The participative time machine

SMAPSHOT

1st online event

HEIG-VD – MEI/INSIT

University of Applied Sciences Western Switzerland

HEIG VD INSIT Institut d'ingénierie du territoire MEI Media Engineering Institute

SMAPSHOT

Welcome

Presentation of the development team
sMapshot news: new collections, collaboration, media

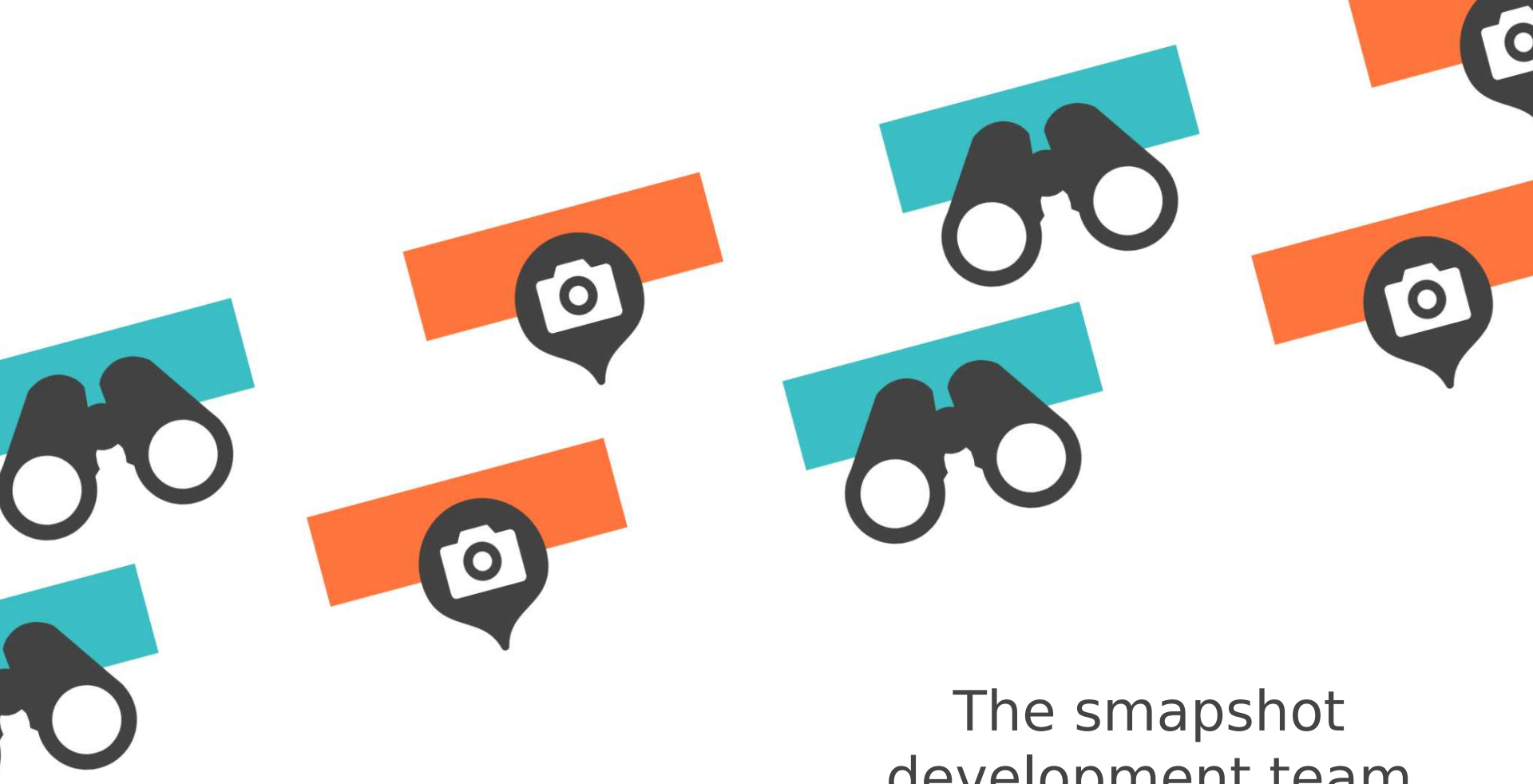
Breakout room 1 (German)

Reflections regarding the future development of sMapshot : new functionality, API development
Benefits and problems of artificial intelligence in the context of sMapshot
Discussion

Breakout room 2 (English)

Rephotography of historical images
Master thesis by Alfred Hirschfeld and Christoffer Karlsson (Lund University)
Discussion

Closing



The smapshot development team

Smapshot development

Daniel Rappo
MEI
Project management

James Taylor
MEI
Web development

Jens Ingensand
INSIT
Project management

Martine Besse
SARI-UNIZH / INSIT
smapshot integration

Nicolas Blanc
INSIT
Data science, smapshot development

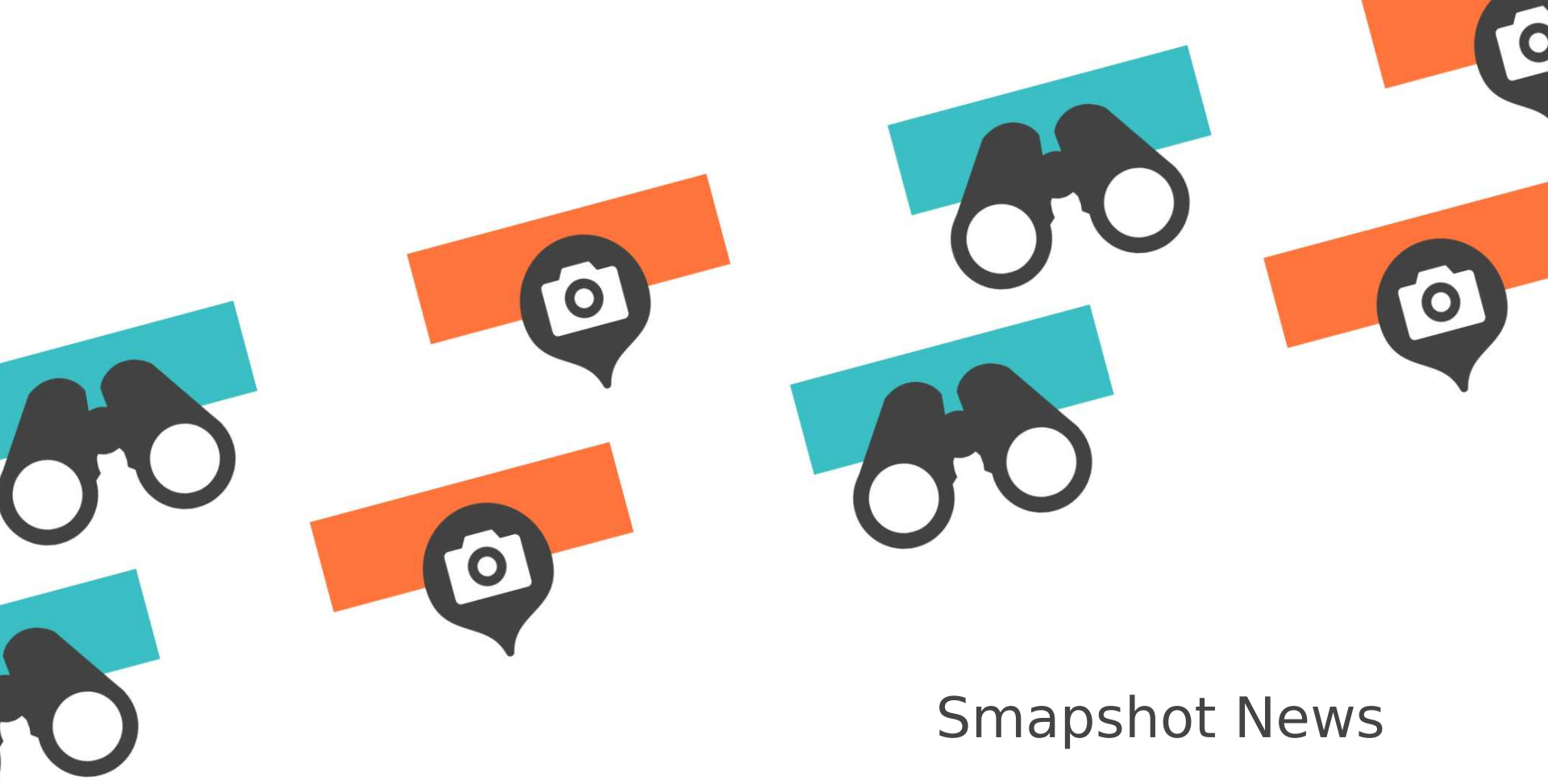
Shadia Huggenberger
MEI
Accounting

Stéphane Lecorney
MEI
Web development, project management

Timothée Produit
IG-Group
Development

Christoffer Karlsson
Lund university
MSc Student

Alfred Hirschfeld
Lund university
MSc Student



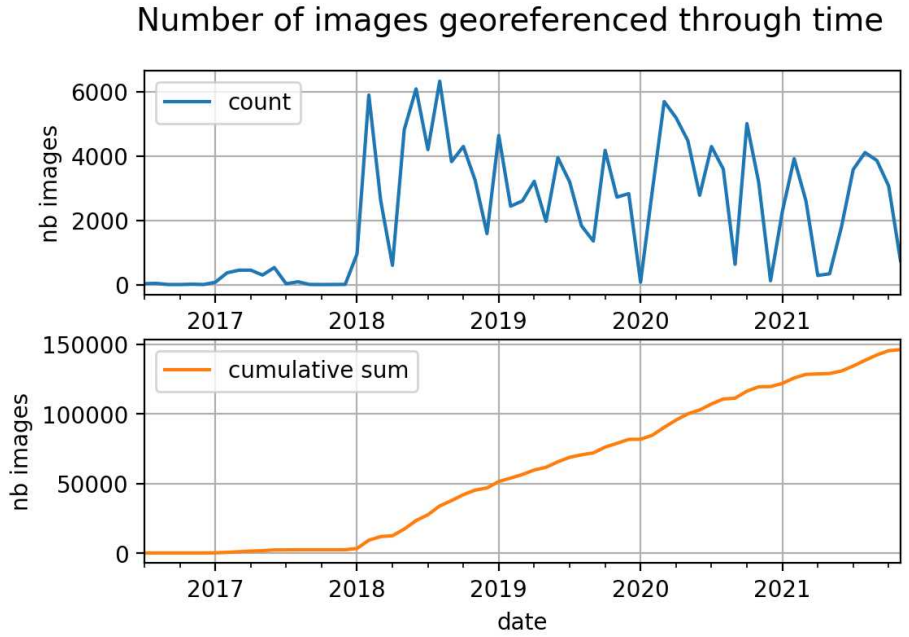
Smapshot News

Smapshot news

Since 2017

150k images geolocalised by the crowd!
Almost 200 k geolocalised images

Integration of ETH collections : 2018
Constant growth since 2018



Smapshot news

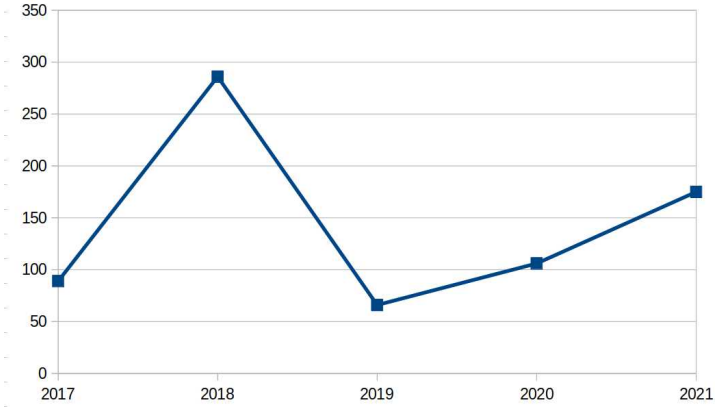
728 members since 2017

Participants

From 01 / 01 / 2017 to 11 / 08 / 2021 All collections

Rank	Name	Geolocalised images	Observations	Corrected titles or captions
1	Walter Zweifel	31168	135	655
2	Hans Zumbühl	22549	13	189
3	Sigi Heggli	18457	4	47
4	Urs Witmer	16994	210	4954
5	anton heer	11789	1	493

Number of participants per year



Smapshot news

2017 :

Integration of the EPFL – ACM collection

Library of congress

Swiss National Library

Swiss Federal Archives

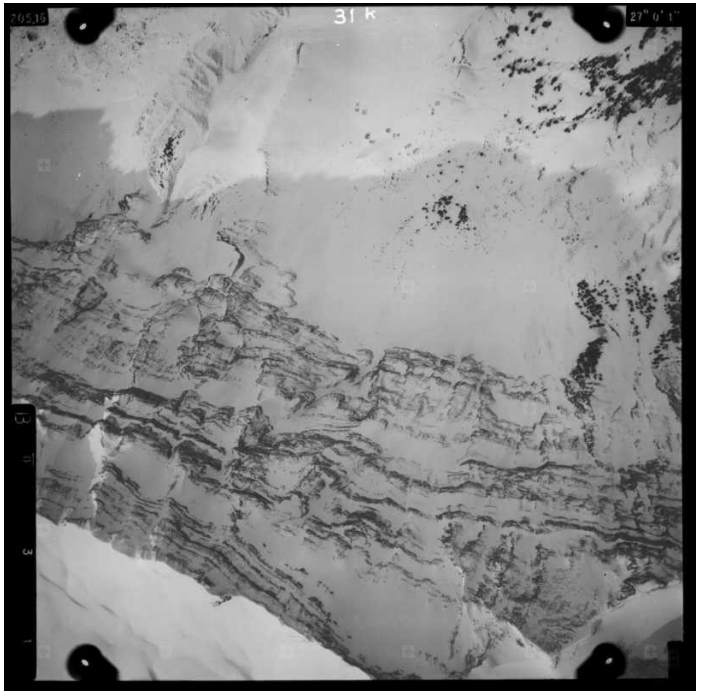
Smapshot news

Since end of 2017 : Integration of ETHZ collections

- Aerial images by Walter Mittelholzer
- Aerial images by Werner Friedli
- Swissair images
- Views of Zurich
- Glaciers
- Comet Photo
- WILD Archive
- Documenta Natura

Smapshot news

Since end of 2017 : Integration of Swisstopo collections
- Terrestrial images
- Aerial images Directorate of cadastral surveying

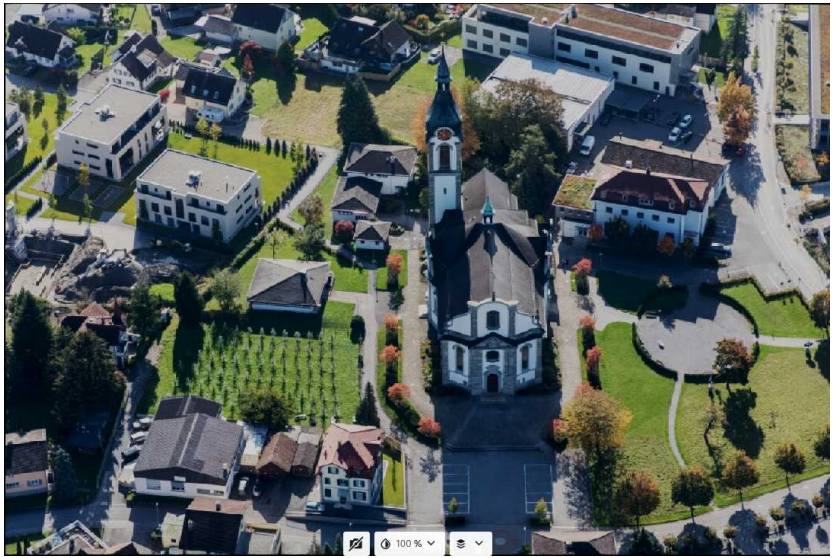


Smapshot news

2018 : State of Vaud
- Aeroport de Lausanne

Smapshot news

2019 : State of Vorarlberg, Austria



- Aerial photographs of the Helmut Klapper collection
- Inclined aerial photos of spatial planning
- Alpine Luftbild

Smapshot news

2020 : Imagine Rio, Brazil
- Imagine Rio collection

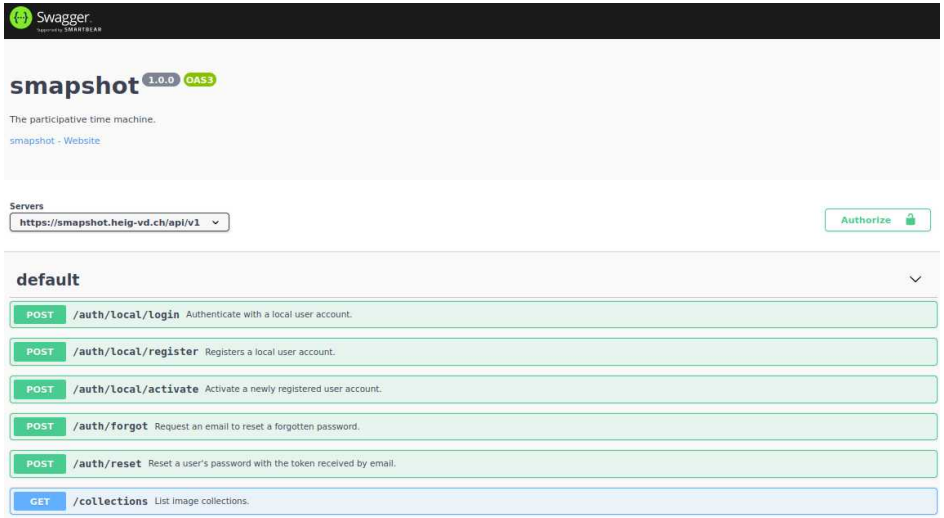
→ Integration of IIIF ressources
→ Integration of dynamic DEM selection

Smapshot news

2021 : Bilder der Schweiz, SARI, UNIZH
- Integration of paintings in smapshot

Smapshot news

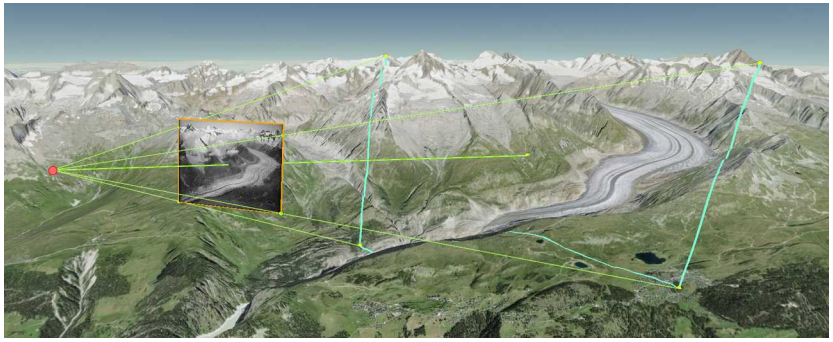
Development of an infrastructure for georeferenced photographs
- NGDI / INDG project: Swisstopo
- Development of an API for the integration of smapshot contents in other systems
- Investigation of standards for sharing
  georeferenced photos (e.g.
  OGC Geopose)
- Investigation of different use-cases:
  Photographic observatories

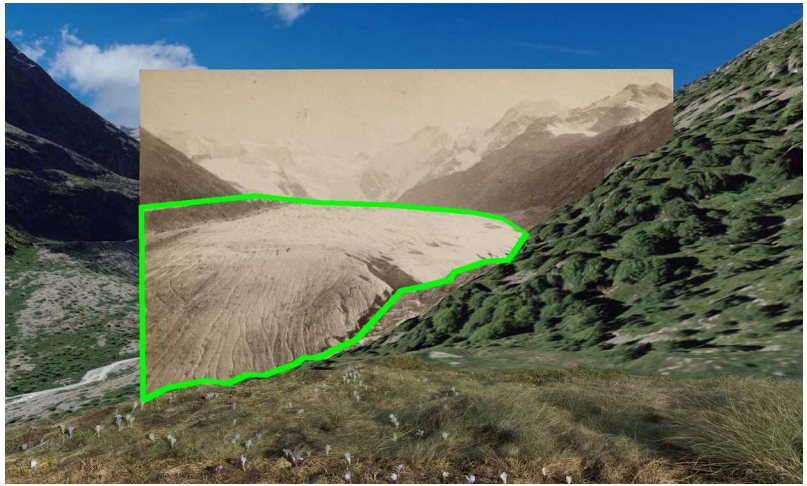


Smapshot news

Vector digizitation in 3D

- digitization of vector-data in 3D on top of historic images
- comparision of the contents with recent imagery

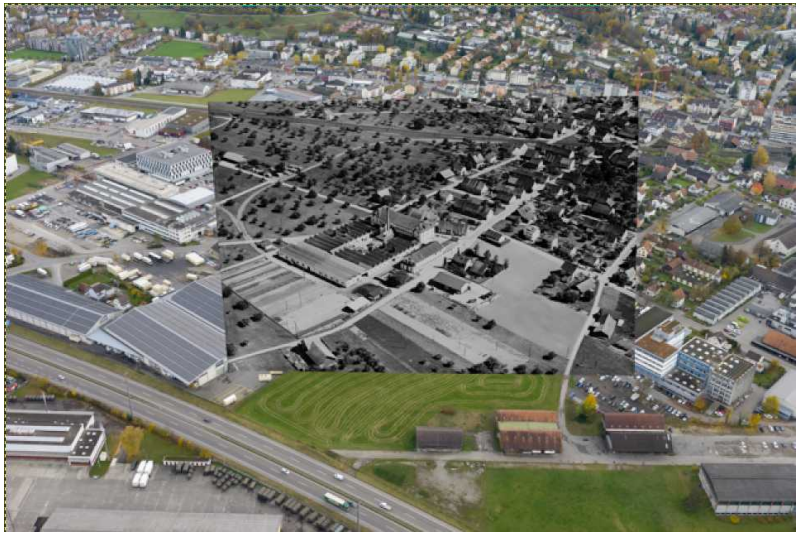




Smapshot news

Rephotography of smapshot-images

- positionnning of a drone at the exact location



Smapshot news

Dynamic calculation of toponyms: improvements

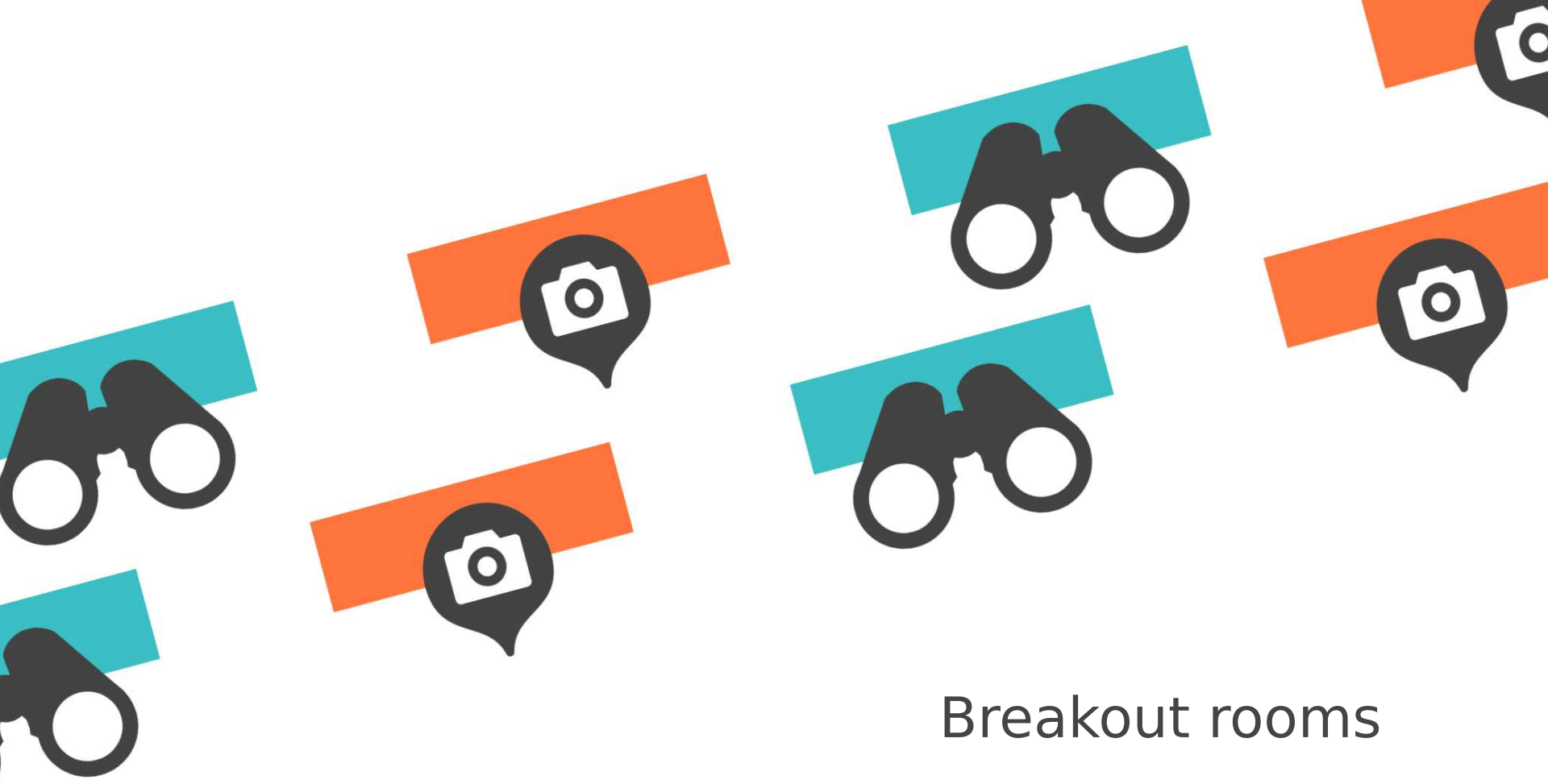
- Footprint improvements
- Taking into account parameters such as :
  - Distance to toponym (from the camera)
  - Type of the toponym (and importance)

In collaboration with the Image Archive of the ETH Library

Smapshot news

DINACon Award 2021

→ Open Data Award

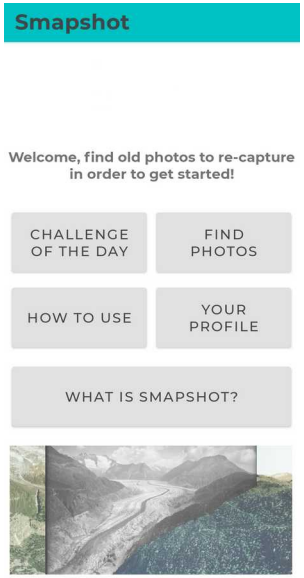


Breakout rooms

Breakout rooms – room 2

Alfred Hirschfeld, M.Sc. in Engineering, Surveying and Land Management
Christoffer Karlsson, M.Sc. in Engineering, department of Computer Science

Development of a mobile application for rephotography



Breakout rooms – room 1

Future development of smapshot

→ New functionality: ideas, planning, etc
→ Utilization of artificial intelligence

Future development

Automatic integration of images :

API development

→ Integration of IIIF collections : pushing of photos within a collection to smapshot

→ Hosting in one central location

→ Automatic exchange of data using the IIIF protocol

Future development

Utilization of 3D buildings for the georeferencing:

→ 3D Buildings: vector data → calculation of ground control points on vector data

Future development

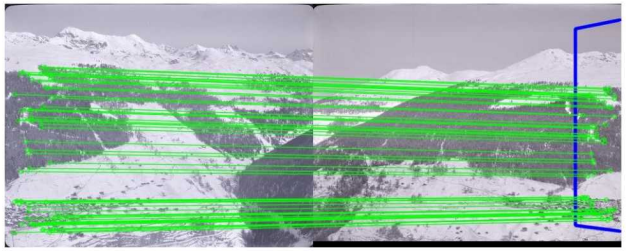
Utilization of artificial intelligence

→ For data validation; data validation is still done manually
→ AI would allow us to
    → Automatically give more feedback: e.g. accuracy of georeferencing
        to volunteers
        to validators

Future development

Utilization of artificial intelligence

→ For the georefencing



Under certain conditions it is possible to automatically georeference a picture

→ Identifiy GCP on non-georeferenced pictures

→ Apply georefencing from other pictures to new pictures

→ Data needs to be validated!

N. Blanc, T. Produit, J.Ingensand : A semi-automatic tool to georeference historical landscape images. PeerJ Preprints 6:e27204v1

Future development

Utilization of artificial intelligence

→ For the improvement of the georeferencing mechanism → help identify GCP

Idea: about 1 million existing GCP
- → categorization of GCP with reference data: e.g. type of a GCP such as churches, mountain peaks, etc
- → identification of potential GCP in pictures (using AI and image segmentation)
- → help for volunteers

Discussion

Goal: smapshot is a crowdsourcing-tool

Without the community there is no smapshot!

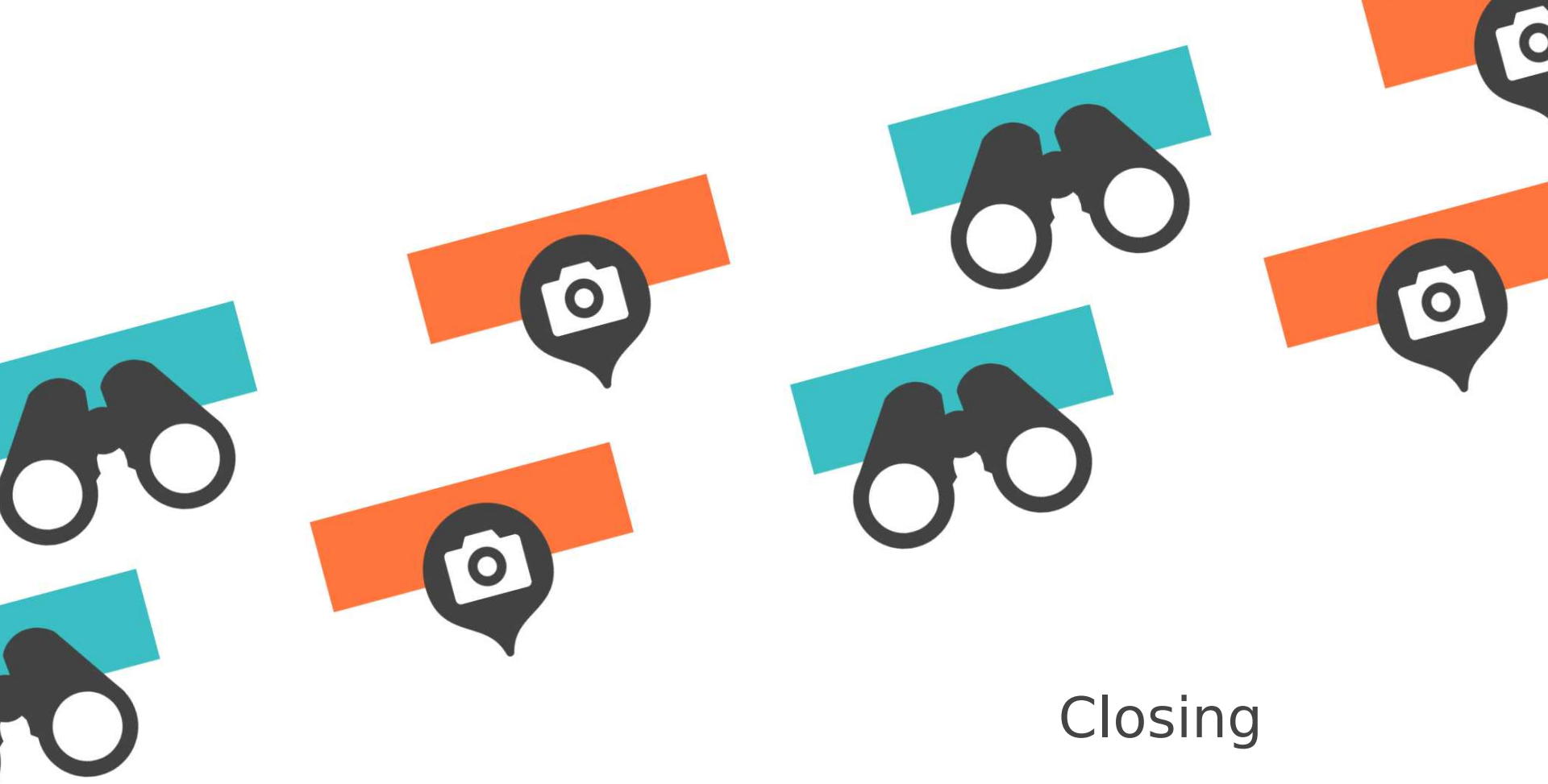
Utilization of AI

→ (Semi-) automatic georeferencing

→ (Semi-) automatic validation

→ Automatic GCP suggestion

Other ideas?



Closing

Thank you

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