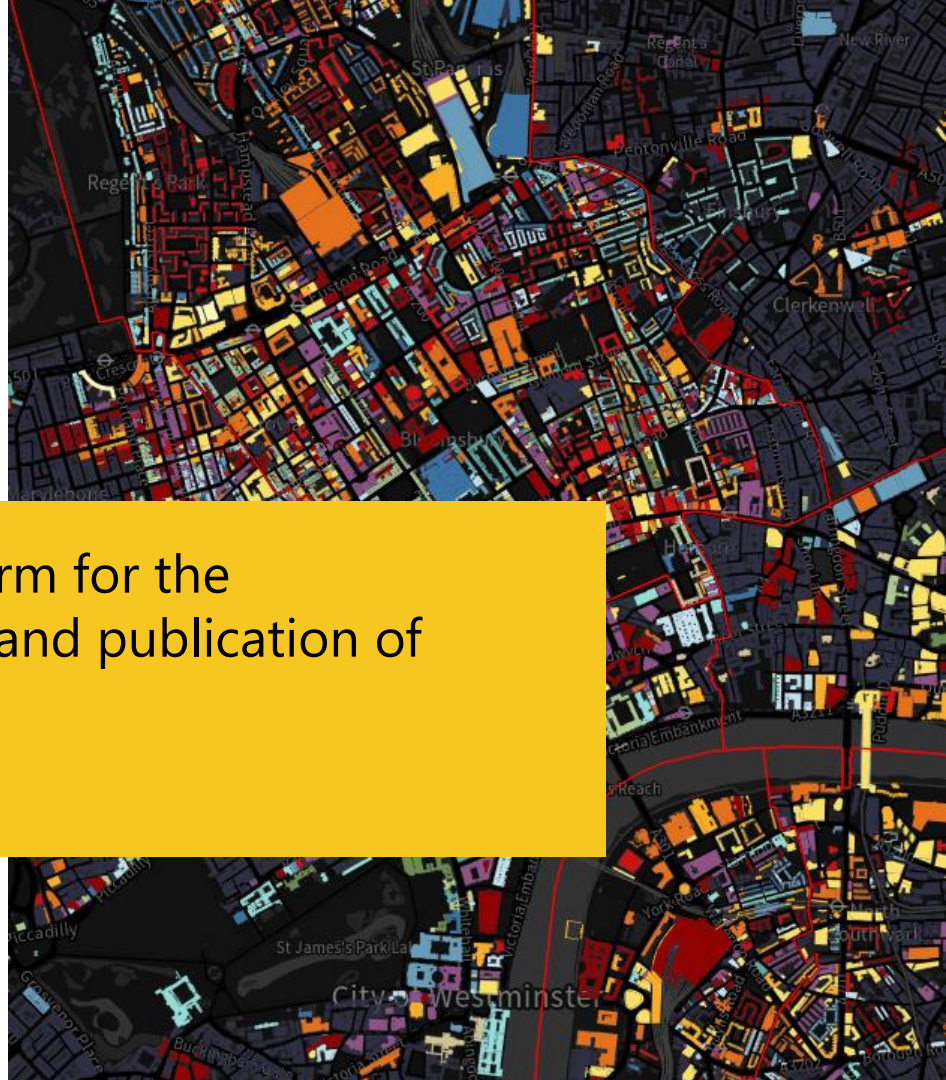Data-Driven Cities: Conference for the Urban Common Good
12–13 February 2024
Nairobi, Kenya and online

Colouring Dresden - An open platform for the collaborative collection, visualization and publication of building information
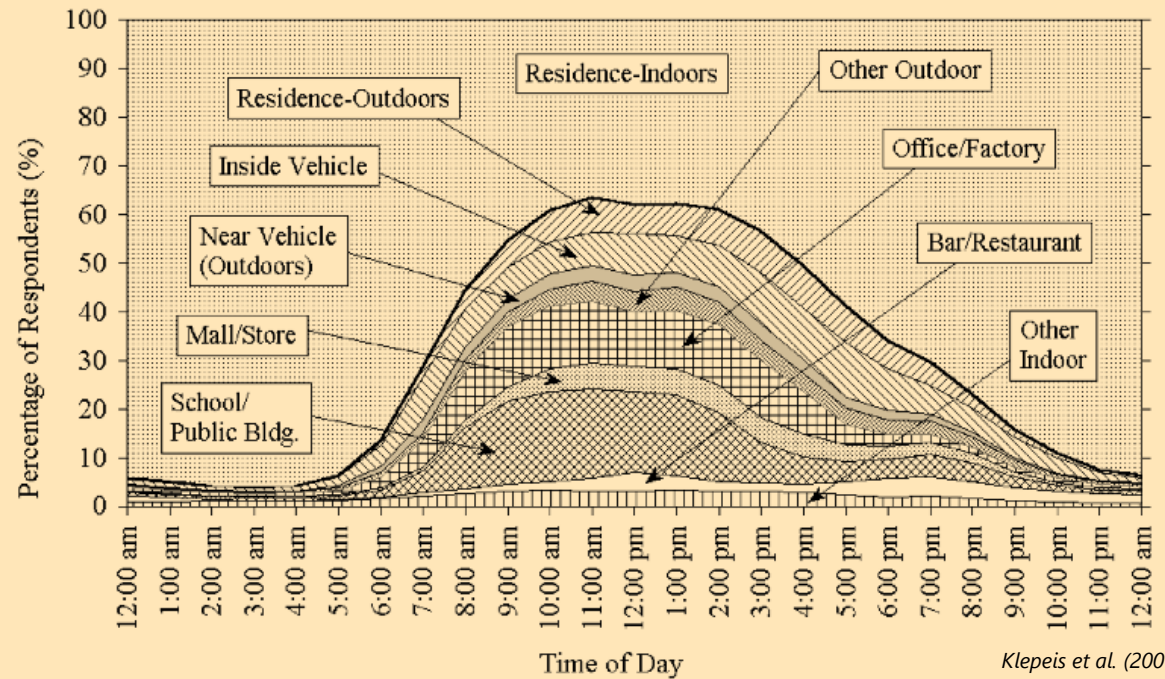
Robert Hecht

Leibniz Institute of Ecological Urban and Regional Development, Dresden, Germany

Where do we spend most of the time?

*Groundhog Day (1993)*

Klepeis et al. (2001)

Relevance of buildings

- **Building stock** is considered the largest economic and cultural capital

- Buildings and their construction consume **resources and impact the environment** (land, fossil energy/CO2 emissions)

- Buildings have great **potential for climate protection/adaptation** (energy-efficient refurbishment, conservation, re-use, adaptation to climate/heat)

- Need for a good **knowledge base for science, politics and society** for the sustainable development of the building stock
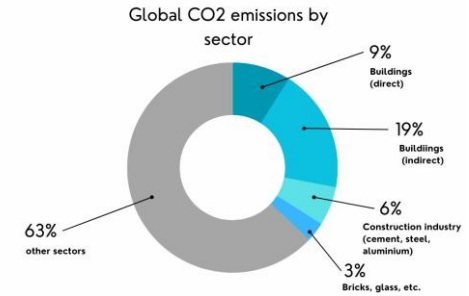
UN Status Report (2022)
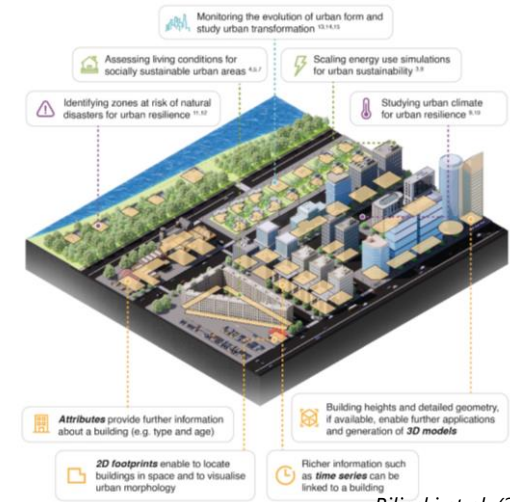
Biljecki et al. (2021)

3

Challenge

- **Large gaps in knowledge** about the building stock at micro-level
- **Semantic information is often missing**, particularly on: building type, usage, occupancy, age, refurbishment status, materials, energy consumption, ownership, etc.)
- **Geospatial Artificial Intelligence (GeoAI)** has made an important contribution to the mapping of building types and attributes characteristics through the use of advanced ML techniques and the integration of various geodata

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Colouring Cities Platform

https://colouringlondon.org/

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Colouring Cities Research Programme

Colouring Cities Open Data Platforms

International Academic Test Sites

Americas	Middle East/Africa	Europe	Asia Pacific
1. Colouring Canada	3. Colouring Lebanon	5. Colouring Britain	9. Colouring Australia
2. Colouring Colombia	4. Colouring Bahrain	6. Colouring Germany	10. Colouring Indonesia
		7. Colouring Greece	
		8. Colouring Sweden	

COLOURING CITIES RESEARCH PROGRAMME

Open code for open, reproducible platforms that collect, verify and visualise data on national building stocks

https://github.com/colouring-cities

The Alan Turing Institute

https://colouringcities.org/

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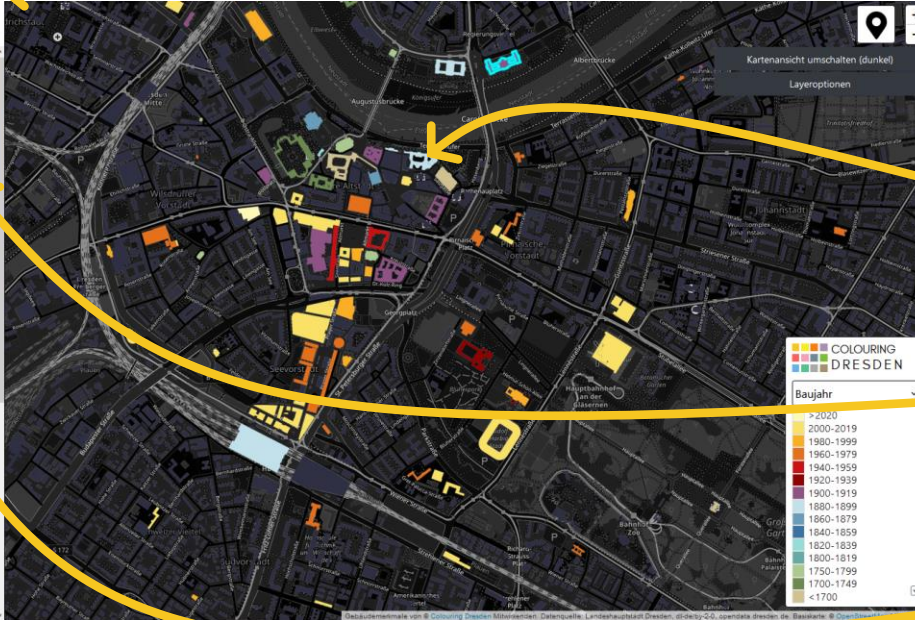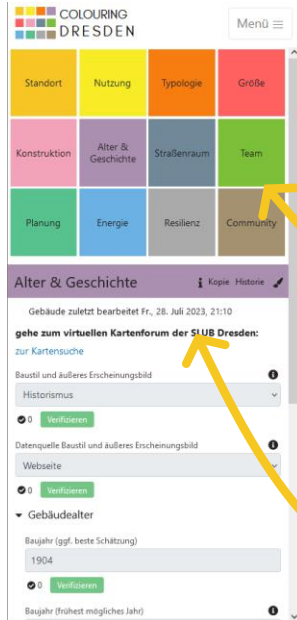
Network activities

- CCRP's Academic Steering Group with academic sessions on specific topics, e.g.
  - Interferring building attributes using ML/AI
  - 3D building data and modeling
  - Spatio-temporal modelling
  - Vectorizing historical maps
  - Citizen Science/Gamification
  - …
- Global hub meeting
- Regional hub meetings
- Technical Meetings

➔ Become part of the network and start your own Colouring Cities platform

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Colouring Dresden Use Case

https://colouring.dresden.ioer.info

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Colouring Dresden

1. Create account
2. Select building to map
3. Start mapping
4. Save progress

https://colouring.dresden.ioer.de/

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How citizen scientists can contribute?
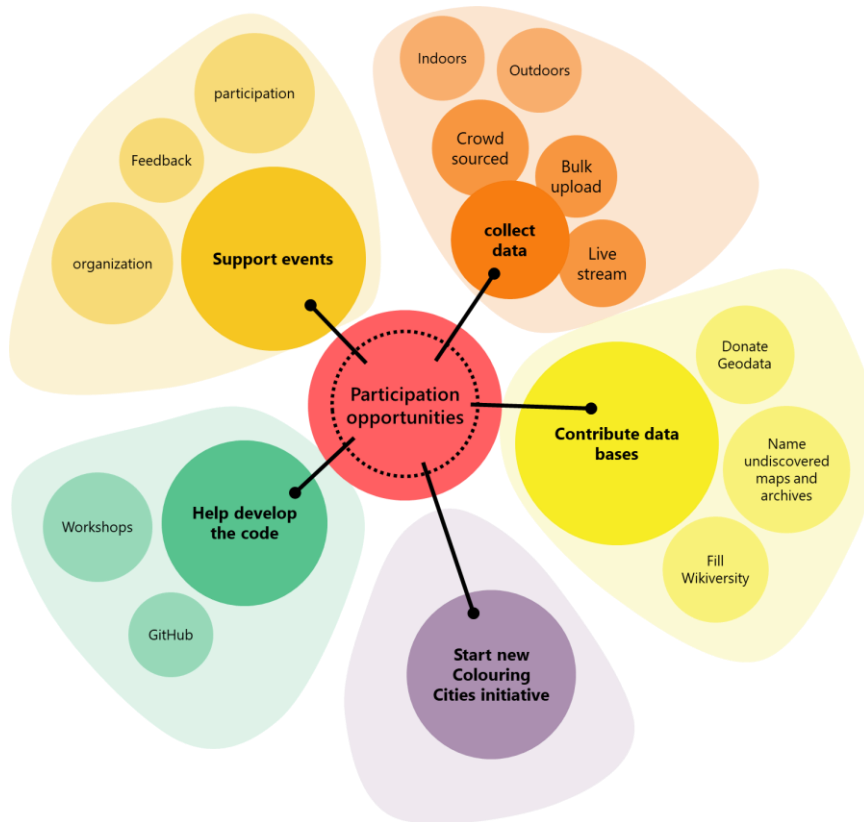
How citizen scientists can contribute?

- **Building attribution and verification** through the web-based digital platform (indoor, outdoor, bulk)
- **Co-development of the platform** (via co-creation workshops) and the possibility to contribute to the open code on GitHub
- **Supporting the collection and processing of data sources**: e.g. georeferencing, vectorizating, annotating, completing digital collections on external collaborative platforms (Wikidata, etc.)
- **Formats to activate the contributors**
  - Talks and dialogue series, Digital round tables
  - City walks, mapathons, hackathons
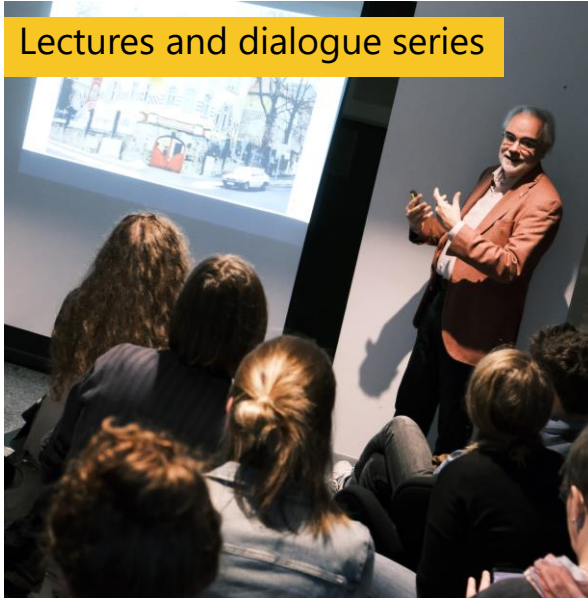
OUTDOOR
MAPPING

INDOOR
MAPPING
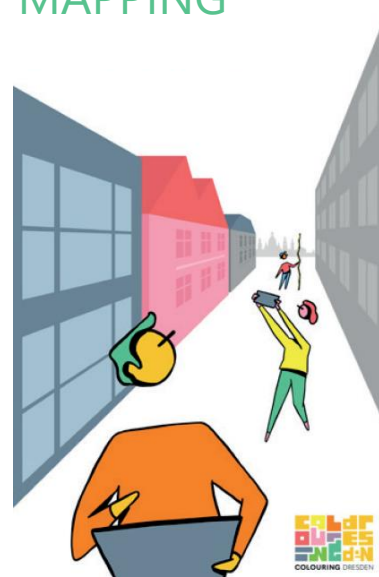
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Citizen science activities

Lectures and dialogue series

10. Mai 2023: Lecture: How can I recognise building ages and styles in Dresden? with Prof. Lippert (TU Dresden)

Workshops

Building Characteristics Workshop

Project demos and exhibitions

Exhibition opening at COSMO

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Outlook

- **Further research**
  - Data quality assessment (e.g. building age, usage, etc.)
  - Exploring predictive power of urban morphological features for inferring other specific building characteristics
  - Investigation of the influence of the size of training data

- **Further improvements of the platform**
  - Adding further data/linking to further external sources and maps
  - Improving usability for outdoor mapping, implementing more gamification elements (dashboard)

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COLOURING DRESDEN

Thank you!

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CCRP Global Hub
Polly Hudson, Falli Palaiologou

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