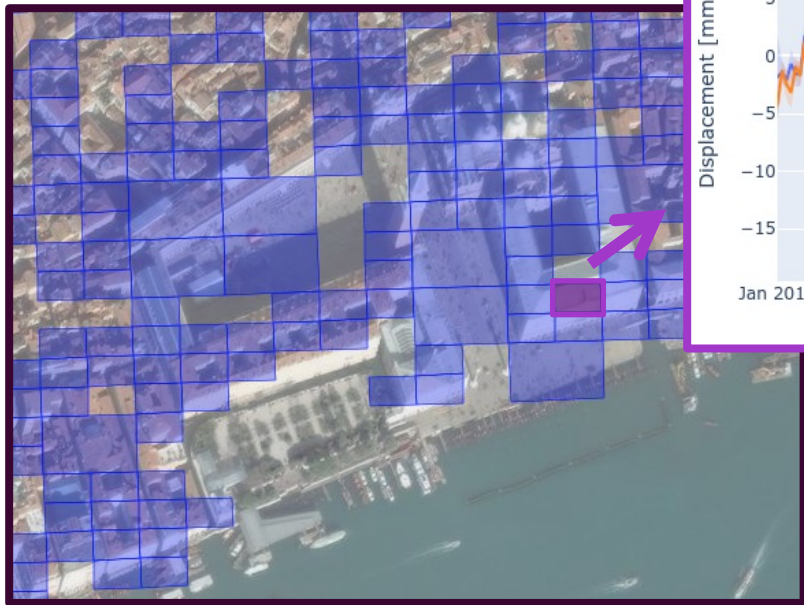
1. Adaptive cells, aggregating ascending and descending points





CHERISH's innovative solution #1 : Adaptative cells (2/3)

2. Spatial averaging of the points within the cell



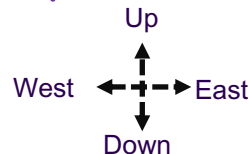
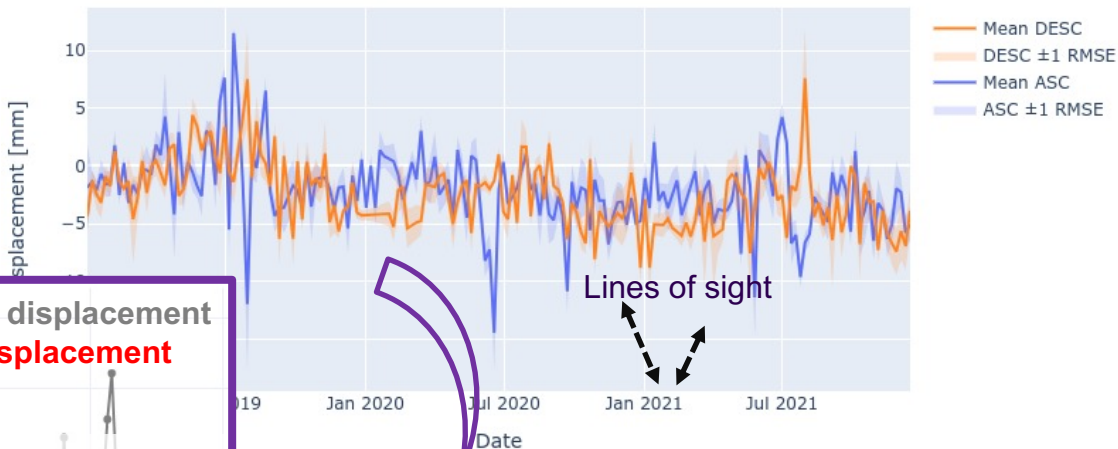
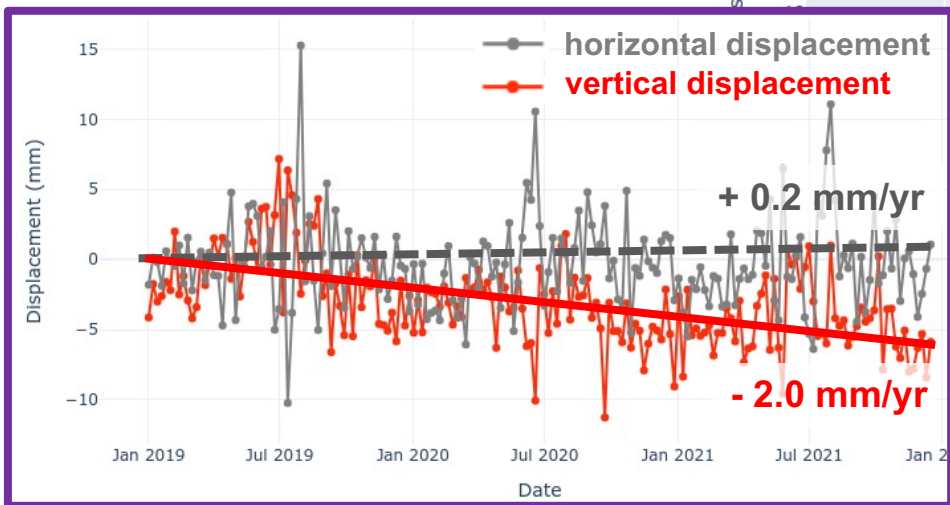
We obtain a mean ascending / descending time series per cell



CHERISH's innovative solution #1 : Adaptative cells (3/3)

3. Decompose ASC & DESC time series into horizontal & vertical time series

4. Linear fit → mean horizontal & vertical velocity for each cell



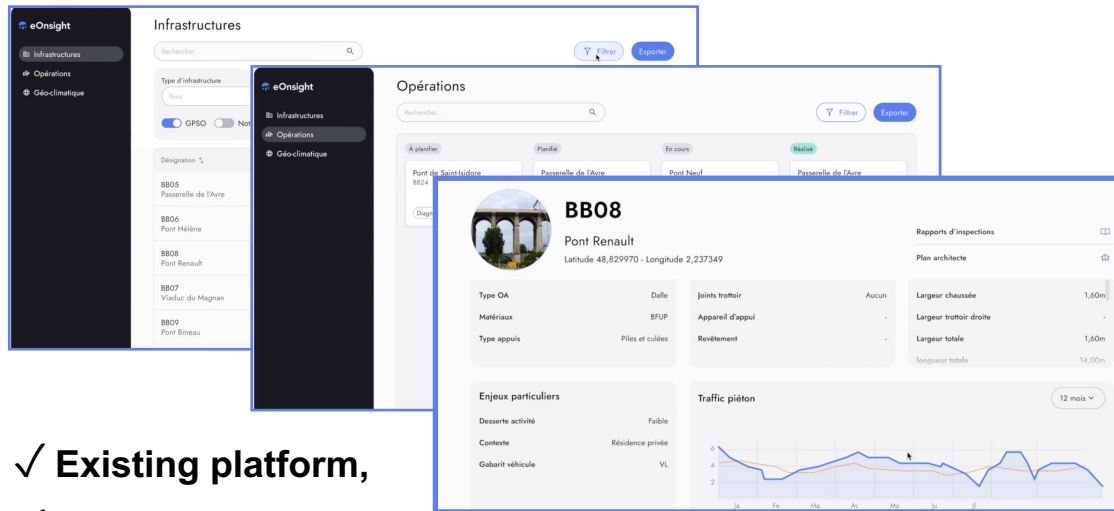


CHERISH's innovative solution #2 : Use of Geostatistics





Current status of development (1/2)



- ✓ Existing platform,
- ✓ Operating workflows,
- ✓ Business rules

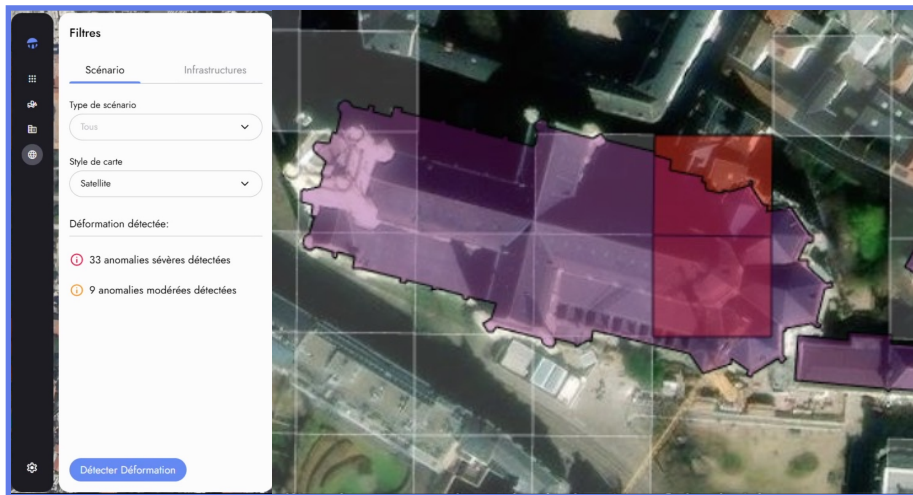
The user can :

- ✓ List the Assets
- ✓ Monitor health status
- ✓ Predict & Alert
- ✓ Keep Secured Records
- ✓ Share with stakeholders
- ✓ Prioritize Inspections

Our solution to monitor infrastructures will be adapted to Cultural Heritage Assets



Current status of development (2/2)

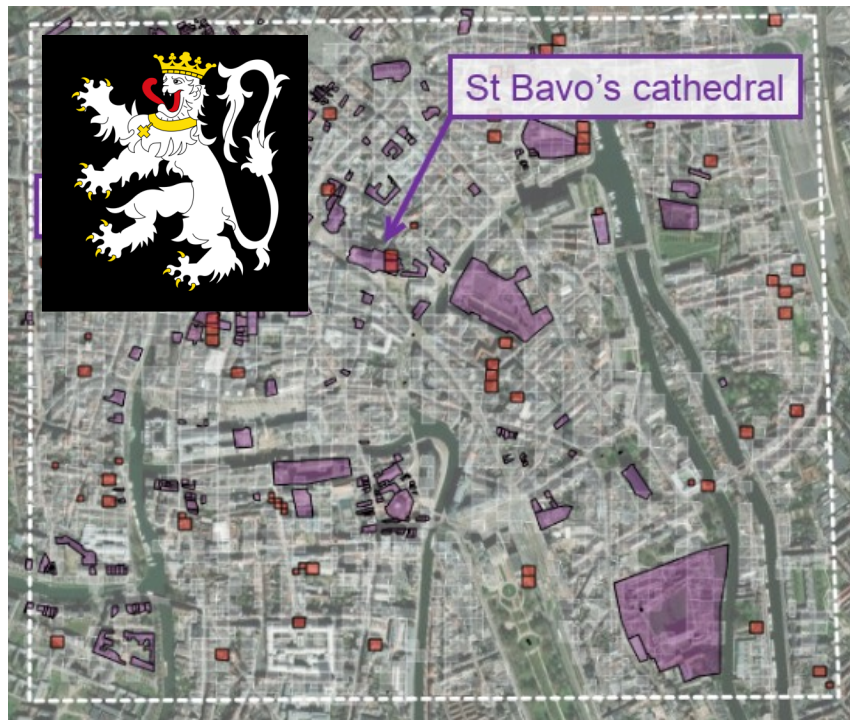


- ✓ **Map** navigation
- ✓ **Detect Ground Deformation**
- ✓ Register **Analysis**
- ✓ **Alert**
- ✓ **Share** with stakeholders
- ✓ **Prioritize Inspections**

Our solution to monitor infrastructures will be adapted to **Cultural Heritage Assets**



Conclusions



- ✓ Feasible
- ✓ Innovative
- ✓ Transferable
- ✓ Interoperable



CHERISH is ready for Phase 2 prototyping with European cities !

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Thank you !

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