indigo 2.0

… because today's traces shape tomorrow's heritage



Geert Verhoeven | Norbert Pfeifer

projectindigo.eu

The INDIGO 2.0 graffiti project is funded by the Heritage Science Austria 2.0 programme of the Austrian Academy of Sciences (ÖAW)



iconic

GRAFFITI
diverse creations



iconic

GRAFFITI
diverse creations



multi-faceted

GRAFFITI
diverse creations

art <> vandalism

pictorial <> textual

socio-political criticism <> entertaining

legal <> illegal

individual <> collective

ephemeral <> enduring

old <> contemporary



multi-faceted

GRAFFITI
diverse creations

art <> vandalism

pictorial <> textual

socio-political criticism <> entertaining

legal <> illegal

individual <> collective

ephemeral <> enduring

old <> contemporary



multi-faceted

GRAFFITI
diverse creations

art <> vandalism

pictorial <> textual

socio-political criticism <> entertaining

legal <> illegal

individual <> collective

ephemeral <> enduring

old <> contemporary



multi-faceted

GRAFFITI
diverse creations

art <> vandalism

pictorial <> textual

socio-political criticism <> entertaining

legal <> illegal

individual <> collective

ephemeral <> enduring

old <> contemporary



multi-faceted

GRAFFITI
diverse creations

art <> vandalism

pictorial <> textual

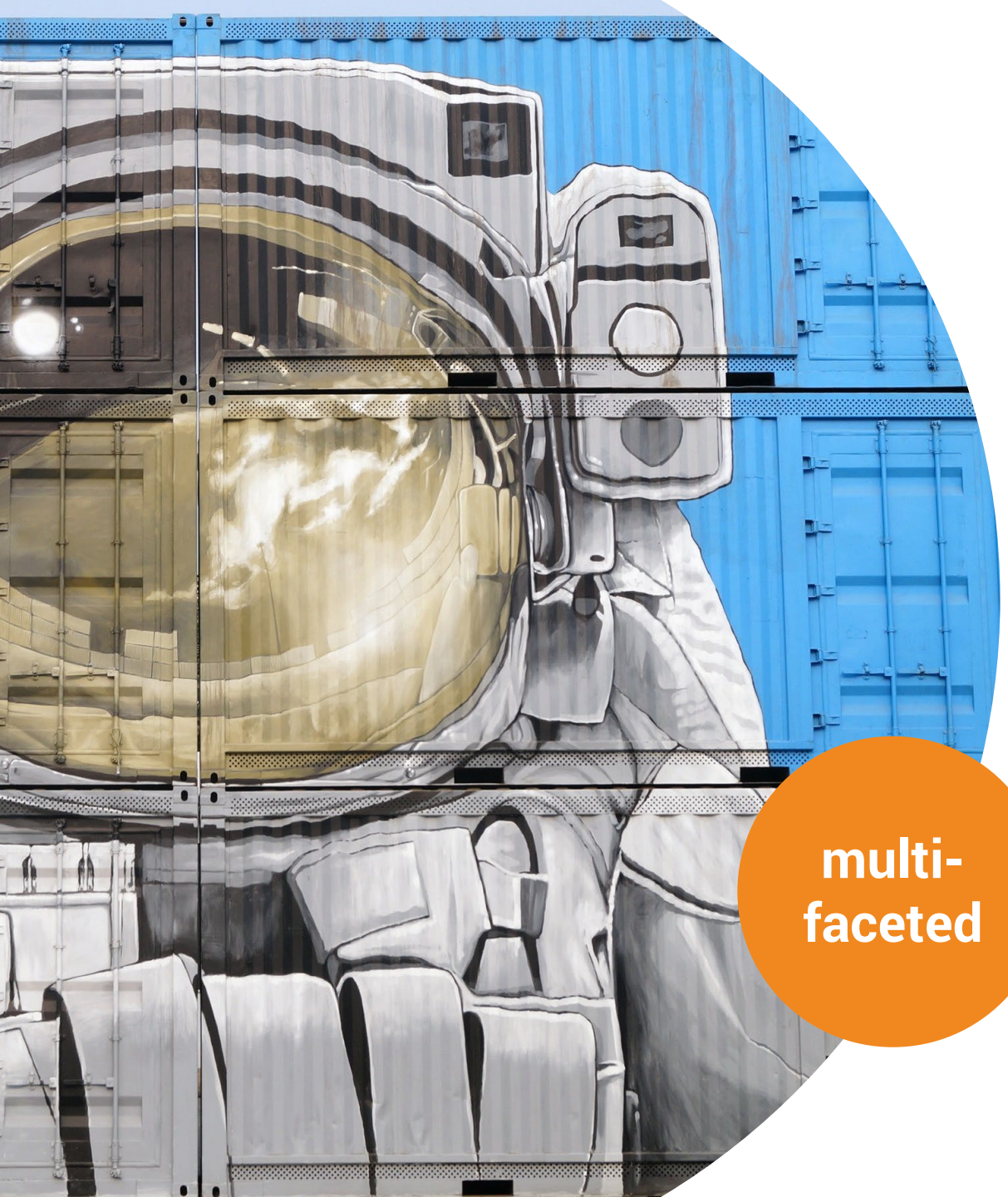
socio-political criticism <> entertaining

legal <> illegal

individual <> collective

ephemeral <> enduring

old <> contemporary



multi-faceted

GRAFFITI
diverse creations

art <> vandalism

pictorial <> textual

socio-political criticism <> entertaining

legal <> illegal

individual <> collective

ephemeral <> enduring

old <> contemporary



multi-faceted

GRAFFITI
diverse creations

art <> vandalism

pictorial <> textual

socio-political criticism <> entertaining

legal <> illegal

individual <> collective

ephemeral <> enduring

old <> contemporary



multi-faceted

GRAFFITI
diverse creations

art <> vandalism

pictorial <> textual

socio-political criticism <> entertaining

legal <> illegal

individual <> collective

ephemeral <> enduring

old <> contemporary



multi-faceted

GRAFFITI
diverse creations

art <> vandalism

pictorial <> textual

socio-political criticism <> entertaining

legal <> illegal

individual <> collective

ephemeral <> enduring

old <> contemporary



multi-faceted

GRAFFITI
diverse creations

art <> vandalism

pictorial <> textual

socio-political criticism <> entertaining

legal <> illegal

individual <> collective

ephemeral <> enduring

old <> contemporary



multi-faceted

GRAFFITI
diverse creations

art <> vandalism

pictorial <> textual

socio-political criticism <> entertaining

legal <> illegal

individual <> collective

ephemeral <> enduring

old <> contemporary



multi-faceted

GRAFFITI
diverse creations

art <> vandalism

pictorial <> textual

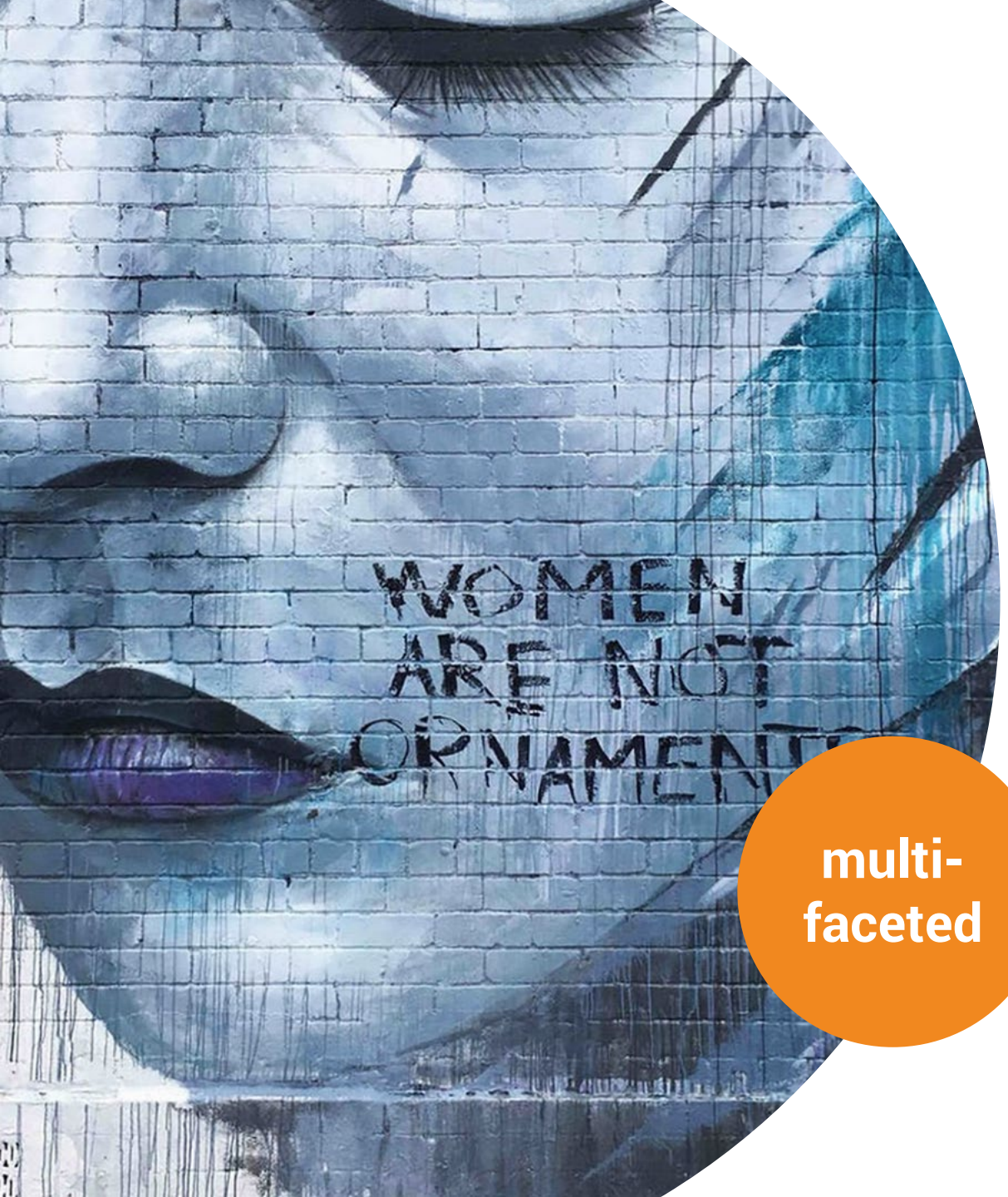
socio-political criticism <> entertaining

legal <> illegal

individual <> collective

ephemeral <> enduring

old <> contemporary



multi-faceted

GRAFFITI
diverse creations

art <> vandalism

pictorial <> textual

socio-political criticism <> entertaining

legal <> illegal

individual <> collective

ephemeral <> enduring

old <> contemporary



multi-faceted

GRAFFITI
diverse creations

art <> vandalism

pictorial <> textual

socio-political criticism <> entertaining

legal <> illegal

individual <> collective

ephemeral <> enduring

old <> contemporary



multi-faceted

GRAFFITI
diverse creations

art <> vandalism

pictorial <> textual

socio-political criticism <> entertaining

legal <> illegal

individual <> collective

ephemeral <> enduring

old <> contemporary



multi-faceted

GRAFFITI
diverse creations

art <> vandalism

pictorial <> textual

socio-political criticism <> entertaining

legal <> illegal

individual <> collective

ephemeral <> enduring

old <> contemporary



multi-faceted

GRAFFITI
diverse creations

art <> vandalism

pictorial <> textual

socio-political criticism <> entertaining

legal <> illegal

individual <> collective

ephemeral <> enduring

old <> contemporary



GRAFFITI
diverse creations

art <> vandalism

pictorial <> textual

socio-political criticism <> entertaining

legal <> illegal

individual <> collective

ephemeral <> enduring

old <> contemporary



multi-faceted

GRAFFITI
diverse creations

art <> vandalism

pictorial <> textual

socio-political criticism <> entertaining

legal <> illegal

individual <> collective

ephemeral <> enduring

old <> contemporary



multi-faceted

GRAFFITI
diverse creations

art <> vandalism

pictorial <> textual

socio-political criticism <> entertaining

legal <> illegal

individual <> collective

ephemeral <> enduring

old <> contemporary



multi-faceted

GRAFFITI
diverse creations

art <> vandalism

pictorial <> textual

socio-political criticism <> entertaining

legal <> illegal

individual <> collective

ephemeral <> enduring

old <> contemporary



multi-faceted

GRAFFITI
diverse creations

art <> vandalism

pictorial <> textual

socio-political criticism <> entertaining

legal <> illegal

individual <> collective

ephemeral <> enduring

old <> contemporary



multi-faceted

GRAFFITI
diverse creations

art <> vandalism

pictorial <> textual

socio-political criticism <> entertaining

legal <> illegal

individual <> collective

ephemeral <> enduring

old <> contemporary



multi-faceted

GRAFFITI
diverse creations

art <> vandalism

pictorial <> textual

socio-political criticism <> entertaining

legal <> illegal

individual <> collective

ephemeral <> enduring

old <> contemporary



multi-faceted

GRAFFITI
diverse creations

art <> vandalism

pictorial <> textual

socio-political criticism <> entertaining

legal <> illegal

individual <> collective

ephemeral <> enduring

old <> contemporary



multi-faceted

GRAFFITI

diverse creations

art <> vandalism

pictorial <> textual

socio-political criticism <> entertaining

legal <> illegal

individual <> collective

ephemeral <> enduring

old <> contemporary



multi-faceted

GRAFFITI
diverse creations

art <> vandalism

pictorial <> textual

socio-political criticism <> entertaining

legal <> illegal

individual <> collective

ephemeral <> enduring

old <> contemporary



multi-faceted

GRAFFITI
diverse creations

art <> vandalism

pictorial <> textual

socio-political criticism <> entertaining

legal <> illegal

individual <> collective

ephemeral <> enduring

old <> contemporary



multi-faceted

GRAFFITI
diverse creations

art <> vandalism

pictorial <> textual

socio-political criticism <> entertaining

legal <> illegal

individual <> collective

ephemeral <> enduring

old <> contemporary



GRAFFITI
diverse creations

art <> vandalism

pictorial <> textual

socio-political criticism <> entertaining

legal <> illegal

individual <> collective

ephemeral <> enduring

old <> contemporary



multi-faceted

GRAFFITI
diverse creations

art <> vandalism

pictorial <> textual

socio-political criticism <> entertaining

legal <> illegal

individual <> collective

ephemeral <> enduring

old <> contemporary



multi-faceted

GRAFFITI
diverse creations

art <> vandalism

pictorial <> textual

socio-political criticism <> entertaining

legal <> illegal

individual <> collective

ephemeral <> enduring

old <> contemporary



GRAFFITI
diverse creations

art <> vandalism

pictorial <> textual

socio-political criticism <> entertaining

legal <> illegal

individual <> collective

ephemeral <> enduring

old <> contemporary



multi-faceted

GRAFFITI
diverse creations

art <> vandalism

pictorial <> textual

socio-political criticism <> entertaining

legal <> illegal

individual <> collective

ephemeral <> enduring

old <> contemporary



multi-faceted

GRAFFITI
diverse creations

art <> vandalism

pictorial <> textual

socio-political criticism <> entertaining

legal <> illegal

individual <> collective

ephemeral <> enduring

old <> contemporary



multi-faceted

GRAFFITI
diverse creations

art <> vandalism

pictorial <> textual

socio-political criticism <> entertaining

legal <> illegal

individual <> collective

ephemeral <> enduring

old <> contemporary



multi-faceted

GRAFFITI
diverse creations

art <> vandalism

pictorial <> textual

socio-political criticism <> entertaining

legal <> illegal

individual <> collective

ephemeral <> enduring

old <> contemporary



multi-faceted

GRAFFITI
diverse creations

art <> vandalism

pictorial <> textual

socio-political criticism <> entertaining

legal <> illegal

individual <> collective

ephemeral <> enduring

old <> contemporary



multi-faceted

GRAFFITI
diverse creations

art <> vandalism

pictorial <> textual

socio-political criticism <> entertaining

legal <> illegal

individual <> collective

ephemeral <> enduring

old <> contemporary



multi-faceted

GRAFFITI
diverse creations

art <> vandalism

pictorial <> textual

socio-political criticism <> entertaining

legal <> illegal

individual <> collective

ephemeral <> enduring

old <> contemporary



graffiti are

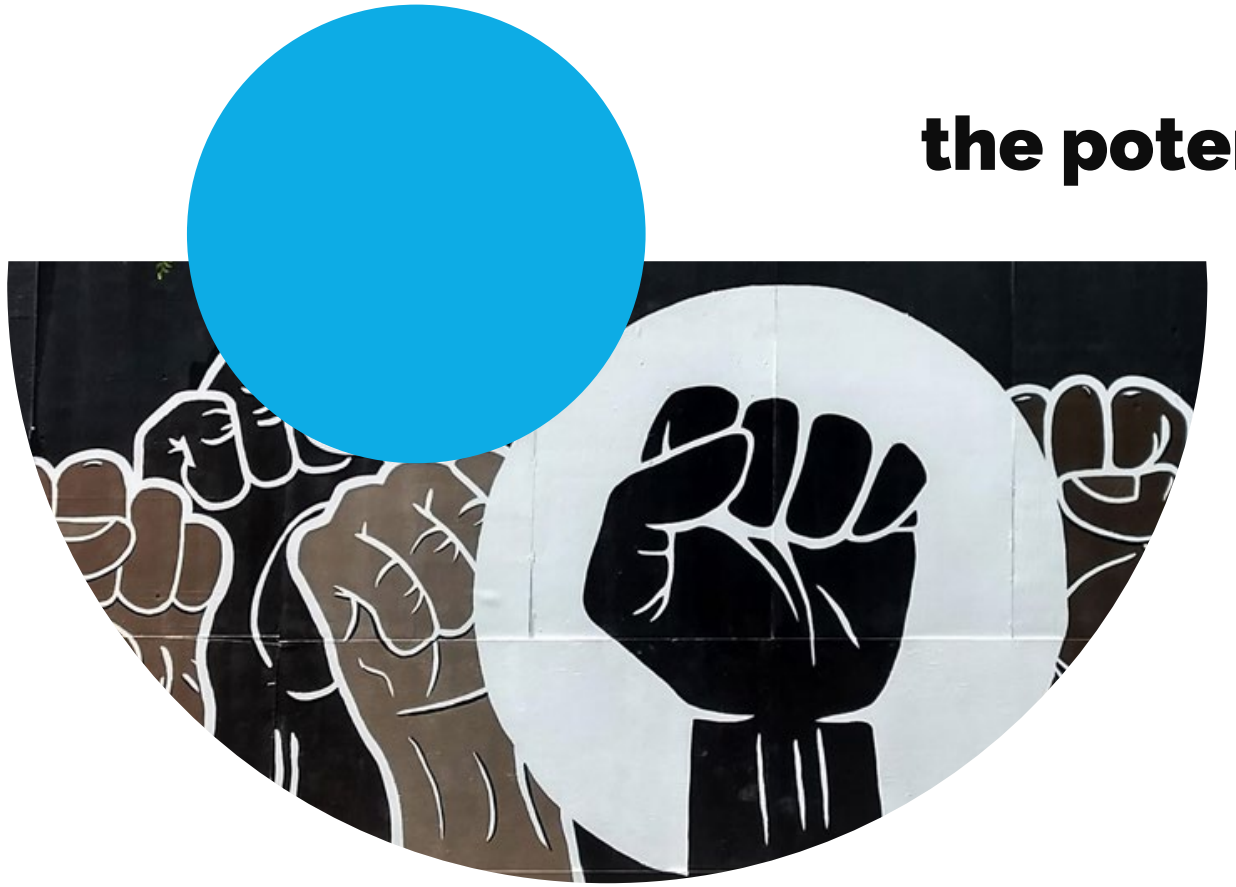
unique

complex

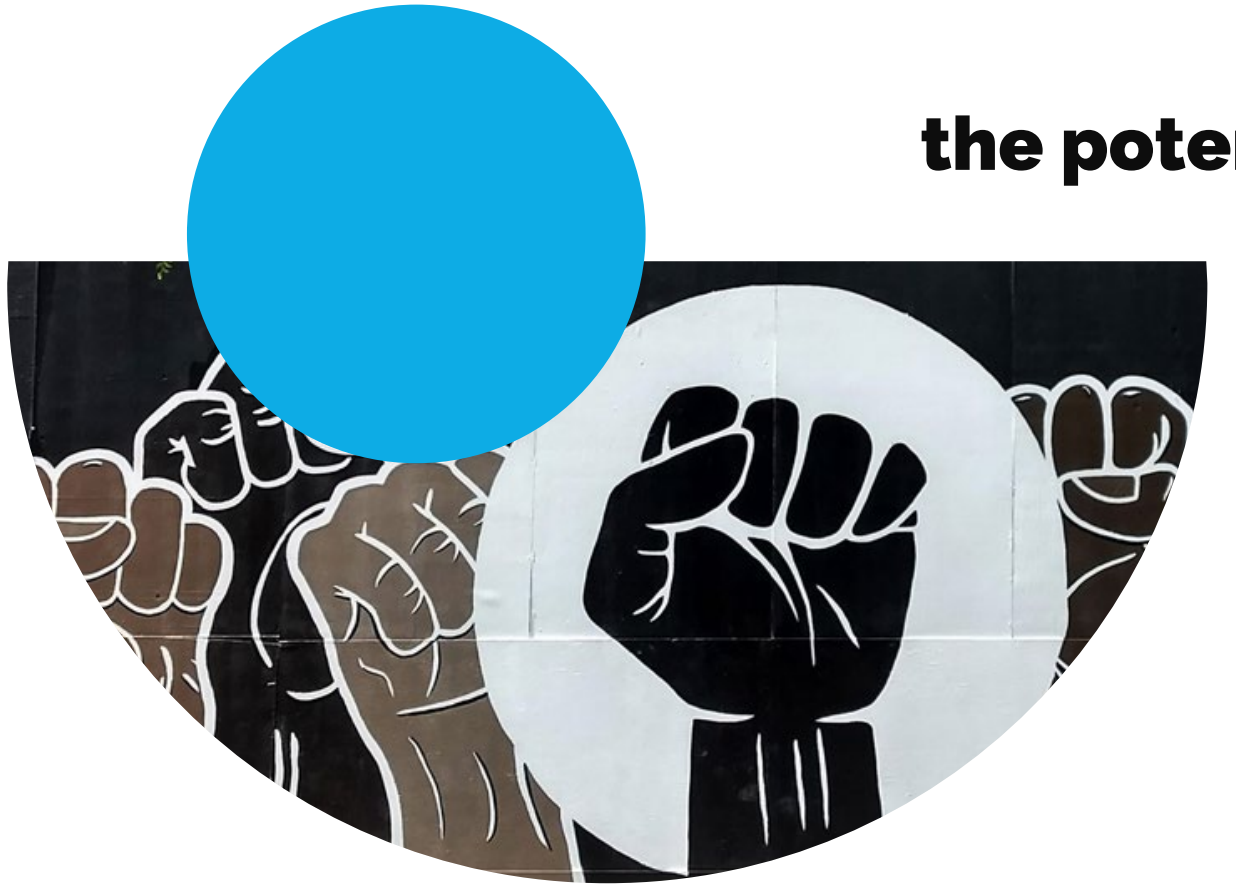
vulnerable

socially relevant

cultural heritage



the potential
of graffiti
to understand
society
is under-exploited



the potential
of recent graffiti
to understand
society
is under-exploited


indigo


indigo
1.0


ventory

Inventory and dissemination

Inventory and disseminate graffiti

Inventory and

disseminate

graffiti along the

d**o**naukanal

Inventory and disseminate graffiti along the donaukanal



Inventory and disseminate graffiti along the donaukanal





Inventory and disseminate graffiti along the donaukanal







INventory and disseminate graffiti along the DOnaukanal









INventory and disseminate graffiti along the donaukanal



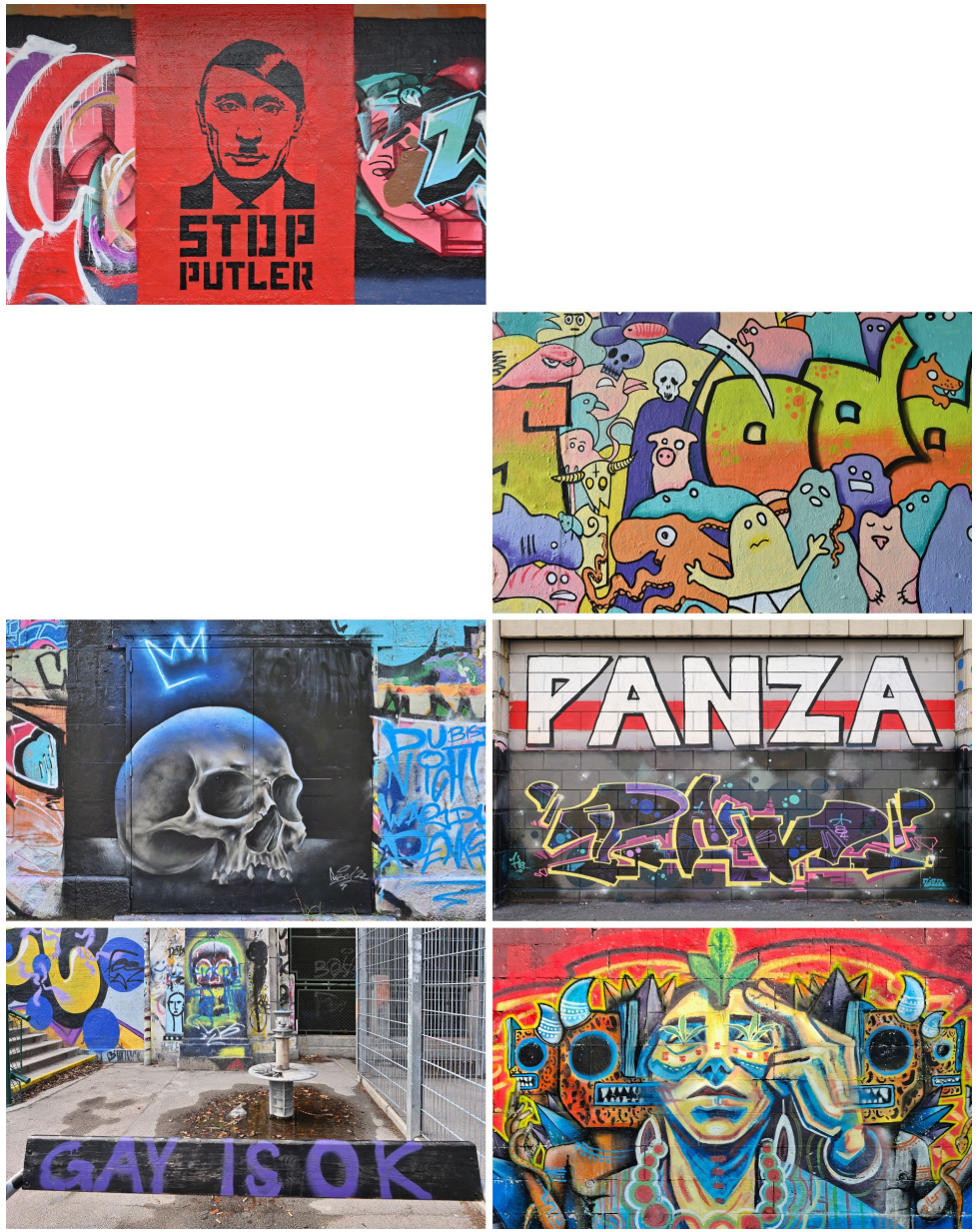




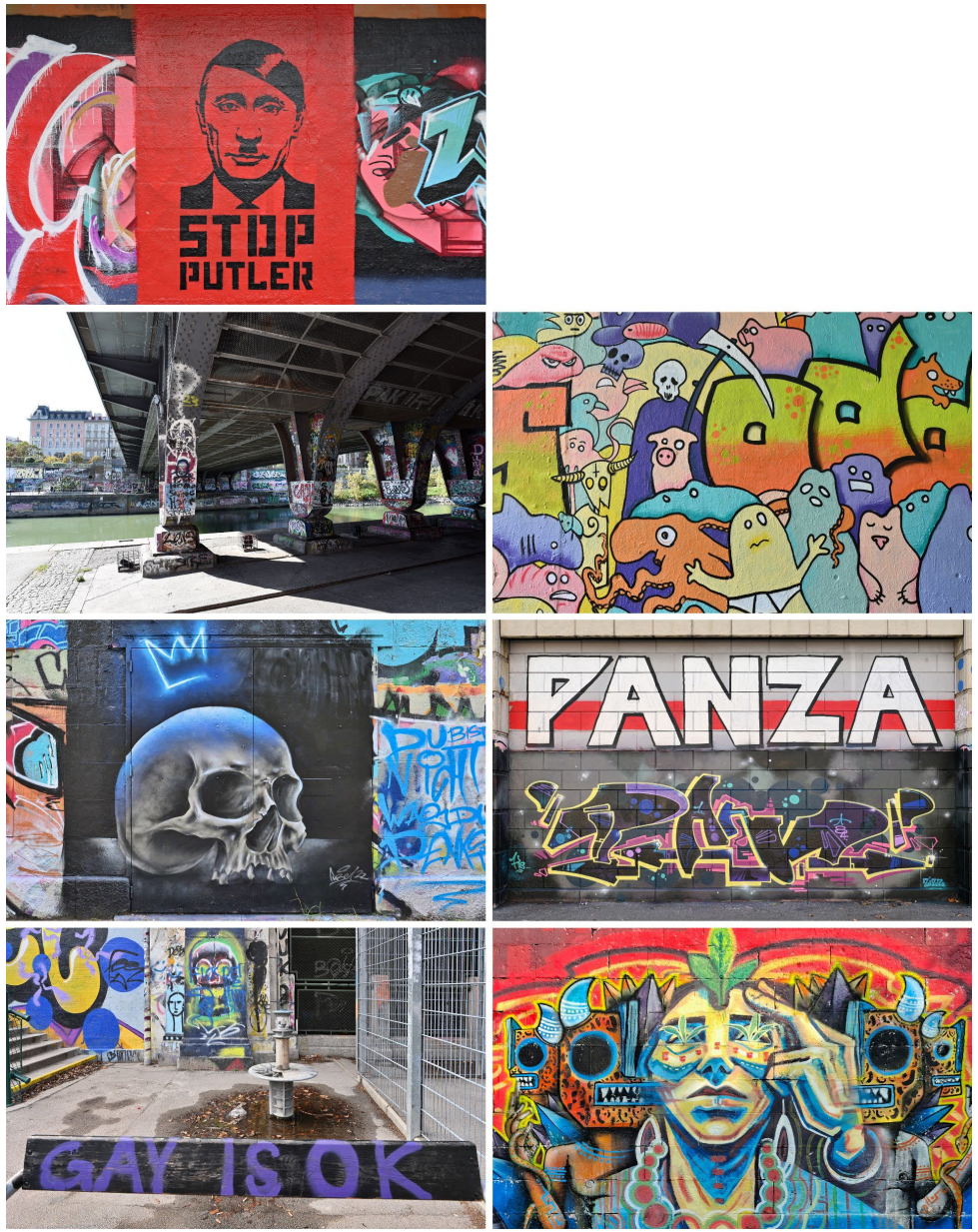




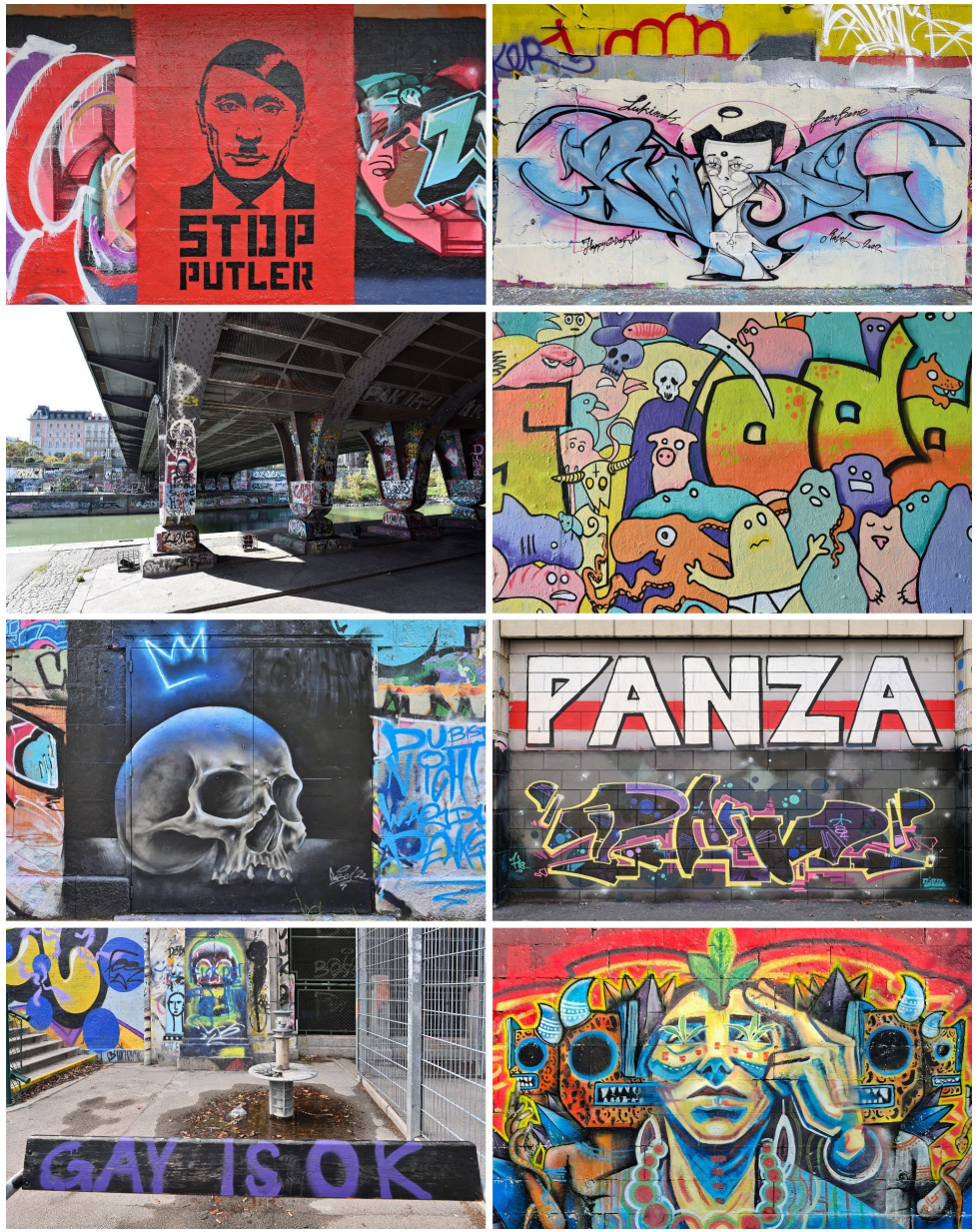
INventory and diSseminate 9raffiti along the dOnaukanal



Inventory and disseminate graffiti along the donaukanal



INventory and disseminate graffiti along the dONaukanal



IN ventory and
di sseminate
g raffiti along the
d O naukanal

SOFTWARE
HARDWARE
3+ 1

DATASETS
5

ARTICLES
BOOKS
6+15 2

THESES
1+2+1

TALKS
31+4

SYMPOSIA
2

AWARDS
2

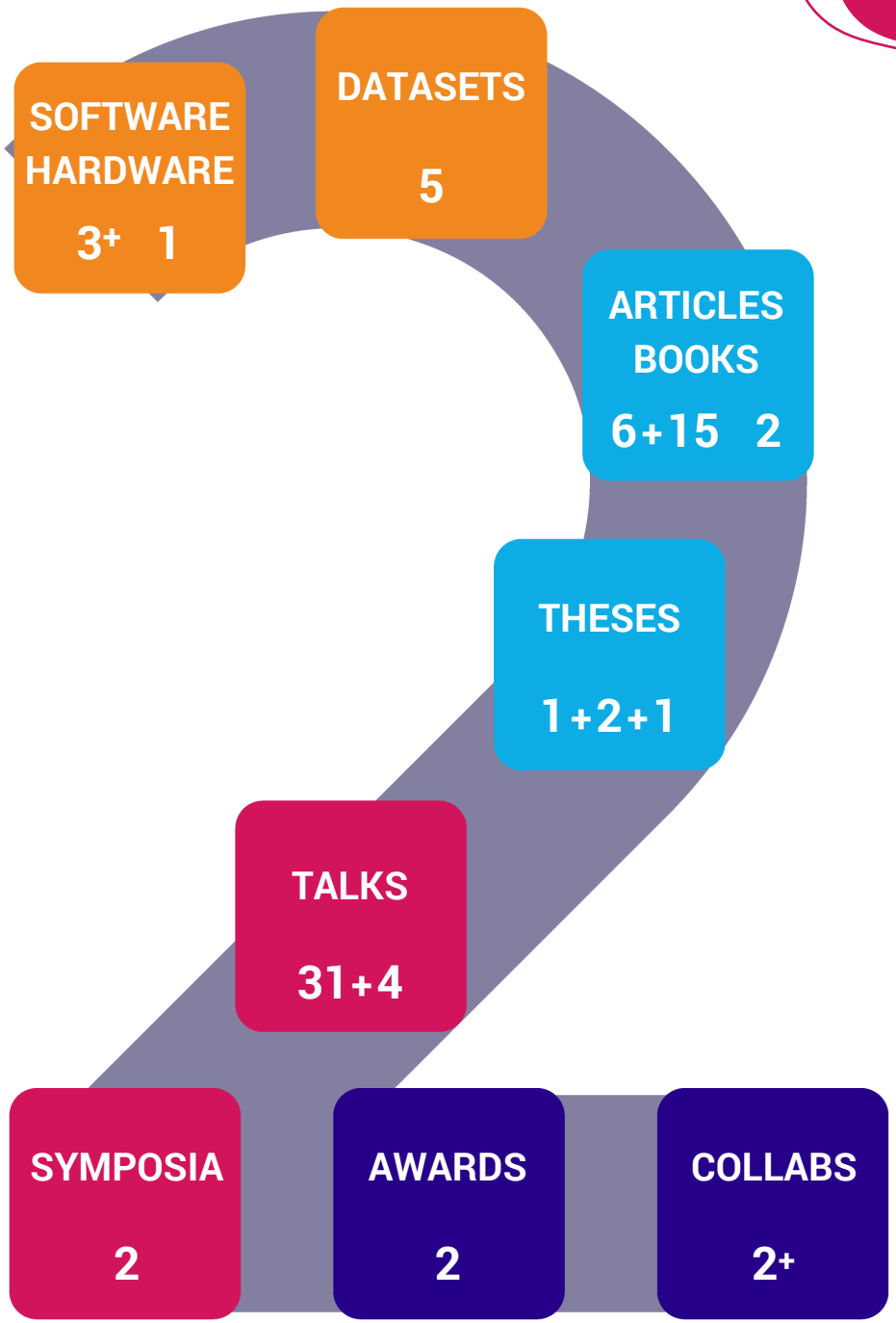
COLLABS
2+

INventory and

disseminate

graffiti along the

d**O**naukanal



Inventory and

disseminate

graffiti along the

d**o**naukanal

2

INDIGO approach

5 research pillars

INDIGO approach

5 research pillars

creation



INDIGO approach

5 research pillars

creation



acquisition



INDIGO approach

5 research pillars

creation



acquisition



processing



INDIGO approach

5 research pillars

creation



acquisition



processing

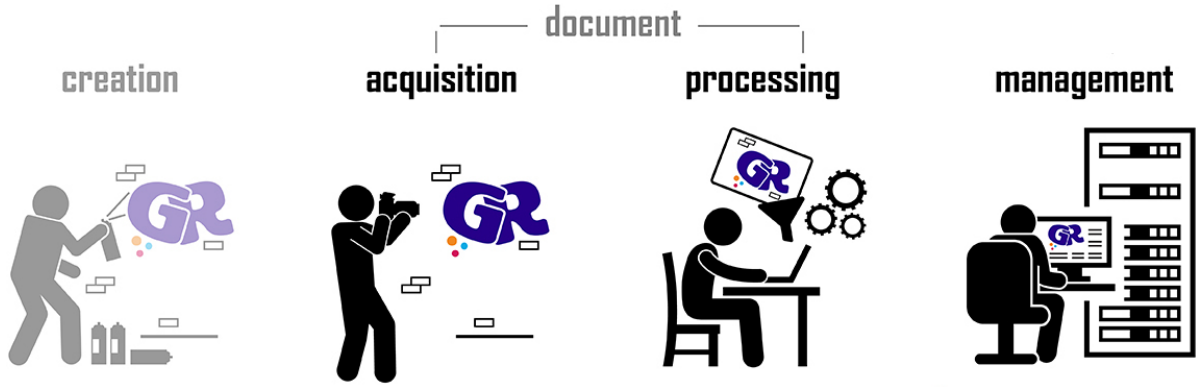


management



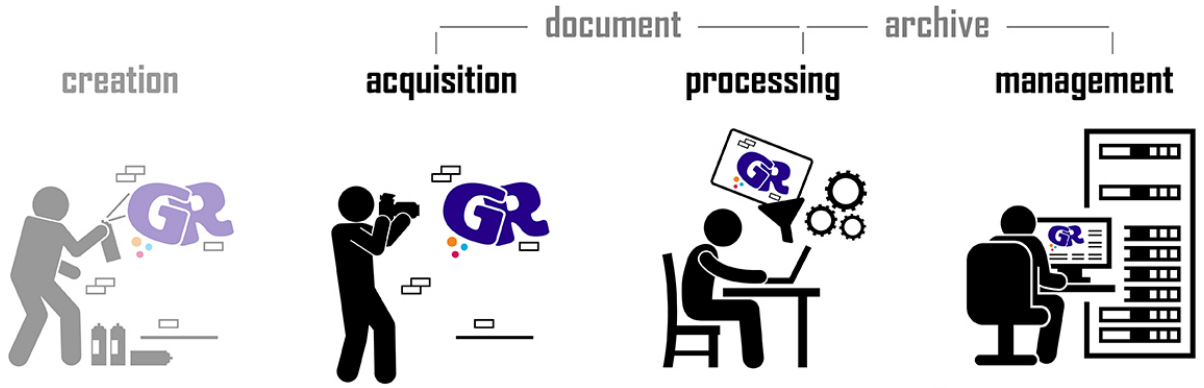
INDIGO approach

5 research pillars



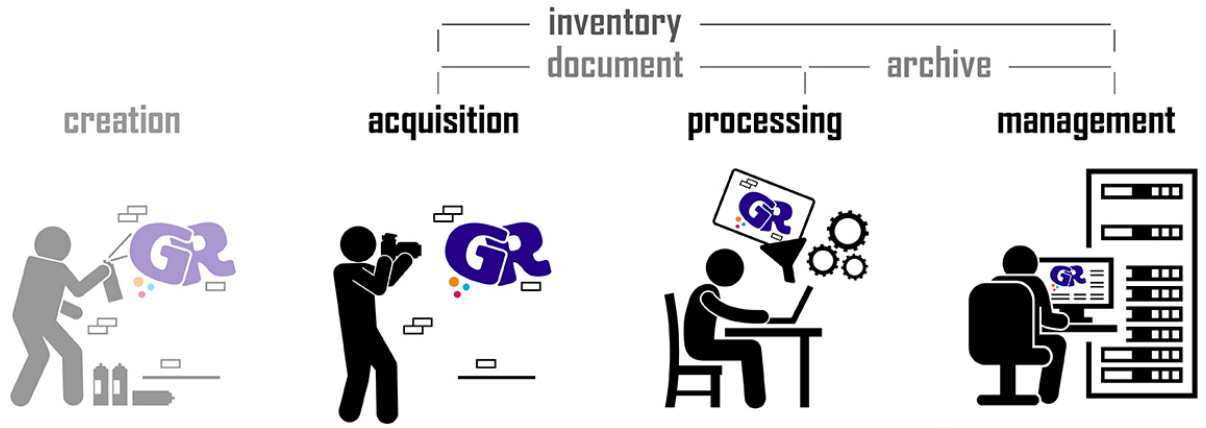
INDIGO approach

5 research pillars



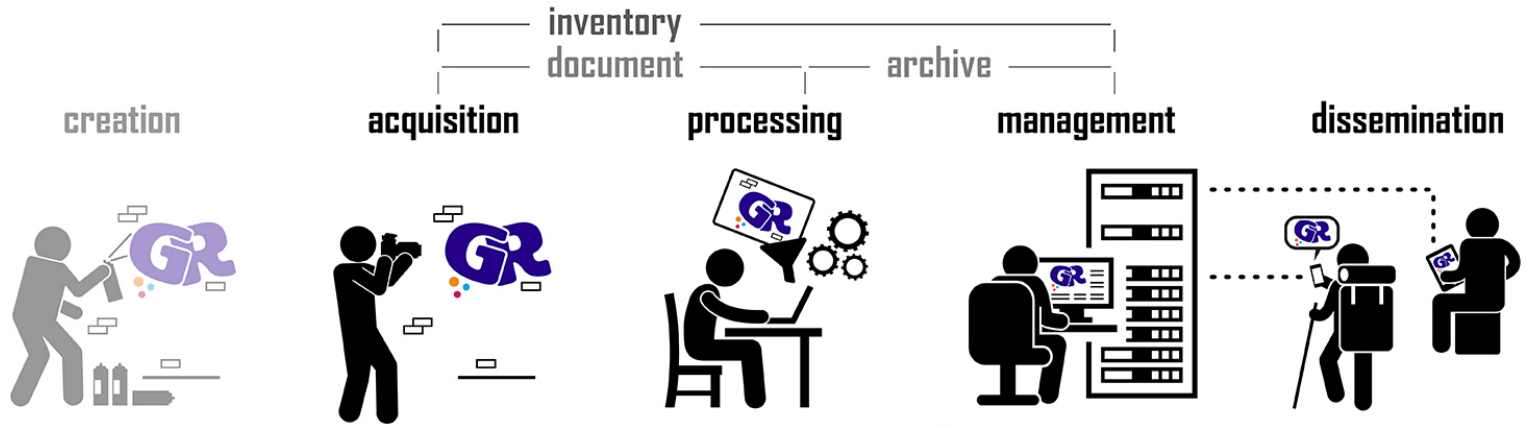
INDIGO approach

5 research pillars



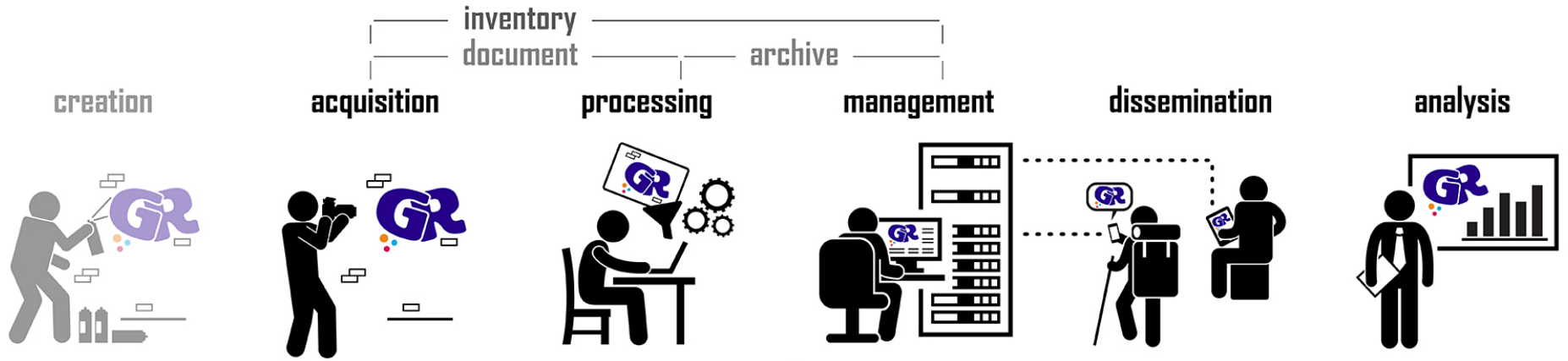
INDIGO approach

5 research pillars



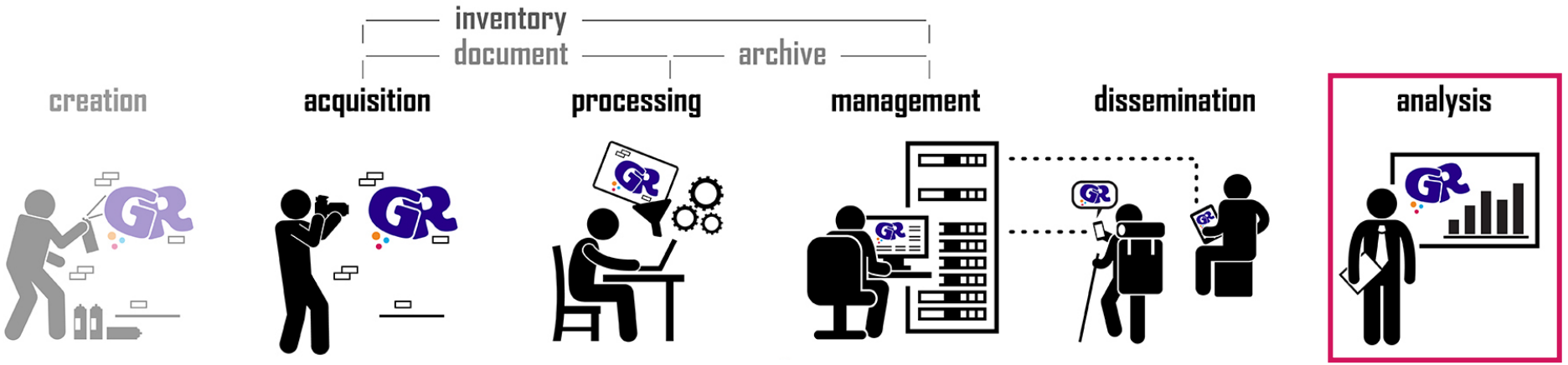
INDIGO approach

5 research pillars

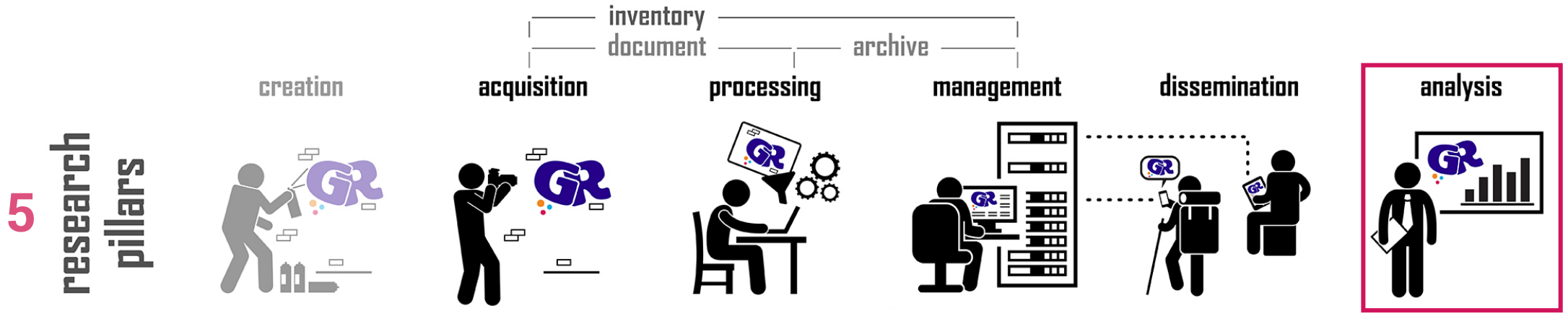


POTENTIAL questions

5 research pillars



POTENTIAL questions



Along the Donaukanal

when and where do political graffiti occur ?

what styles, colours, and lifespans do they exhibit ?

which graffiti types most often cover political messages ?

POTENTIAL questions

GRAFFITI *LOCATION*

Along the Donaukanal

when and where do political graffiti occur ?

what styles, colours, and lifespans do they exhibit ?

which graffiti types most often cover political messages ?

POTENTIAL questions

GRAFFITI *LOCATION*

GRAFFITI *TEMPORALITY*

Along the Donaukanal

when and where do political graffiti occur ?

what styles, colours, and **lifespans** do they exhibit ?

which graffiti types most often cover political messages ?

POTENTIAL questions

GRAFFITI *LOCATION*

GRAFFITI *TEMPORALITY*

GRAFFITI *TERMINOLOGY*

Along the Donaukanal

when and where do **political graffiti** occur ?

what styles, colours, and lifespans do they exhibit ?

which **graffiti types** most often cover political messages ?

POTENTIAL questions

GRAFFITI *LOCATION*
GRAFFITI *TEMPORALITY*
GRAFFITI *TERMINOLOGY*
GRAFFITI *CHARACTERISATION*

Along the Donaukanal

when and where do political graffiti occur ?

what styles, colours, and lifespans do they exhibit ?

which graffiti types most often cover political messages ?

GRAFFITI archaeology

GRAFFITI *LOCATION*
GRAFFITI *TEMPORALITY*
GRAFFITI *TERMINOLOGY*
GRAFFITI *CHARACTERISATION*

Along the Donaukanal

when and where do political graffiti occur ?

what styles, colours, and lifespans do they exhibit ?

which graffiti types most often cover political messages ?

GRAFFITI archaeology

GRAFFITI *LOCATION*
GRAFFITI *TEMPORALITY*
GRAFFITI *TERMINOLOGY*
GRAFFITI *CHARACTERISATION*

In Rome, ~~Along the Donaukanal~~

when and where do political graffiti occur ?

what styles, colours, and lifespans do they exhibit ?

which graffiti types most often cover political messages ?

GRAFFITI archaeology

GRAFFITI *LOCATION*
GRAFFITI *TEMPORALITY*
GRAFFITI *TERMINOLOGY*
GRAFFITI *CHARACTERISATION*

In Rome, ~~Along the Donaukanal~~

when and where do ancient political graffiti occur ?

what styles, colours, and lifespans do they exhibit ?

which graffiti types most often cover political messages ?

GRAFFITI archaeology

STANDARDS

- GRAFFITI *LOCATION*
- GRAFFITI *TEMPORALITY*
- GRAFFITI *TERMINOLOGY*
- GRAFFITI *CHARACTERISATION*

In Rome, ~~**Along the Donaukanal**~~

when and where do ancient political graffiti occur ?

what styles, colours, and lifespans do they exhibit ?

which graffiti types most often cover political messages ?

GRAFFITI archaeology

STANDARDS

- GRAFFITI *LOCATION*
- GRAFFITI *TEMPORALITY*
- GRAFFITI *TERMINOLOGY*
- GRAFFITI *CHARACTERISATION*

In Rome, ~~**Along the Donaukanal**~~

when and where do **ancient** political graffiti occur ?

what **styles, colours, and lifespans** do they exhibit ?

which graffiti types most often cover political messages ?

GRAFFITI archaeology

STANDARDS

- GRAFFITI *LOCATION*
- GRAFFITI *TEMPORALITY*
- GRAFFITI *TERMINOLOGY*
- GRAFFITI *CHARACTERISATION*

Heritage science

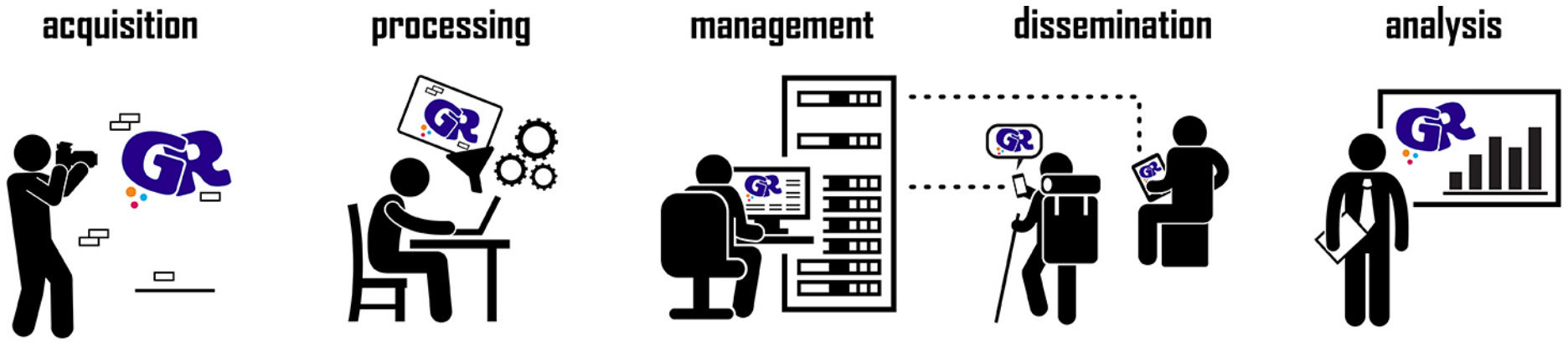
In Rome, ~~**Along the Donaukanal**~~

when and where do **ancient** political graffiti occur ?

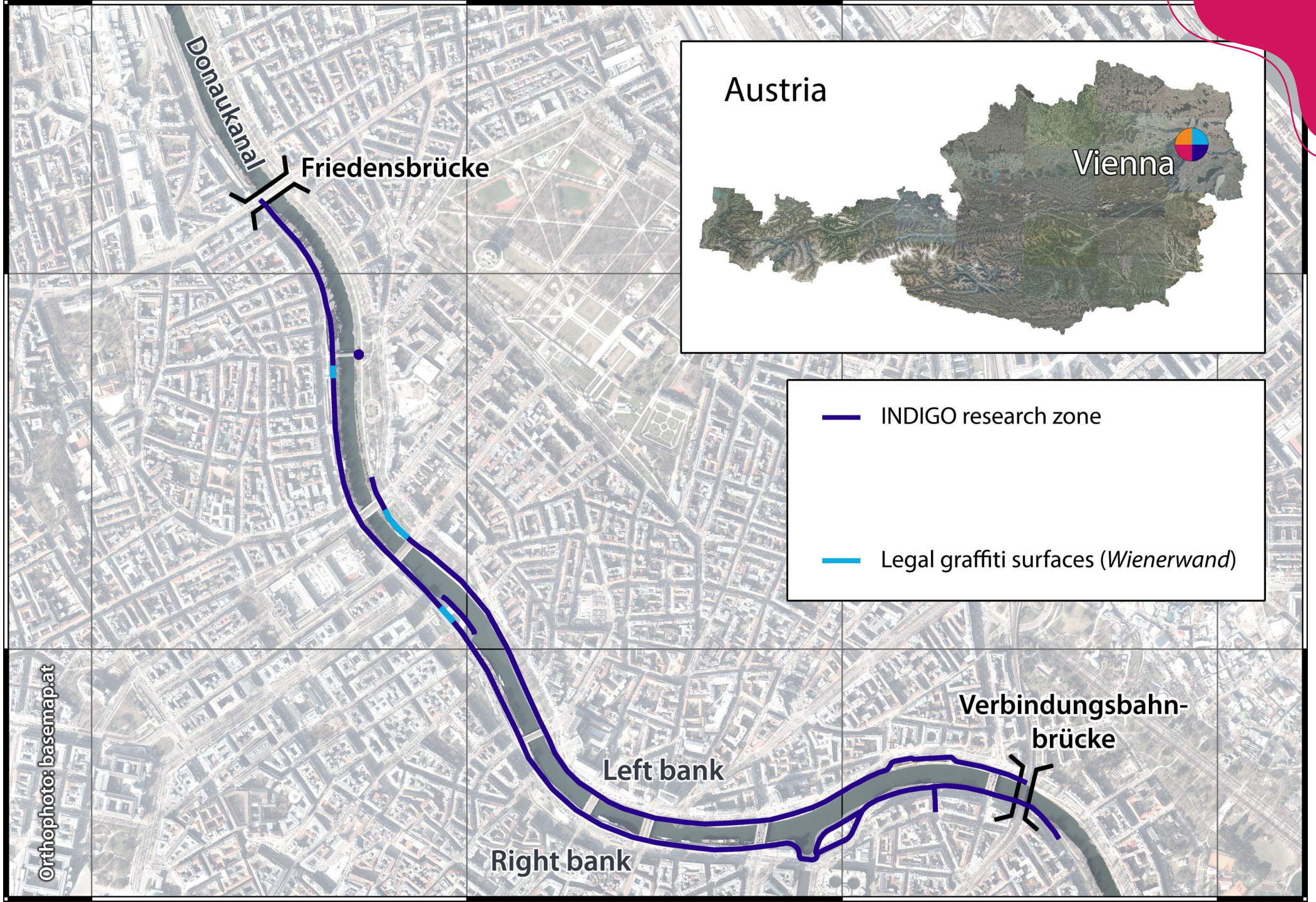
what **styles, colours, and lifespans** do they exhibit ?

which graffiti types most often cover political messages ?

INDIGO 1.0


acquisition
processing
management
dissemination
analysis

acquisition

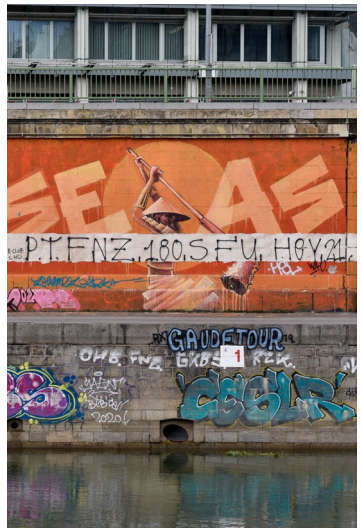


acquisition

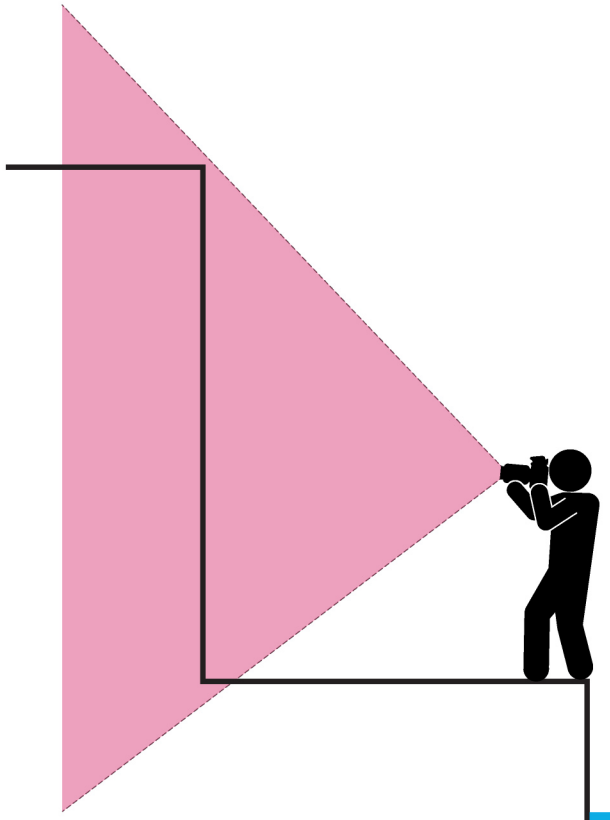


acquisition

INDIGO 1.0



INDIGO 1.0





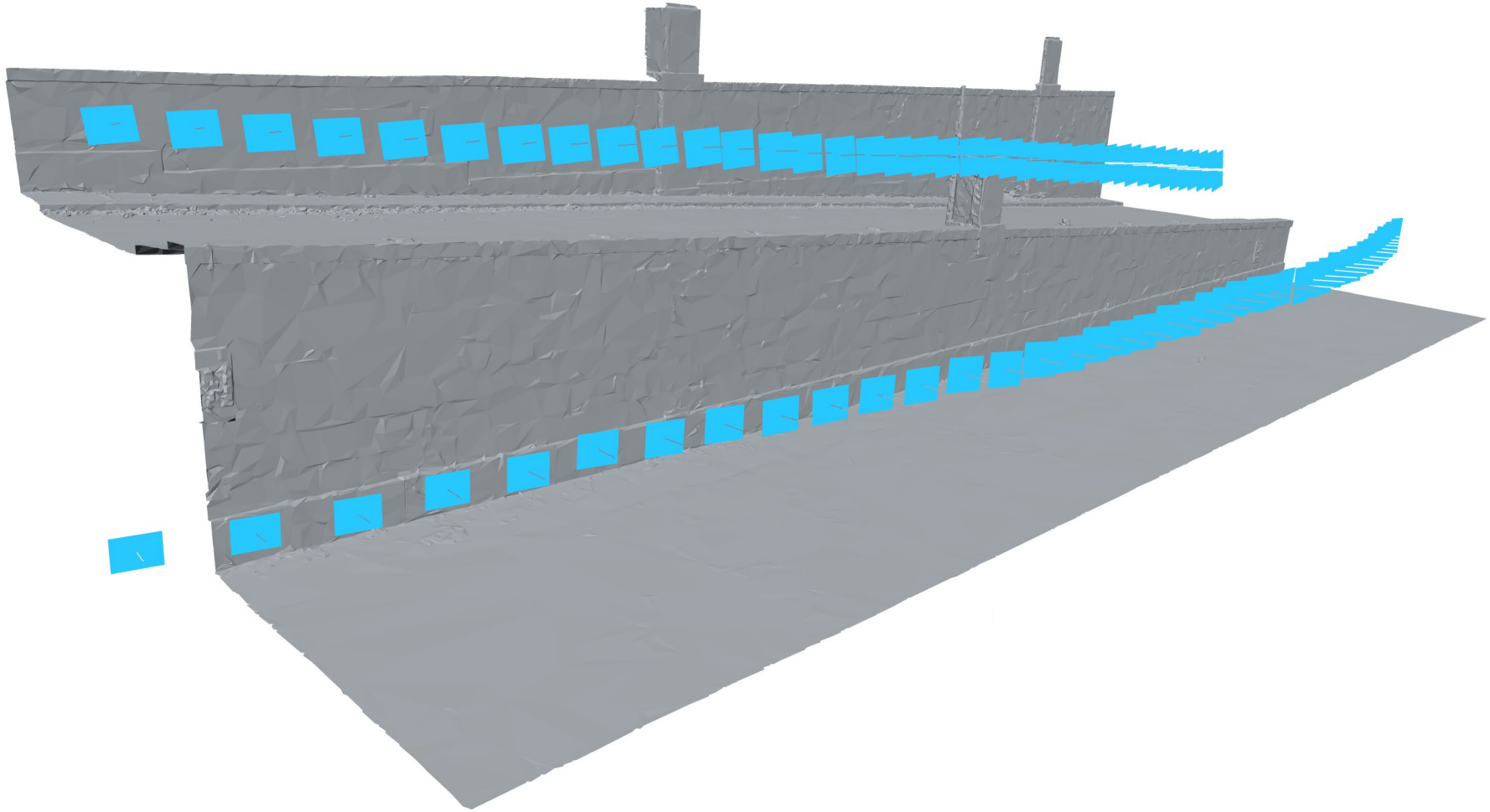
INDIGO 1.0


Nikon
NIKKOR
S


RTK
GNSS
Scene2Map RTK
AP:192.168.1.79
BATT%
IMG: 0 0
66
POS: None
SATS: 0
ACC HOR: 10 m
NO

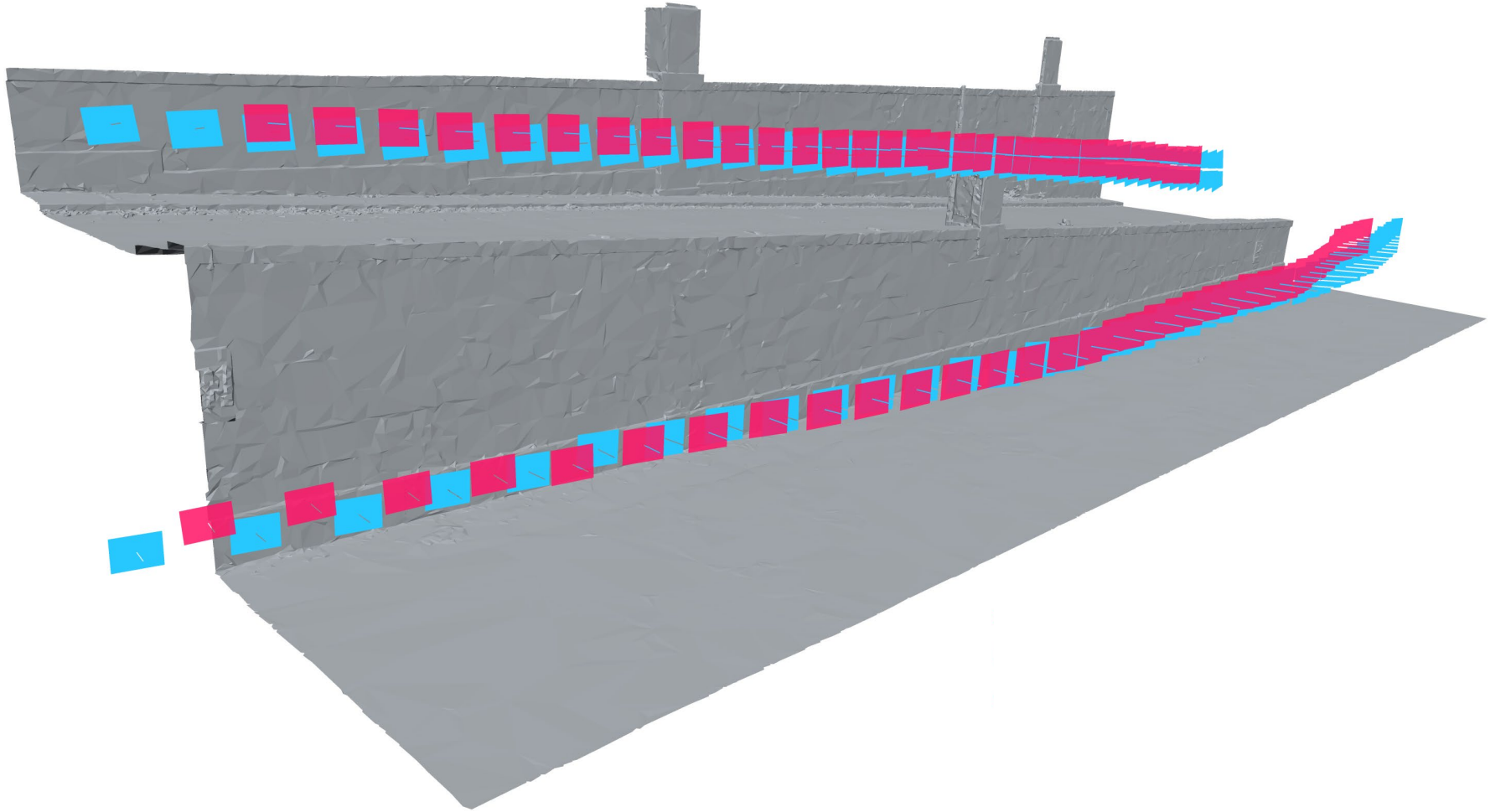
processing

INDIGO 1.0



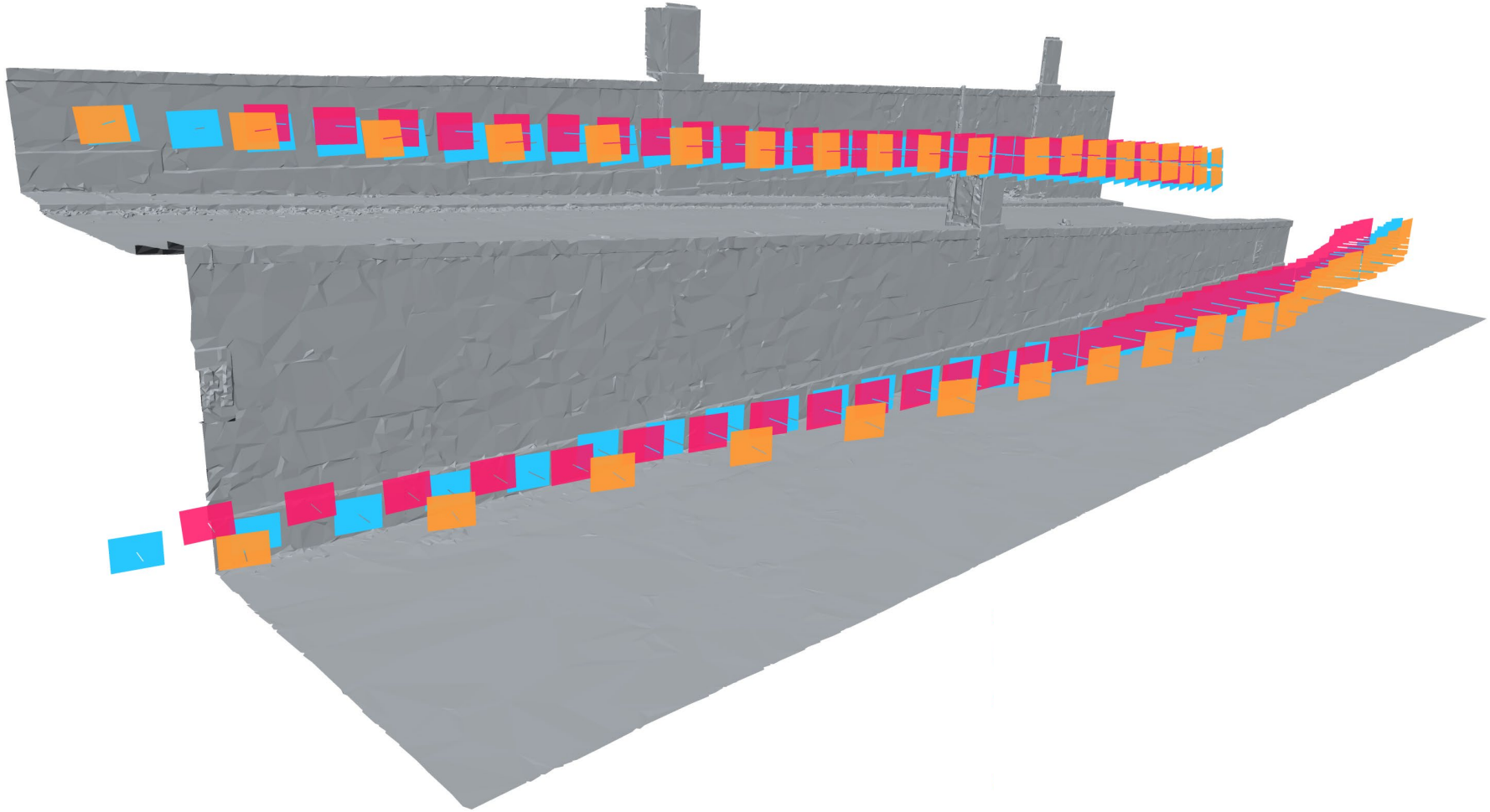
processing

INDIGO 1.0



processing

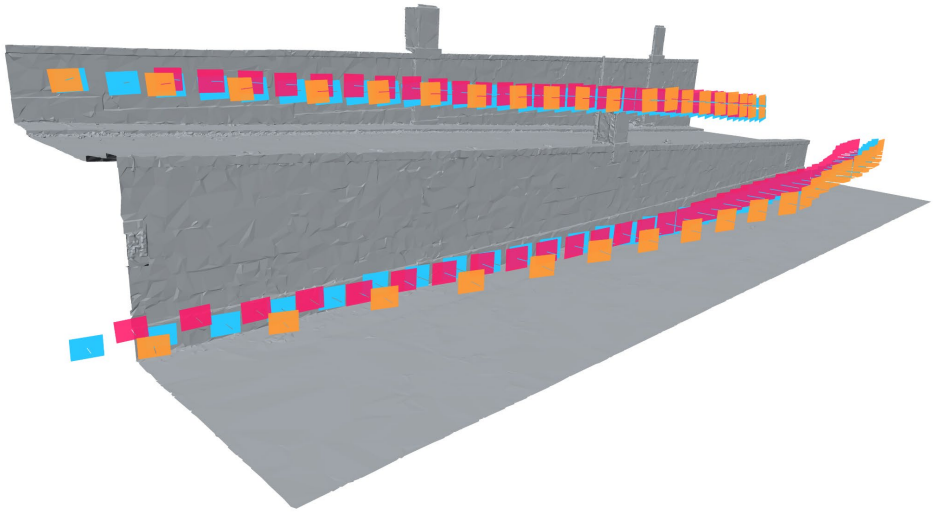
INDIGO 1.0



processing



INDIGO 1.0







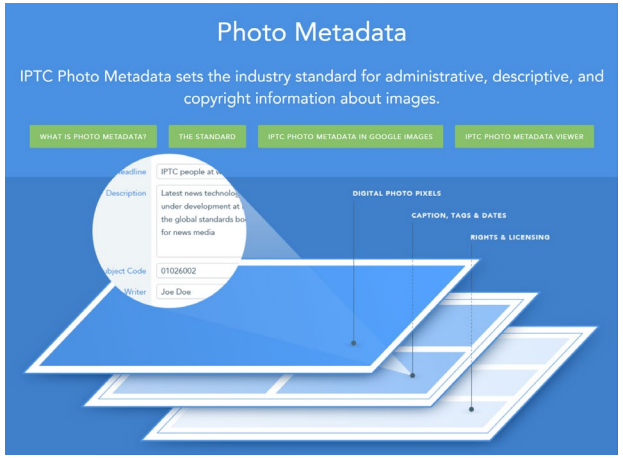


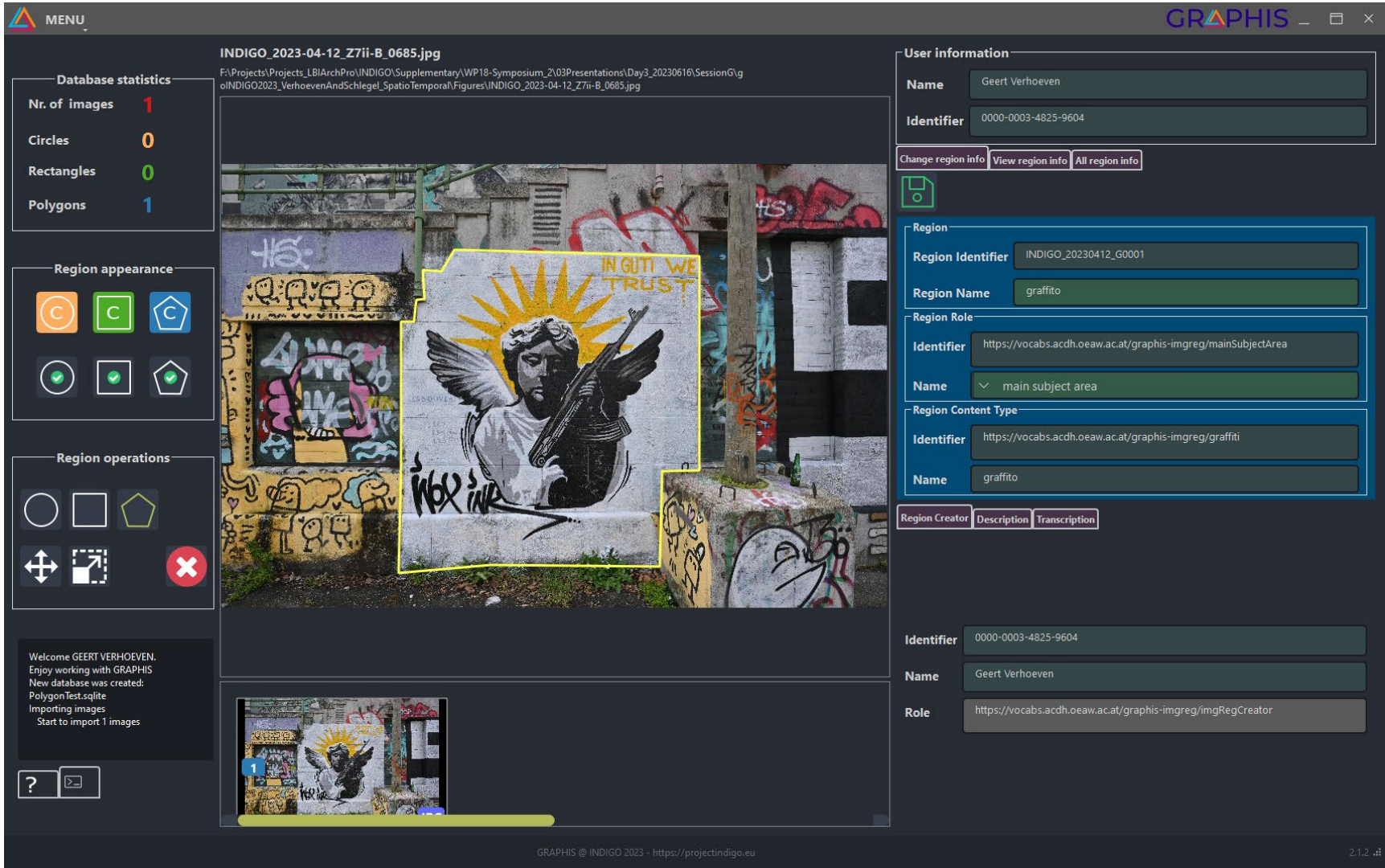
processing



INDIGO 1.0







management



INDIGO 1.0

Vocabs Vocabularies About Editor API Help | Interface language: English

GRAPHIS Image Region

Alphabetical Hierarchy Groups

A
area of interest
D
description writer
G
graffito
I
image region creator
M
main subject area
S
subject area
T
text (graffito)
transcript writer

Vocabulary information

TITLE	GRAPHIS Image Region
DESCRIPTION	This GRAPHIS Image Region vocabulary contains all concepts GRAPHIS currently provides its users to annotate image regions. Image regions are shapes like rectangles, circles or any possible polygon that can be marked and saved within an image. The IPTC Photo Metadata Standard (https://iptc.org/standards/photo-metadata/iptc-standard) has enabled storing these image regions since its 2019.1 version (see https://iptc.org/std/photometadata/specification/IPTC-PhotoMetadata#image-region, https://www.iptc.org/std/photometadata/specification/IPTC-PhotoMetadata-2019.1.html). GRAPHIS (Generate Regions and Annotations for Photos using the IPTC Standard) is a software developed within the academic graffiti project INDIGO and freely available on GitHub (https://github.com/GraffitiProjectINDIGO/GRAPHIS). GRAPHIS provides a graphical user interface to generate, visualise and annotate these image regions while adhering to the IPTC Photo Metadata Standard.
CREATOR	Massimiliano Carloni Geert Verhoeven
LICENSE	https://creativecommons.org/publicdomain/zero/1.0/
LANGUAGE	en
VERSION	1.0.0
SOURCE	Contains information from the IPTC NewsCodes "Content Production Party Role" controlled vocabulary (http://cv.iptc.org/newscodes/contentprodpartyrole/), which is made available under the Creative Commons Attribution 4.0 International License. Contains information from the IPTC NewsCodes "Image Region Role" controlled vocabulary (http://cv.iptc.org/newscodes/imageregionrole/), which is made available under the Creative Commons Attribution 4.0 International License. Contains information from the IPTC NewsCodes "Image Region Type" controlled vocabulary (http://cv.iptc.org/newscodes/imageregiontype/), which is made available under the Creative Commons Attribution 4.0 International License.
RELATION	https://projectindigo.eu
CREATED	Tuesday, April 4, 2023 12:53:26
LAST MODIFIED	Friday, August 25, 2023 16:26:42
RIGHTS HOLDER	project INDIGO
TYPE	http://www.w3.org/2004/02/skos/core#ConceptScheme
URI	https://vocabs.acdh.oeaw.ac.at/graphis-imgreg/

Resource counts by type

Type	Count
Concept	8
• Deprecated concept	0
Collection	3

management



INDIGO 1.0

Vocabs Vocabularies About Editor API Help | Interface language: English

INDIGO Graffiti Thesaurus

Alphabetical Hierarchy Groups

A B C D E F G H I K L M N O P R
S T U V W !* 0-9

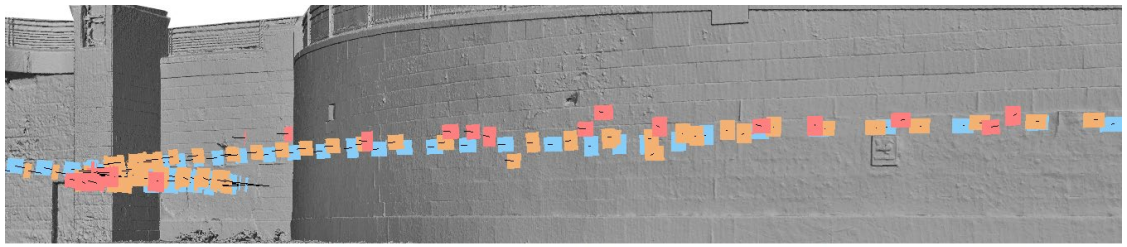
abstract → abstract style (graffiti)
abstract (graffiti) → abstract style (graffiti)
abstract (style) → abstract style (graffiti)
Abstract Style → abstract style (graffiti)
Abstract style → abstract style (graffiti)
abstract style (graffiti)
accidental surface covering processes <guide term>
Activities <facet>
additive and joining processes and techniques <guide term>
Agents <facet>
Anarchy sign → anarchy symbols
anarchy sign → anarchy symbols
anarchy symbol → anarchy symbols
anarchy symbols
Anti Style → anti style (graffiti)
Anti style → anti style (graffiti)
anti style (graffiti)
anti-style → anti style (graffiti)
arrow → arrows (motif)
arrow (letter attribute) → arrows (letter attribute)
arrow (motif) → arrows (motif)
arrows → arrows (motif)
arrows (letter attribute)
arrows (motif)
artist, street → street artists (graffiti)
artists, street → street artists (graffiti)
Associated Concepts <facet>
Associated Concepts <hierarchy name>
at → @ signs (motif)
at-sign → @ signs (motif)
at-signs → @ signs (motif)
attributes and properties by specific type <guide term>

Vocabulary information

TITLE	INDIGO Graffiti Thesaurus
SUBJECT	street art graffiti
DESCRIPTION	The INDIGO Graffiti Thesaurus is a curated academic resource centred on contemporary graffiti terminology, with a spatial focus on the Danube Canal in Vienna, Austria. It is not just a compilation of terms, but also a specialised tool that organises and categorises graffiti-related concepts within a controlled vocabulary. More specifically, it takes the form of a thesaurus, where concepts are connected to each other through equivalence, hierarchical, and associative relationships. By leveraging the Simple Knowledge Organization System (SKOS) data model, the thesaurus ensures consistency and precision in its representation of information. The use of SKOS not only makes the thesaurus accessible but also interoperable, allowing for seamless integration with other widely used resources such as Wikidata and the Getty Art & Architecture Thesaurus (AAT) of the J. Paul Getty Trust and Getty Research Institute. The thesaurus is inspired by the AAT and therefore also contains information provided under the ODC Attribution License by the Getty Research Institute. Moreover, the content systematically reflects the structure of the AAT by using facets, hierarchy names, and guide terms. The thesaurus is made available through the Vocabs service of the Austrian Centre for Digital Humanities and Cultural Heritage (ACDH-CH), which utilises Skosmos, an open-source software tailored for publishing vocabularies. For enhanced accessibility, the thesaurus can be queried via a REST API (Representational State Transfer Application Programming Interface), facilitating its interaction with data over the World Wide Web. Moreover, its availability in diverse data formats, including TSV (Tab-Separated Values) and JSON (JavaScript Object Notation), caters to a wide range of academic and technological preferences. With its unique focus on the graffiti culture of the Danube Canal, the thesaurus offers a deep insight into Vienna's Danube Canal contemporary graffiti world and serves as a valuable tool for all those interested in this form of creativity.
PUBLISHER	project INDIGO; ACDH-CH
CREATOR	Geert Verhoeven Massimiliano Carloni Jona Schlegel Stefan Wogrin
LICENSE	Open Data Commons Attribution License (ODC-By) 1.0; http://opendatacommons.org/licenses/by/1.0/
LANGUAGE	English
VERSION	1.0.0
SOURCE	Contains information from the J. Paul Getty Trust, Getty Research Institute, the Art & Architecture Thesaurus, which is made available under the ODC Attribution License. Graffiti Project INDIGO Thesaurus Repository: https://github.com/GraffitiProjectINDIGO/graffiti-thesaurus Schlegel, Jona, Massimiliano Carloni, Stefan Wogrin, Ann M. Graf, and Geert J. Verhoeven. 'Making a Mark—Towards a Graffiti Thesaurus'. Document | Archive | Disseminate Graffiti-Scapes, 2023, 203–19. https://doi.org/10.48619/indigo.v0i0.710.
RELATION	https://projectindigo.eu



INDIGO 1.0









urban chameleon

analysis

INDIGO 1.0





EXPOSING
core challenges

To sustain cultural heritage,
we must first sustain its documentation.

INDIGO 2.0





MONITORING

episodic

on-foot

slow

EXPOSING
core challenges

To sustain cultural heritage,
we must first sustain its documentation.

INDIGO 2.0





MONITORING

episodic

on-foot

slow

ANNOTATION

manual

unscalable

unformalised

EXPOSING
core challenges

To sustain cultural heritage,
we must first sustain its documentation.

INDIGO 2.0





MONITORING

episodic

on-foot

slow

ANNOTATION

manual

unscalable

unformalised

TEMPORALITY

fragmented

implicit

fuzzy



EXPOSING
core challenges

To sustain cultural heritage,
we must first sustain its documentation.

INDIGO 2.0



MONITORING

episodic

on-foot

slow

ANNOTATION

manual

unscalable

unformalised

TEMPORALITY

fragmented

implicit

fuzzy

DATABASES

multi-faceted

relational

rigid



EXPOSING
core challenges

To sustain cultural heritage,
we must first sustain its documentation.

INDIGO 2.0

indigo 2.0

how do we sustainably
monitor & understand
contemporary graffiti-scapes
with a humanistic-technological framework

Heritage Science Austria 2.0 programme | € 550 k | 3 years

INDIGO 2.0
organisation

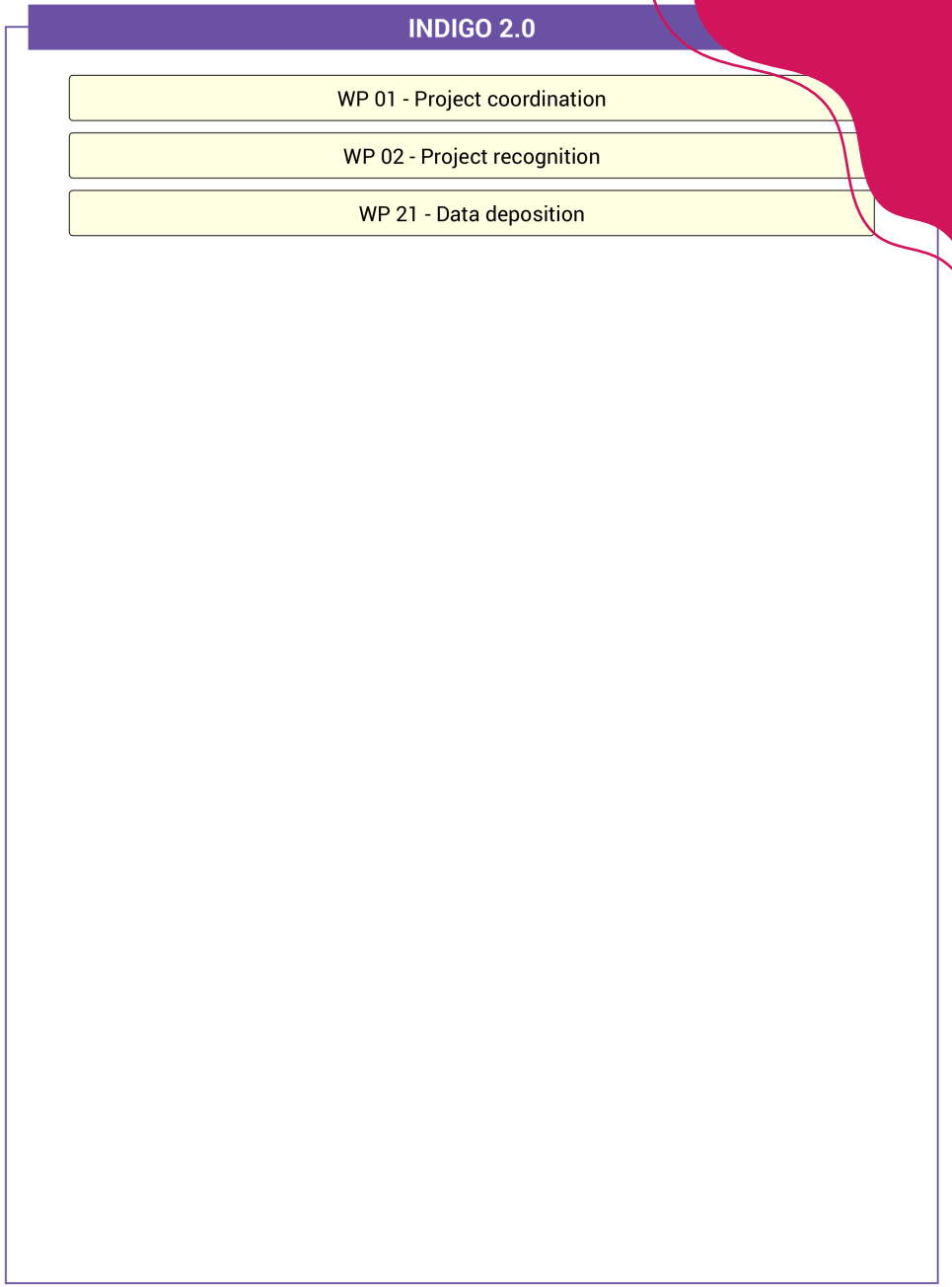
INDIGO 2.0 organisation

21 Work Packages (WPs)

INDIGO 2.0 organisation

21 Work Packages (WPs)

3 overarching

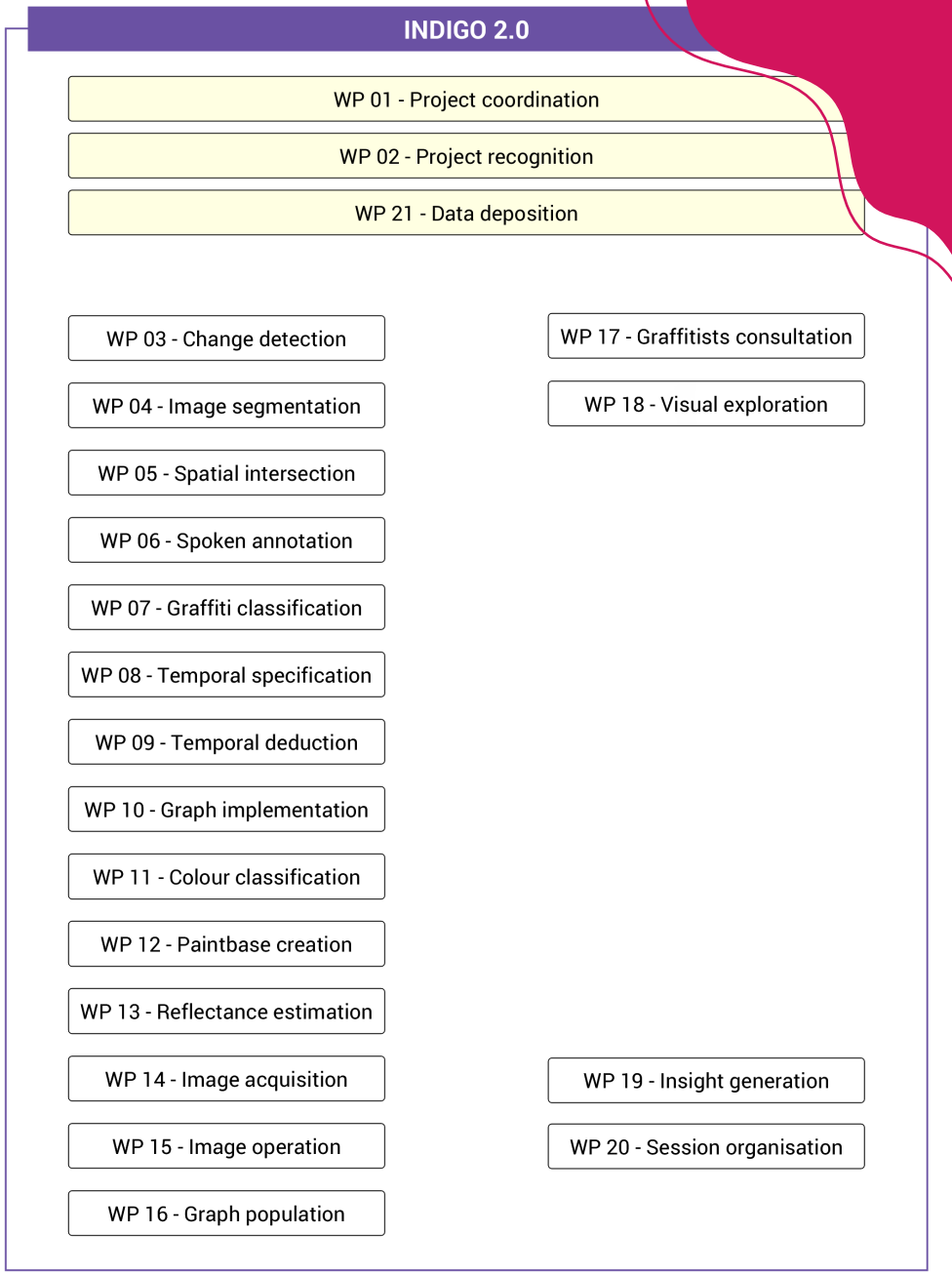


INDIGO 2.0 organisation

21 Work Packages (WPs)

3 overarching

18 specific



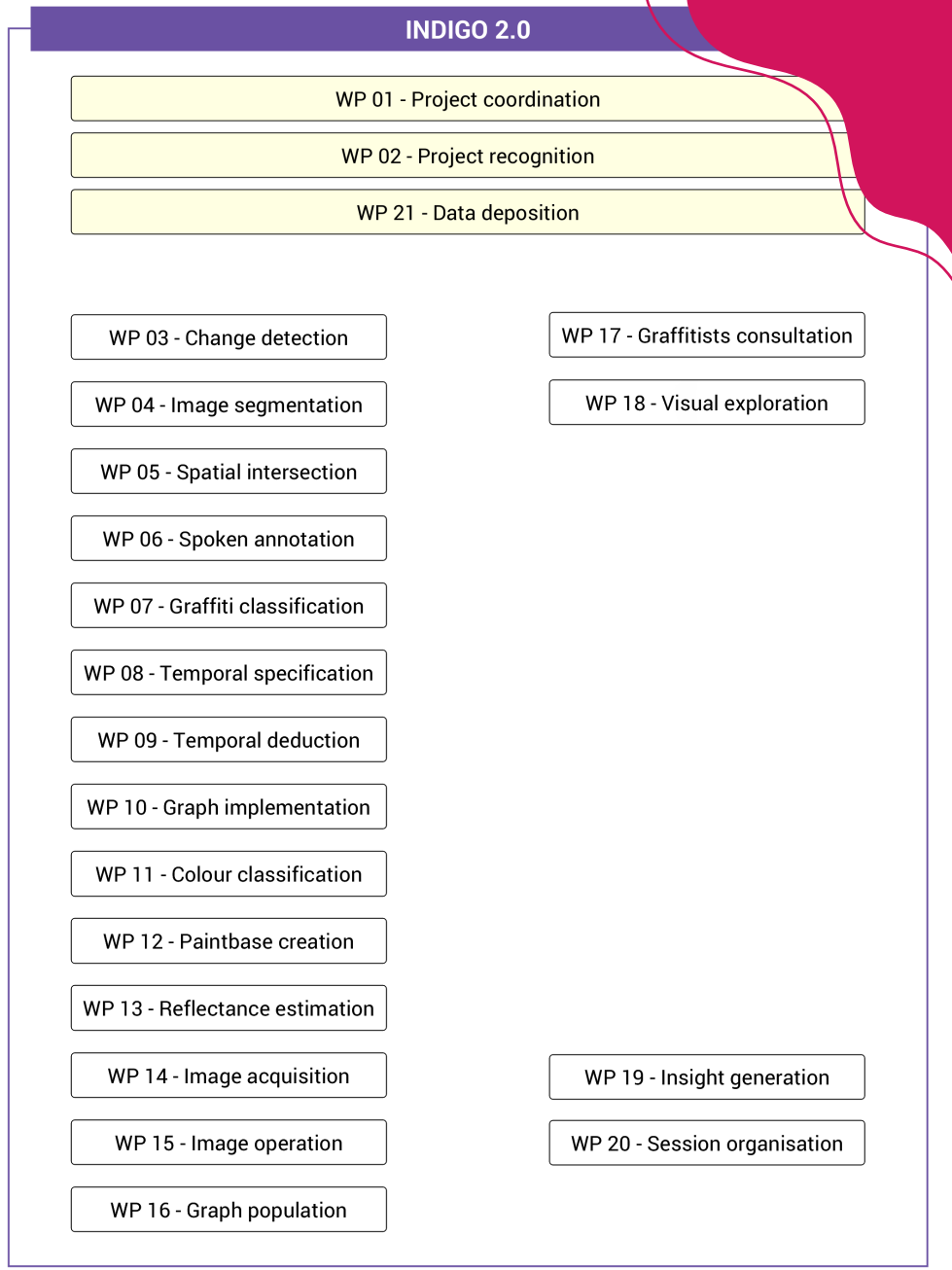
INDIGO 2.0 organisation

21 Work Packages (WPs)

3 overarching

18 specific

2 branches



INDIGO 2.0 organisation

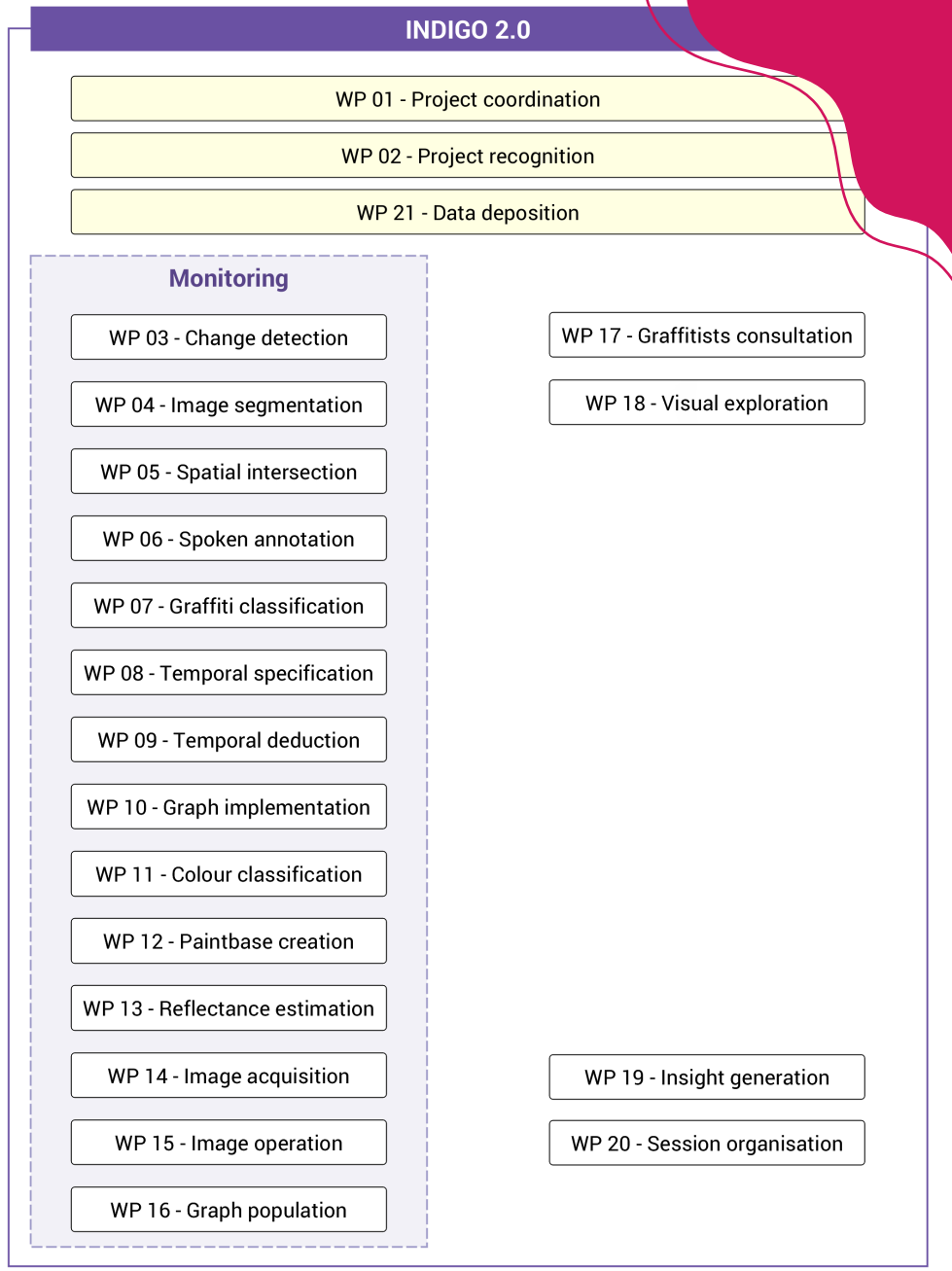
21 Work Packages (WPs)

3 overarching

18 specific

2 branches

Monitoring



INDIGO 2.0 organisation

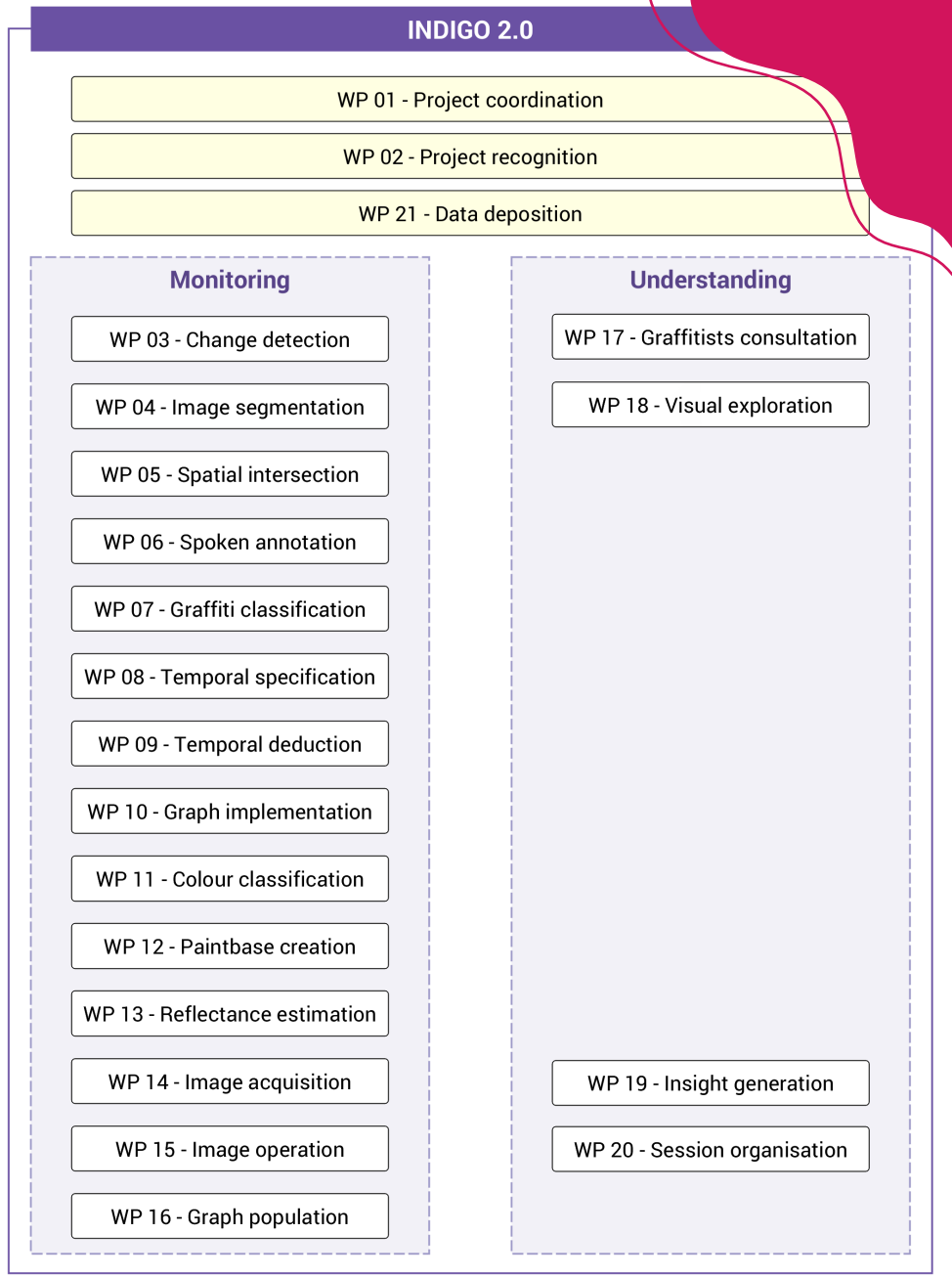
21 Work Packages (WPs)

3 overarching

18 specific

2 branches

Monitoring & Understanding



INDIGO 2.0 organisation

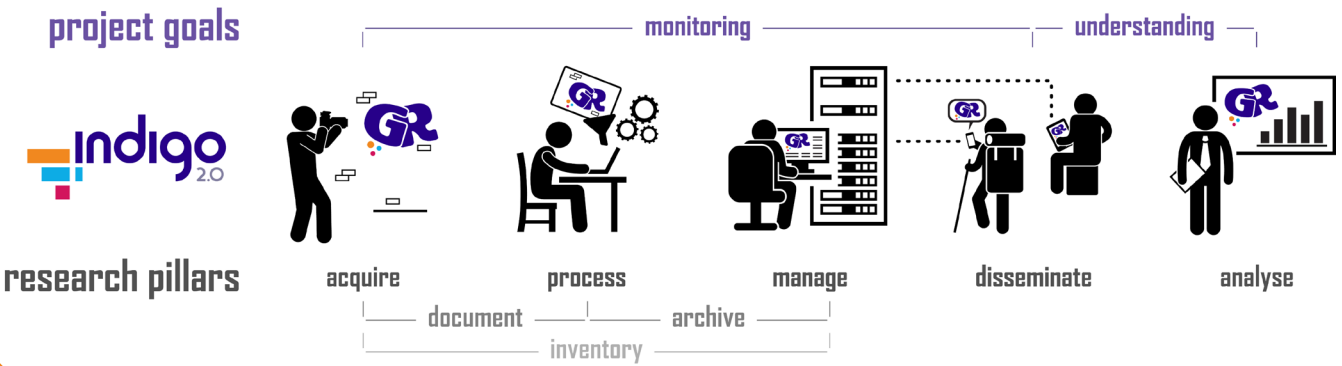
21 Work Packages (WPs)

3 overarching

18 specific

2 branches

Monitoring & Understanding



INDIGO 2.0

- WP 01 - Project coordination
- WP 02 - Project recognition
- WP 21 - Data deposition

Monitoring

- WP 03 - Change detection
- WP 04 - Image segmentation
- WP 05 - Spatial intersection
- WP 06 - Spoken annotation
- WP 07 - Graffiti classification
- WP 08 - Temporal specification
- WP 09 - Temporal deduction
- WP 10 - Graph implementation
- WP 11 - Colour classification
- WP 12 - Paintbase creation
- WP 13 - Reflectance estimation
- WP 14 - Image acquisition
- WP 15 - Image operation
- WP 16 - Graph population

Understanding

- WP 17 - Graffitists consultation
- WP 18 - Visual exploration
- WP 19 - Insight generation
- WP 20 - Session organisation

INDIGO 2.0 organisation

21 Work Packages (WPs)

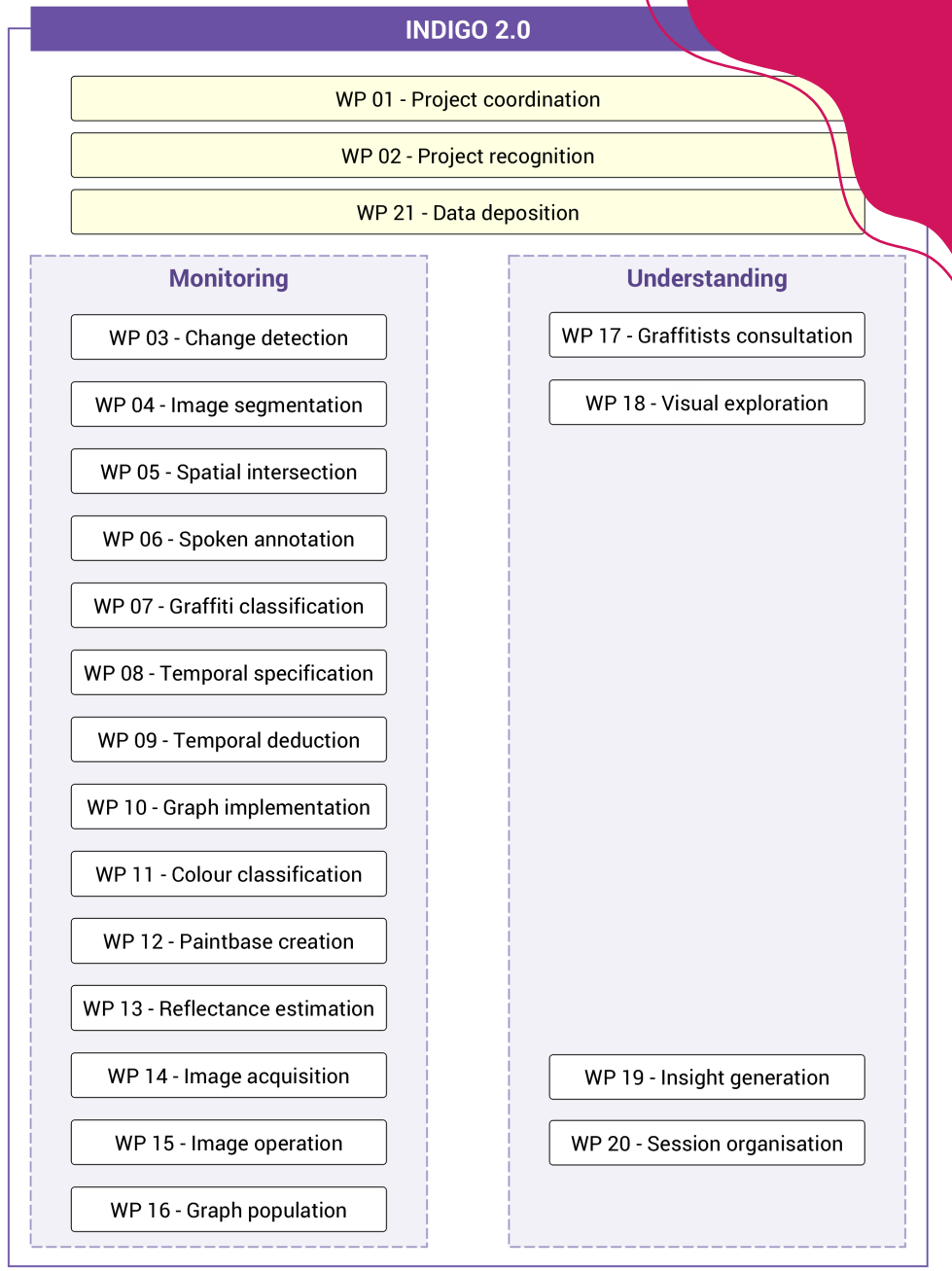
3 overarching

18 specific

2 branches

Monitoring & Understanding

2 layers



INDIGO 2.0 organisation

21 Work Packages (WPs)

3 overarching

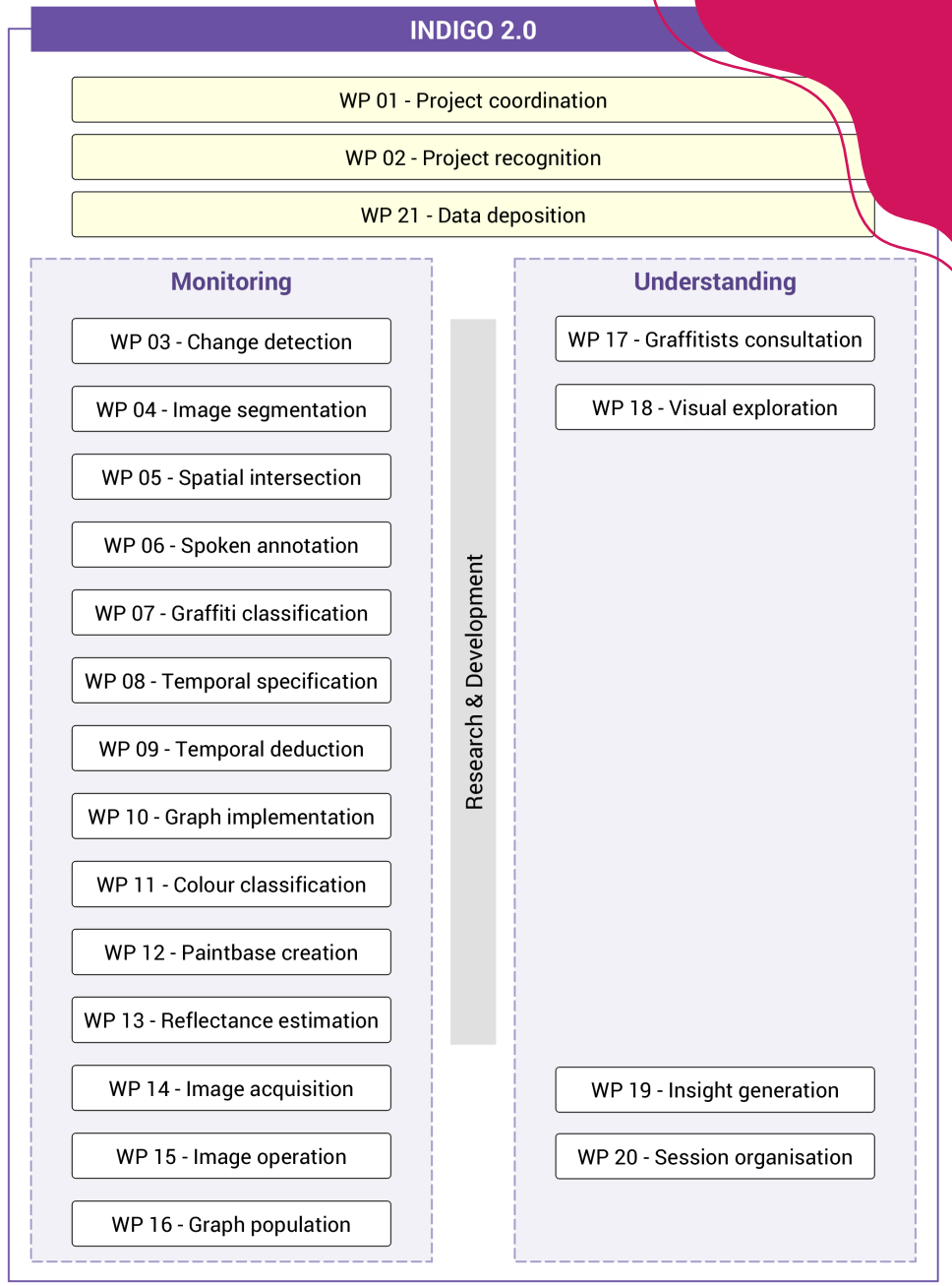
18 specific

2 branches

Monitoring & Understanding

2 layers

R&D



INDIGO 2.0 organisation

21 Work Packages (WPs)

3 overarching

18 specific

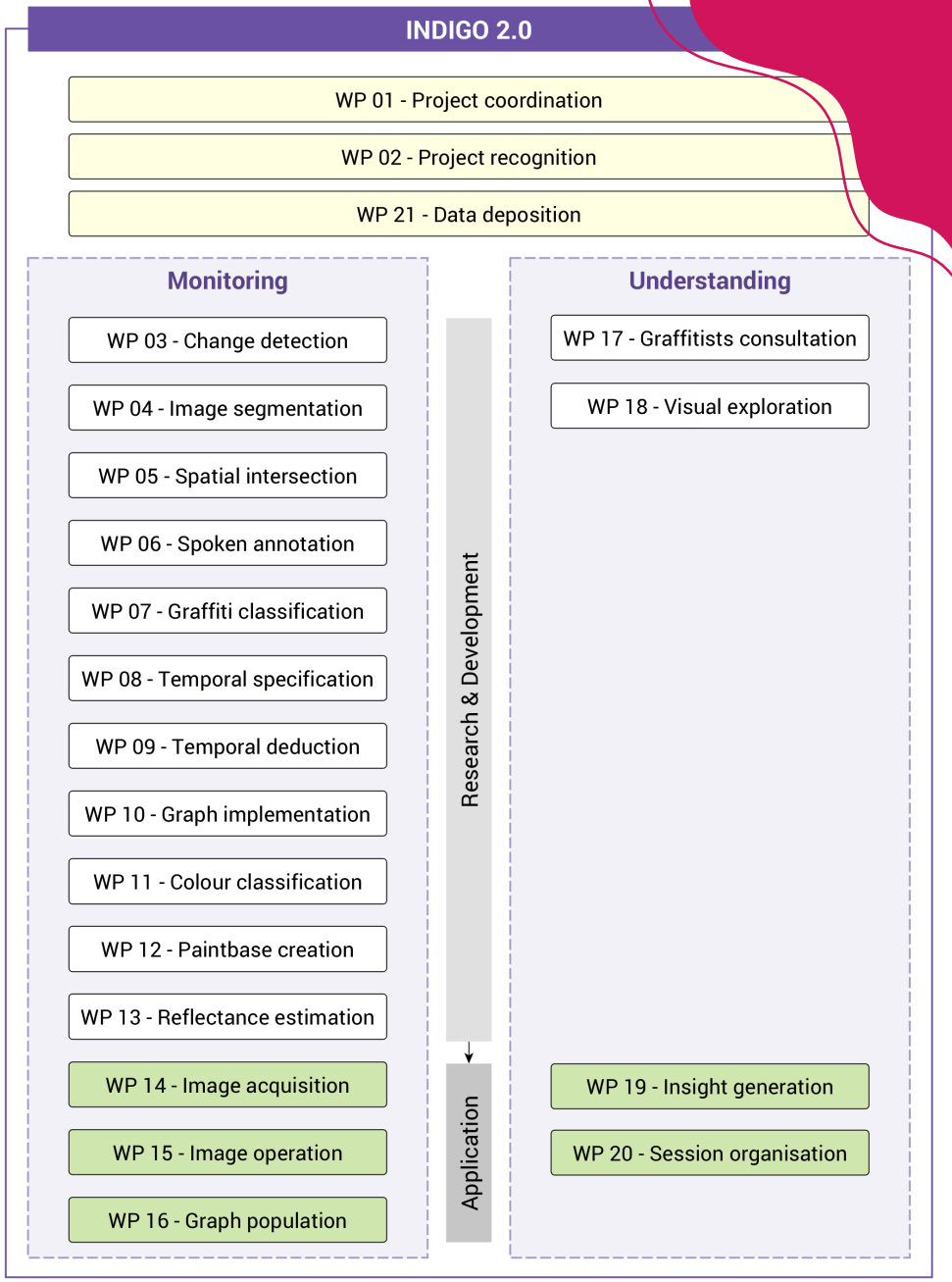
2 branches

Monitoring & Understanding

2 layers

Application

R&D



6 | Application

7 | Management

INDIGO 2.0 organisation

21 Work Packages (WPs)

3 overarching

18 specific

2 branches

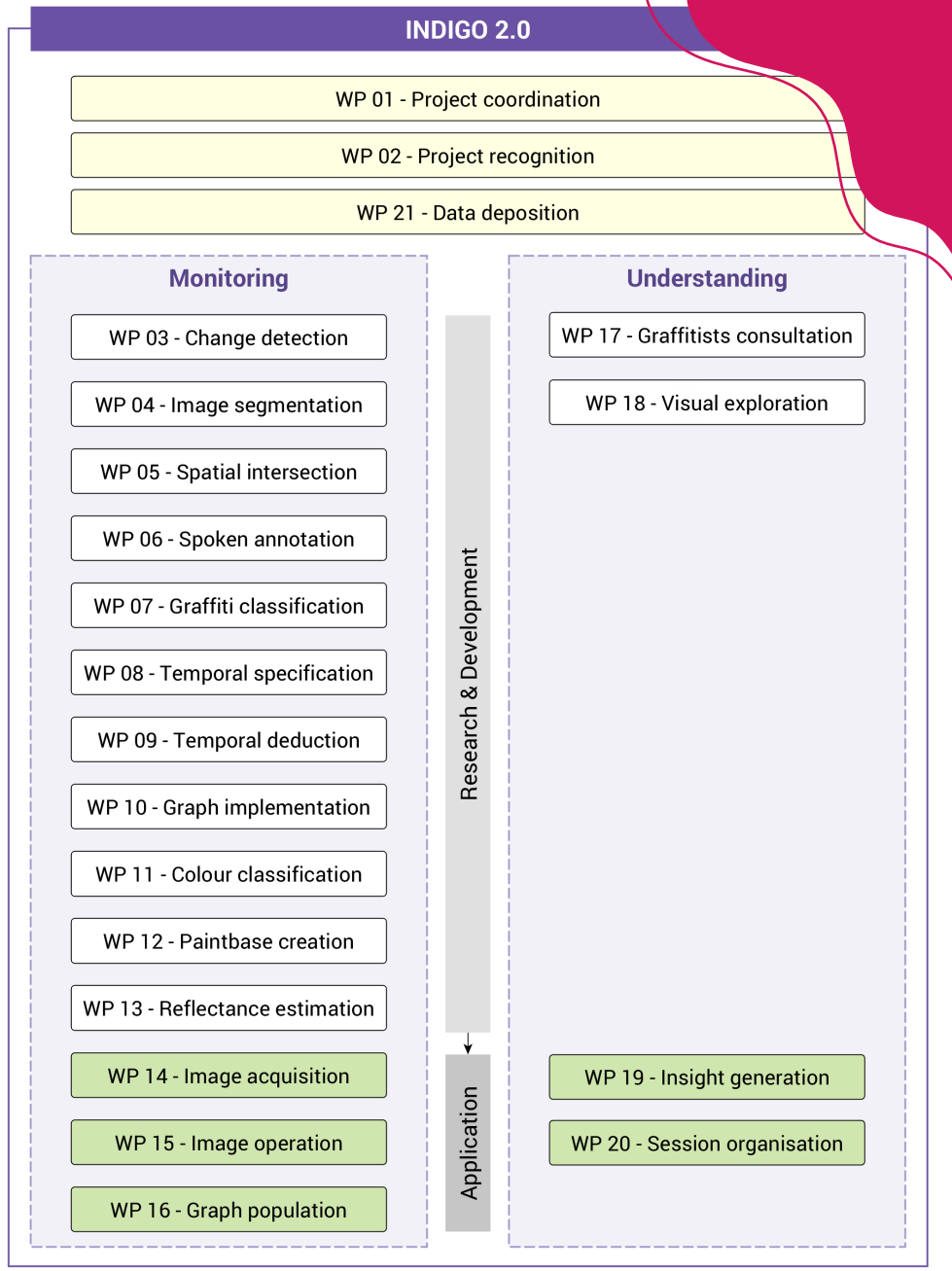
Monitoring & Understanding

2 layers

Application

R&D

5 SRQs



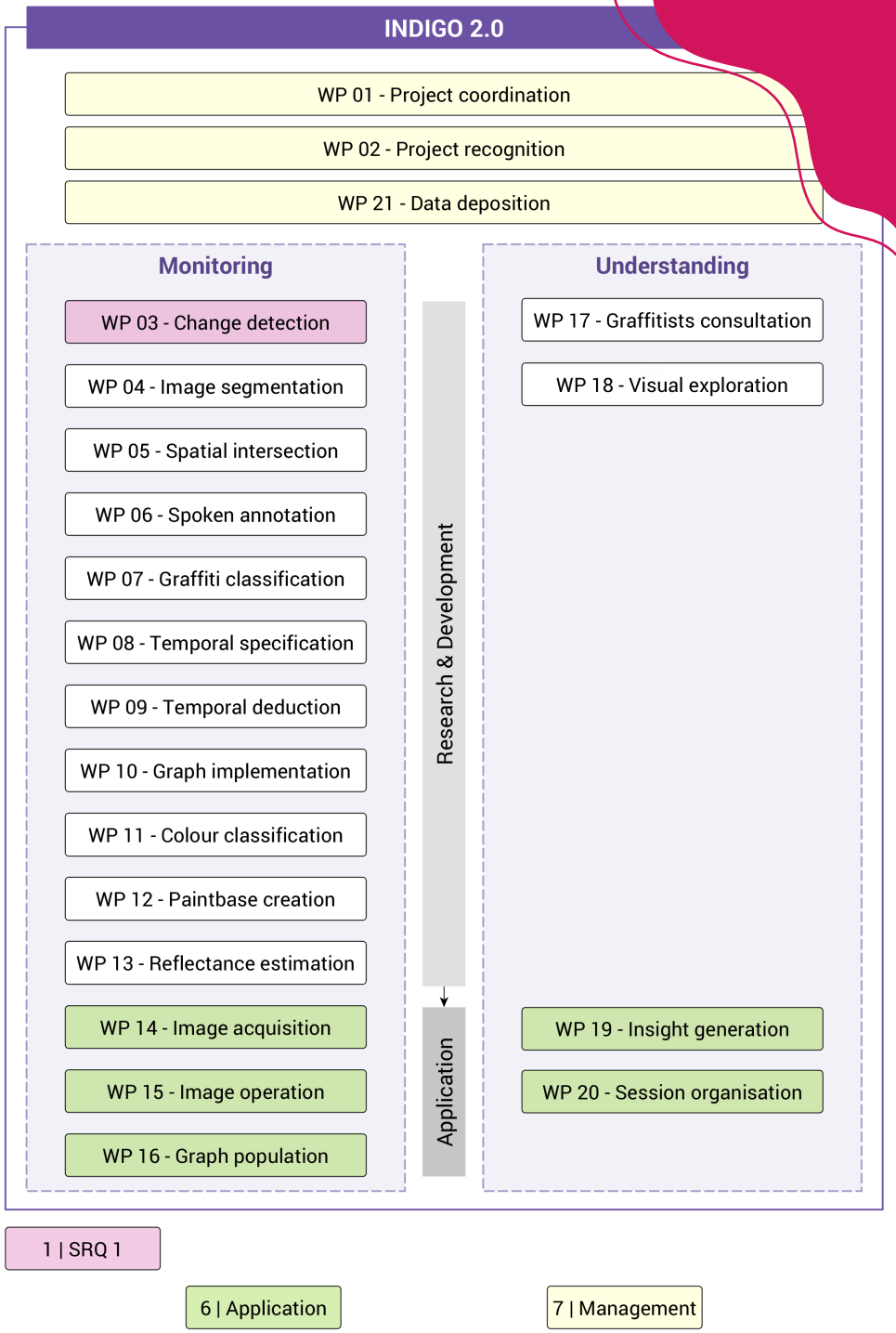
INDIGO 2.0 organisation

SRQ 1. How can we effectively detect and document new graffiti photographically?



R&D

5 SRQs



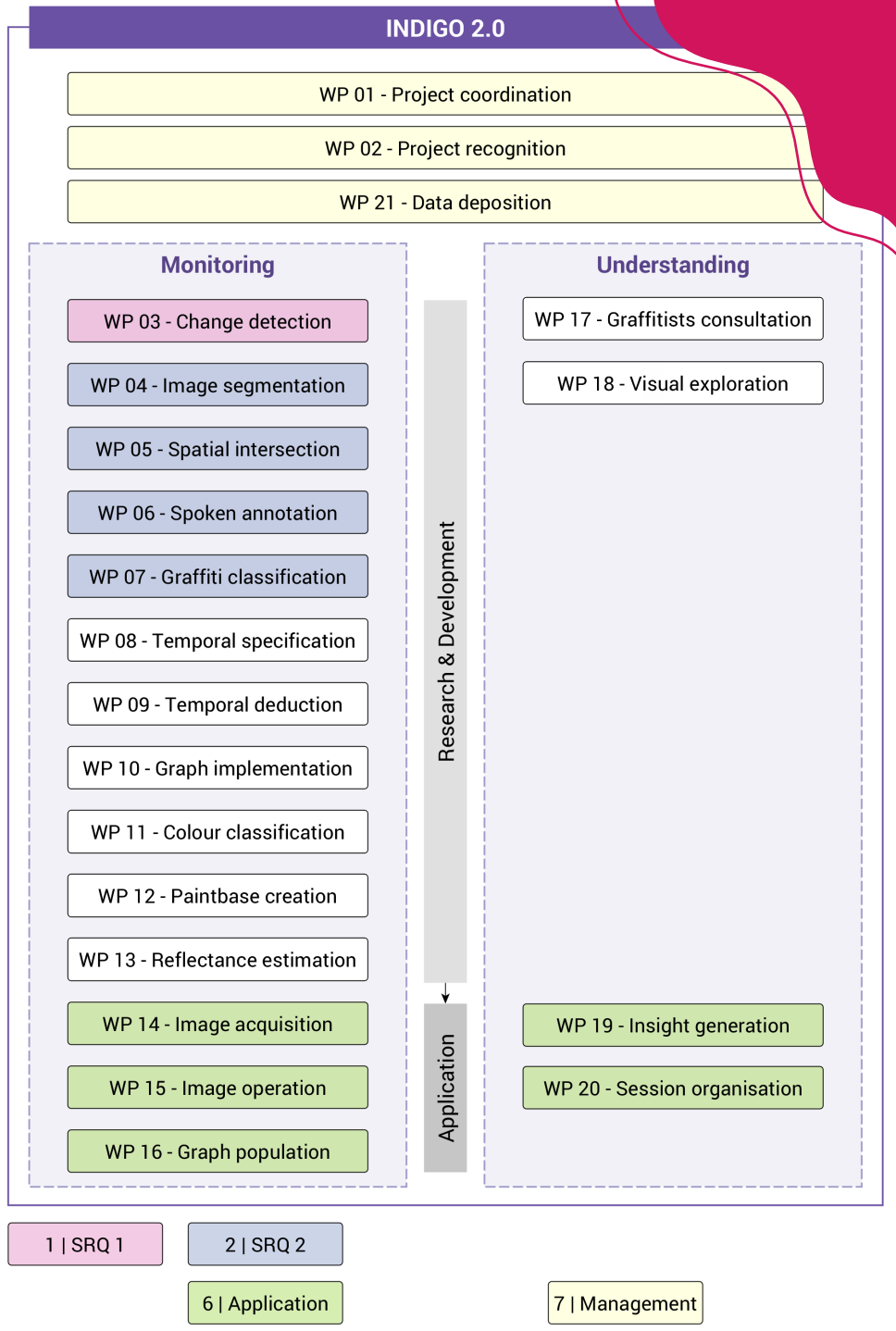
INDIGO 2.0 organisation

SRQ 1. How can we effectively detect and document new graffiti photographically?

SRQ 2. How can we accelerate the segmentation and annotation of graffiti photos?

R&D

5 SRQs



INDIGO 2.0 organisation

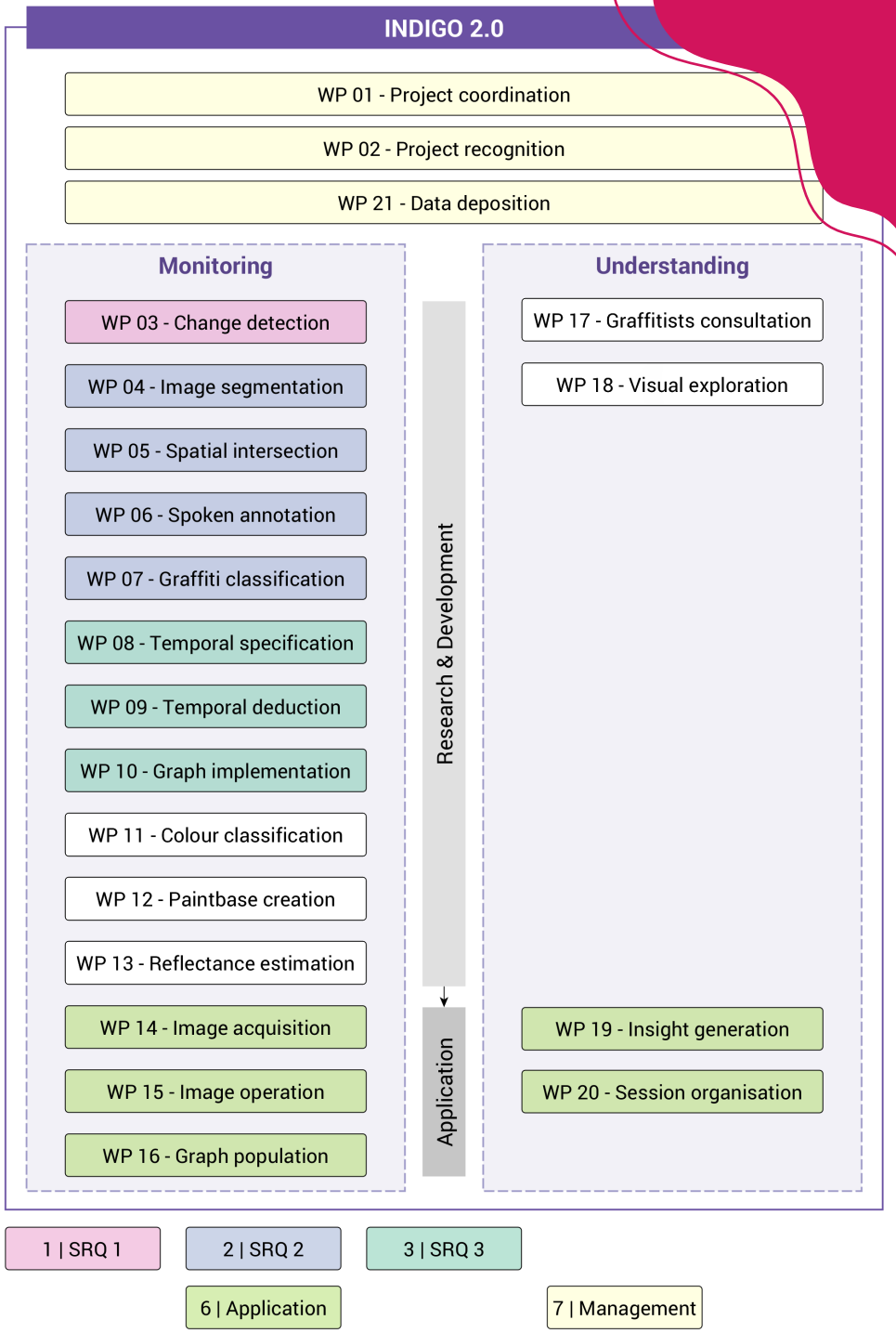
SRQ 1. How can we effectively detect and document new graffiti photographically?

SRQ 2. How can we accelerate the segmentation and annotation of graffiti photos?

SRQ 3. How can we appropriately represent, track, visualise, and query graffiti's temporality?

R&D

5 SRQs



INDIGO 2.0 organisation

SRQ 1. How can we effectively detect and document new graffiti photographically?

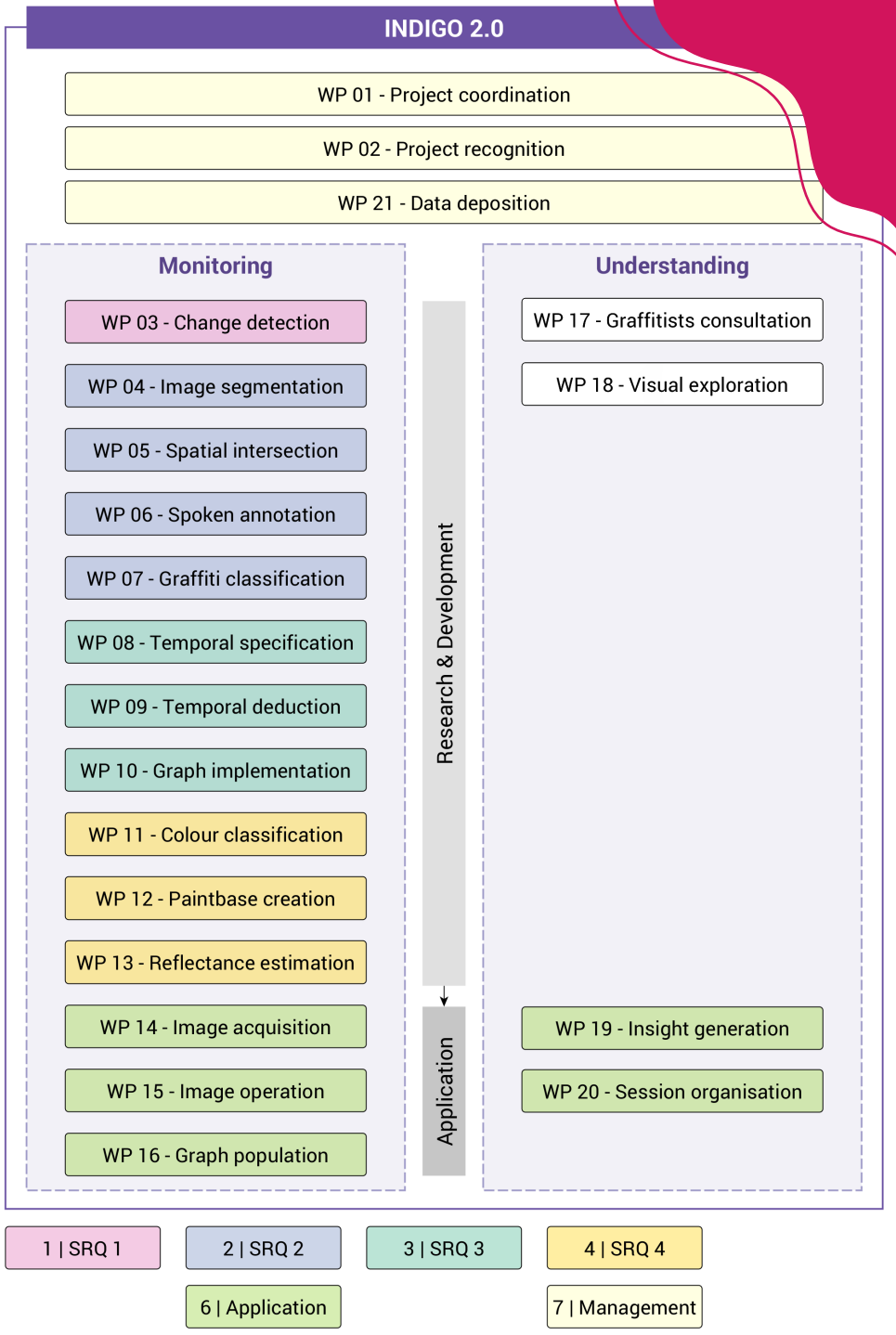
SRQ 2. How can we accelerate the segmentation and annotation of graffiti photos?

SRQ 3. How can we appropriately represent, track, visualise, and query graffiti's temporality?

SRQ 4. How can we determine graffiti colours via non-contact methods?

R&D

5 SRQs



INDIGO 2.0 organisation

SRQ 1. How can we effectively detect and document new graffiti photographically?

SRQ 2. How can we accelerate the segmentation and annotation of graffiti photos?

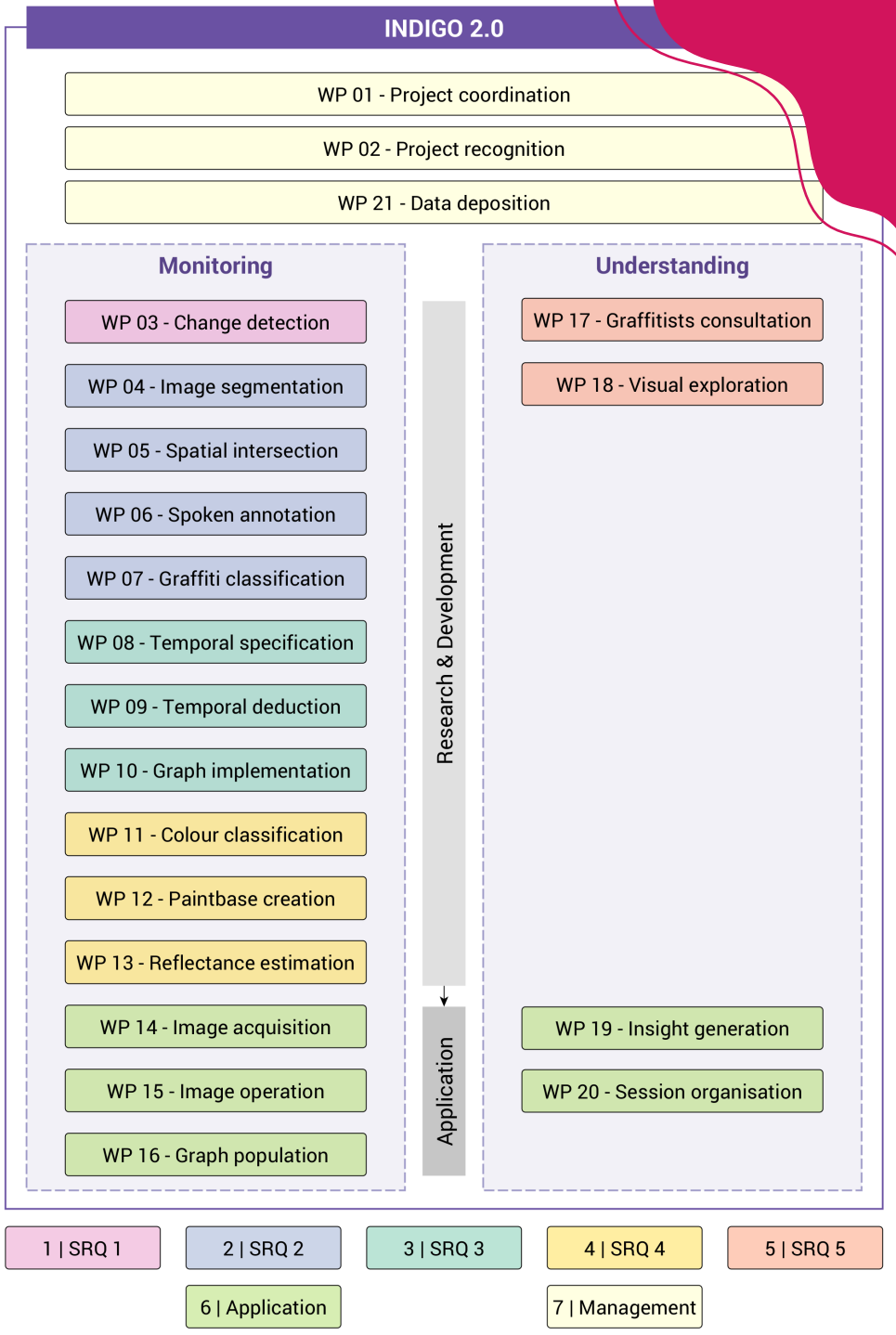
SRQ 3. How can we appropriately represent, track, visualise, and query graffiti's temporality?

SRQ 4. How can we determine graffiti colours via non-contact methods?

SRQ 5. How can we better understand graffiti-scapes through socio-technical approaches?

R&D

5 SRQs



INDIGO team

INDIGO team

universität wien



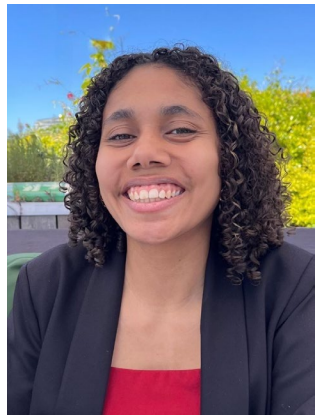
Elena Parsy



Geert Verhoeven

INDIGO team

universität wien



Elena Parsy

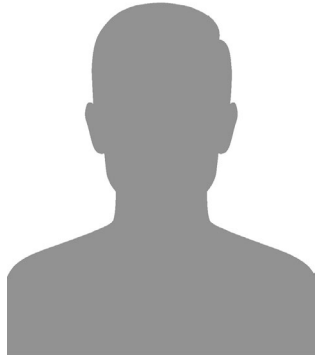


Geert Verhoeven

TU WIEN



Martin Wieser



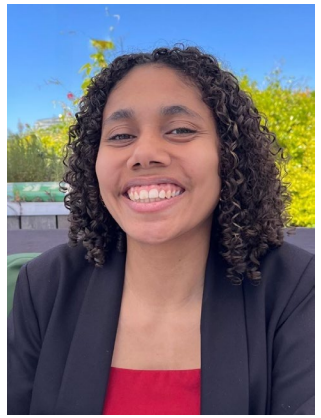
Sebastian Mikolka-Flöry



Norbert Pfeifer

INDIGO team

universität wien



Elena Parsy



Geert Verhoeven



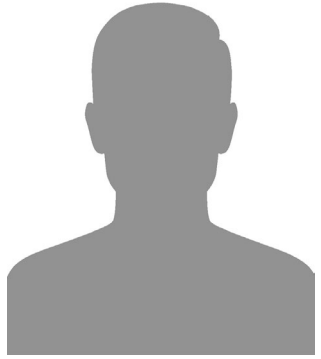
Jona Schlegel

archaeoINK

TU WIEN



Martin Wieser



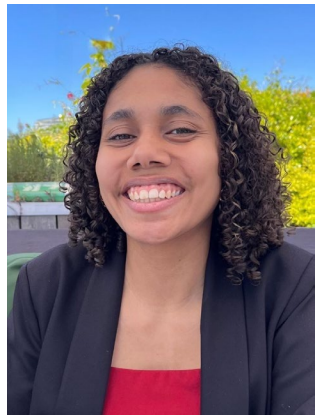
Sebastian Mikolka-Flöry



Norbert Pfeifer

INDIGO team

universität wien



Elena Parsy



Geert Verhoeven



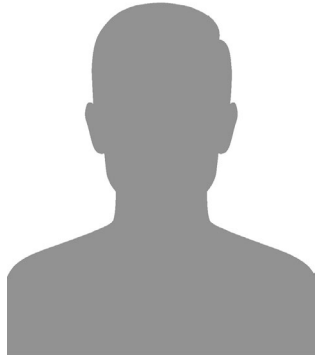
Jona Schlegel

archaeoINK

TU WIEN



Martin Wieser



Sebastian Mikolka-Flöry



Norbert Pfeifer

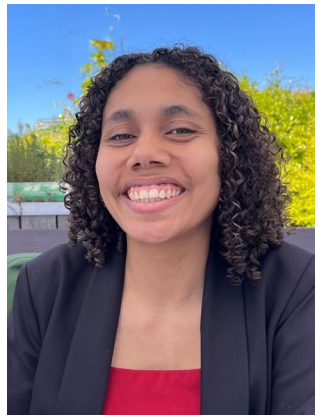


Stefan Wogrin

SPRAY CITY.AT

INDIGO team

universität wien



Elena Parsy



Geert Verhoeven



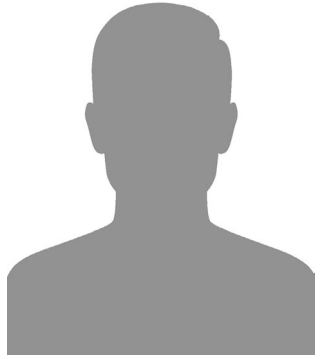
Jona Schlegel

archaeoINK

TU WIEN



Martin Wieser



Sebastian Mikolka-Flöry



Norbert Pfeifer



Stefan Wogrin

SPRAY CITY.AT

INDIGO 2.0 approach

INDIGO 2.0 approach

ACQUISITION

on-bike

change detection

automated & frequent

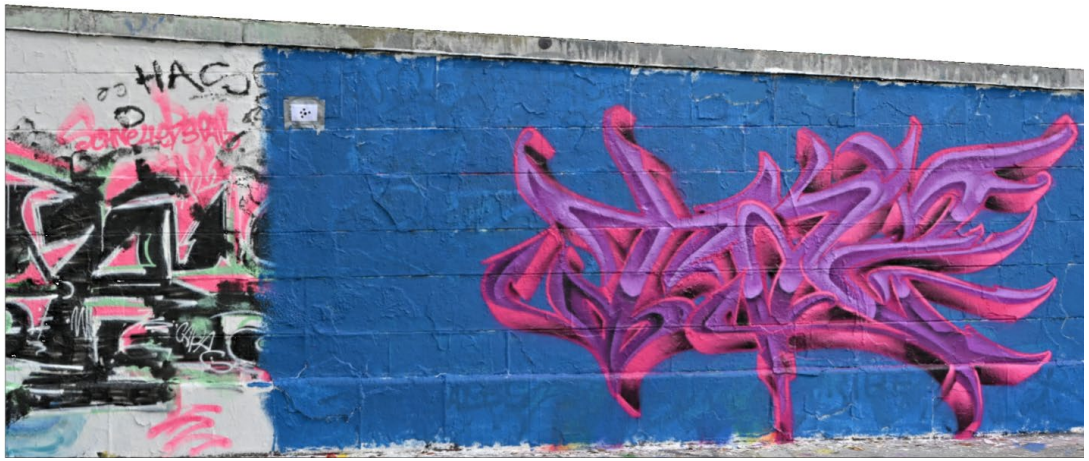


CHANGE detection

CHANGE detection

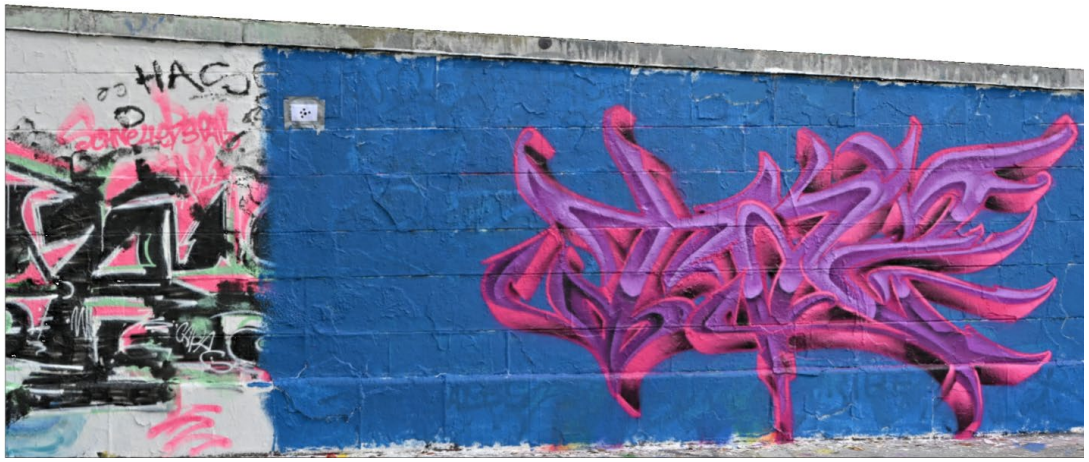


CHANGE detection





CHANGE detection







CHANGE detection

Published October 11, 2023 | Version 1.0.0

Dataset Open

INDIGO Change Detection Reference Dataset

Wild, Benjamin[1]; Verhoeven, Geert[2]; Muszyński, Rafał[3]; Pfeifer, Norbert[1]

Show affiliations

Citation Style APA

Wild, B., Verhoeven, G., Muszyński, R., & Pfeifer, N. (2023). INDIGO Change Detection Reference Dataset (1.0.0) [Data set]. TU Wien. https://doi.org/10.48436/ayj4e-v4864

Description

The INDIGO Change Detection Reference Dataset

Description

This graffiti-centred change detection dataset was developed in the context of INDIGO, a research project focusing on the documentation, analysis and dissemination of graffiti along Vienna's Donaukanal. The dataset aims to support the development and assessment of change detection algorithms.

The dataset was collected from a test site approximately 50 meters in length along Vienna's Donaukanal during 11 days between 2022/10/21 and 2022/12/01. Various cameras with different settings were used, resulting in a total of 29 data collection sessions or "epochs" (see "EpochIDs.jpg" for details). Each epoch contains 17 images generated from 29 distinct 3D models with different textures. In total, the dataset comprises 6,902 unique image pairs, along with corresponding reference change maps. Additionally, exclusion masks are provided to ignore parts of the scene that might be irrelevant, such as the background.

CHANGE detection





Reference



CHANGE detection





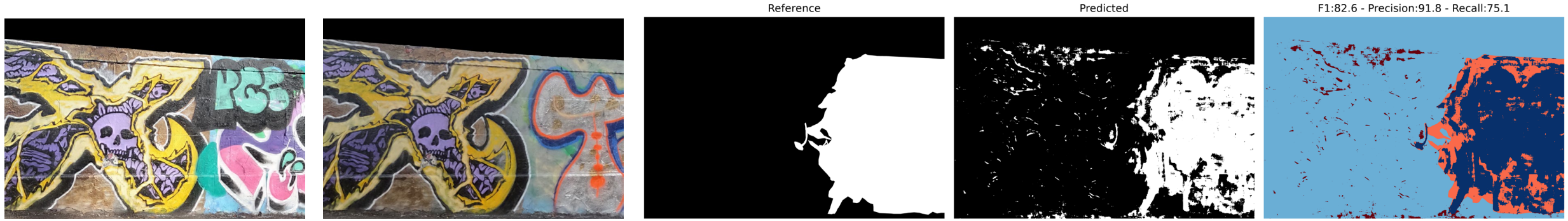
Reference



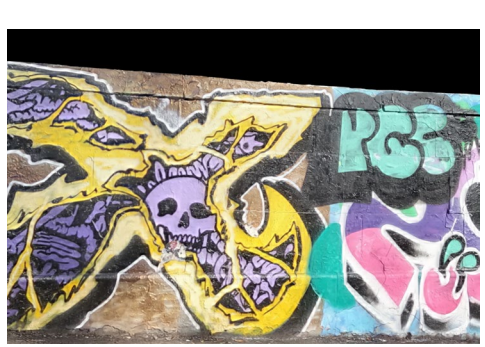
Predicted

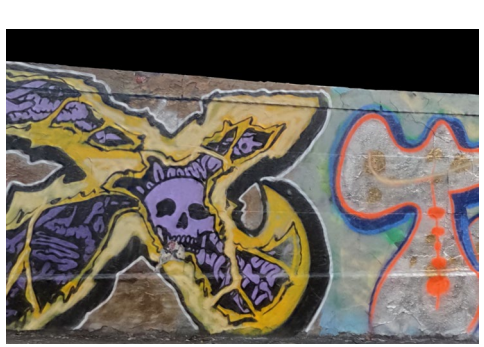


CHANGE detection

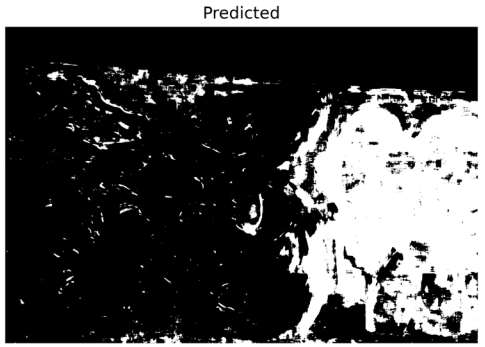


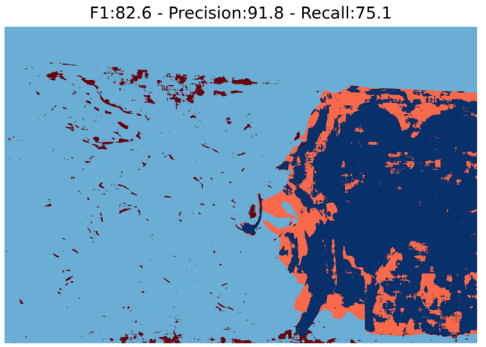
CHANGE detection

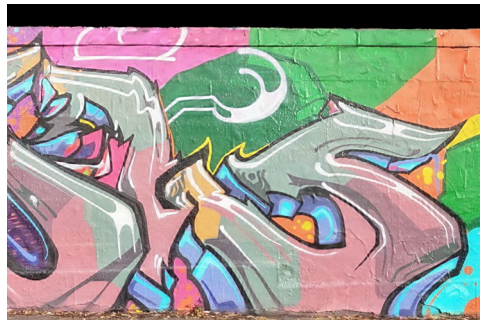
















CHANGE detection



CHANGE detection



INDIGO 2.0 approach

ACQUISITION

on-bike

change detection

automated & frequent



INDIGO 2.0 approach

ACQUISITION

on-bike

change detection

automated & frequent



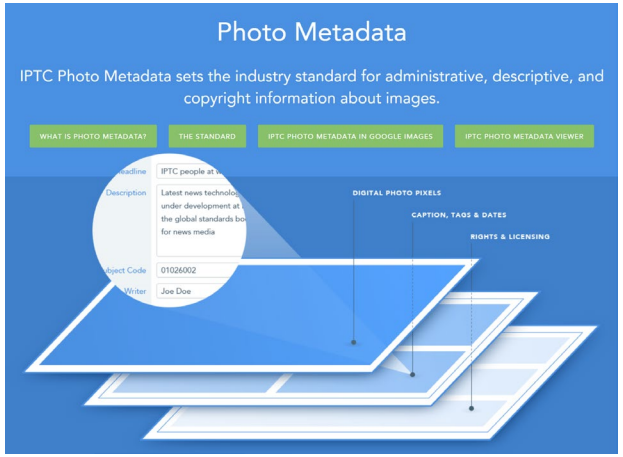
PROCESSING

auto-segmentation

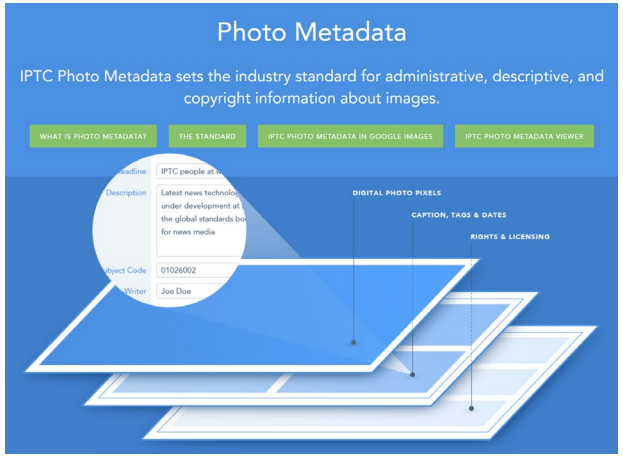
voice-to-text

rule-based

AUTO segmentation

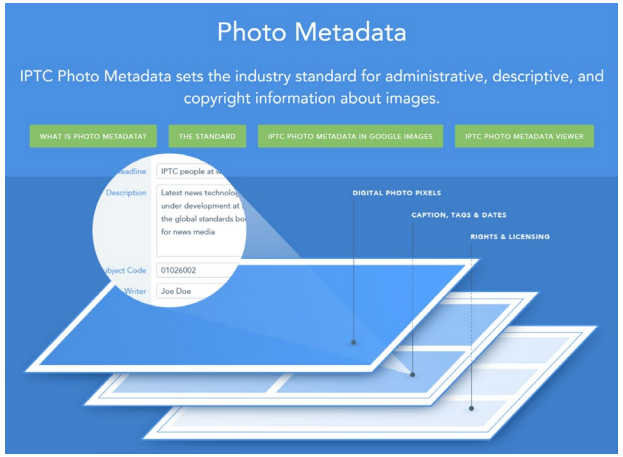


AUTO segmentation



PMS 2026.2

AUTO segmentation



PMS 2026.2

polygon with holes

multipolygon

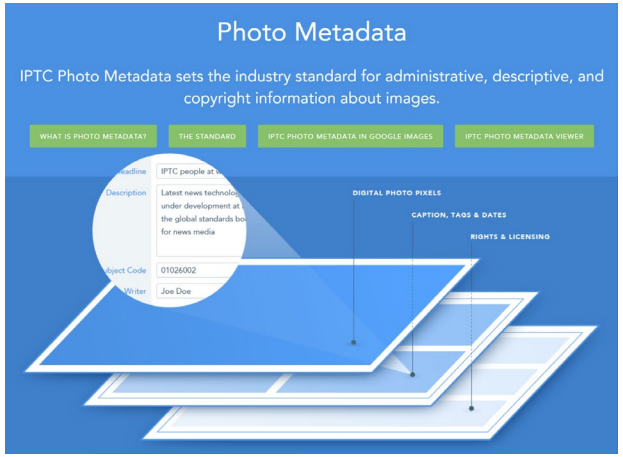
point, multipoint

linestring, multilinestring

depth order

member of

AUTO segmentation



PMS 2026.2

polygon with holes

multipolygon

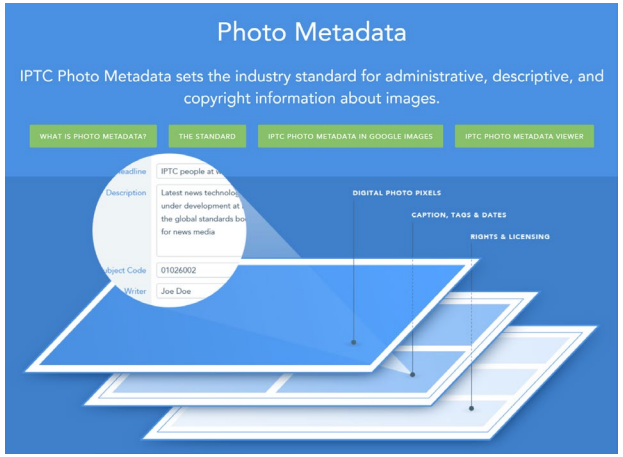
point, multipoint

linestring, multilinestring

depth order

member of

AUTO segmentation



PMS 2026.2

polygon with holes

multipolygon

point, multipoint

linestring, multilinestring

depth order

member of

GRAPHIS

COLOUR thesaurus

COLOUR thesaurus



COLOUR thesaurus



COLOUR thesaurus



orange

COLOUR thesaurus



orange

light brown

COLOUR thesaurus



orange

light brown

salmon

COLOUR thesaurus



orange

light brown

salmon

sRGB: 211–160 –131

COLOUR thesaurus



orange

light brown

salmon

sRGB: 211–160 –131

$CIELAB_{D65/2°}$: 70–15–23

COLOUR thesaurus



Database query:

Retrieve all graffiti with orange

orange

light brown

salmon

sRGB: 211–160 –131

$CIELAB_{D65/2°}$: 70–15–23

COLOUR thesaurus

1931 – 1955

unify colour terms across sciences

COLOUR thesaurus

1931 – 1955

unify colour terms across sciences

Inter-Society Color Council &
US National Bureau of Standards

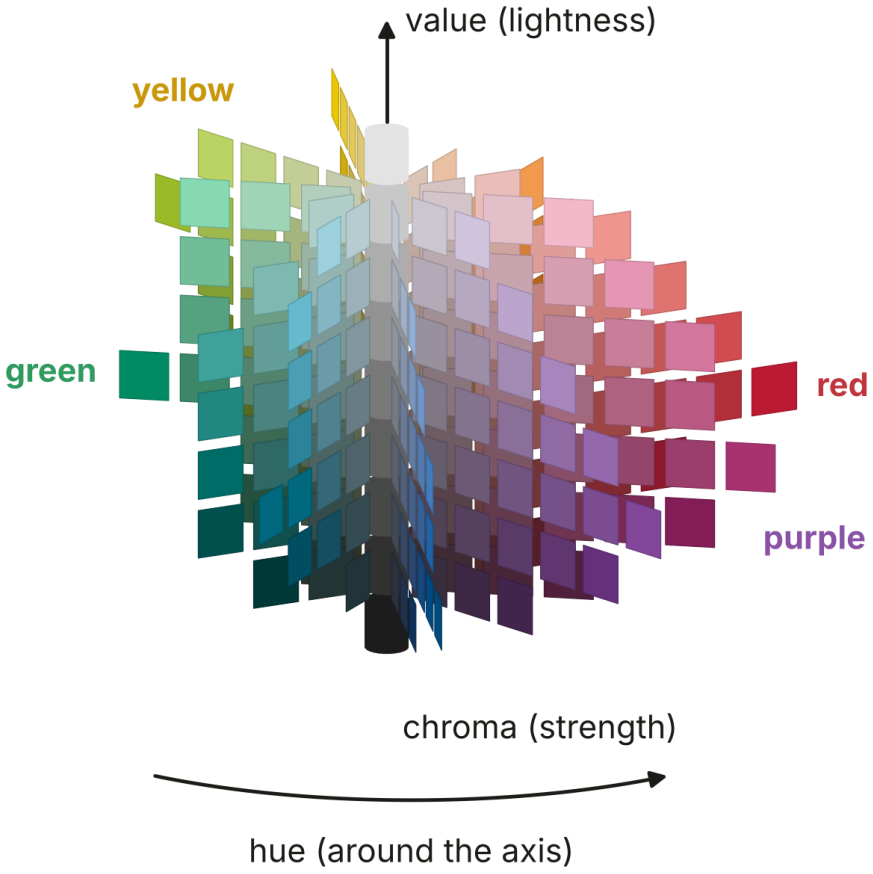
COLOUR thesaurus

1931 – 1955

unify colour terms across sciences

Inter-Society Color Council &
US National Bureau of Standards

Munsell colour space: 267 regions



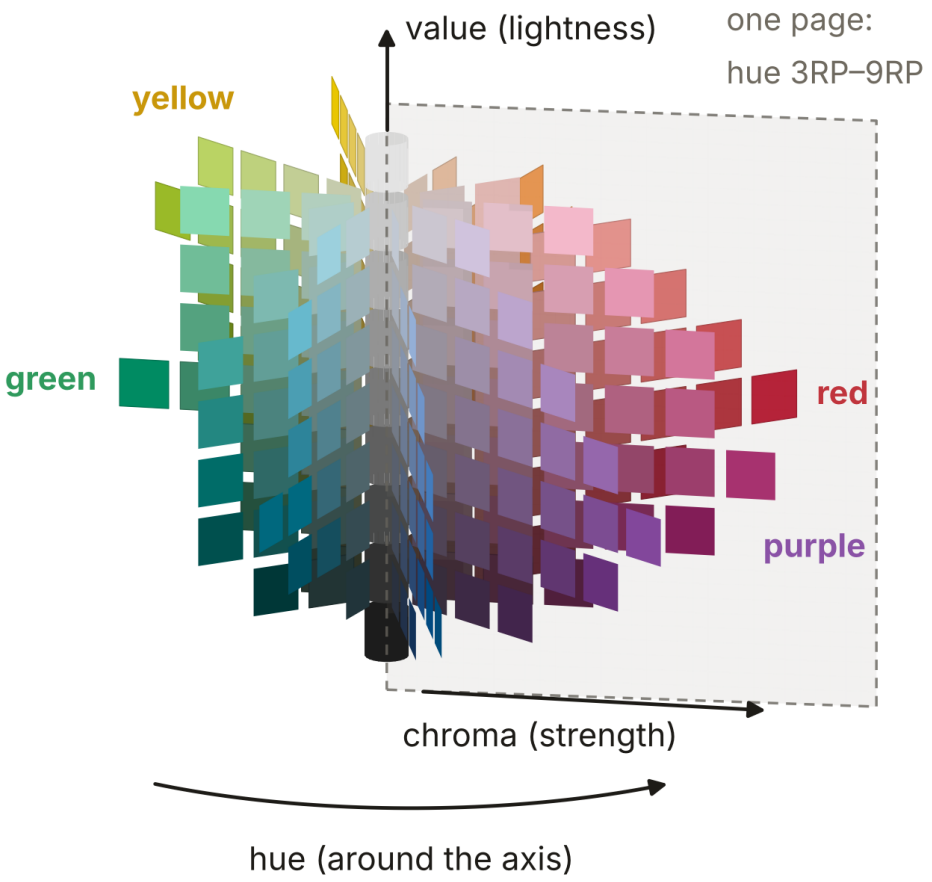
COLOUR thesaurus

1931 – 1955

unify colour terms across sciences

Inter-Society Color Council &
US National Bureau of Standards

Munsell colour space: 267 regions



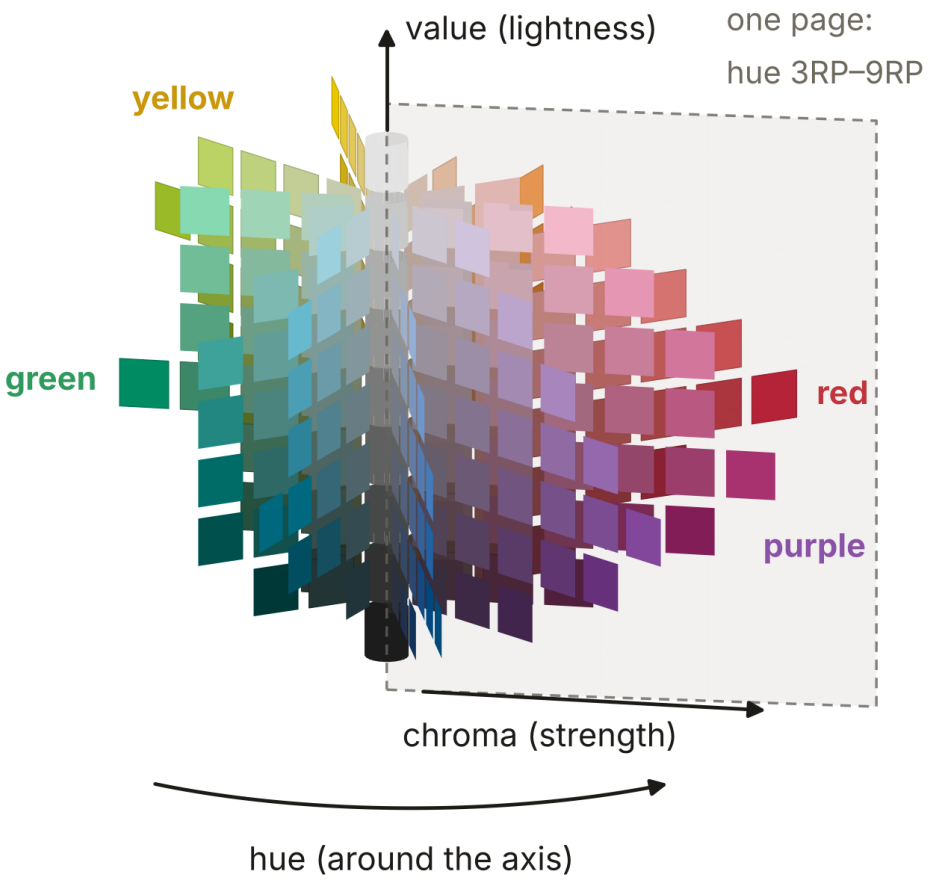
COLOUR thesaurus

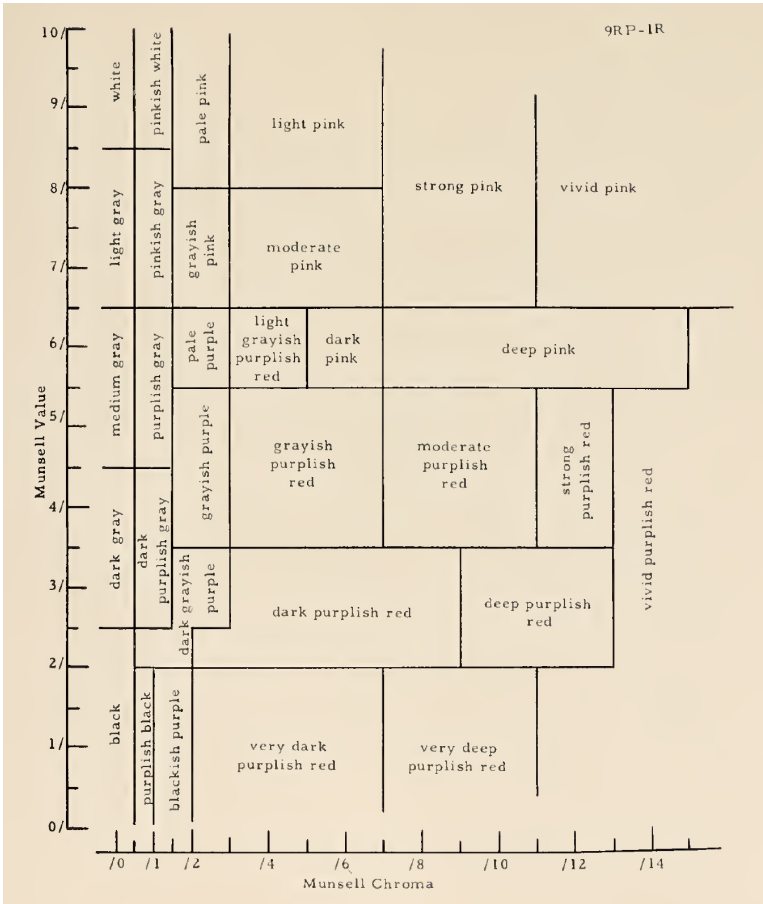
1931 – 1955

unify colour terms across sciences

Inter-Society Color Council &
US National Bureau of Standards

Munsell colour space: 267 regions





COLOUR thesaurus

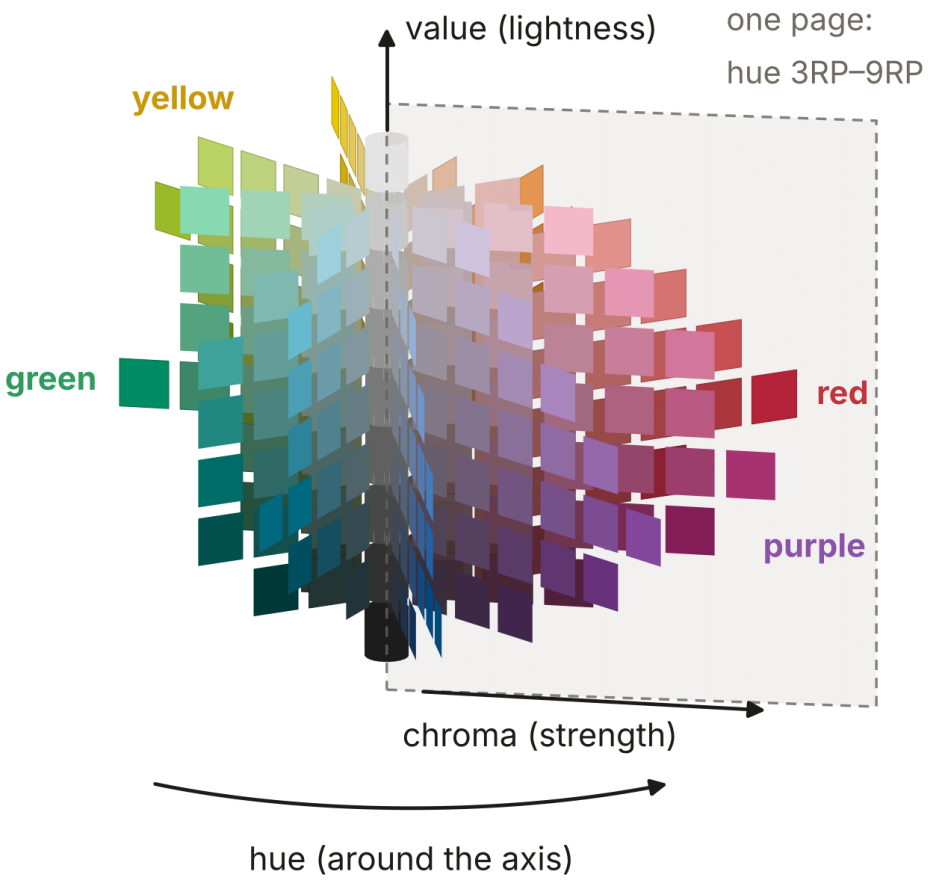
1931 – 1955

unify colour terms across sciences

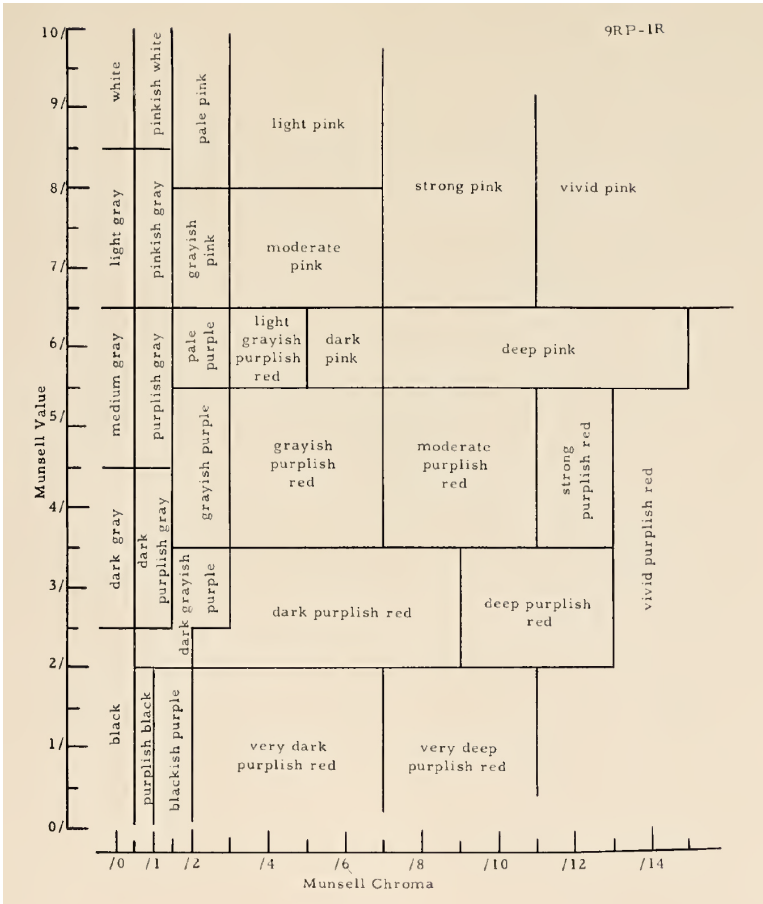
Inter-Society Color Council &
US National Bureau of Standards

Munsell colour space: 267 regions

each region → plane colour name
strong purplish red



one page:
hue 3RP–9RP



COLOUR thesaurus

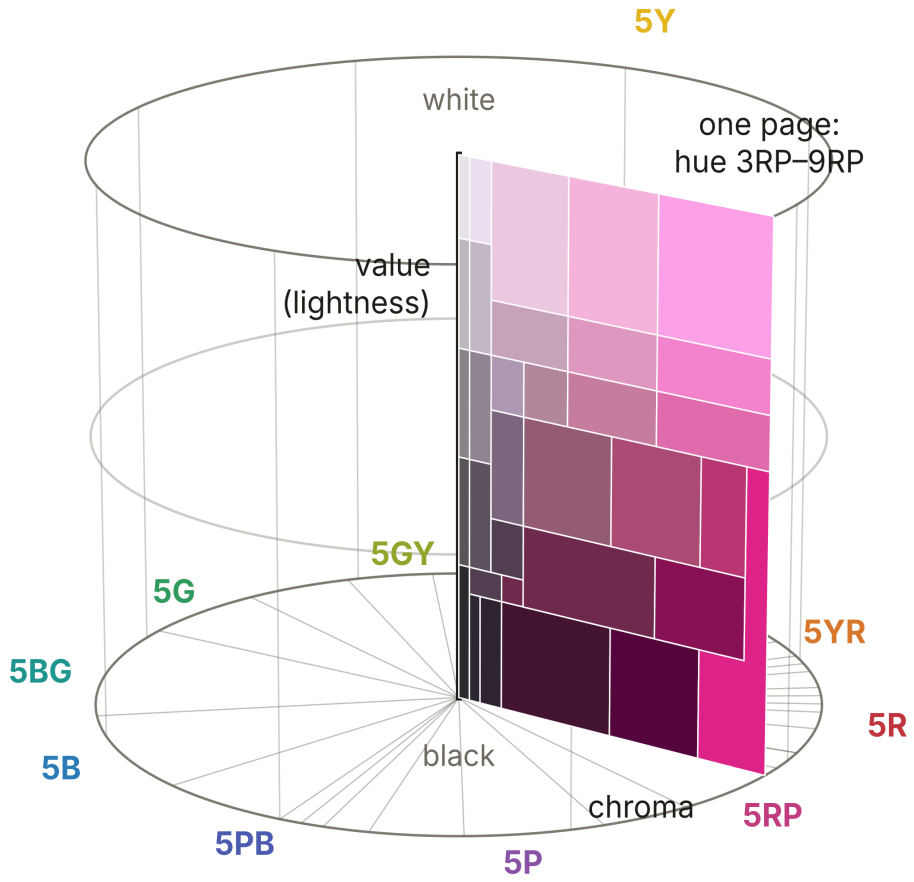
1931 – 1955

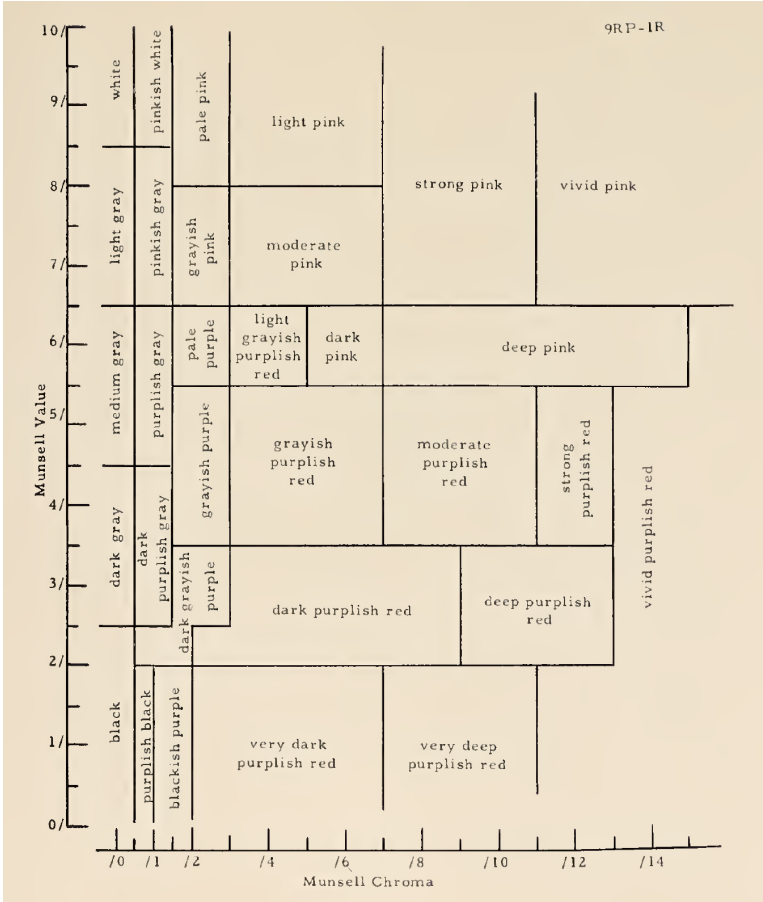
unify colour terms across sciences

Inter-Society Color Council &
US National Bureau of Standards

Munsell colour space: 267 regions

each region → plane colour name
strong purplish red





COLOUR thesaurus

1931 – 1955

unify colour terms across sciences

Inter-Society Color Council &
US National Bureau of Standards

Munsell colour space: 267 regions

each region → plane colour name

strong purplish red

ISCC–NBS
Method of Designating Colors

COLOUR thesaurus

1931 – 1955

unify colour terms across sciences

Inter-Society Color Council &
US National Bureau of Standards

Munsell colour space: 267 regions

each region → plane colour name
strong purplish red

ISCC–NBS Method of Designating Colors

1965

Kelly added 2 levels

COLOUR thesaurus

1931 – 1955

unify colour terms across sciences

Inter-Society Color Council &
US National Bureau of Standards

Munsell colour space: 267 regions

each region → plane colour name
strong purplish red

ISCC–NBS Method of Designating Colors

1965

Kelly added 2 levels

29 broad names
13 broader names

COLOUR thesaurus

1931 – 1955

unify colour terms across sciences

Inter-Society Color Council &
US National Bureau of Standards

Munsell colour space: 267 regions

each region → plane colour name
strong purplish red

ISCC–NBS Method of Designating Colors

1965

Kelly added 2 levels

29 broad names
13 broader names

→ **Heritage Colour Thesaurus**

COLOUR thesaurus

1931 – 1955

unify colour terms across sciences

Inter-Society Color Council &
US National Bureau of Standards

Munsell colour space: 267 regions

each region → plane colour name
strong purplish red

ISCC–NBS Method of Designating Colors

1965

Kelly added 2 levels

29 broad names
13 broader names

Heritage Colour Thesaurus

consistent colour names

query colour on 3 levels

any starting point

permanent IDs (in progress)

INDIGO 2.0 approach

ACQUISITION

on-bike

change detection

automated & frequent



PROCESSING

auto-segmentation

voice-to-text

rule-based

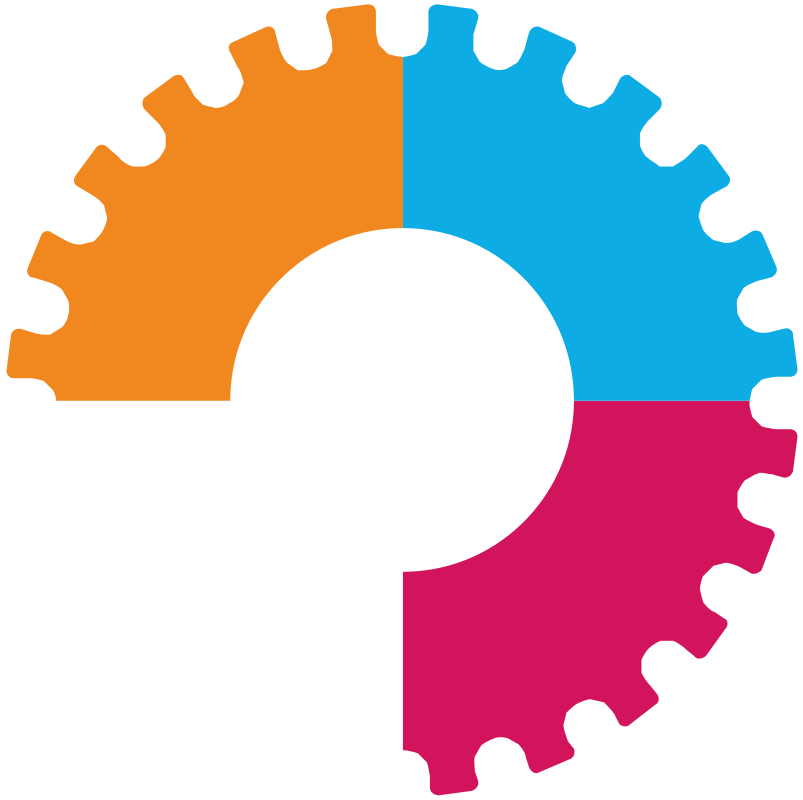
INDIGO 2.0 approach

ACQUISITION

on-bike

change detection

automated & frequent



PROCESSING

auto-segmentation

voice-to-text

rule-based

MANAGING

ontology

temporality

graph-based

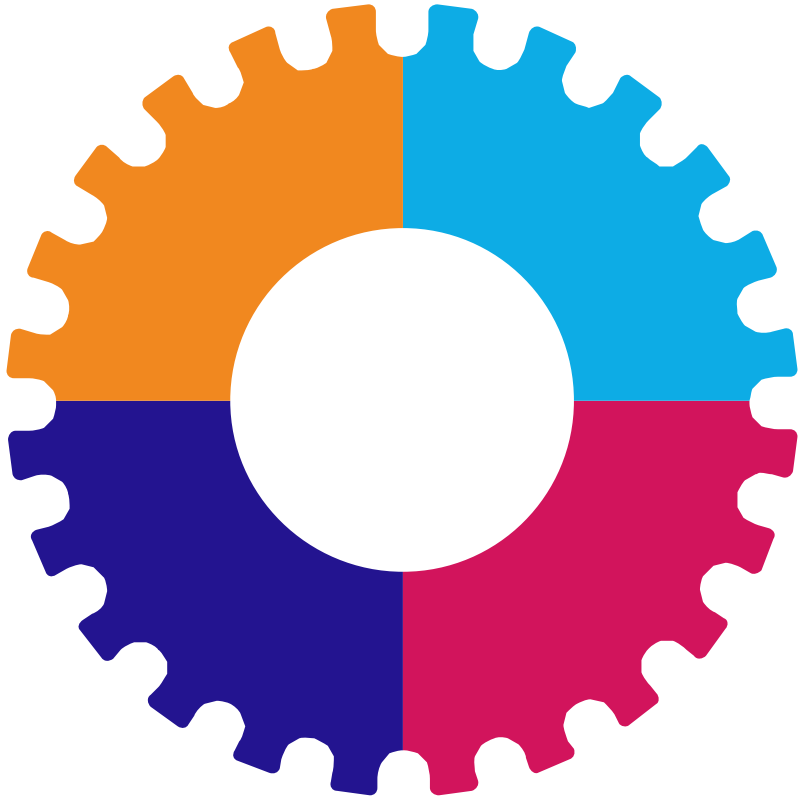
INDIGO 2.0 approach

ACQUISITION

on-bike

change detection

automated & frequent



PROCESSING

auto-segmentation

voice-to-text

rule-based

UNDERSTANDING

online survey

visual exploration

interactive querying

MANAGING

ontology

temporality

graph-based

INDIGO 2.0 benefits

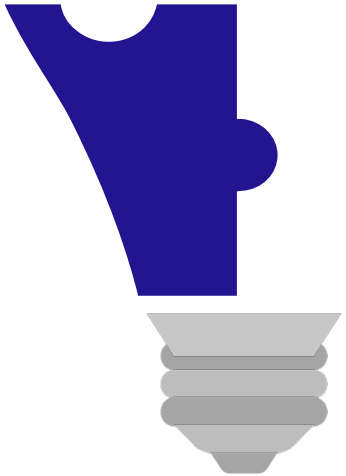
INDIGO 2.0 benefits

COLLABORATION

graffitists – scholars – public

humanities – exact sciences

graffiti projects



INDIGO 2.0 benefits

STANDARDS

acquisition

processing

managing



COLLABORATION

graffitists – scholars – public

humanities – exact sciences

graffiti projects

INDIGO 2.0 benefits

STANDARDS

objectification
- acquisition
- processing
- managing



COLLABORATION

graffitists – scholars – public

humanities – exact sciences

graffiti projects

INDIGO 2.0 benefits

STANDARDS

objectification
- acquisition
- processing
- managing



REACH

- reusable
- automated
- transferable

COLLABORATION

graffitists – scholars – public

humanities – exact sciences

graffiti projects

INDIGO 2.0 benefits

STANDARDS

monitoring

data storage

objectification

COLLABORATION

graffitists – scholars – public

humanities – exact sciences

graffiti projects



REACH

reusable

automated

transferable

SUSTAINABILITY

economic

scientific

social



because

today's
traces

shape

tomorrow's
heritage

Thank You

Geert Verhoeven | Norbert Pfeifer

projectindigo.eu

