



Delft University of Technology

## ConCom and momove contributing to open science and education

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# momove

Modern Movement and Infrastructure

Contributions to the  
Docomomo virtual exhibition - momove

in collaboration with the  
18th Docomomo Germany Conference 2021  
Online from the Bauhaus Dessau  
26th February 2021

# ConCom

**TH OWL**  
TECHNISCHE HOCHSCHULE  
OSTWESTFALEN-LIPPE  
UNIVERSITY OF  
APPLIED SCIENCES  
AND ARTS

2020/2021

detmold school at bauhaus  
2021 virtual exhibition



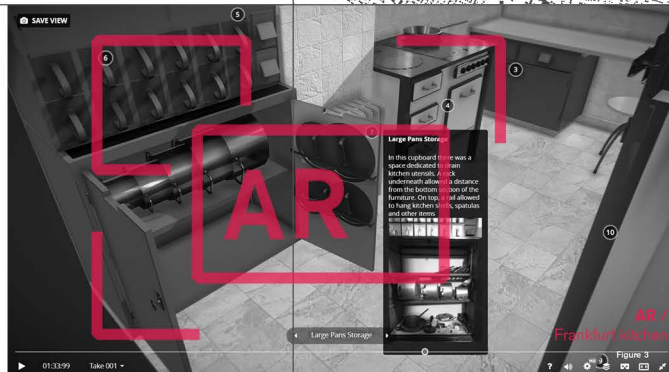
movie /  
Bielefeld urban development



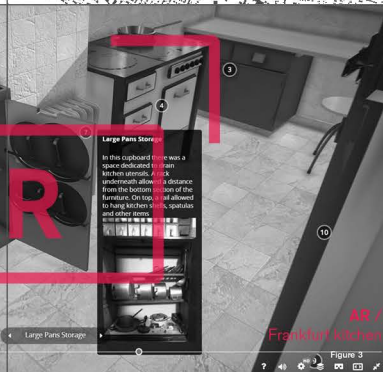
website /  
water towers in Germany



website /  
power plants in Germany



website /  
terraced houses



VR /  
Amman Hangar Exhibition



movie /  
Beirut urban development



website /  
corporate architecture



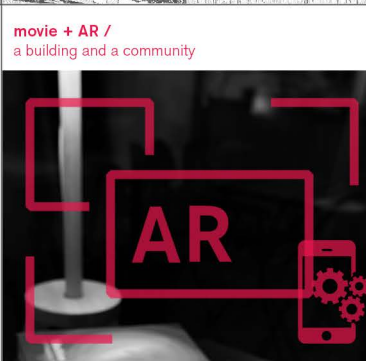
movie /  
filling stations



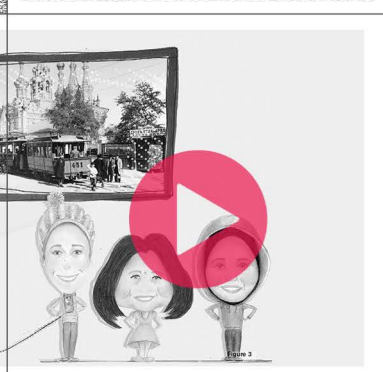
website /  
facade innovations



movie /  
Bauhaus - art and technology



movie + AR /  
a building and a community



movie /  
power stations



Technische Hochschule  
Ostwestfalen-Lippe  
Detmold School of  
Architecture and  
Interior Architecture  
MIAD/MID  
Winter Semester  
2020/2021

detmold school at bauhaus

**momove**

## CONCOM AND MOMOVE CONTRIBUTING TO OPEN SCIENCE AND EDUCATION

UTA POTTGIESSER & ANICA DRAGUTINOVIC

### Abstract

The Conference and Communication (ConCom) course at the Detmold School of Architecture and Interior Design (TH OWL) introduces students in the master's program to scientific work and pursues the goal of establishing a correlation between teaching and research. In particular, it is about conveying current knowledge and new findings in the form of the so-called non-written output (NWO) or non-traditional research output (NTRO). This diverse and low-threshold form of presentation increases the visibility of research findings and promotes their inclusive communication.

In the academic year 2020/21, the ConCom course took up the topic of the 18th Docomomo Germany Conference "Modern Movement and Infrastructure". The students were asked to interpret the previously researched topic of infrastructure (e.g. building services, water towers, power plants, electricity, cinemas, gas stations, kitchens, ...) for an exhibition accompanying the conference at the Bauhaus Dessau and to prepare it as multimedia exhibits – different from the usual poster presentations and papers. Complementing the contributions in the conference, ConCom served as a platform for students to explore Modern Movement's (MoMo) achievements around the world, but also to explore digital tools and their applicability for communicating research results. On display are websites, apps, films as well as applications of 360 degree images, augmented and virtual reality and as such they are aiming to contribute to the Docomomo Virtual Exhibition - MoMove.

Building on a literature review in the pre-semester, specific topics are selected and worked on in the context of scientific conferences. ConCom tests innovative teaching and learning formats at the intersection of scholarly research and outreach in the field of the built environment, with a particular focus on cultural heritage, digital technology, and their societal impact. This has enabled students to conduct cross-cultural and cross-sectoral research in interdisciplinary and international teams.

### Docomomo meets Open Science

As a non-profit organization Docomomo International is dedicated to the documentation and conservation of buildings, sites and neighborhoods of the Modern Movement (Docomomo International, 2021). Since its foundation in 1990 it has devoted thirty years to the study, documentation and conservation of the architectural heritage of the Modern Movement, and today enjoys widespread recognition and prestige on the part of the academic world in general and of architectural heritage in particular. The organization has created an international network of academics, professionals and supporters, currently structured in over 70 national or regional chapters located on the five continents.

Facing the rapid digital developments and globalisation Docomomo fostered its role as an international platform by offering new services through its website by making the knowledge and information available online and by creating the new Docomomo virtual exhibition (MoMove 2021). With these achievements the basis is set to further digitize the existing research and publications and extend the virtual exhibition by including the homework, case studies and new content and media and make them "openly accessible, comprehensible and reusable via the Internet" as part of Open Science (Open Science AG, 2021) and Open Scholarship (Tennant at al., 2020).

**Figure 1:**  
Collage of student works in the ConCom course and media used. - Authors.

**Figure 2:**  
Amman Virtual Exhibition. Simulation by Adel Abdel Jabar and Abdullah Abujraiban.

**Figure 3:**  
Blooms Taxonomy. According to the original diagram: Blooms Taxonomy, Vanderbilt University Center for Teaching, source: <https://cft.vanderbilt.edu/guides-sub-pages/blooms-taxonomy/> - Authors

**Figure 4:**  
Augmented Reality to partially immerse into the history of places. Illustration by Dielza Kolegici.

**Figure 5:**  
Figure ground plans of Bielefeld (1895, 1978, 2020) and Kaunitz (1891, 1970, 2020). Illustration by Louis Wanders & Marvin Düsterhus.





Figure 2

According to Open Science AG (2021) this is “intended to open up new possibilities for science, society and industry in dealing with scientific findings” by applying the following six principles of open science (OpenscienceASAP, 2021; Open Research Glossary, 2015):

- Open methodology
- Open source
- Open data
- Open access (OA) Publications
- Open peer review -
- Open educational resources (OER)

Since the early 2000s and the publication of the Budapest Open Access Initiative (BOAI, 2002) open access publishing has developed into a movement undertaken by academia, professional publishers and non-governmental institutions to promote work types (images, text, audio, video, data, databases, source code, etc.). By publishing its policy guidelines on open access UNESCO supports the goal of giving “universal access to information and knowledge, focusing particularly on two global priorities: Africa and Gender equality.” (Swan, 2012):

*What Open Access does is to maximise audience size so that articles that are worthy of citing stand the maximum chance of being seen by anyone who might have reason to cite them.*  
(Swan, 2012, 29)

As a result of these statements and along with the rapid development of digital technologies and the growth in undergraduate and graduate students over the past two decades,

the world encountered a significant increase in the number of scholars and data-intensive research outputs (European Commission, 2014). The STM Report counted “28,100 ... scholarly peer-reviewed English-language journals in late 2014 (...further 6450 non-English-language journals), ... publishing about 2.5 million articles a year.” (STM 2015, 6) in science, technology and medicine and emphasized the “increasingly data-centric nature” of research outputs (STM 2015, 157). This huge amount of data and information justified the need for new digital infrastructures and management and thus gave rise to digital repositories and the new professions of data-stewards but also to guidelines on how to use and manage the data according to the FAIR Data principles (Wilkinson et al., 2016 and 2019). And finally, the new open science policy created new target groups besides the academia and specific scientific communities, namely the general public and lay people – which opened science to society and has coined the term of Citizen Science (CS). This fact also raises the question on how to communicate research results to different target audiences, an aspect we have just experienced in the context of the ongoing COVID-19 pandemic.

Further, and with regard to the specific focus of the design disciplines and the goals of Docomomo to contribute to documentation and conservation of our recent built environment and heritage (landscapes, cities, buildings and interiors), it is a long-lasting scholarly discussion on how to deal with and assess research outputs in general and in particular beyond written data. The increasing pressure in academic systems and the dominating quantitative metrics of measuring research output has led to criticism and to the search for alternatives

(Wilsdon, J., et al., 2015). In their report the authors elaborated on the “potential uses and limitations of research metrics and indicators”, the “use of metrics across different disciplines” and on the “development of research excellence and impact.” They looked at research management and assessment internationally and in particular in the UK where the Research Excellence Framework (REF) is the national reference. This report reflects the general skepticism that is put forward in the research community towards the dominant use of indicators such as journal impact factors (JIFs) and expressed in the San Francisco Declaration on Research Assessment (DORA, 2013) and the Leiden Manifesto (Hicks et al., 2015).

Since then, Anglo-Saxon and Australian universities in particular have changed their policies and included alternative categories and qualitative indicators into their policies. The University of Dublin included the categories of “Design”, “Exhibition”, “Media”, and “Performances” into their guidelines (UCD, 2018). In their Excellence in Research Assessment (ERA) the Australian Government takes into account research outputs that are not in the “form of published books, book chapters, journal articles or conference publications” and refers to them as “non-traditional research outputs (NTROs)” which include (Australian Research Council, 2019):

- original creative works,
- live performance of creative works,
- recorded/rendered creative works,
- curated or produced substantial public exhibitions and events,
- research reports for an external body,
- portfolio,

and the University of the Sunshine Coast lists the following examples of creative works (USC, 2021):

- an artwork, a diagram or map, a photography, a sculpture or an installation,
- a building or a design project,
- a public exhibition or a live or recorded performance such as a play or a film.
- a novel, an exhibition catalogue or an entry in an exhibition catalogue.

RMIT, as one of the world’s leading universities in the field of Art, Design and Architecture has included the category of “Non-academic publications” into their library guidelines “to reach a broader audience beyond academia” and considers this as “one way to show research impact or engagement.” (RMIT, 2021). The University of Sydney has published detailed criteria and output weightings for the NTRO for their assessment (University of Sydney, 2015).

So far, most European and American institutions have not yet formalized these categories and indicators, but discussions are starting in many places (University of Guelph, 2019) and funding bodies are including the DORA-Declaration into their funding calls. This tendency is further confirmed by new documents that aim to “valuing a diversity of types of research; and recognizing all contributions to research and scholarly activity.”, known as The Hong Kong Principles (Moher et al., 2020).

#### Exploring Education for MoMove and Dissemination

Complementing the contributions in the conference, ConCom served as a platform for students to explore MoMo’s achievements around the world, but also to explore digital tools and technologies and their applicability for communicating research results. Students were asked to think about how they can communicate academic results (resulting from their literature research in the semester before) and how they can

contribute to society. Finally, the results are also expression of the university’s approach to research and education. A series of non-written output was generated showing experimental works of the master students representing the master course of Integrated Architectural Design (MIAD) and of Integrated Design (MID) with the two specifications of facade design and computational design.

In introductory sessions, students were analyzing the state of the art of digital archives, depots, exhibitions and museums in order to evaluate the positive and negative aspects and formulating pros and cons. They were also asked to identify the used technologies, software and sources and to understand the potentials and limits of each. Different approaches are described in the articles of Marzia Loddo (potentials and initiatives) and Eva-Lucia Jörg (restrictions and limits) always related to the specific needs of each institution: great for archives and depots, maybe for Museums, depending on their size and a potential for artists who can present themselves and their work online.

Tools and technologies identified by the students were: websites, apps, short movies, films, as well as applications of 360-degree images, augmented and virtual reality and online platforms to display their exhibits. The first conception included the idea to have a hybrid setting with an on-site exhibition complemented by virtual exhibits. Due to ongoing pandemic restrictions the exhibition was completely turned into a virtual exhibition, aiming to contribute to the conference experience and finally to the Docomomo Virtual Exhibition MoMove.

The student’s works are offering an advanced experience of the MoMo achievements through in-depth virtual and visual representation and interpretation. The approaches and outputs have been diverse and mostly been developed in teams and in an iterative process of individual docent’s and peer group’s feedback, completely based on online teaching in video conferences. Based on Bloom’s investigations related to group instruction compared to one-to-one tutoring (Bloom, 1984), the course applied a mixed but strict methodology based on the semester schedule with different deadlines for input and presentations. The course structure also referred to the updated Blooms taxonomy (Armstrong, 2010) represented in Fig. 3. In combination with the literature review and an extended abstract produced in the semester before, the students started with remembering and understanding. Applying and analyzing was divided into two steps, starting with the written extended abstract and the further development of the visualized exhibits. Evaluating and creating were the main process steps in the ConCom course.

The ConCom approach was allowing a great variety of subjects to be investigated and tools to be applied, also depending on the students educational and cultural backgrounds and interests. This also reflected indirectly the idea of five different schools of thoughts within the Open Science community as described by Fecher and Friesike (2014) who distinguish between:

- The “infrastructure school” (concerned with the technological architecture),
- the public school (concerned with the accessibility of knowledge creation),
- the „measurement school“ (concerned with alternative impact measurement),
- the „democratic school“ (concerned with access to knowledge) and
- the „pragmatic school“ (concerned with collaborative research).



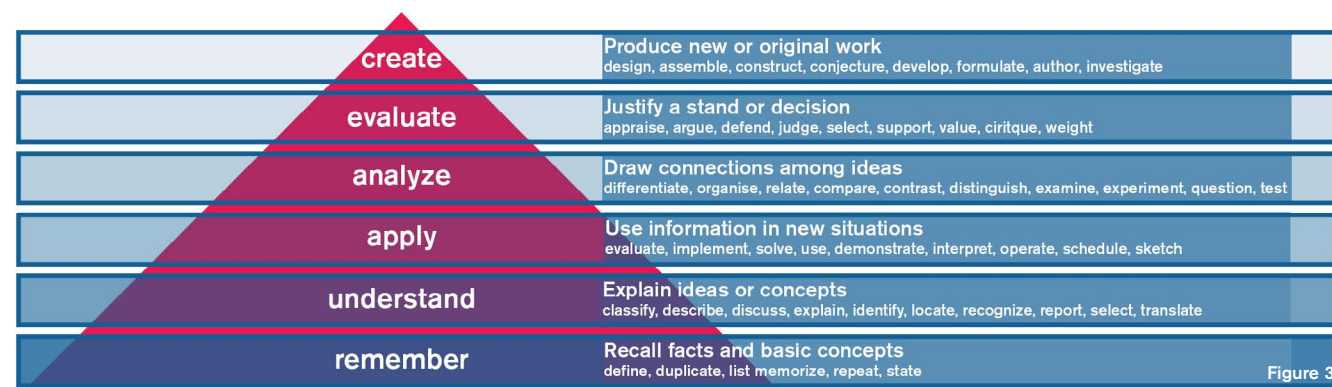


Figure 3

On display are websites, apps, short movies, films, as well as applications of 360-degree images, augmented and virtual reality. Many students aimed to raise public awareness based on their research findings: e.g. the health impact energy production (Kraftwerke), the reuse potential of power stations (Adaptive Reuse), water towers (Convertible Supply Architecture), and industrial plants and buildings (Bielefeld, Kaunitz and Amman) or the societal impact buildings (Building and Community) and sites for the collective memory (Beirut). Others were exploring the features of digital tools for visualization and exhibition: e.g. the VR Amman Hangars (Jordan), the Bauhaus App (Dessau) and the AR for the Frankfurt Kitchen (Detmold, Frankfurt) and the Building and Community (Algiers, Pristina, Kandovan). And another group was rather focusing on historical facts and developments related to certain typologies and infrastructures: e.g. history of the gas station (Germany), the facade developments and ventilation (International), the town houses from 1910-2010 (Germany) and the Corporate Architecture of AEG and Siemens (Berlin).

With regard to the target audience the students have made different choices and focus, but all of them were apt to communicate their new knowledge to a wider and non-expert audience. This can be seen as the attempt to reach any societal and practical impact on how to deal with the recent built heritage in order to achieve a healthy and sustainable development of the built environment with the support of many different stakeholders. Still the design and impact of such open dissemination (Heise, 2018) needs to be further investigated.

At the same time the ConCom course has also raised the awareness of the students for their responsibility as future designers and engineers to shape the livability of our cities, sites and buildings and it allowed for interdisciplinary, international and cross-cultural research.

## Outlook

The results highlight the importance of creative and innovative research outputs that would increase diversity and visibility of academic research and therefore have the potential of having higher impact to professional audiences, lay people and the society.

Docomomo International and its national working parties are to strengthen the international academic collaborative network that has already been established in projects where Docomomo International converges with museums, universities, foundations and, in general, any kind of public or private, international or local, institution with which it shares objectives. Education in all its' facets including teaching, lobbying and protesting, ranging from academia to architectural professionals, politicians and layman was and will continue to be one of the

pillars of Docomomo. Digitization in form of Open Access (OA), Free and Open Software and Source (FOSS) and Open Educational Resources (OER) will be of great help and is also part of the proposed educational agenda that addresses the ideas of Modern Movement on different levels for different audiences.

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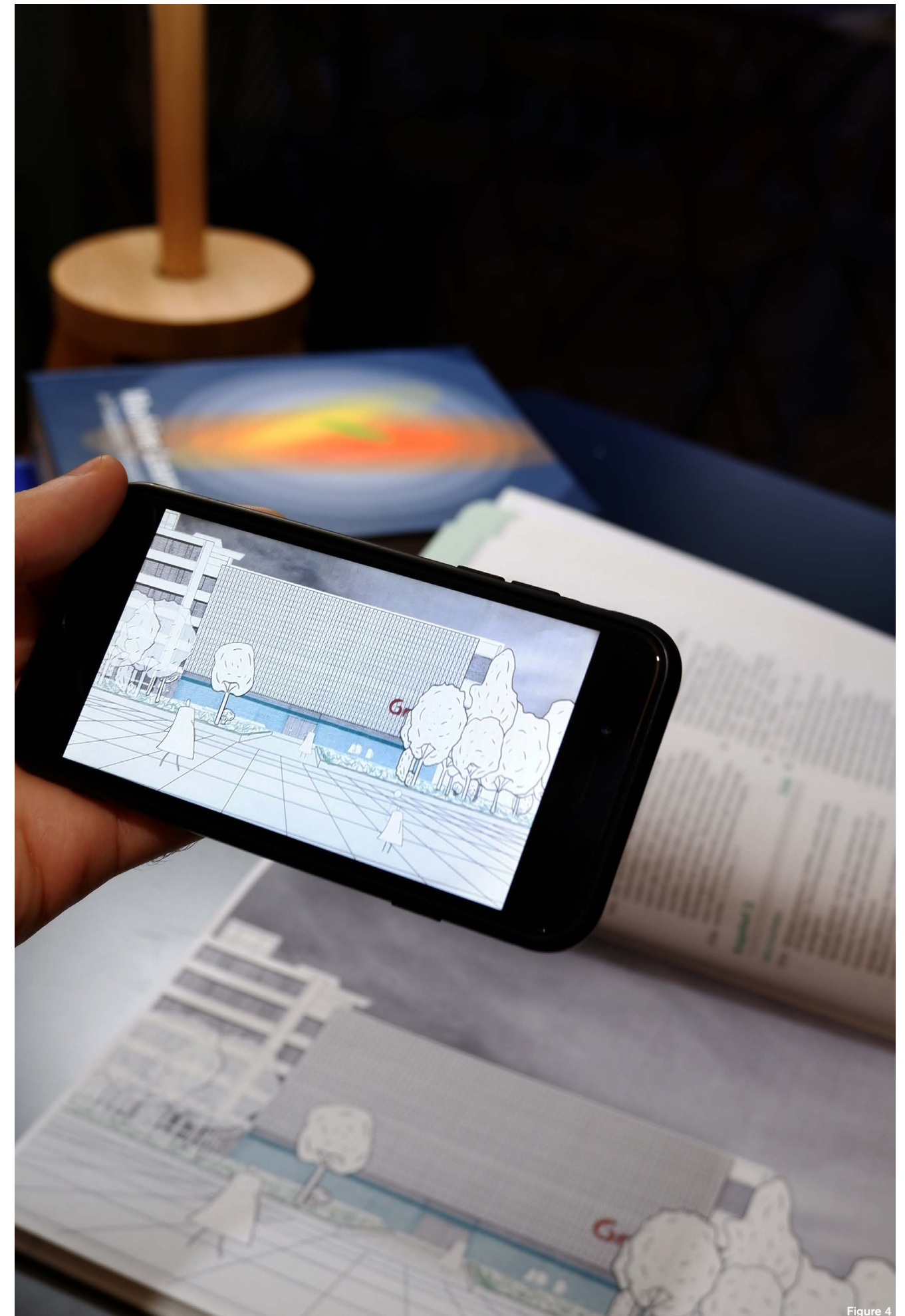


Figure 4



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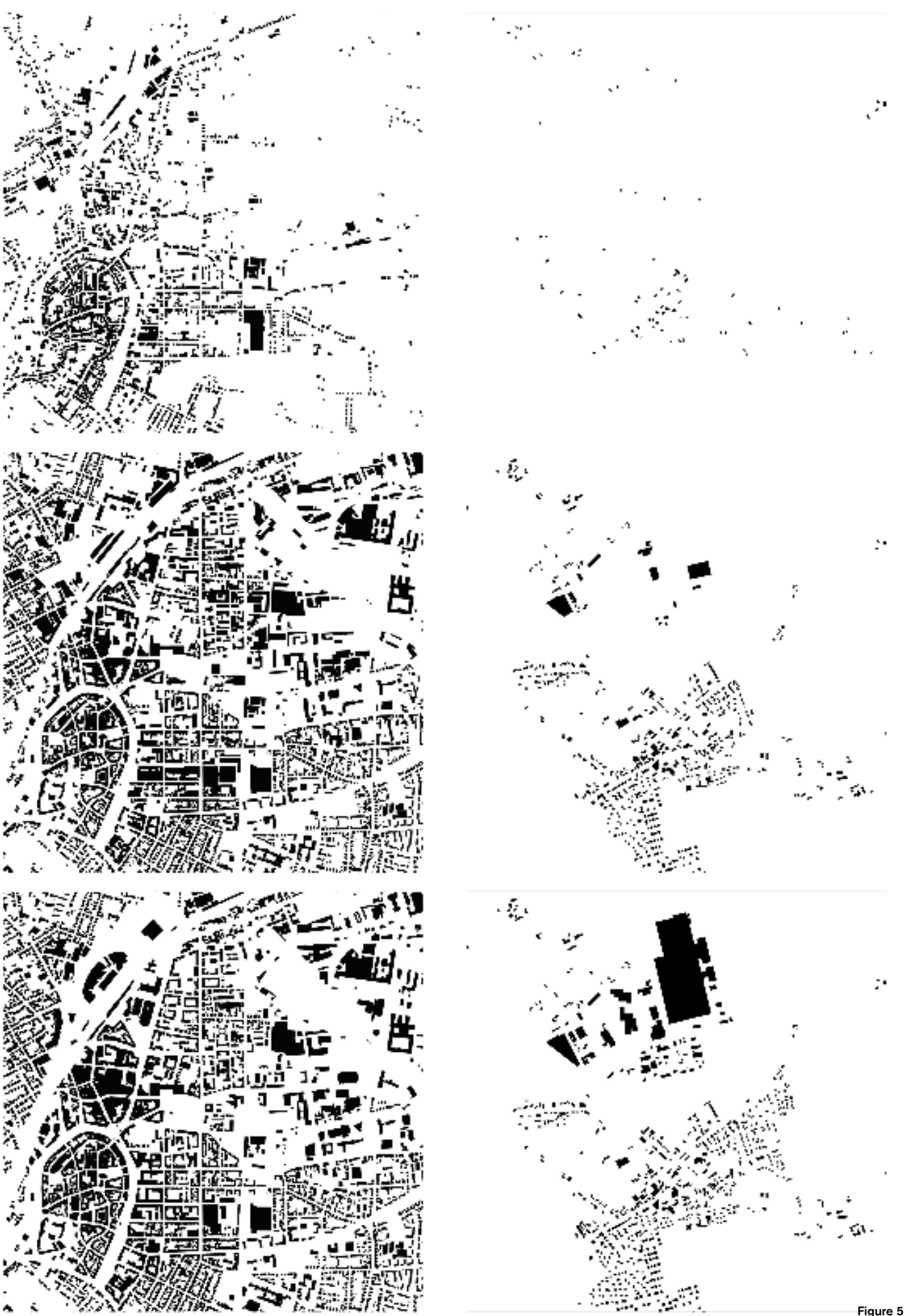


Figure 5