DOCUMENT, DISSEMINATE & ANALYSE A GRAFFITI-SCAPE

Geert Verhoeven, Benjamin Wild, Jona Schlegel, Martin Wieser, Norbert Pfeifer, Stefan Wogrin, Lothar Eysn, Massimiliano Carloni, Bernhard Koschiček-Krombholz, Adolfo Molada Tebar, Johannes Otepka-Schremmer, Camillo Ressl, Martina Trognitz, Alexander Watzinger

The INDIGO graffiti project is funded by the Heritage Science Austria programme of the Austrian Academy of Sciences (ÖAW)

inventory and disseminate graffiti along the Donaukanal

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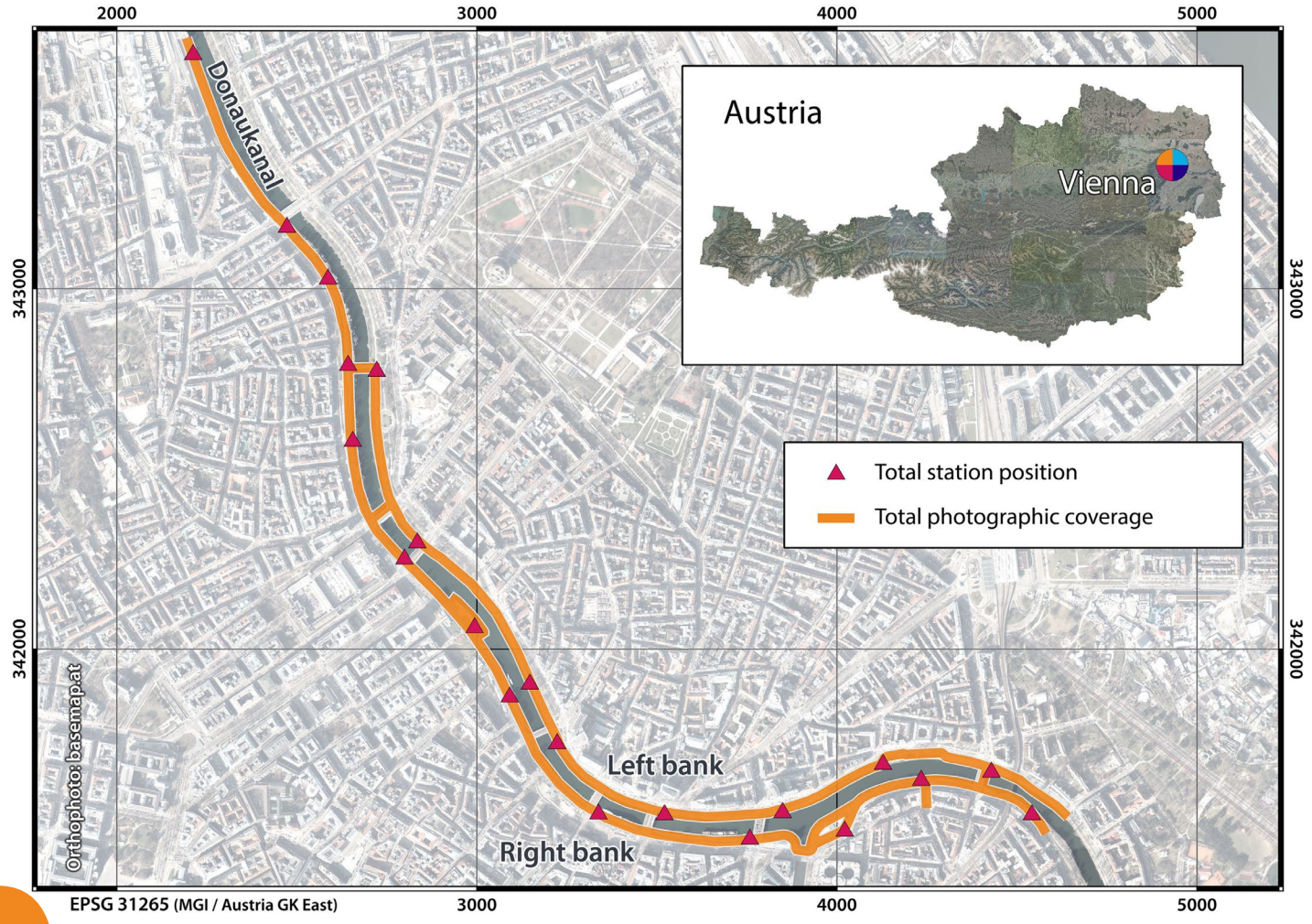
Donaukanal

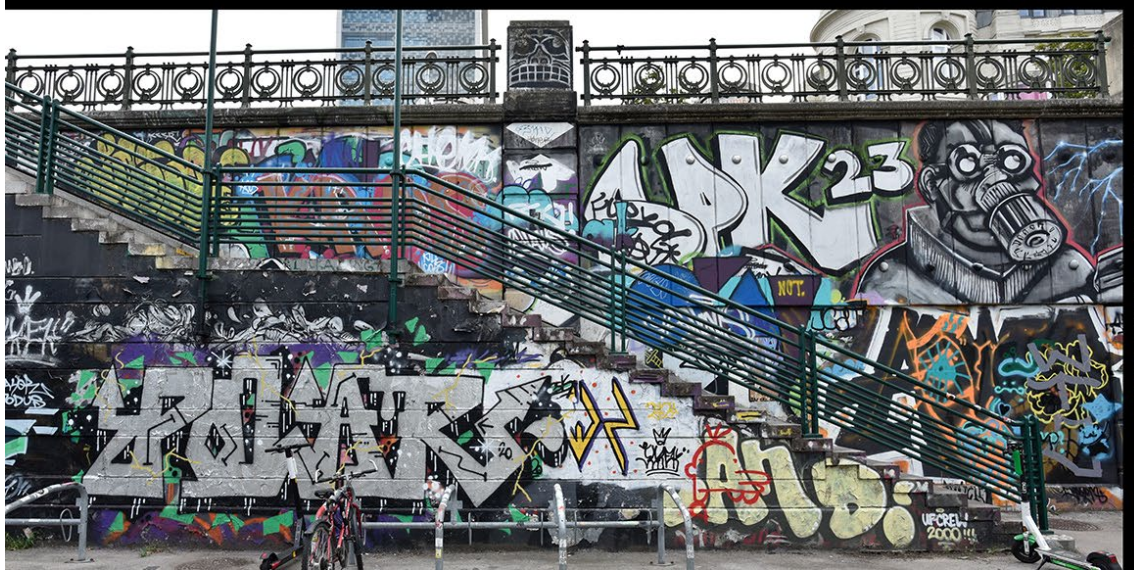


~ 13 km of graffiti covered surfaces

Donaukanal


...MONTANA STORE VIENNA.


ONLY RESPECTING WOMEN
YOURE ATTRACTED TO
IS N T RESPECTING WOMEN


APK23


KING
Drugs
are
amazing
420

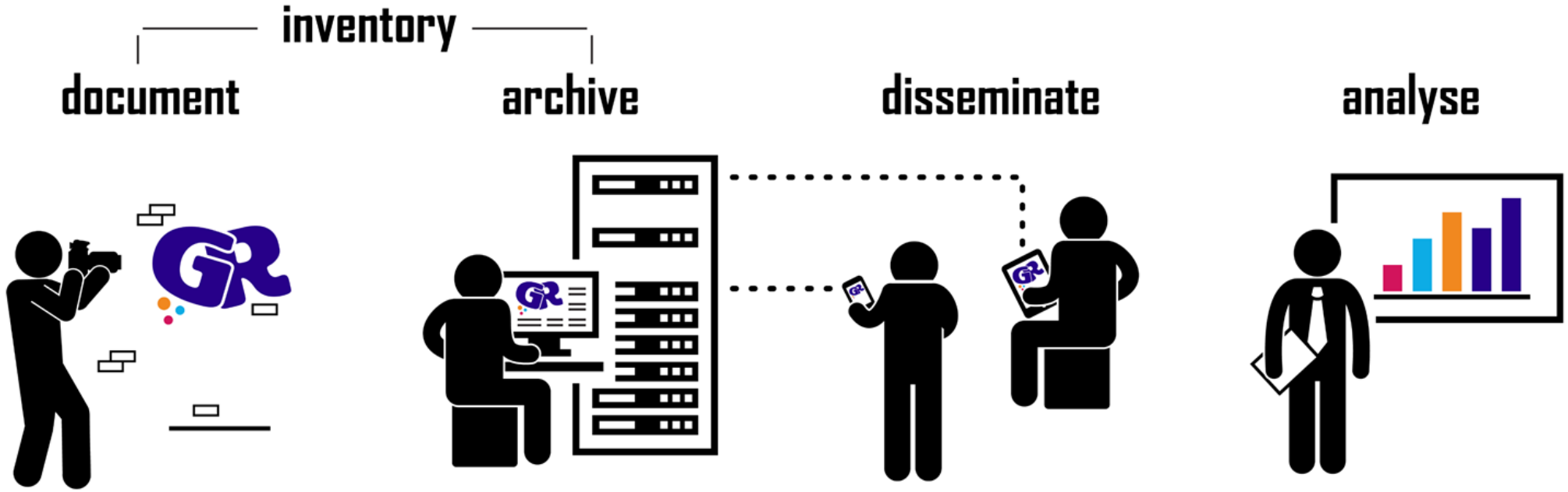
graffiti is

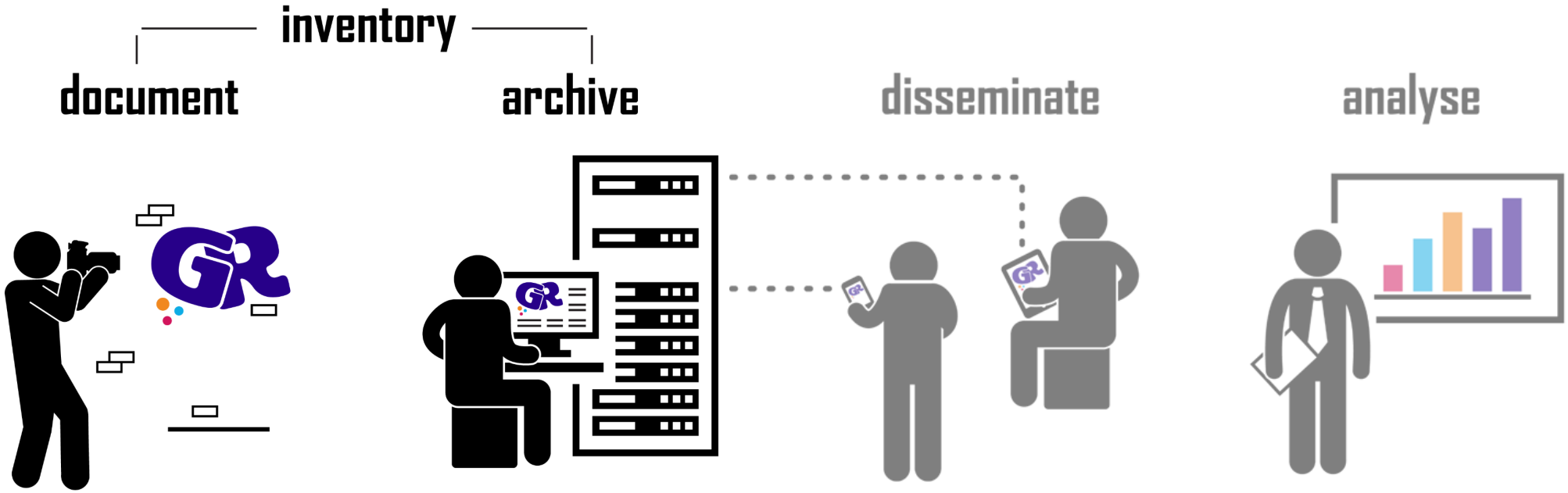
unique
complex
short-lived
socially relevant

cultural heritage

~ 16 000 B.C.
Lascaux Cave, France

2022
Donaukanal Vienna, Austria

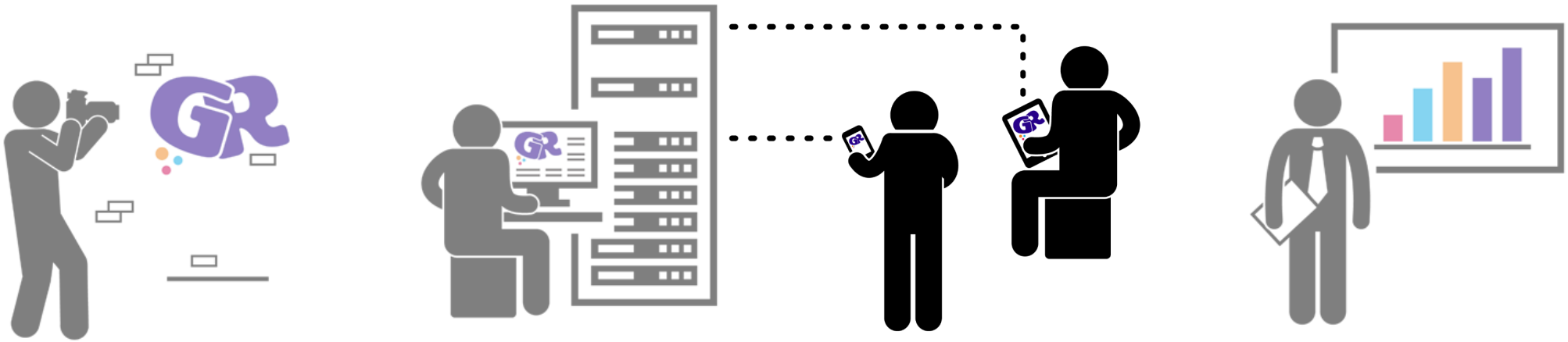

inventory
document
archive
disseminate
analyse



geometrical - shape dimensions
spectral - colour
geographical - location
temporal - time of creation and life span
contentual - meaning

inventory

document | archive | disseminate | analyse



geometrical - shape dimensions
spectral - color
geopgraphical - location
temporal - time of creation and life span
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spatial database
multi-temporal
interactive querying
3D-model
online and open-access

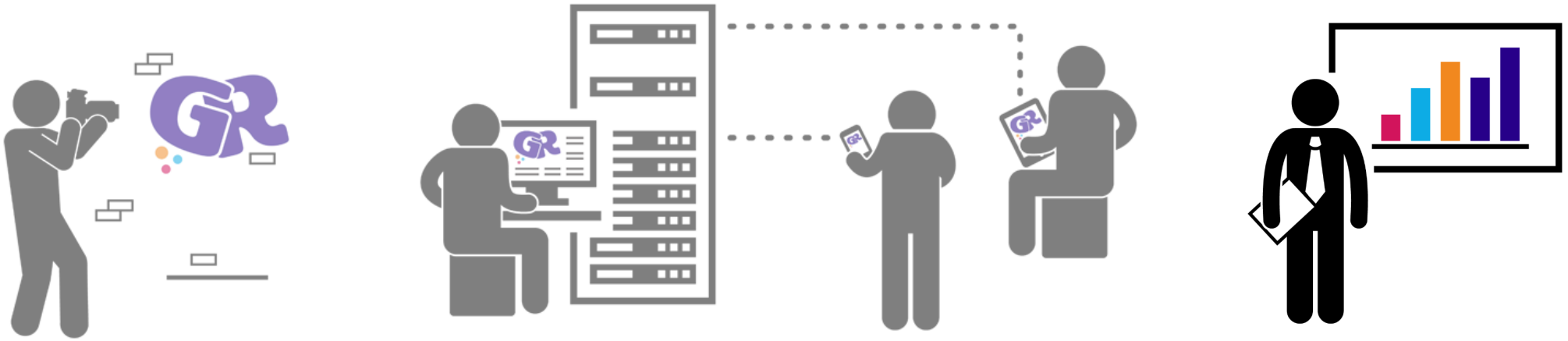
inventory

document

archive

disseminate

analyse



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spatial database
multi-temporal
interactive querying
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online and open-access

meta-data
social
political
cultural

INDIGO benefits

BUILDING BRIDGES

graffitists – scholars – public

humanities – exact sciences

graffiti archives

INDIGO benefits

NEW STANDARDS

data recording & processing

data inventory

data storage

BUILDING BRIDGES

graffitists – scholars – public

humanities – exact sciences

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FURTHERING RESEARCH

spatio-temporal analysis

machine learning

open access & FAIR policy

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GRAFFITI HUB

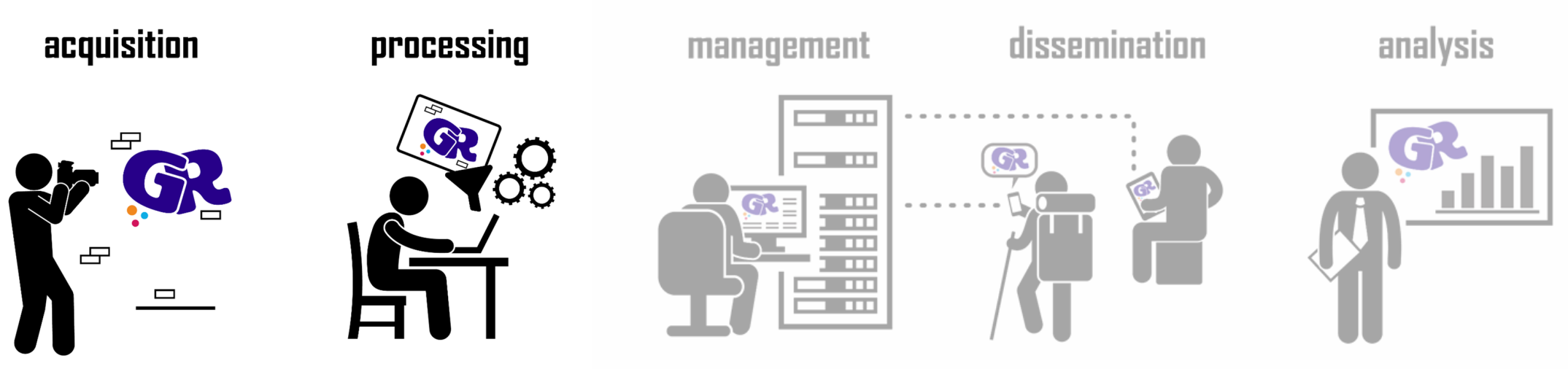
reference dataset

workshops & symposia

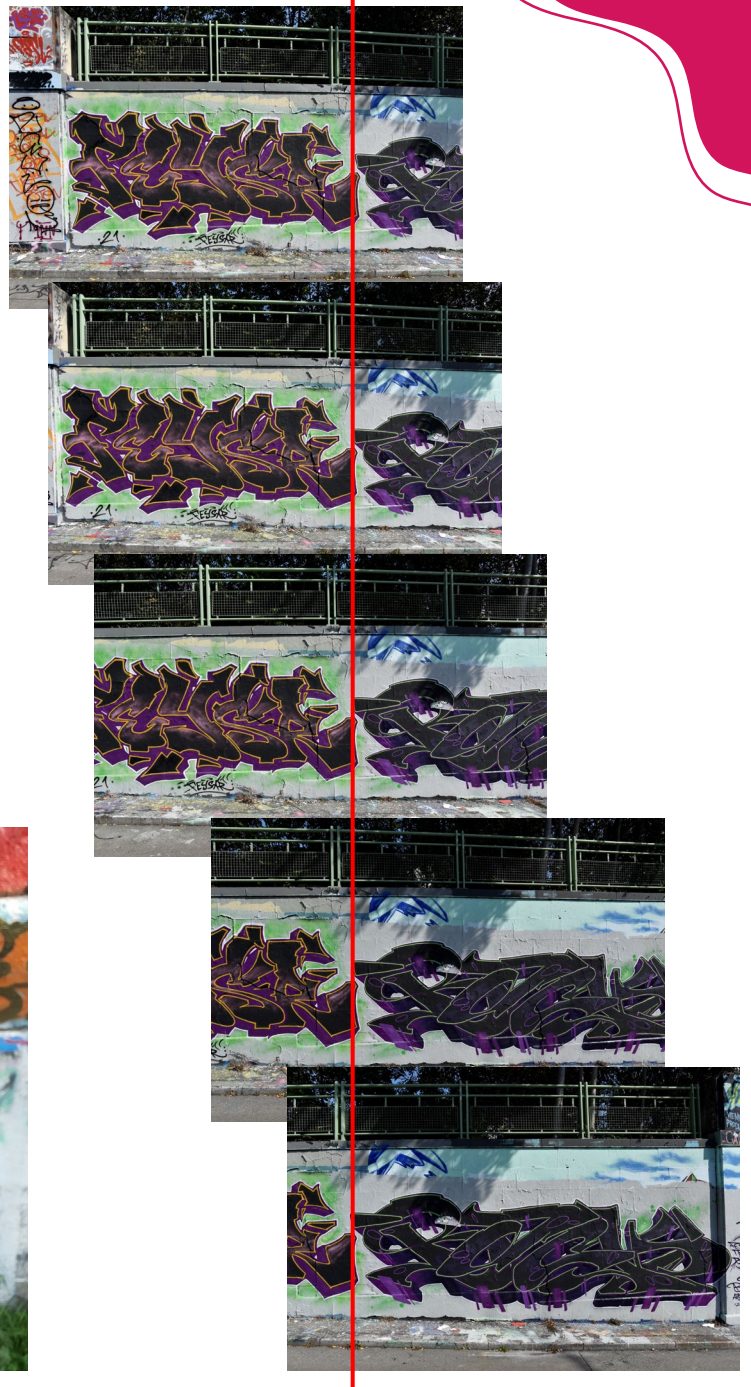
tourism

INDIGO research pillars

INDIGO research pillars



Acquisition - Images



3D model – the geometric backbone

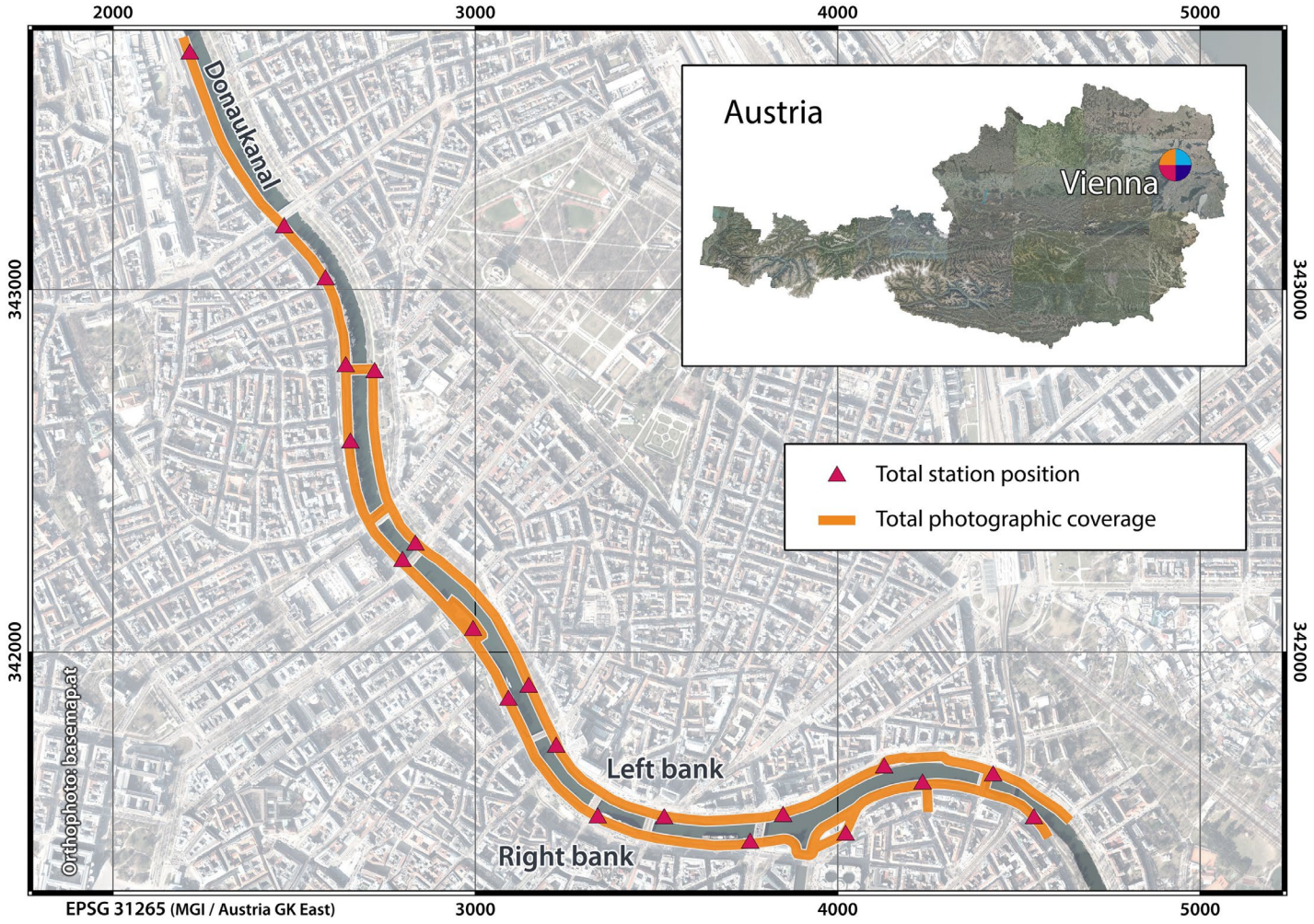
- Gap-free
- Georeferenced
- Highly accurate

- Online platform
- Orthorectification

- Full photographic coverage
- October 2021
- 26.7k photographs –> SfM

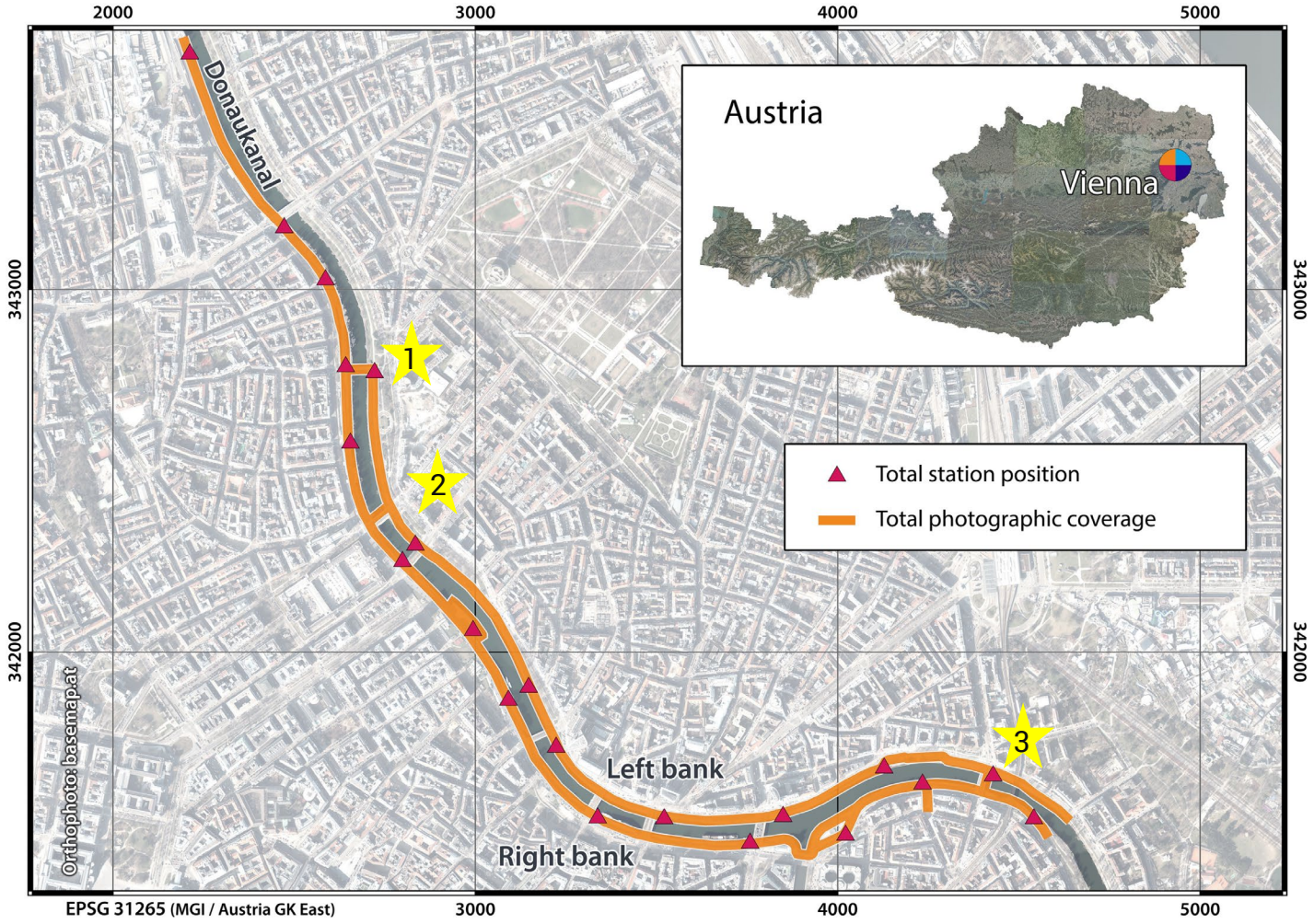
- High overlap
- No refocusing
- ...

Acquisition - Images



Acquisition - Images

3 times bridged → loop closure



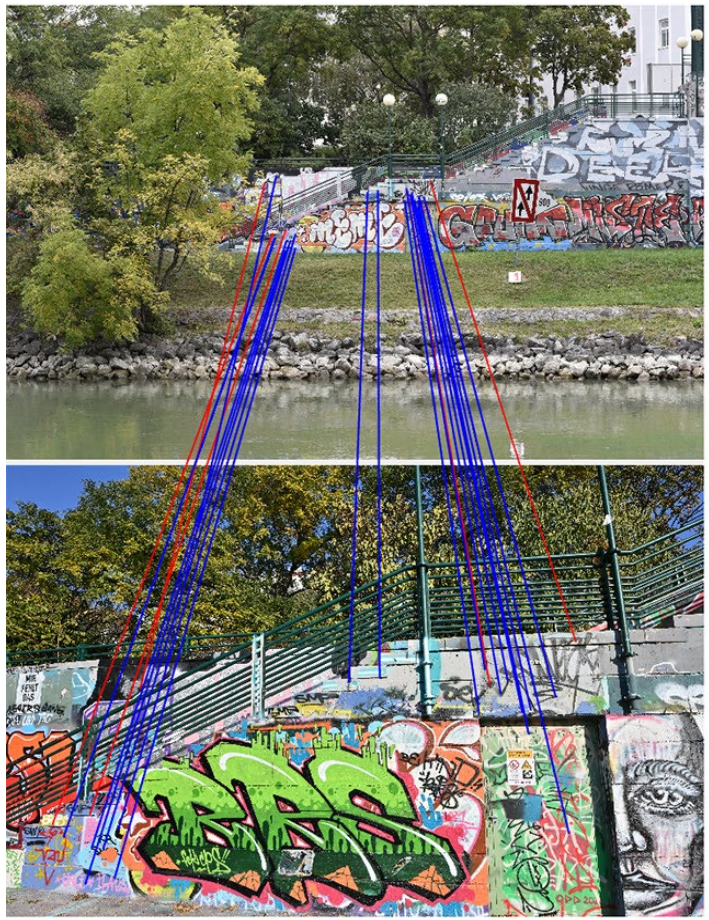
Acquisition - Images

2 Cameras:

a. **NIKON D750 + 85mm**
   Mean GSD: 3.6 mm

b. **NIKON Z7 II + 20 mm**
   Mean GSD: 0.9mm

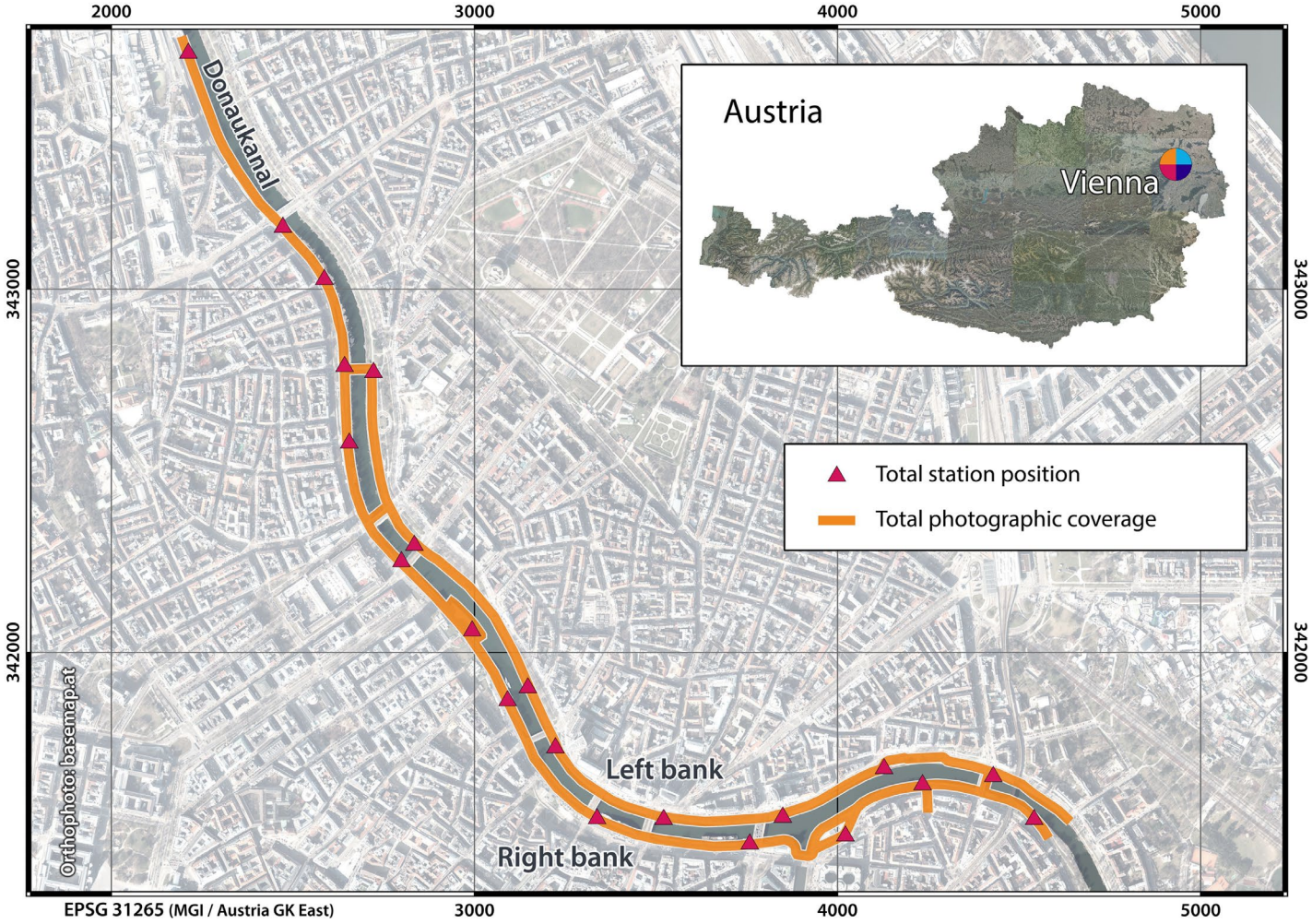
Nikon D750 + 85 mm
30-09-2021



Nikon Z7 II + 20 mm
29-10-2021

Acquisition - GCPs

- Graffiti-scape Control Point (GCP)
- Terrestrial surveying campaign
- 22 clusters
  - Equally distributed along the Donaukanal → ▲
  - 17-37 GCPs



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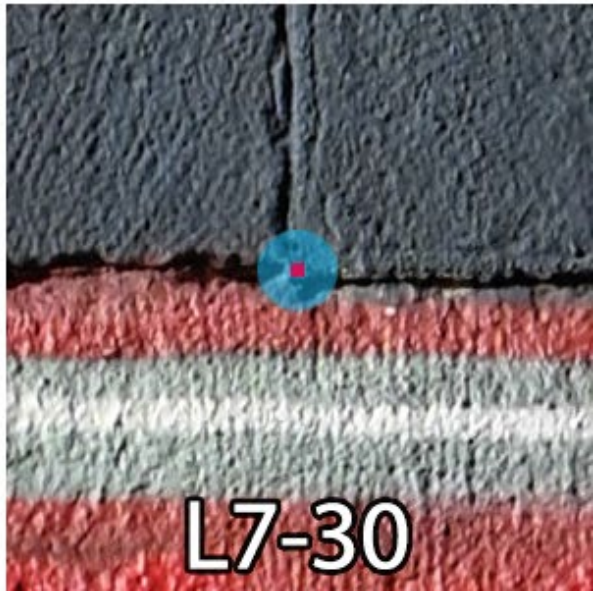
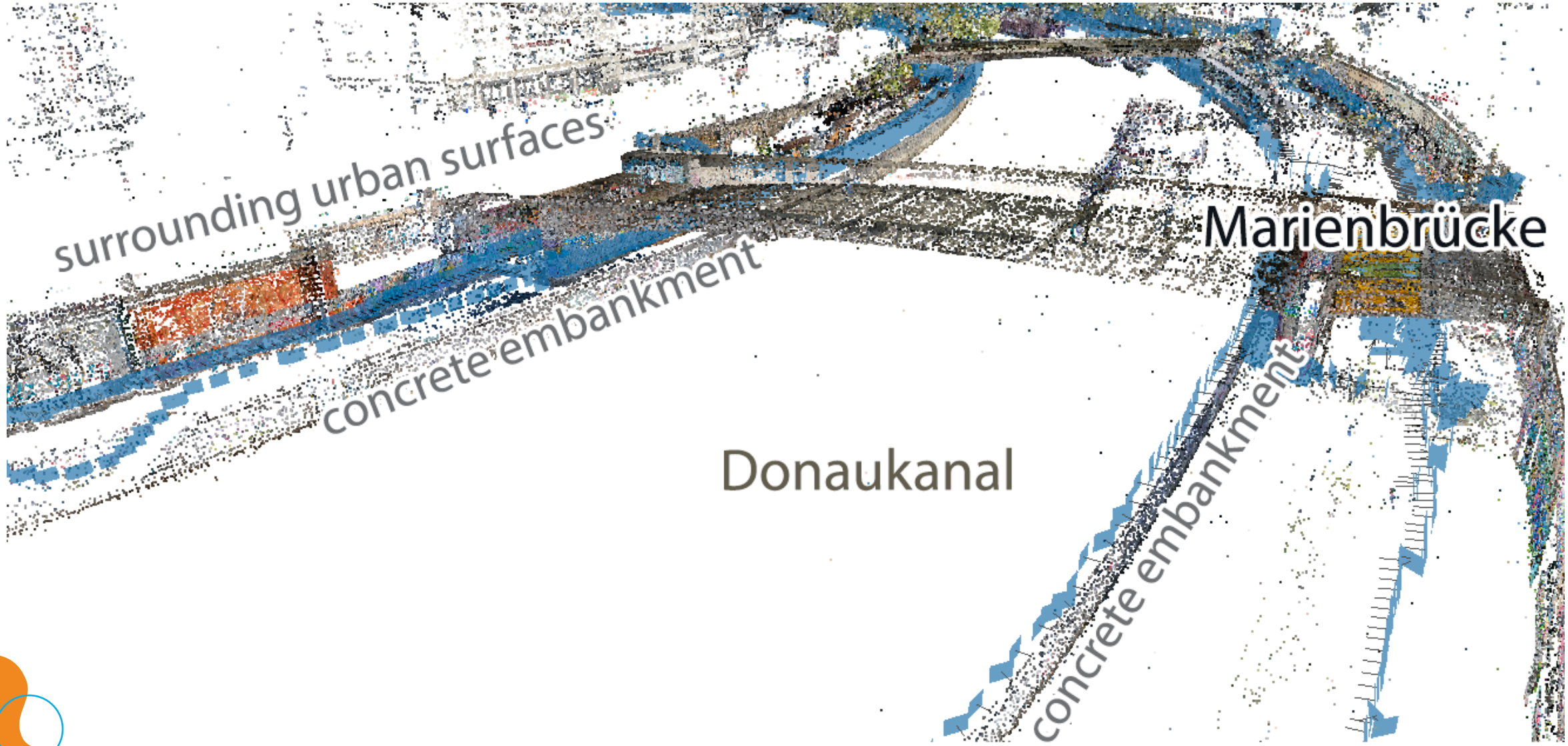


Acquisition - Processing



Processing

raw photo(s)

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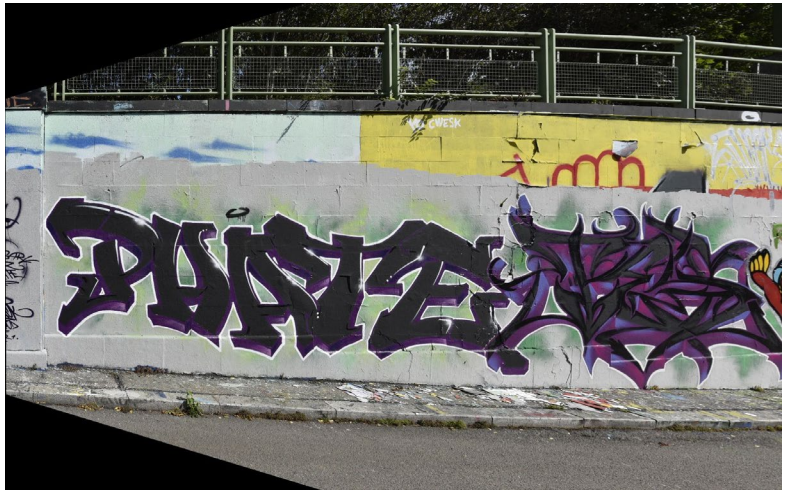
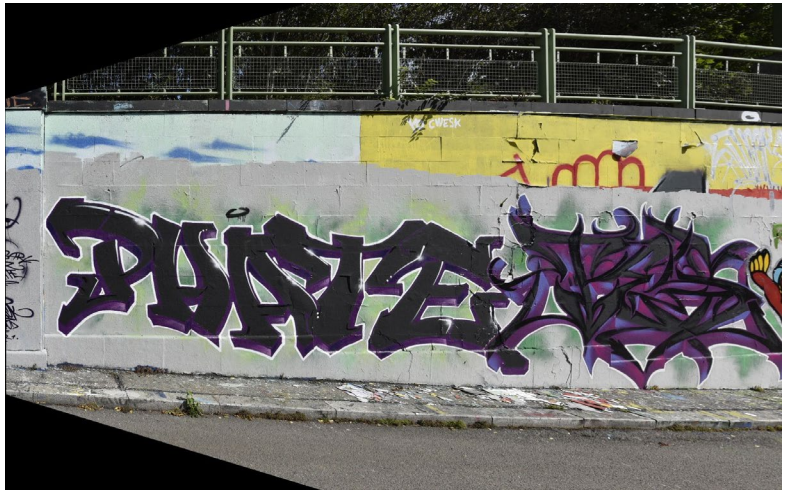
raw photo(s)



geometrically corrected

Processing

raw photo(s)

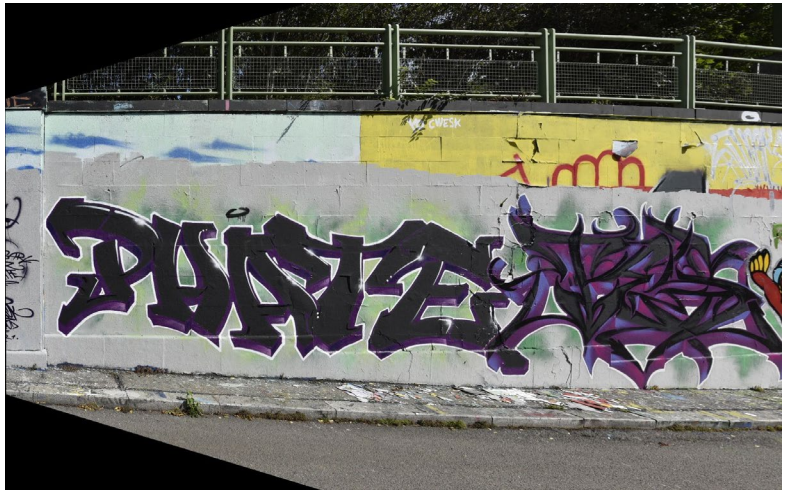


geometrically corrected

colour corrected

Processing

raw photo(s)



geometrically corrected

colour corrected

segmented and labelled

Orthorectification Strategies

Manual Planar Rectification

+ only 1 photo required
+ computationally easy

- planar surfaces
- time consuming

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Direct Georeferencing

+ high degree of automation

- additional hardware necessary
- fails beneath bridges

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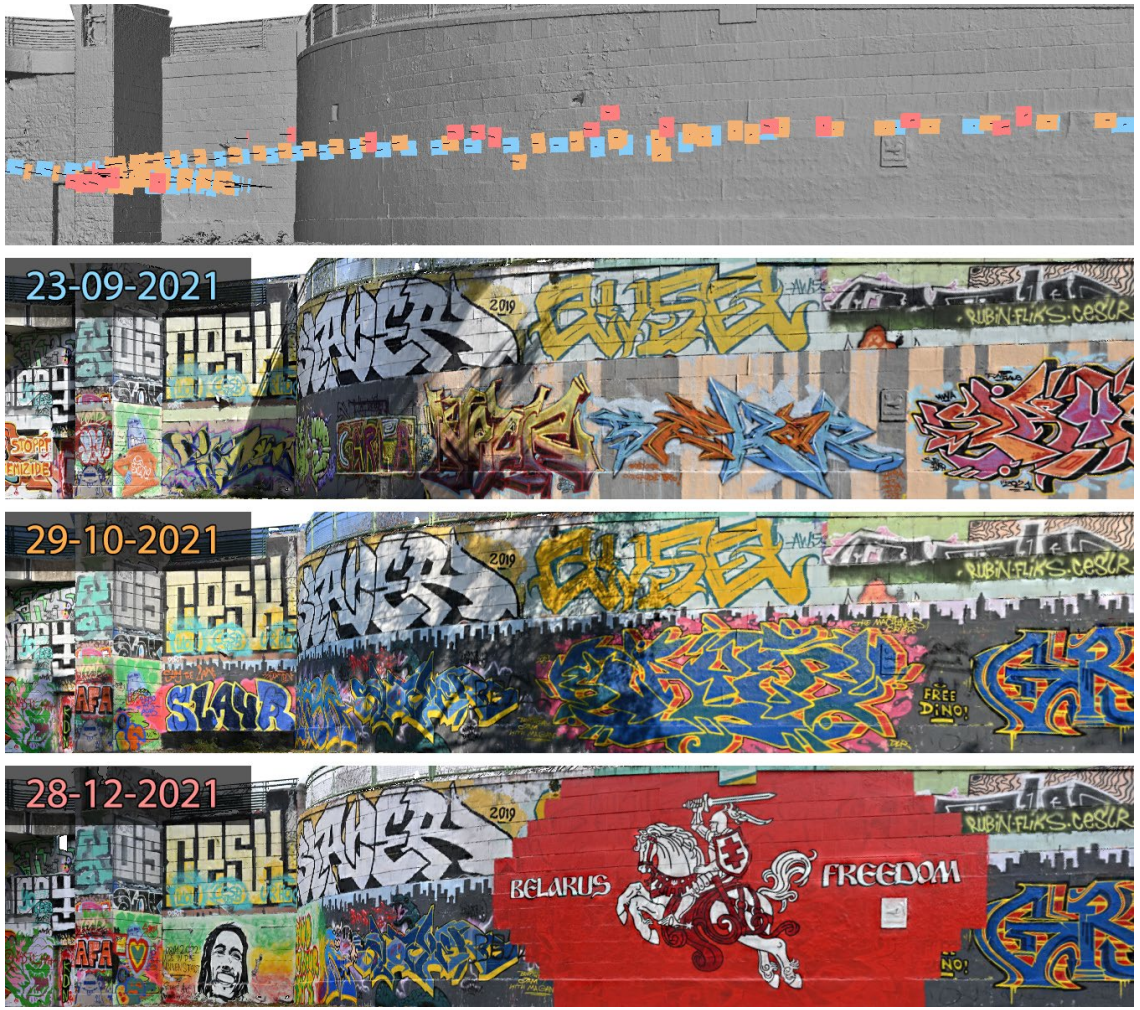
Incremental SfM

+ high degree of automation
+ high accuracy

- invariant surrounding required
- 3rd party software needed

Orthorectification Strategies



Incremental SfM

+ high degree of automation
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- invariant surrounding required
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Conclusions

- Open access platform
- Controversial
- Multi-faceted
- Image count

indigo

ÖAW

GiFLE

TU WIEN GEO

vrvis

Stadt Wien

SPRAY CITY.AT

LUDWIG BOLTZMANN INSTITUTE
Archaeological Prospection and Virtual Archaeology

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