CA²RE+

3

FRAMEWORKS OF DESIGN-DRIVEN RESEARCH

Ignacio Borrego | Ralf Pasel | Jürgen Weidinger (Eds.)

Berlin
Universities Publishing

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Conference for Artistic and Architectural REsearch

Collective Evaluation of Design Driven Doctoral Training

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Editor’s Note

Ignacio Borrego
Ralf Pasel
Jürgen Weidinger

Technische Universität Berlin

After the six conferences for artistic and architectural research CA²RE+ has contributed substantially to the fact that Design Driven Research today is a widely established and scientifically accepted research method on most European countries and the number of involved universities is an indicator for a rapidly growing community in the field of practice-based research. We have the feeling of having arrived somewhere. Should it be rather considered as if we had just crossed an intermediate sprint?

This big effort has meant an interchange of knowledge and at the same time the construction of an international net with very valuable connections: 9 universities of 8 countries and 4 international institutions, 247 applications, 346 peer reviews, 136 accepted presentations and 169 registrations, 76 peer reviewers, from 13 countries, 23 universities, 66 texts, 273 research papers, published 54 scientific papers of 7 different disciplines, 207 hours of public conversations summarized by 10 editors in 3 books, 1.320 pages in a total of around 240.000 published words in the time frame of 3 years.

We have created a collective learning environment where we have developed a multidisciplinary approach to a design-driven methodology on scientific research along six steps: observation, sharing, comparison, reflection, reformulation and recommendation, that arrive now to an end, or at least to a preliminary evaluation after this three-year journey.

We would like to thank all universities taking part in this experience: Aarhus School of Architecture (Aarhus), Technische Universität Berlin (Berlin), Technische Universiteit Delft (Delft), Katholieke Universiteit te Leuven (Ghent), HafenCity University Hamburg (Hamburg), University of Ljubljana (LJUBLJANA), Politecnico di Milano (Milano), COFAC – Universidade Lusofona (Porto), Norwegian University of Science and Technology (Trondheim), specially the six host universities of the six events (Ghent, Trondheim, Milan, Hamburg, Ljubljana and Delft), and the following international institutions: European Association for Architectural Education (EAAE), European League for the Institutes of the Arts (ELIA) and Architectural Research European Network Association (ARENA).

In this final book we collect and share the results of the last two events (Ljubljana and Delft) and the recommendations and conclusions from all partners participating in the whole process. We have now an experience to profit from. The race must go on.

By Design, or Within Culture? A Reflection upon (Artistic and Architectural) Design-Driven Research

Johan De Walsche
University of Antwerp; EAAE, ARENA

When EAAE decided to write a Charter on Architectural Research – it was in 2009 – the main goal was to hold a plea for the particular scope, modes and methods that the disciplinary field of architecture could offer with regard to urgent societal, social and environmental issues. And, since architectural design was considered as the core practice and essential feature of the discipline, it was paramount to point to the option to consider design practice not solely as a trajectory towards the conception of a building, but also as an epistemic, inquisitive practice in its own, a practice aiming at the emergence of "new insights, knowledge, practices or products."[1] The provision of a clear definition of Research by Design – "any kind of inquiry in which design is the substantial constituent of the research process" – was in this regard one of the most crucial and strategic paragraphs of this Charter.[2]

The emphasis in this charter on the concept of Research by Design is to be understood as an attempt to give short shrift to the ongoing ontological dissent whether design could ever be research or not. The course and nature of the discourses can be nicely illustrated by comparing three publications. In "Research Design and Designing Research" (1999), Ranulph Glanville systematically unravels both design and research into their essential constituents, and turns the question whether design can ever be research into the statement that research always is design in itself.[3] In 2009, An Heylighen e.a. rely upon

1 EAAE Charter on Architectural Research. European Association for Architectural Education, 2012, accessed 20 August 2014, www.eaae.be/about/statutes-and-policy/eaae-charter-architectural-research/
2 ibid.
3 Glanville, Ranulph (1999), "Researching Design and Designing Research." [In English], *Design Issues* 15, no. 2, 80–91.

the concept of intentionality to explain why design can never be research.[4] In 2013 Murray Fraser publishes the book "Design Research in Architecture, an Overview", commenting and explaining the features and merits of actual research conduct "by design" in scholarly contexts, and at several academic institutions.[5]

Indeed, parallel to the writing of the EAAE Charter, the debate went on, and the epithet "by design" was not only considered crucial but also popular. Conferences such as *Communicating (by) Design* (Brussels, 2009),[6] *Theory by Design* (Antwerp, 2012),[7] and *Knowing (by) Designing* (Ghent/Brussels, 2013) further consolidated the discourse.[8] Meanwhile, a four million Euro prestigious European Marie Curie funding was granted to a joined four year programme involving a consortium of seven universities and architecture schools, the so-called the ADAPT-r project.[9]

At this point, it could be stated that design research – or, more emphatically called "research by design" – had come of age. When in 2013 the architectural research network ARENA was founded, it immediately launched the DR_SoM project, the acronym of *Design Research, Series*

4 Heylighen, Ann, Humberto Cavallin, and Matteo Bianchin (Winter 2009), "Design in Mind." Article. Design Issues 25, no. 1, 94–105.
5 Fraser, Murray (2013), "Design Research in Architecture, An Overview", Ashgate Publishing Limited.
6 Verbeke, Johan, and Adam Jakimowicz (eds.) (2009), "Communicating (by) Design.", Chalmers University of Technology and Hogeschool voor Wetenschap & Kunst - School of Architecture Sint-Lucas.
7 De Vos, Els, De Walsche, Johan, Michels, Marjan and Verbruggen, Sven (2012), "Theory by Design. Architectural Research Made Explicit in the Design Teaching Studio", Antwerp, Faculty of Design Sciences, Artesis University College, Antwerp University Association.
8 KULeuven, Luca.
9 The consortium consisted of St-Lucas School of Architecture, RMIT School of Architecture and Design from Melbourne, the architecture school of Aarhus, the universities of Westminster and Ljubljana, the Glasgow School of Art, and the Estonian School of Art and Design.

on Method.[10] The rationale behind this series of workshops and seminars was the observation that after those decades of ontological dissent, there was no more merit in demonstrating the existence of high level academic research by design, nor in demonstrating the breadth of this field or multitude and diversity of issues that it was able to tackle, but to provide in the need for a stronger establishment of this field by focussing on the quality of the diverse endeavours of design research. Its goal was to reach more rigour and precision in research conduct by design, to more accurately identify appropriate peers, and to establish appropriate assessment and validation of the outcome. In the timespan between 2013 and 2019, six workshops have taken place. Each workshop was looking for a specific methodological commonality thus bringing together researchers around a common focus, for instance the role of models (Cork, 2016); the role of empathy (Antwerp, 2015); digital practices (Graz, 2019); or professional practice as a privileged field of research (Reading, 2016; Lisbon, 2018).[11]

The CA²RE conferences, and its enclosed CA²RE+ research project, can be seen on the one hand as a continuation of the ADAPT-r project, but on the other hand there is a crucial difference: while ADAPT-r was unfolded within a rather closed academic community of likeminded scholars, the CA²RE conferences open up for the wider academic community, thus broadening not only the range of presenting researchers

10 De Walsche, Johan, and Susanne Komossa (2016), "Prototypes and Paradigms : Architectural Research Vis-À-Vis Research by Design.", Delft, TU Delft Open, 9–22.

11 For an overview of the workshops, see http://www.arena-architecture.eu/projects/dr_som/

and topics they investigate, but also the range of commenting panellists, and the diverse paradigmatic gazes they represent.

This expansion of scope, modes and audiences impacts the debate and shifts the focus. The multiformity of research topics and conduct, so clearly driven by designerly minds, appealing spatial sensitivities, and addressing architectural understanding, has decreased the need to emphasize *design* as a valid "pathway through which new insights (etc.) come into being". Indeed, it is now generally acknowledged that the role and position of design within a research endeavour can largely vary. Research conduct "by design" is not a goal in itself. The act of coming to know and the quest for "having new insights effectively shared" are the drivers that should direct research conduct. Research practices – of which *design* can be one – should coherently and rigorously connect to this goal. Moreover, when studying the position of the projects presented within the framework of CA²RE conferences, we can notice different positions that design can take within a research projects, so that one can discern research that is design-led, design-oriented, design-based, etcetera – hence the adoption by the CA²RE consortium of the overarching term "design-driven-research".

However, given this expansion, one can – once more – wonder what then could be a uniting and distinctive factor, that drives students, researchers, supervisors, panellists, and even research policy-makers to the CA²RE gatherings, rather than to other scientific conferences. In an attempt to answer this question, I would suggest

to look at the position of the researcher as a person – mind and body - in relation to the topic under investigation. When looking at this relation in an instrumental way, one could say that the positivist scientist is interested in nature and the formulation of natural laws, irrespective of human understanding. The mind of the researcher is mobilized in order to identify orders and regularities. Method is no issue, since there is only one: the empirical cycle. In contrast, human and social scientists are exactly interested in the mind of the others, more precisely in how others understand the world. The outcome is the construction of theory about how others understand the world (and respond to it). In these disciplinary fields, method is an issue. Given the many ways how one can try to grasp "how others understand the world," an impressive methodological body has been developed. In research conduct, there is a strong emphasis on research methodology. In these disciplines, method is prescriptive, and to be rigorously followed.

In artistic and architectural design-driven research, I would argue that the mind of the researcher is instrumentally adopted exactly for its understanding of the world, as a medium. I mean, while the positivist researcher adopts his/her mind to study the *world*, and the human and social researcher adopts his/her mind to study "how others understand this world," the artistic and design-driven research adopts his/her understanding of the world "to understand others, to understand the world," and "to understand the understanding of others of the world".

The impact of this deliberately subjective mode of

operation is far reaching. The implications are not so much situated in issues of subjectivity. Human and Social Sciences have extensively discussed such issues under concepts as intersubjectivity, positionality and situatedness to get out of this obstacle. More important is that these artistic and design-driven approaches allow for grasping realities that the two other approaches do not allow. Already in the 20s and early 30s, John Dewey has pointed to the gap, caused by science, regarding the identification of what is *known* with what is *real*, stating that science has made it appear as if all other dimensions of human life – such as the practical, aesthetic, ethical, or the religious dimensions – can only be real if they can be reduced to and validated by what is revealed through (scientific) knowledge.[12] Dewey states that science "has stripped the world of the qualities which made it beautiful and congenial to men,"[13] putting us in a situation in which there are two equally unattractive options: "the 'inhuman rationality' of science or the 'human irrationality' of everyday life"[14].

It is exactly to these incapability of natural, human and social sciences that artistic and architectural design-driven approaches provide ways to go. By addressing and mobilizing the body and mind of the researcher in an instrumental way, including non-cognitive, immediate responses, such as emotions, sensitivities and sensibilities, and situated understandings, the researcher will not so much aspire for objective knowledge *about* the culture we live in (as a societal

12 Biesta, Gert (2007), "Towards the Knowledge Democracy? Knowledge Production and the Civic Role of the University." Studies in Philosophy and Education 26, no. 5, 467–479.

13 Dewey, John (2007), "The Quest for Certainty: A Study of the Relation of Knowledge and Action", Gifford Lectures, New York, Minton, Balch, 1929, 33. in: Biesta.

14 Biesta, 2007.

phenomenon), but at providing a “culturally grounded understanding” of the world we live in. It is here that the main contribution of artistic and architecturam design-driven research is to be found, and, so I guess, it is this what brings this community of researchers to CA²RE.

Commendare (Latin): To Commit to the Care or Keeping (of Someone)

Andrea B. Braidt
Academy of Fine Arts Vienna, president of ELIA

Uncannily – or not – the etymology of the word recommendation brings us back (a few centuries) to the Latin root "commendare", which implies (still, after thousands of years)[1] a commitment to the CARE of someone – or something, one might add. This is uncanny, because it brings together in an ideal way the notion of recommendation (the prefix implying, in this case, a strengthening of the verb) with the notion of care – or rather CARE. How to commit to taking care of design driven research?

The obvious answer is to be found in this book. Recommendation being one of the key topics describes – above many other things – the relationship between the supervisor, mentor, coach or teacher-person with the PhD-candidate, with those who are the carriers and keepers of the torch of research. PhD candidates are the most adamant, the most innovative, flexible and creative when it comes to challenging the boarders of the discipline. And therefore, they are the ones to be commended and given perfect frameworks for their endeavors.

No such thing as a perfect framework, of course, as the definition of "perfect" when it comes to frameworks to do research in, is highly dependent on the individual: on the frame-maker (and keeper) and on the researcher alike. Thus, the best recommendation is not the one that is perfect for everbody (not possible) but the one that contains the values, the goals, the process definitions that can be adapted for every singular process of research and knowledge production.
Design driven research might not be the *only*

1 On the etymology of recommend see www.etymonline.com/word/recommend

example of a discipline that develops such frameworks, but it is certainly an excellent example. Already the many ways in which research needs to be incorporated in the process of design itself are hinting at the complexity of the immense dimensions of design driven research. Rather than a specification of artistic research, design driven research inhabits an interface between architecture, art, design, sound and the theory of all those fields. It is the huge achievement of CA²RE+ to make this interface internationally known and widely accessible.

ELIA as the membership organization of all art universities in Europe we can only commend CA²RE+ on the fantastic way it formulates its recommendation for design driven research, especially in the area of PhD research. We are happy to be part of this adventure and hope to continue to partner with CA²RE+ for many years to come.

Foreword

Ilaria Valente
EAAE Vice-President

The discussion about Ph.D.s' goals and scientific contents in architecture and the arts began many years ago.

Over the years, the debate has focused on the nature of the doctoral thesis and doctoral research training. From the beginning, the research community questioned the "scientific" legitimacy of doctorates paths in these disciplines; more and more doctorates focused on design issues.

At the European level, traditions and methods are different from country to country. At an initial stage, the doctoral thesis was a highly individual theoretical dissertation, based on the close dialogue between the Ph.D. candidate and mentor, to be concluded in the necessary time to achieve certain originality of the issue. The design perspective was progressively considered and accepted as a goal and as a research method year by year.

Since the late 90s, with the launch of the Bologna Process and the establishment of the Lisbon Strategy, doctorates have increasingly taken the form of third-level training courses, closely connected to research structures. Thus, their potential as collective incubators of new research content emerged.

The merit of the CA²RE network experience is to offer a common ground for comparison between the different Ph.D. backgrounds. The community of the Ph.D. programs in the architectural and artistic disciplines, over the years, progressively discuss and evaluate them, increasing the

refinement and clarification of methodologies and research goals.

This third issue, “FRAMEWORK: REFORMULATION + RECOMMENDATION” which represents a synthesis of the CA²RE events, materials, and reflections developed between 2019 and 2022, collects various aspects: design-driven research methods; new emerging themes, ideas for the structuring of doctoral research in a multidisciplinary and international perspective; recommendations on methodologies and evaluation processes.

Some topics emerged strongly: the fact that the design process could be a new typology of access to knowledge; the quality of interaction between theory and practice; the project as an original research product, capable of producing examples and best practices, of being the fundamental substratum of theoretical elaboration. At the same time, the dialogue on Ph.D. programs and their organization was significant regarding formulating the themes, the research work, the discussion, and the evaluation. The position papers produced for the CA²RE events significantly contribute to the current doctorates’ activities and their future perspectives.

Another peculiarity of CA²RE is represented by the reasoned collection of research topics offered by the Ph.D. candidates; these are often on edge between disciplines and design experiments investigating different scales. But, above all, the case studies provide a potential interpretative grid of the built environment’s current condition that matches future design challenges. In this

frame, the doctoral thesis issues represent different ways of preparing best practices and achieving design goals.

The European Commission recently published the document “Commission Communication on a European Strategy for Universities” (18-01-2022: https://education.ec.europa.eu/document/commission-communication-on-a-european-strategy-for-universities), focused on the higher education perspectives and the fundamental role of universities. The document emphasizes that “the higher education sector has an essential role to play in Europe’s post-pandemic recovery and in shaping sustainable and resilient societies and economies. Excellent and inclusive universities are a condition and foundation for open, democratic, fair, and sustainable societies as well as sustained growth, entrepreneurship, and employment.” In this new framework, a collaboration such as CA²RE represents a sample on connecting higher education and research and fostering collaboration between universities on specific projects. Considering the actual necessity to define updated and future-oriented design skills, the Ph.D. programs could play a particular role in establishing a hinge between profession and research, between advanced training, long-life learning, and professional reskilling and upskilling.

Ljubljana

CA²RE / CA²RE+ Ljubljana 2021

Tadeja Zupančič
Faculty of Architecture, University of Ljubljana

The CA²RE / CA²RE+ Ljubljana event is a part of the CA²RE+ Erasmus+ Strategic Partnership. It is the 5th of 6 Intensive Study Programmes for Doctoral Candidates within the Strategic Partnership running 2019–2022. The project is developed as a parallel and a trigger to the continuity of the CA²RE Conferences for Artistic and Architectural REsearch. The CA²RE Ljubljana is the 10th in that series.

CA²RE Ljubljana can express its artistic and architectural research tradition through the CA²RE+ project step of REFORMULATION with its sensitivity to delicate and even vulnerable places of our contemporary architectural and urban environments. The architectural culture in Slovenia reflects the small-scale hybrid landscapes of settlements with a very high level of vulnerability of places, due to both natural and cultural spatial dynamics. The research culture is thus hybrid and inclusive, open and flexible to a wide variety of DDr research approaches. CA²RE Ljubljana can also build on the experience as the organizer of the second in the CA²RE conference series in Autumn 2017. If that event was oriented to the supradisciplinary field or the arts and architecture, the CA²RE+ in Autumn 2021 looks to the wider context of humanities and social sciences. It takes the advantage of the established research ties between the Faculty of Architecture, the Academy of Fine Arts and Design, and also the Faculty of Arts and the Faculty of Social Sciences. It brings environmental psychologists, philosophers, anthropologists, urban sociologists, geographers, experts in cultural studies, experts in human resource management, and other related experts into the discussion.

Selected fellow presentations

Nadir Bonaccorso
Mariacristina D’Oria
Taufan ter Weel
Jakob Grelck
Mar Muñoz Aparici
Miljana Nikovic
Tim Simon-Meyer
Monica Tusinean
Paula van Brummelen
Maja Zander Fisker

LOW-COST DIY UPGRADE STRATEGIES FOR IMPROVED COMFORT IN POOR BRAZILIAN HOUSES IN HOT CLIMATES PROCESS AND RESULTS

Nadir Bonaccorso
Évora University

Supervisors:
Guilherme Carrilho da Graça, Lisbon University
Pedro Matos Gameiro, Évora University

This paper presents the process and the results of a Design Driven research (DDr) on passive techniques to improve the indoor temperature of poor houses in Brazilian hot climates. Poor houses, which offer an overheated indoor environment, have been analysed. The paper gives a more detailed description of the in-situ research phase, which informed the hypothesis through the experience with the contacted communities, setting up the pre-requisite: all strategies applied should be effective; low-cost; Do It Yourself (DIY) friendly for self-construction. Design and post-design phases, sequentially alternate during the investigation, three times, until the pursuit of viable solutions. Radiant barrier and Tetrapak insulation board solutions presented the best results, at a cost of 5 €/m^2 and 1 to 2 €/m^2, respectively. The research presents suitable and validated low-cost materials

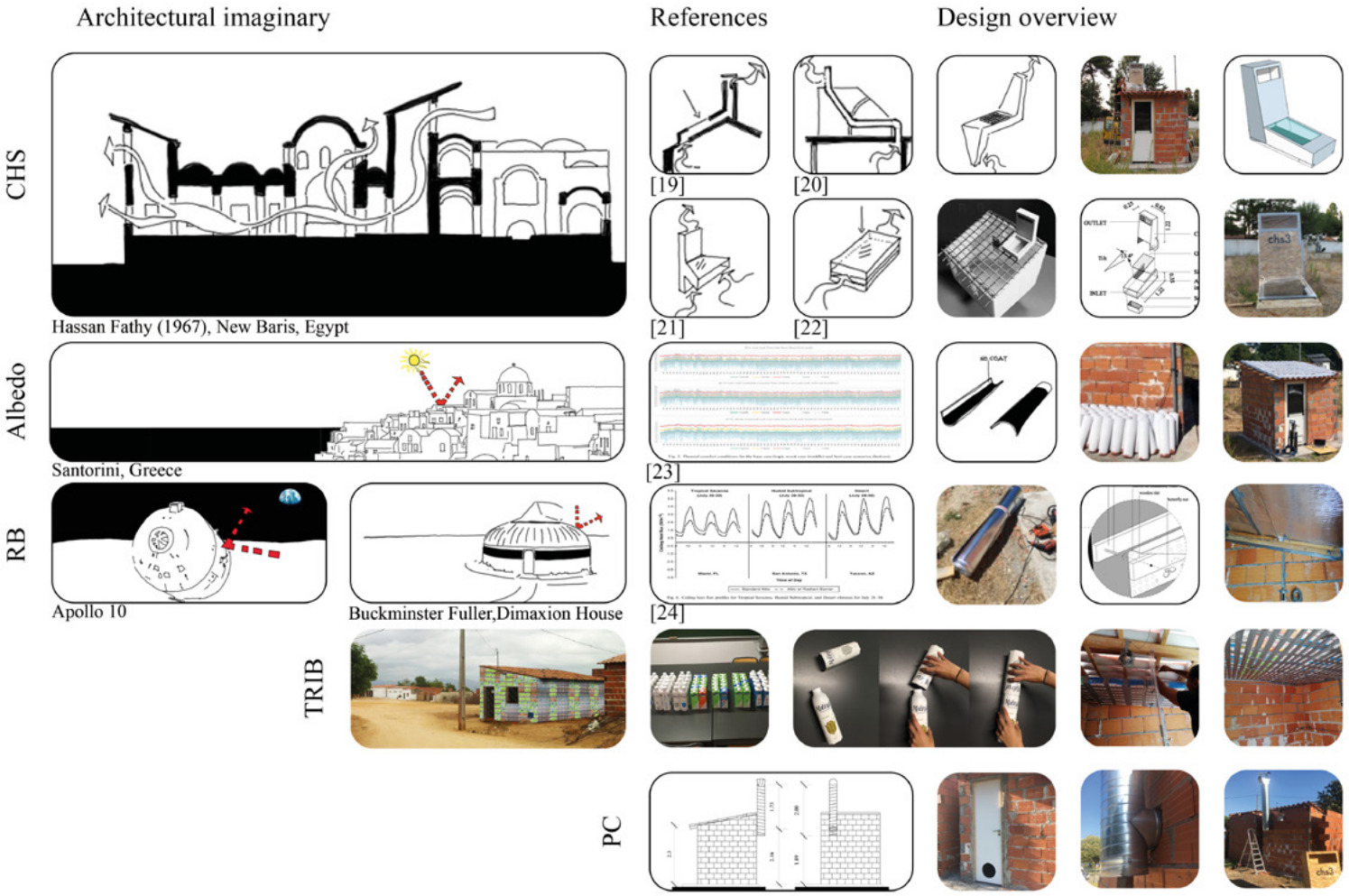

FIGURE 1. Scheme of all strategies applied - Design Stage

and technics to be used to shape both thermal and physical spaces in this poor context, showing a possible path to find “the place of architecture in a planet of slums”[1].

For the pursuit of low-cost DIY technics to be applied in poor houses environments for improving thermal comfort, the investigation used a Design a Driven research (DDr) methodology and a scientific

1 Arantes Friori, Pedro (2008), “O lugar da arquitectura num planeta de favelas”, Opúsculo, Ed. Dafne, Porto, 3.

FIGURE 2. Brazilian Phase Atlas

methodology for measurements, simulation, and analysis, where both qualitative and quantitative approaches informed and defined the extents and the limits of the investigation question.
Interlacing with a poor community to collect information for the research was the major challenge, as poor environments are closed and violent. The residents are usually suspicious of strangers. Thus, for the endowment of trust, I had to understand the underlying philosophy and methodology of the poor. During the pre-design

stage, I adapted my DDr strategy to a different type of "order" and "chronology" used in this context, improving my abilities as a bricoleur, which allowed me to work on viable solutions. To verify the effectiveness of the hypothesis, I was compelled to "build a bridge" between the "First Science" of Levi-Strauss and the contemporary scientific methodology and its digital tools. A constant realignment of the construction of the artefacts, based on trial and error to validate the solution, was performed. Finally, the achievement of equilibrium between qualitative and quantitative approaches turned to be the key to the research and may show the importance of the methodology used, to better comprehend our complex human World.

GEOMETRIES OF TIME

Taufan ter Weel
TU Delft

Mariacristina D'Oria
University of Trieste

Supervisors:
Roberto Cavallo, TU Delft
Heidi Sohn, TU Delft
Giovanni Corbellini, Politecnico di Torino

The multimedia installation *Geometries of Time,* a collaborative work presented as Artefact at CA²RE/CA²RE+ Ljubljana, explores different scientific abstractions produced from the Enlightenment onward in connection with their social and environmental implications for how we engage with the landscape. More specifically, the work questions and contextualises the tensions between the increasingly blurring absolute representations of reality and the relative spacetime of entangled processes by means of architectural diagrammatisation and multimedia experimentation. In this transdisciplinary design-driven approach, the process of diagrammatisation allows for thinking how concepts, techniques, and technical objects work or operate – how they engage with the environment, landscape, associated milieu – rather than solely what they are or represent.

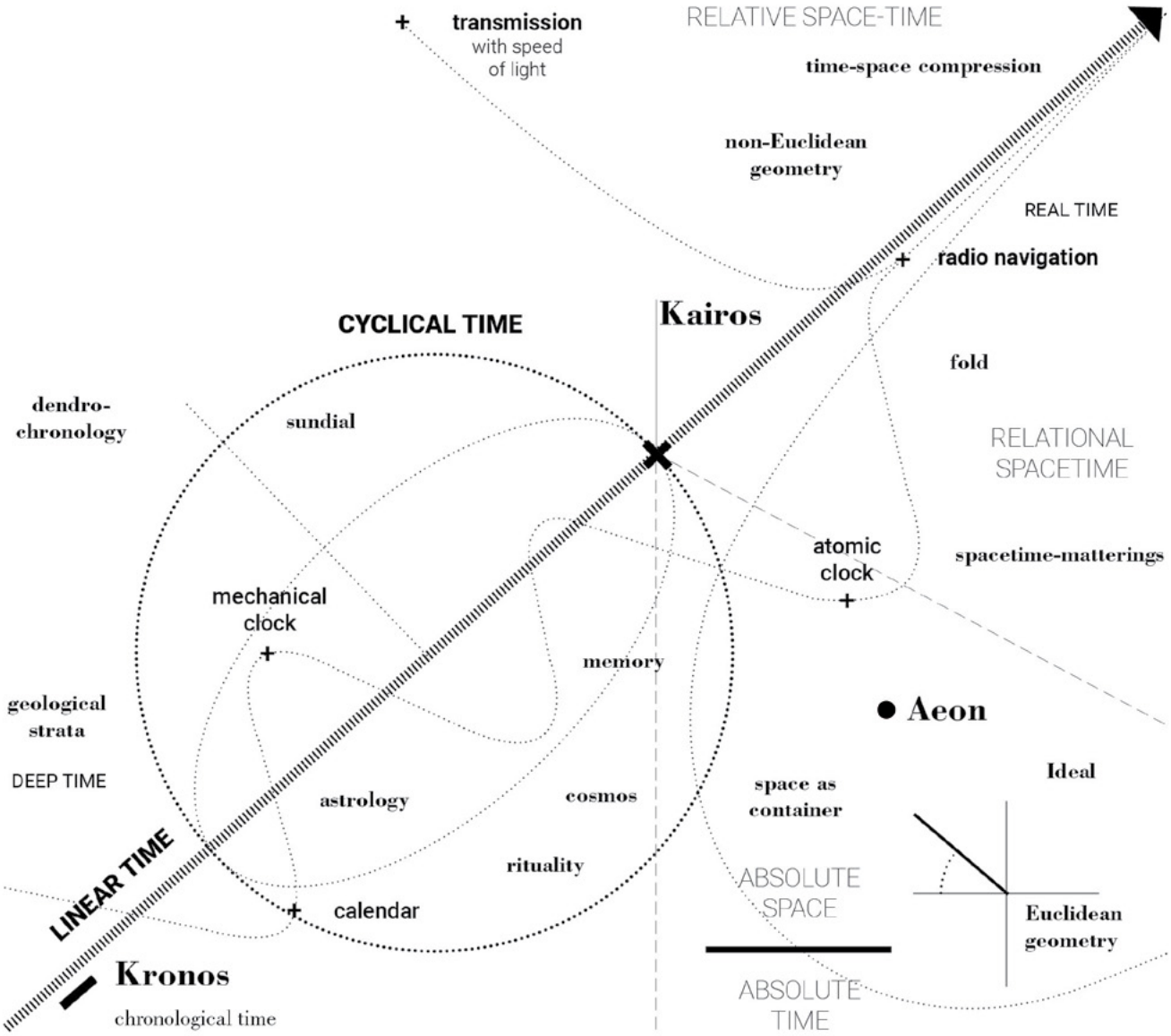

FIGURE 1.
Diagrammatisation as a means of theoretical investigation through the concept of space and time in order to intercept the warped section of the entanglement

Architectural diagrammatisation is understood as a material-discursive process or practice that reconfigures our relation to the world, exploring latent potentials within an associated milieu, exposing frictions and discrepancies, and suggesting a broader set of relations connecting multiple environments, spaces and times. First, following Karen Barad's notion of material-discursive practice[1], the process entails both epistemological and ontological dimensions, both meaning and matter, and is performative. Second, in this material-discursive process of diagrammatisation, theory is not isolated from

1 Barad, Karen (2007), "Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning", Durham, London, Duke University Press.

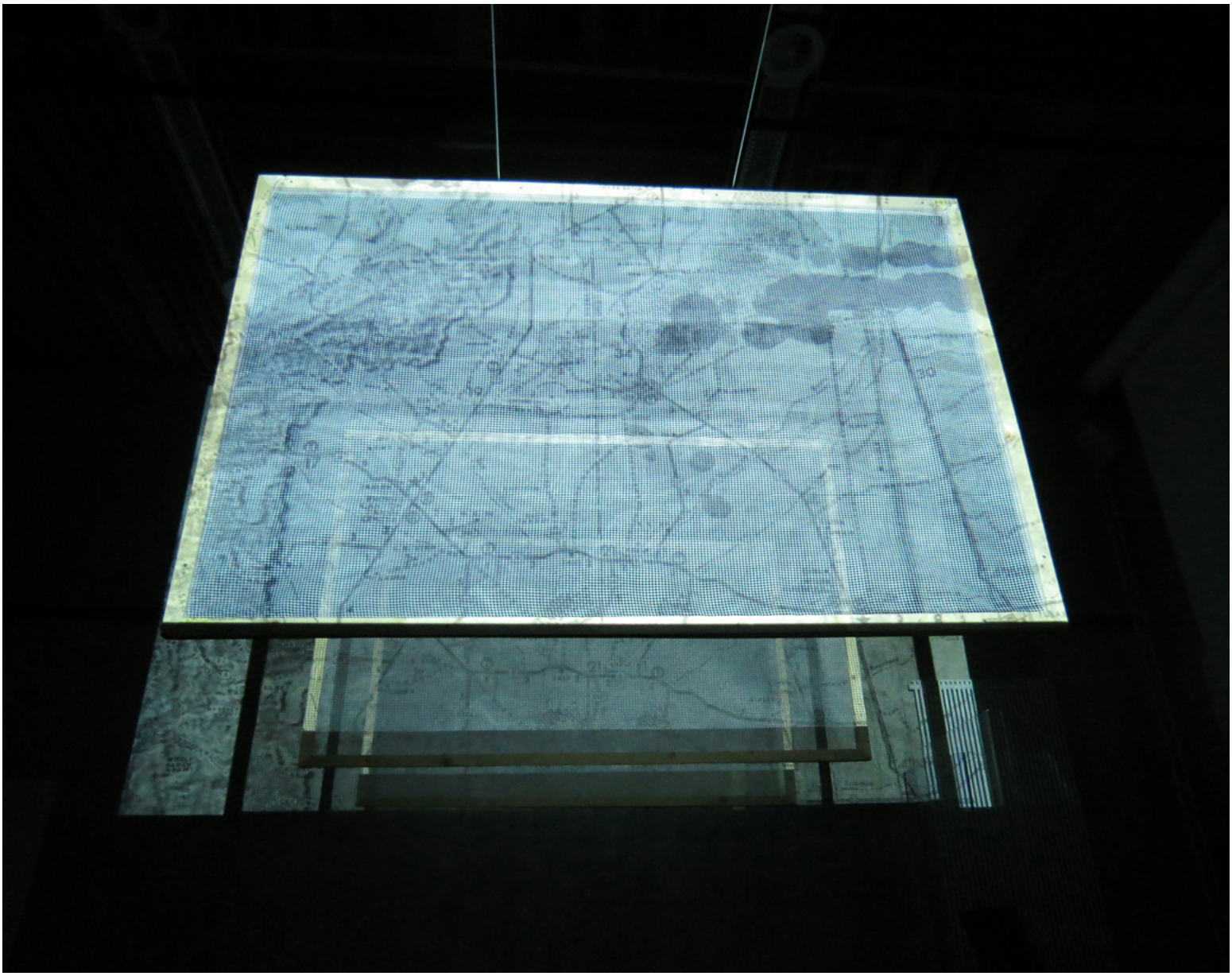

FIGURE 2. Installation

practice but is intertwined with it, aiming to go beyond the dualism between theory and practice. Theory is not instrumentalised to justify practice, or vice versa, but rather the production of concepts (theory) and the production of spatio- temporal configurations, designs, and compositions (generally understood as practice) run in parallel, or more precisely, are entangled. Third, in line with Félix Guattari and Gilles Deleuze, the diagram is deterritorialised, it is trans-spatial and trans-temporal, allowing to cut across and link different spatial and temporal coordinates.[2] Fourth, diagrammatisation is suggestive, it introduces

2 See Guattari, Félix (1995), “Chaosmosis: An Ethico-Aesthetic Paradigm”, trans. Paul Bains and Julian Pefanis, Bloomington, Indianapolis, Indiana University Press.

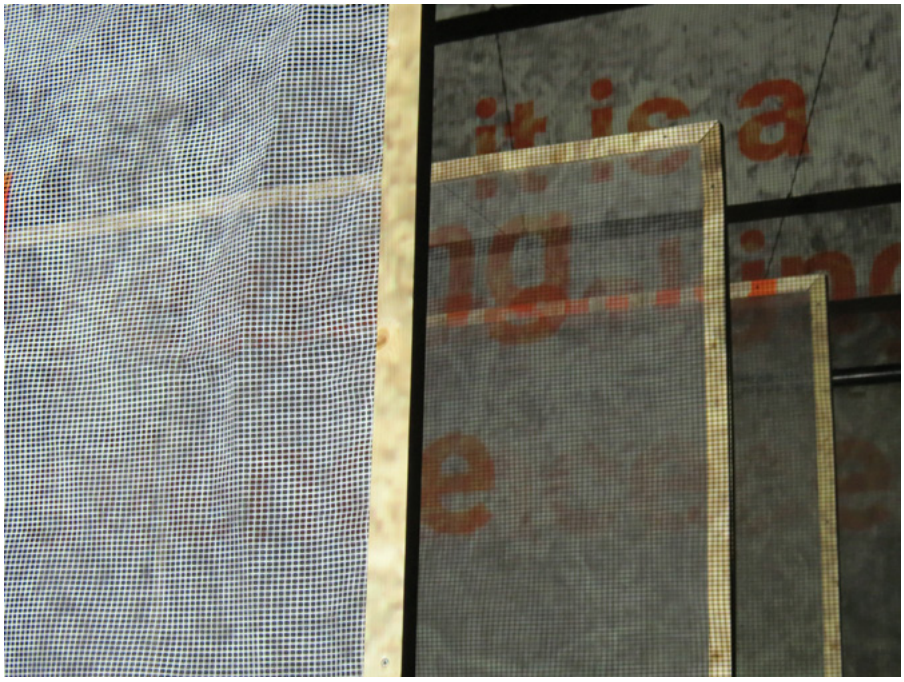

FIGURE 3. Installation

"possibilities of fact," as Deleuze puts it, drawing on chaos, discovering rhythm. In the words of Francis Bacon, "it unlocks areas of sensation"[3]. Last, diagrammatisation entails a focus on technicity: technical processes and objects produced by supposedly enlightened and advanced humanity, in this case to underline the frictions and discontinuities they generated.

The multimedia installation, in turn, is a continuation of the process of diagrammatisation, whereby the audience becomes part of it. More precisely, the diagram is put into operation and the audience is physically immersed in this process. Combining sound, light, video projections, and drawings, allows for a multidirectional mode of abstraction, composing spatio-temporal manifestations in a dynamic, instant, and real-but-abstract way. In particular, the semi-transparent surfaces that constitute the screens, composed by different materials and textures, progressively filter the

3 Deleuze, Gilles (2003 [1981]), "Francis Bacon: The Logic of Sensation", trans. Daniel W. Smith, London, New York, Continuum, 102–110.

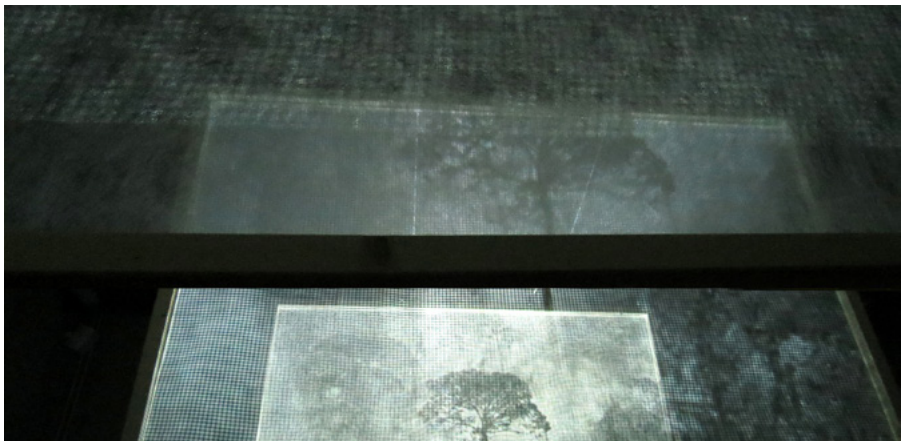

FIGURE 4. Installation

FIGURE 5. Installation

projections, diffracting and blurring the initial image that constantly changes, in the attempt to perform the complexity and multiplicity that constitute the very notion of the entanglement. A collage and ten panels show different spaces and times, geographically and historically separated but nonetheless connected by being subjected to imperialist and colonial exploitation such as nuclear testing and military use justified by being supposedly deserted islands. Recorded landscapes and concrete rhythms are convolved with and modulate or trigger generated sounds and stochastic processes; fixed media are combined with self-generative processes.

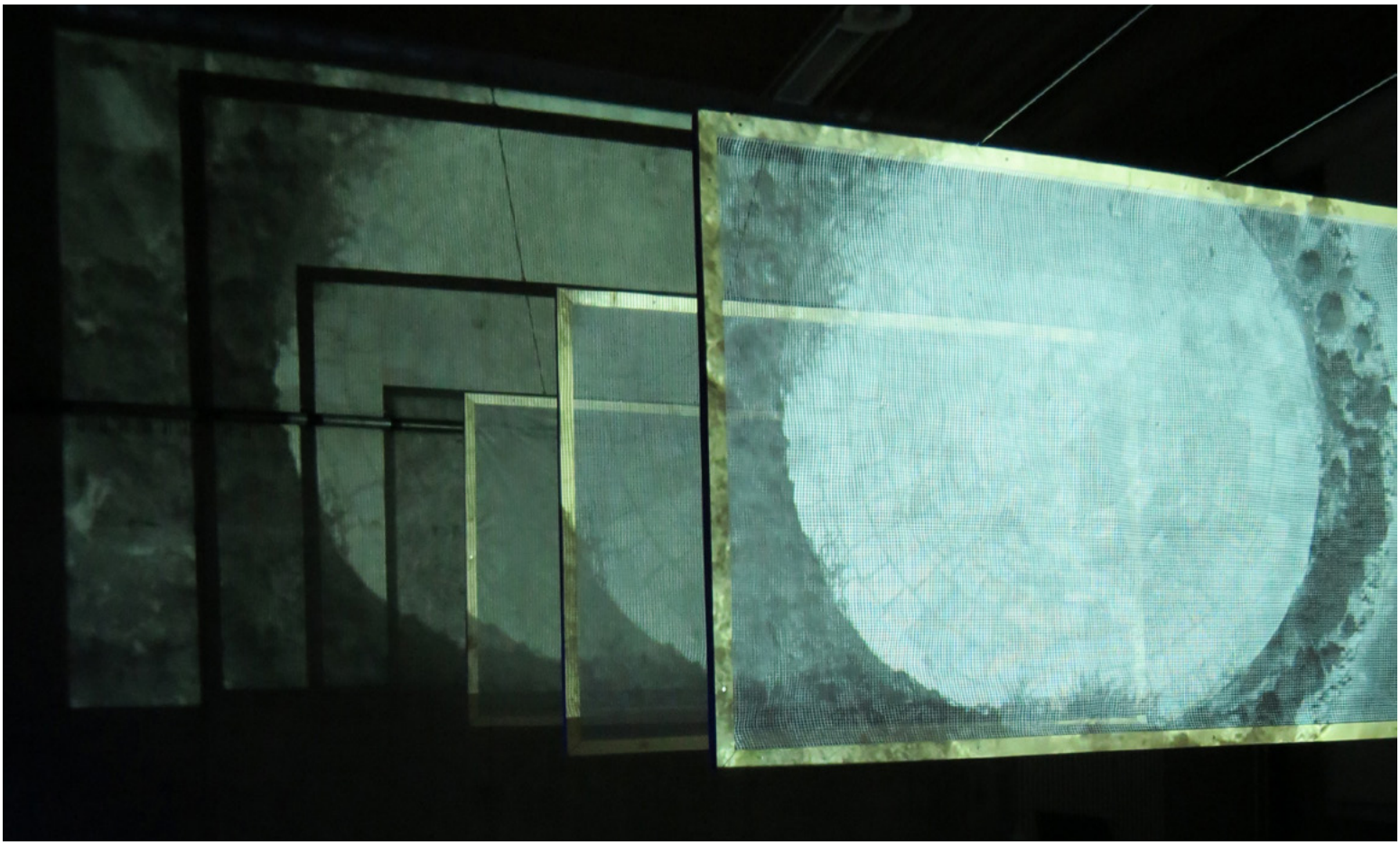

FIGURE 6. Installation

The installation is both a first test of and one of the possible configurations produced through this process of diagrammatisation. It performs an exploration across, on the one hand, different abstractions of time and space, and on the other, the entanglements between various landscapes in formation, generating a warped cross-section or archipelago of places and multitude of times linked by the resounding echoes of exploitation. The processes of diagrammatisation and multimedia experimentation explore and expose complex relationships and open up possibilities for further exploration with regard to the design-driven research. The architectural diagram as an explorative tool and performative process helps us to understand architectural space in terms of intensive properties and the production of it as entanglement of meaning and matter, as material-discursive process.

ENABLING SYSTEMS FOR OPEN TRANSFORMATIONS WITHIN THE EXISTING BUILT CONTEXT

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The rise of the active user has prompted new imaginaries in architecture and design culture. Although there are several examples in architectural history attempting to integrate unskilled workers within the design and execution process, some of them conditioned by times of economic hardship, this tendency doesn't find a systematic approach in today's architectural design. By implementing this research within a series of both, past and running projects within my architectural design practice, this proposal is aiming to gain new perspectives for working within the existing built context through establishing a system, which enables the user for future changes and adaptations through its components. These concerns are explored through a consideration of the whole spectrum of a building's life to address issues such as durability, flexibility, demountability,

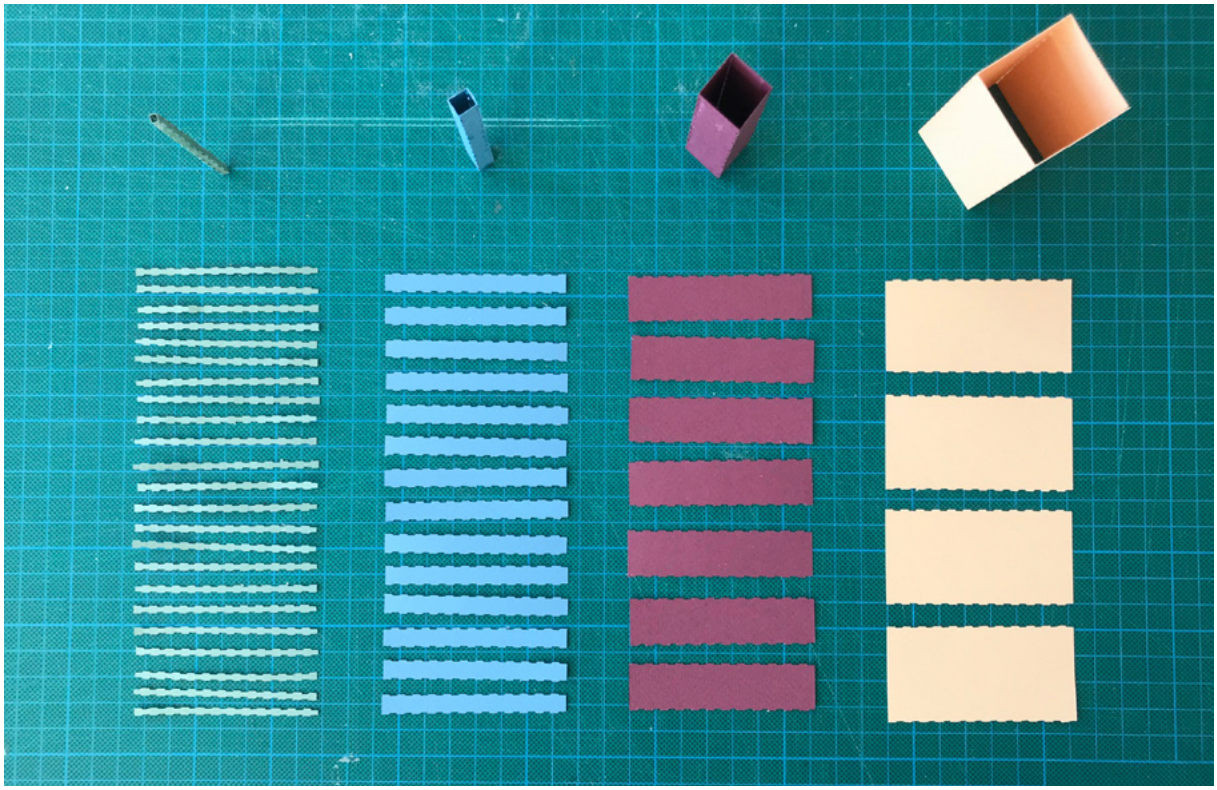

FIGURE 1. Example in a 1:33 paper model for a schematical 2-dimensional system made of cnc-cut spruce plywood

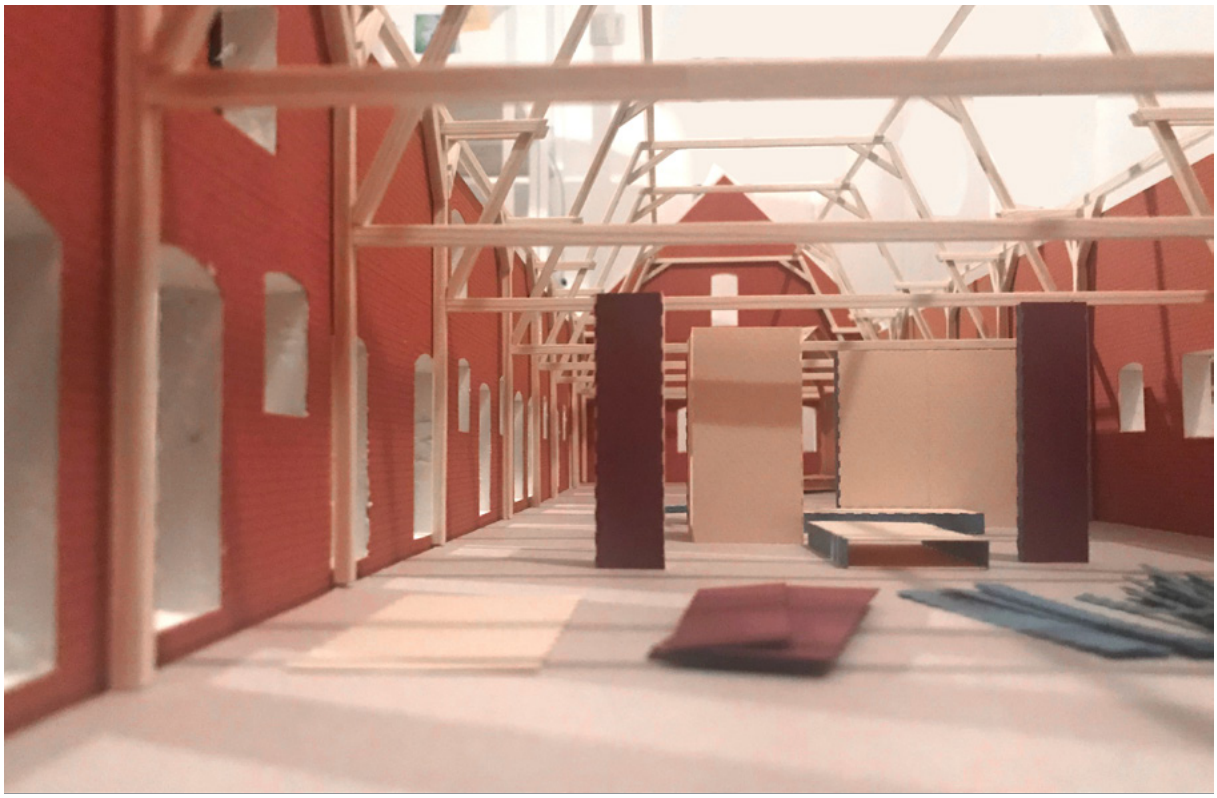

FIGURE 2. A possible floorpan outcome of 2-dimensional system in existing context model for a community built conversion of a barn building

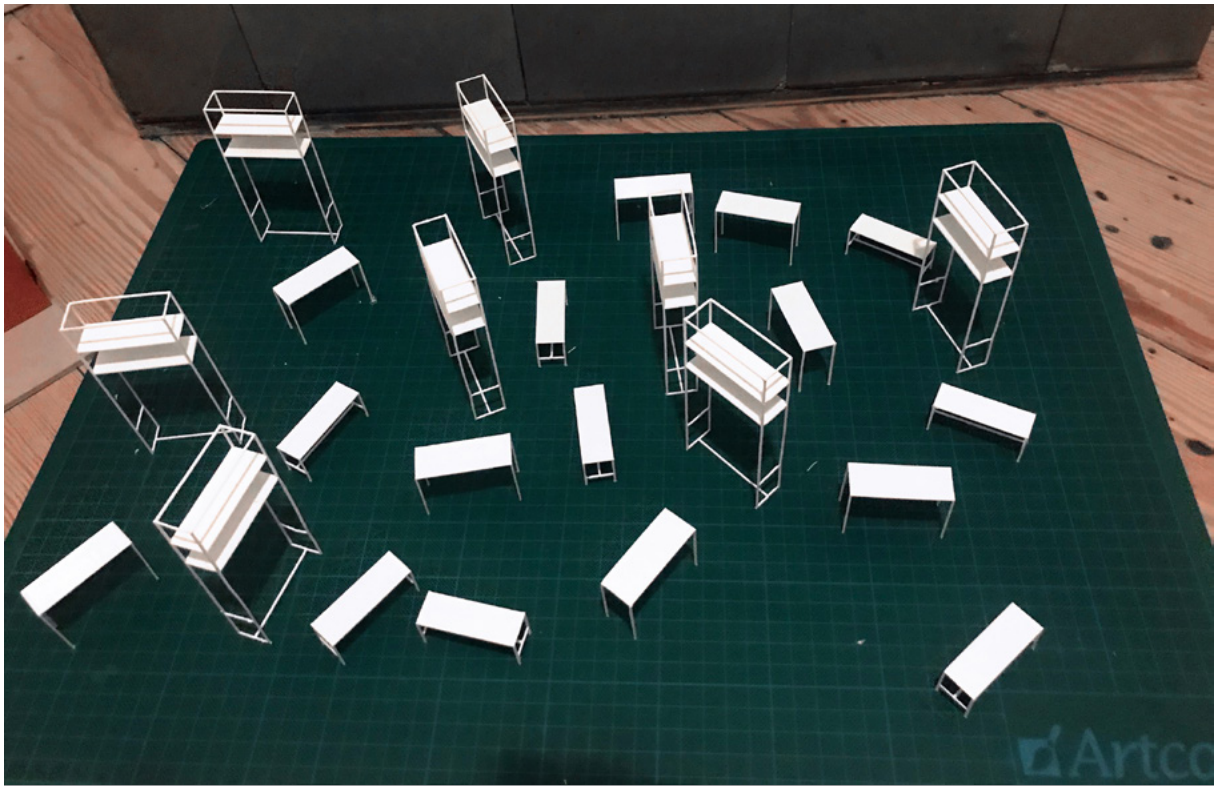

FIGURE 3. Initial explorations in 1:20 model. 3-dimensional enabling furniture system adapting to existing floorplans

and actual use and to create an organism-like architecture, rather than an object that will be completed after its practical completion. The project argues that the interference the blending of existing built context and the enabling system gives rise to, can unlock new possibilities for architectural production today.

The conception of the research project has started from a necessity, identified during past architectural design projects within the last years of my practice and it is aligned with the methods commonly used within design-based research. It has shifted between several types of research activity and involved theory and design precedents but also with a major focus this research will be based on my current architectural design process and building experiments centered around the topic of collaborative making. For the strengthening of the research culture of architecture, in my view it's important to employ the discipline's own methodologies in research projects. By bringing

FIGURE 4. 1:1 testings in workshop, production of 3-dimensional elements for a community-radios office transformation

FIGURE 5. Example for a linear kit, printed elements in scale 1:33

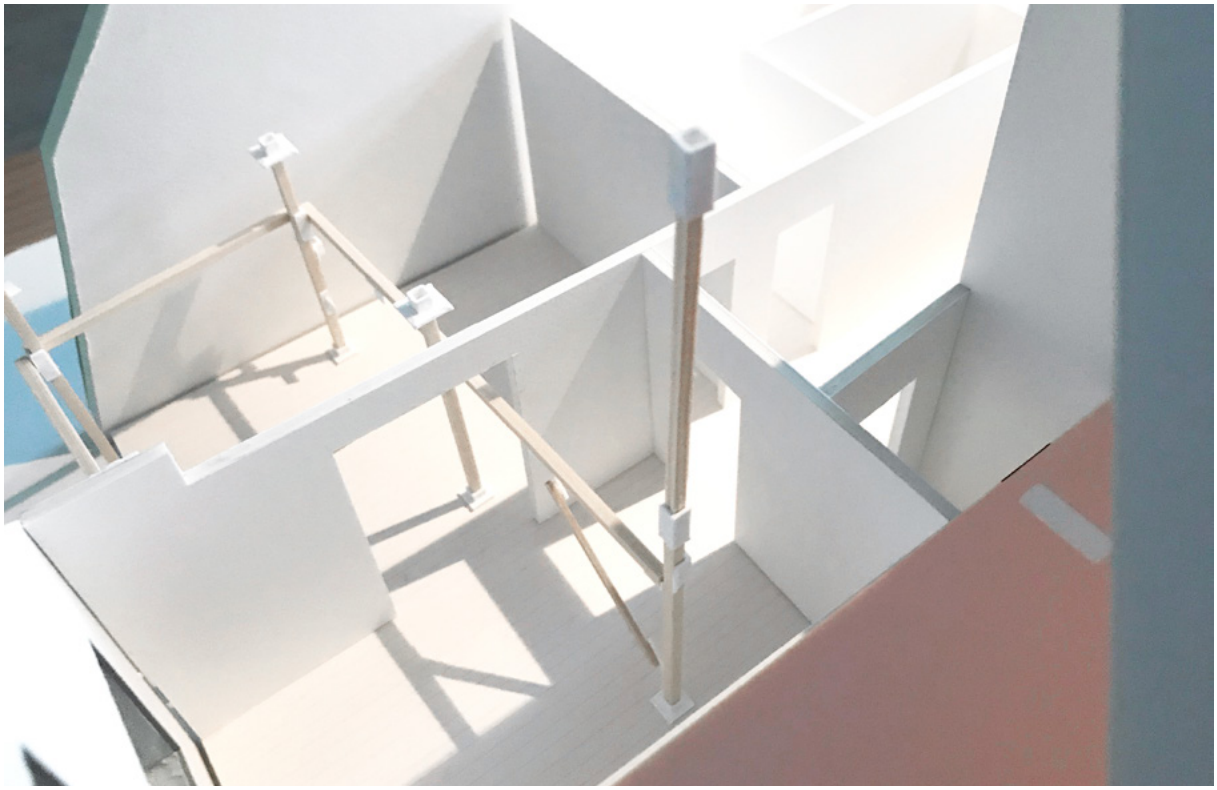

FIGURE 6. Linear system in contextual model, connecting with existing floorplan and developing within 2 apartments

research and practice closer together as well as by implementing Design-Driven Research within design teaching in architecture new perspectives for the training of young creative professionals can emerge. This PhD project is developed following a Research-through-Design methodology which oscillates among a combination of approaches. Designs can play the role of feedbacking to a wider knowledge base, that is specific in each project but can be universal in the reflection of the different outcomes and create insights within a wider interest. While designs will become a proposal for specific questions in each project, a universal set of systems will emerge with the capacity to become combined and tested in new projects. An analytical approach in which different techniques like diagrams, a taxonomy of systems, models, and workshop-technique will be explored, will both structure knowledge and outcomes and follow the aim to scope out new fields of action within a changing field of practice.

MAKERLABS
MAKERSPACES IN LIBRARIES AS MODERN SPACES OF URBAN BELONGING

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In the context of changing reference points that characterizes contemporary late modernity, public buildings are demanded to adapt to transforming cultural values. Buildings, static long-lasting structures, must satisfy changing purposes, programs, and users. One example of this shift are libraries which are undergoing transformations both as an institution and as a built object. Since digital resources are broadly accessible through digital means, libraries are shifting from *knowledge consumption* to *knowledge creation* spaces. The concept of "making" appears as one upcoming approach to explore contemporary literacy in libraries.

The project *Makerlabs: Makerspaces in libraries* shows how designing public buildings as unfinished *publicity thresholds* makes space for cultural

values' creation and transformation. In this study, theories on public buildings, liquidity, thresholds, and values ground the framework informing design propositions tested with spatial interventions. Design Driven Methodologies are used as a discursive communication medium between theory and practice, concepts, and approaches, as a generative and reflective tool.

ON SITUATED ACKNOWLEDGEMENT

Showing how to increase the socio-cultural effect of public buildings on the public sphere in and around them can be formulated theoretically but can only be proven by intervening in the physical world. Design-driven methodologies help to turn the theoretical hypotheses into design premises to be tested in a real location. It can be the means to bridge the gap between theory and practice. In this project design will be the guiding thread connecting the three layers of action: researching, designing and experimenting.

Design, and specifically public design, is a practice materially and procedurally situated. On the one hand, it is always placed in time and space both as a process and as a product. On the other hand, it is the "product of bodily, social, environmental, and cultural interactions" of the involved agents including the designer[1]. To use design as a research methodology, special attention is to be paid to the tacit knowledge, design assumptions and the building's agency within the urban ecology to avoid biased naïf simplifications. Where is the

1 Langdridge, Darren (2014), "Situatedness.", In T. Teo (Ed.), Encyclopedia of Critical Psychology, New York, NY, Springer New York, 1757.

building situated in time and space? What are the evident and hidden actors? Who am I? What do I see that others do not? What do others see that I do not? What are my assumptions? Considering these apparent limitations is the way of defining the research's boundary conditions and scientific accuracy. One cannot erase the complexity of reality but acknowledging it turns the focus towards the relevant aspects contributing to the body of knowledge.

PUBLIC THRESHOLDS

Public Buildings are public space condensations traditionally conceptualized in binary perspectives: public-private, indoor-outdoor, accessible-restricted. Nevertheless, the complexity of social, political and economic structures deems such definition dated. Public Buildings are dynamic thresholds that change with the flow of publicity where a threshold is "a point [...] above which something is true or will take place and below which it is not or will not"[2]. Therefore public buildings are thresholds defined by the point – or *limen* – at which individuals enter *public life* to undertake collective action in a momentary *foam* that later disintegrates again into individual bubbles[3] (Fig. 1).

Since public space is produced socially by a class and power conflict, public buildings also embody the *self-augmentation* tension of engaging in a collective[4] (Fig. 2). This tension is not static

2 Merriam-Webster.com (2021), "Threshold" in: Merrian Webster Online Dictionary. https://www.merriam-webster.com/dictionary/threshold.
3 Palese, Emma (2013), "Zygmunt Bauman. Individual and Society in the Liquid Modernity." in: SpringerPlus 2, no. , 2–5, https://doi.org/10.1186/2193-1801-2-191
4 Lefebvre, Henri (1991), "The Production of Space", Malden, MA: Blackwell. https://doi.org/10.4324/9781315565125-7

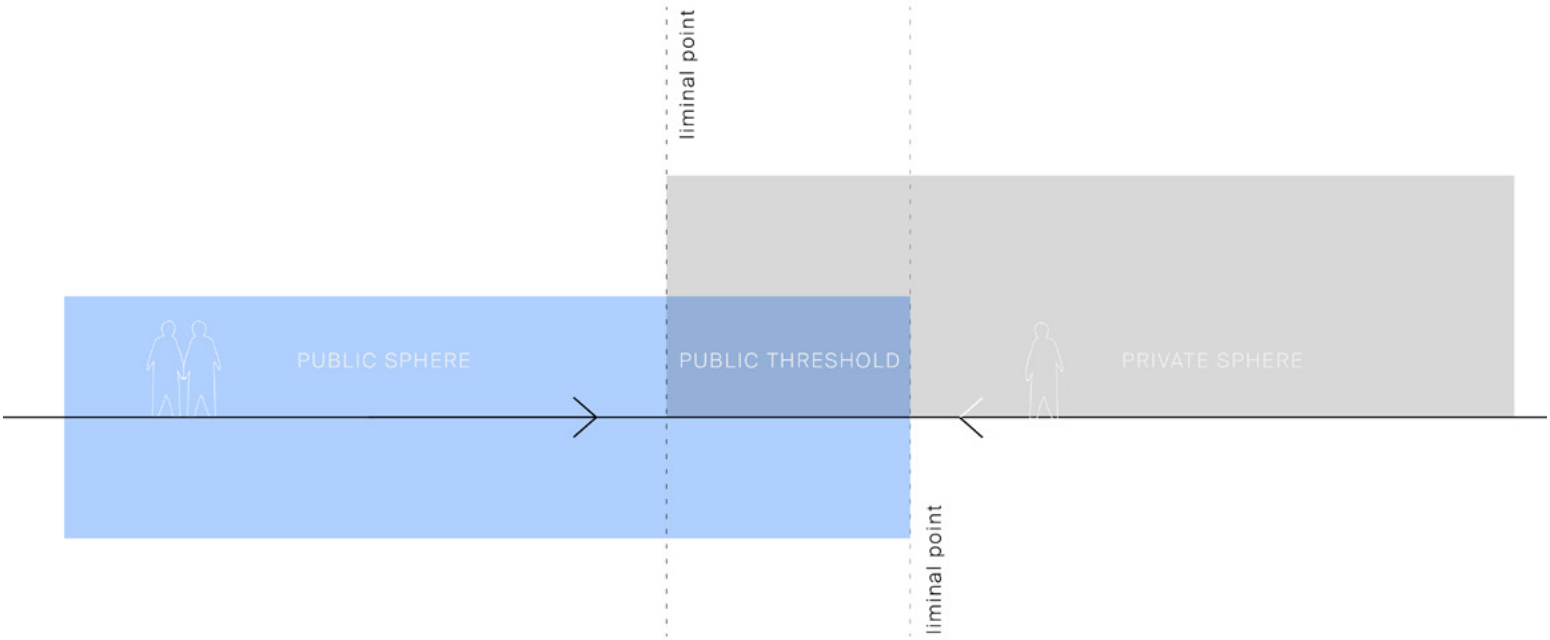


FIGURE 1. Public Thresholds: liminality and changing transitions

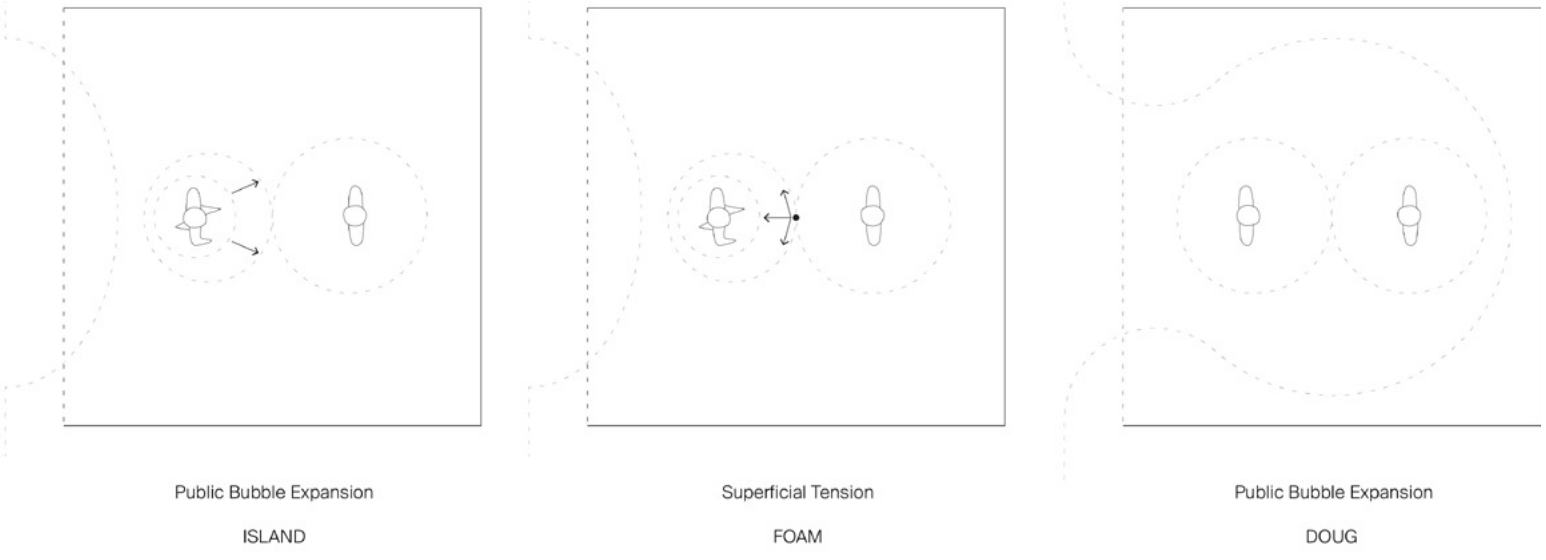
but changes according to the *public condition*. Individuals of different backgrounds come together to collectively act, whether watching a theatre play or debating the future of their neighbourhood. During that time-period, they re-define their shared cultural values of beauty, identity, belonging or democracy. If designed considering their role in the public sphere, public buildings can be a powerful tool to strengthen cultural values by providing a *common space* for civic connections and social interaction.

Cultural public buildings – those related to collective and common human practices such as libraries, museums or cultural centres – are the paradigm of cultural value creation. They exist to host the birth and proliferation of cultural practices that through interaction and conflict eventually become cultural values. Buildings last decades while cultural values transform at the speed of

society. Therefore, conceiving public building as *unfinished thresholds* could make room for the creation and transformation of cultural values.

In recent *late modernity*, architectural practice's success was defined by the amount and impact of its cultural building's designs. Buildings were designed as global and interchangeable representations of modernity: Museums in China that could have been libraries in the US or Theatres in Switzerland that could become Casinos in Thailand. Cultural buildings became consumer products shaping local, national, and global identities. Nevertheless, the lack of connection with their immediate visible and invisible agents and ecologies limited their effect on the public sphere to eminently economic value (regeneration, gentrification, touristification). To avoid undesired effects and ensure positive impact on the public sphere, public buildings must incorporate *collective knowledge* into a building that is an *open-ended process* instead of a *finished object.* Public buildings as agents of the public sphere keep the

FIGURE 2. Engaging in public life in public buildings



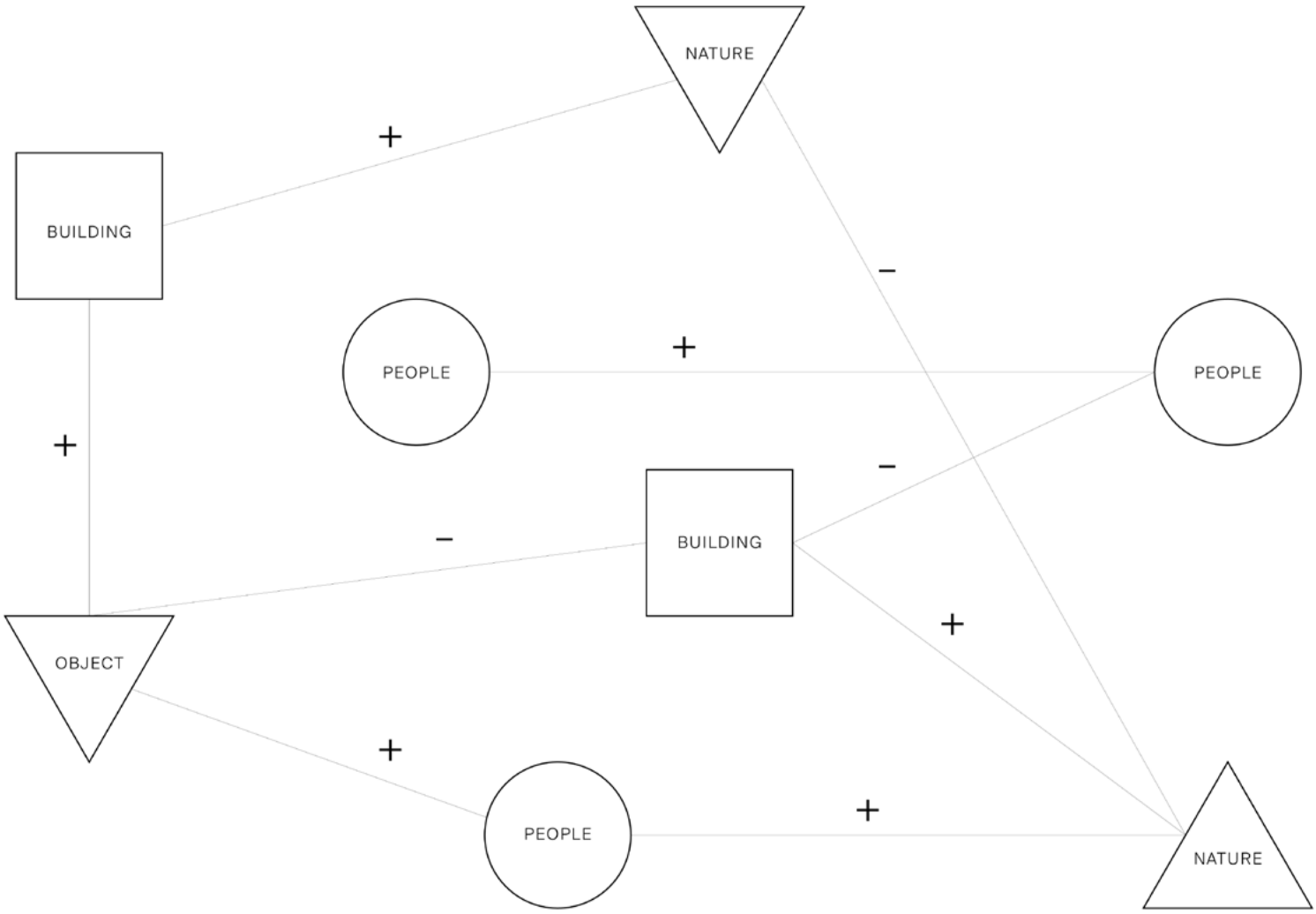


FIGURE 3. Ecology mapping: public buildings as agents in a complex urban ecology

purpose of facilitating through technical solutions the union of individuals to form a collective through a common activity while embracing their conflictive nature as spatial agents of a *complex urban ecology* (Fig. 3). Cultural public buildings combine collective interest into affordances and possibilities that host civic relationships.

As cultural public buildings, libraries are a representation of a specific civilization and demonstrate the values and aspirations of their immediate and extensive community. In late modernity, not only are external reference points fluid but there is also a continuous process of "self-actualization" or "life politics" as Anthony Giddens articulates it. Individuals "who using their own

resources try to change the course of their own life"[5]. From a time when our life was defined by solid references (religion, profession, family) we shifted towards a situation where the definition of the self is completely dependent on the individual's capability to continuously improve oneself. In this context of liquifying institutions and reflexive exploration of the self is where Makerspaces as community spaces emerge as a space for belonging to counteract alienating modern existence.

MAKERLABS: EXPERIMENTING WITH MAKERSPACES IN LIBRARIES

Democratization of knowledge has turned citizens into *prosumers*: producers and consumers. These terms not only refer to an economic exchange but also to a change of roles in cultural institutions. *Prosumerism* has turned cultural institutions – from which also libraries – into *performative spaces*[6]. In these spaces, users are expected to engage with the available tools in co-creation. Makerspaces in libraries are a great example of performative spaces because of their critical role in repurposing spaces for literacy. Whether focused on creativity or innovation, makerspaces in libraries share the goal of enlarging literacy beyond books.

The challenge of transforming libraries' civic role is one of programmatic and spatial magnitude. On the one hand, new functions demand different activities, themes and ways of doing. On the other, giving new meanings to traditional building

5 Bauman, Zygmunt (2012), "Liquid Modernity Revisited", Lecture. Aarhus Universitet, https://vimeo.com/41344113

6 Jochumsen, Henrik/ Skot-Hansen, Dorte/ Hvenegaard Rasmussen, Casper (2017), "Towards Culture 3.0 – Performative Space in the Public Library", International Journal of Cultural Policy 23, no. 4, 524, https://doi.org/10.1080/10286632.2015.1043291

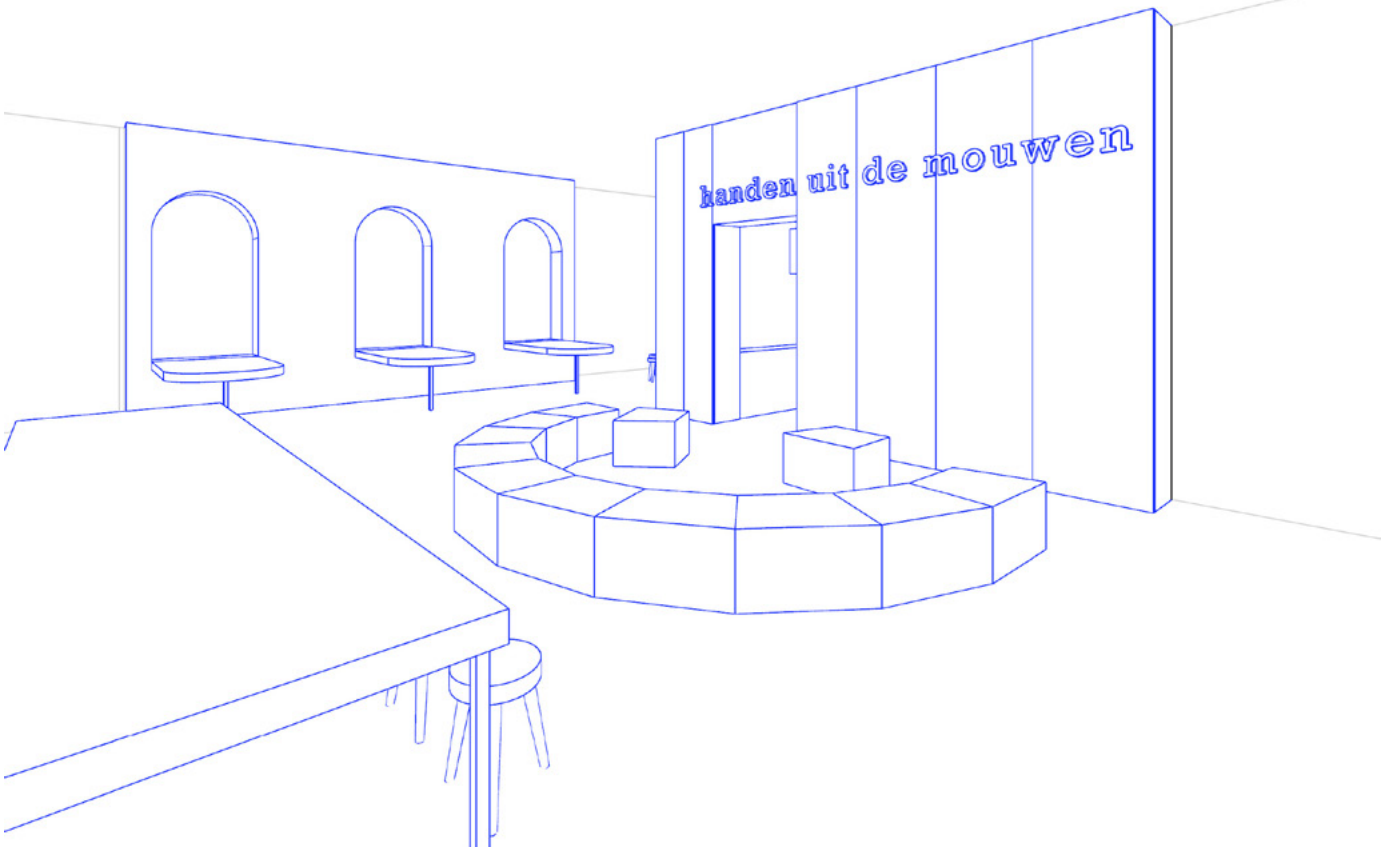


FIGURE 4. MAKERLAB: Proposal for a spatial intervention

functions requires original design concepts and methods. The objective of the Makerlabs project is to demonstrate how a design intervention in an existing public library can activate the building's agency in the public sphere, motivate use and human interaction and therefore produce cultural value dynamics in and around the makerspace.

The Makerlab project is a two-year collaboration between the Royal Library of the Netherlands, Delft University of Technology, Hogeschool Rotterdam and 4 pilot libraries per year cycle. The project departs from a co-creation process with library representatives, users and *making* experts clarifying the themes and cultural values of each makerspace. Later the PhD candidate translates the received input into a design blueprint where the functions and spatial gestures are presented. In that phase, Industrial Design students take over the given blueprint to design products or experiences that enhance the designed value-spatial framework. The last phase of this design experiment is to integrate the transdisciplinary

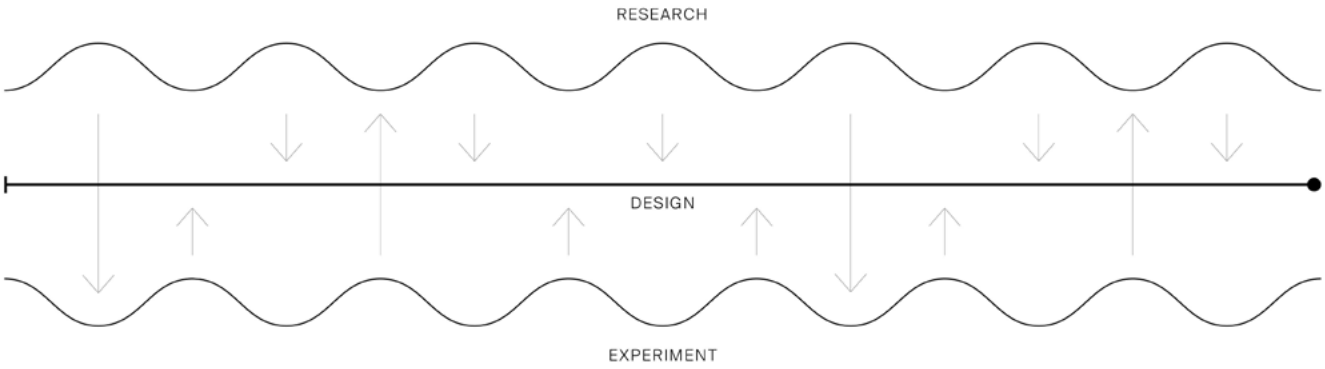


FIGURE 5. Research Synergy: non-linear design driven research

research findings on *makerspaces'* program, space and objects into a spatial intervention to be built in the library (Fig. 4).

As the first case study of this Design Driven Doctorate, the project serves to prove a discursive methodology where there is a continuous back and forth between theory and practice, thinking and doing, words and drawings. Instead of following a linear approach, the research is designed to develop literature review and design premises simultaneously to maximise their synergy (Fig. 5). For example, designing the indoor-outdoor connection of the makerspace will bring the focus to what are the conditions of spatial publicity. Inversely, reading about Spinoza's contributions to architecture leads to discovering designs such as the Fun Palace. The experiments will consist of a three-step testing process: designing, executing and reflecting on the intervention. Ultimately, the Makerlabs experiments will prove by design how the agency of a public building in the public sphere can be activated.

BELGRADE ON SCREENS: BEFORE THE WAR/ BEFORE THE TRUTH (CUT 1)

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Supervisor:
Mona Mahall, HafenCity Universität Hamburg

The project “Belgrade on Screens: Visions of Continuous Discontinuities” explores Belgrade’s urban destructions through (post-)Yugoslav moving images. Cities being self-paced to their built environment, architectural discontinuities refer to disruptions, losses, and traumas caused by wars, inner conflicts, or political decisions. However, while film cutting essentially constructs continuity, filmmakers use discontinuous editing to emphasize emotional response by atypical shot-arrangements. Affecting collective memories, films articulate and manipulate the image of a town and its inhabitants. Therefore, how do cinematic effects and scenography manifest Belgrade’s discontinuities? How do audiovisual media impact our cognitive awareness of a city? Do they produce new interpretations or generate any misconceptions?

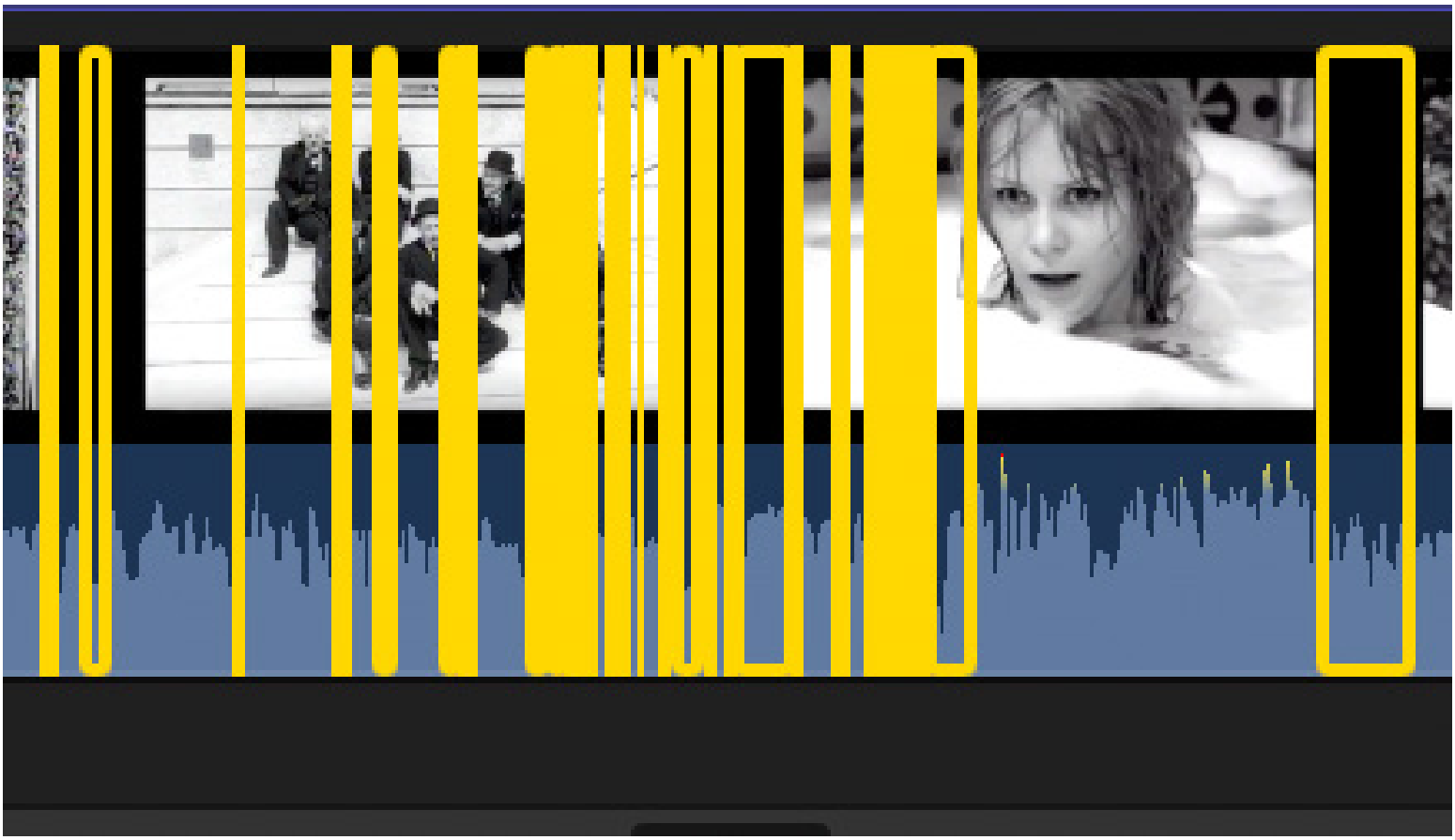

FIGURE 1. Screenshot from the ongoing editing process

Developed with a theoretical background, the first phase is an archival investigation within genres showing decisive historical urban “gaps” in the 20th century. Collected data will be analyzed, before being re-used for the second part of the research as immersive video-collage.

Encouraged to start experimenting with footage as soon as possible, the purpose of “Cut 1” was to test a first fragment or potential results. After isolating all relevant scenes from two selected movies, an early phase implied new compositions through a direct transformation of chosen excerpts in a video editing software program. Both movies being black and white, the color – or lack of it – helped playing with textures and audiovisual repetitions, to provide a natural sense of unity and/or confusion between intersected narratives. Another approach was to

FIGURE 2. Screenshot from the ongoing editing process

gradually differentiate them from each other by a series of effects. Although montage techniques allowed some freedom in the re-use, a set of internal rules has been implemented. These rules can be seen as distant parameters, but they were needed as a basis or starting point.

To the question “Which (dis)continuities are to be disclosed?”, a formal classification of (dis) continuities, divided into neutral subcategories, even multiplied the implicit (dis)continuities. In an early draft, the clips were organized according to their location, the number of characters appearing on the screen, their behavior and physical activity, the movement of the camera, and the sound or dialogue (if relevant). Very quickly, these categories have been reformulated in a more objective manner into 16 cases: day, night, exterior, interior, and for

each of these four settings: crowd, small groups of people, one individual, nobody. The process of arranging the selected clips into these 16 strictly defined cases was similar to the solving of a puzzle in order to recreate an image (or narrative). The only difference from a regular puzzle was that the number of final outcomes was infinite, since the new image/narrative has to be created anew. Finally, the 16 fragments were reformulated again, into 5 chapters: “Same time, different place”; “Same time, same place”; “Different time, different place”; “Similar place, no time”; and “Same places, different times”. The dynamics of the scenes contributed to a larger sense of freedom, many compromises made during the editing, and especially an intuitive method of *assemblage*. The titles were also supposed to be an additional commentary to the “unspoken” or “invisible” layers hidden within the images.

However, the reactions and remarks coming from panelists who were not very familiar with the sociopolitical, historical and cultural contexts of Serbia, strongly contributed to the understanding of the gap in terms of audiences. In that sense, “Cut 1” as the first experiment was a successful test because it completely failed. Not only were the sequences too fast and compact to be engaged with, but their hermetic structure clearly did not provide enough elements to fully understand the implicit messages and connectors. Instead, it assumed some previous knowledge or background from the viewer’s side. This is why it becomes urgent to reconsider the question “For whom are these (dis)continuities to be disclosed anyway, and why?”. Only by finding the target group (location and/or generation) it will be easier to search for the

FIGURE 3. Screenshot from the ongoing editing process

types of (dis)continuities and how to connect them, as well as what types of films to choose in that quest.

Interestingly, during the editing, ethical responsibility towards used footage quickly became detectable, because of the increased amount of manipulation (audiovisual distortions but also changes in the narrative). At some moments, out of respect towards the original *chef d'œuvre*, the temptation of leaving the footage as it was initially intended to be presented, was significantly high. This hesitative approach requestions the nature (genre) of the films and their selection (criteria). For instance, the filmmaker Rakonjac – whose work still remains insufficiently inspected – directed around 20 films, which could all perfectly fit to the topic of this doctoral research. At the other hand, by doing so, the discontinuity of the film spectrum

(ideological standpoints, but also kinds of movies) will be missed.
Moreover, both of these decisions (audience and film selection) fully rely on the individual positioning, which remains unclear because “charged with emotional complexity” as formulated by the observer of the panel.

One key to the previously listed concerns can be the spatial representation of (dis)continuities through “physical” video fragments. It has been advised to now shift from montage to scenography, and use multiple screens as types of devices (television, computer, smartphones) as elements representing (dis)continuous technological tools for media dissemination. By doing so, we might find a more common ground for all kinds of audiences, reflecting on our continuous intimacy with audiovisual material and its accessibility.
Finally, above the actual devices, it might be as well relevant to test 3D modelling or digital projections of the city (mapping, geographical data, renderings).

THE POTENTIAL OF A TECTONIC APPROACH FOR THE EXPERIENTIAL QUALITIES OF ARCHITECTURE

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Ignacio Borrego Gómez-Pallete, Technische Universität Berlin

My Research Project derives directly from my practical work as an architect and is based on a series of Design Build Projects I have realized so far – it is practice based. The field and the topic of the research have not been fully defined at the beginning, they have much more been developed through the observation and analysis of my own work in comparison to others and are still in progress.

Within the research the Design Build Projects form the methodological key point of generating new knowledge. They serve as case studies and are developed and realized regularly throughout the research. But how can this knowledge, that is already existing in the artefact, be excavated – and how can it be made accessible?

FIGURE 1. ALBERTO Pavilion, 2019, Minde, Portugal, Atelier JQTS with Matthias Ballestrem and Students of HCU Hamburg and UAL Lisboa, photos by Joao Barat

With the help of different methods of reflection past and present projects are investigated in order to provide findings for future projects. Two faces of the architectural project are of interest – both seen from a phenomenological point of view:

The Making of the architecture – focusing on the specific design process that starts with a given material – called the Tectonic Approach.
The Experience of the architecture – looking to experiential qualities that are revealed through the observation of bodily interactions with the architecture.

THE MAKING

By looking back to and reflecting on past projects I define particular characteristics of them and try to understand what makes them specific and why. A theoretical framing and a contextual setting helps

FIGURE 2. POVERA Pavilion, 2015, Almada, Portugal, Atelier JQTS and Students from Lisbon, photos by Diana Quintela

to investigate the projects from a defined but not necessarily unmovable point of view. The active involvement in the making of the projects allows the reflection in action in order to review and enhance previously defined assumptions. From the very first sketch until the built project the design process can be characterized as a (physical) conversation with the given materials – like asking the brick what it wants to be. Accordingly, the design process moves constantly back and forth between the rationality of the structural possibilities and the intuition of creative intentions defined by both me as the architect and the material as the driver of expression.

This reflection on and in actions needs a transfer in order to be able to apply the findings to future projects. It aims for comprehensibility through a descriptiveness of the specific design method – named the Tectonic Approach.

FIGURE 3. VERTIGO Pavilion, 2014, Lisbon, Portugal, Atelier JQTS, photos by Diana Quintela

THE EXPERIENCE

The observation of visitors and in particular performers reacting to and interacting with the built projects and its elements uncovers experiential qualities that seem to be inherent in these projects. Through the analysis of and reflection on these actions in relation to the architecture particular characteristics can be named, evaluated and related to theoretical positions such as the phenomenological perception.

These performances can also be seen as a medium of reflection. In their subjective, direct and exposed gestures they can give points of reference for the further investigation of the architectural characteristics that evoke these interactions.
In order to transfer and communicate these characteristics various ways of graphical and model representation are explored.

FIGURE 4. KAIROS Pavilion, 2012, Lisbon Portugal, Atelier JQTS, photos by JQTS

REFORMULATION

Through this iterative process of analysis, reflection and evaluation the research tries to unfold the particular characteristics of a specific design method, name them and investigate their meaning for the relation of Tectonics and the architectural Experience.

By making use of different methods commonly known as methods of architectural design like sketches, photographs, drawings, movies, models, mock ups, constructions, etc. the research tries to find ways of communicating the findings and make them accessible and comprehensible for a bigger community. The research is based on a particular (personal) design approach but seeks for knowledge that can be of common interest.

APPROACHING INDUSTRIAL RUINS IN A POST-COMMUNIST LANDSCAPE. A DESIGN-DRIVEN TRANSFORMATIVE RETHINKING OF INDUSTRIAL HERITAGE IN ROMANIA.

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Technische Universität Berlin

Supervisors:
Ignacio Borrego Gómez-Pallete, Technische Universität Berlin
Jürgen Weidinger, Technische Universität Berlin

REVISED DDDRR STATEMENT

Tackling the research issue – the handling of industrial ruins in a post–communist landscape – through principles anchored in architectural design has proven particularly fruitful. A design–directed approach has enriched the research process by adding another essential layer to the process of generating knowledge: the speculative creative moment, in which intuition and reason interweave, followed by the subsequent interrogation of outcomes through a structured lens.

This practice allowed the uncovering of underlying complex entanglements of issues by means of "tacit knowing"[1] (1), which is intrinsic to architectural

1 Prominski, Martin (2019), "Design Research for Urban Landscapes", Routledge.

design. The basis for this is a “research method collage”[2] (1), anchored primarily in the comparative interrogation of the conflicts that arise between design versus built realities as well as conceptual designs versus complete architectural designs, all tied into an overarching written narrative of personal and shared memory and perception of the post-communist cultural landscape.

Three self-authored design case studies evolve and inform each other simultaneously, in an interplay of design timeframes: Case Study 1 representing a type of “paleoteric knowledge”[3] (2), by which a finalized design project (which employed traditional attitudes towards design) can be interrogated retrospectively, versus the “neoteric knowledge” introduced by the other two Case Studies, which are forward-looking[4] (2), and intrinsically playful and speculative.

Case Study 1 is a full design and execution, Case Study 3 is a conceptual design proposal, and Case Study 2 is a range of design experiments and analyses, which don’t tie into a single full architectural design, as one would hand up for a competition, but are more process, rather than final result oriented. The interplay between these three designs has so far yielded some preliminary conclusions and strategies, and is still a work in progress.

Some modes of design action that are recognizable in all three designs include: clarifying structures,

2 Ibid.
3 Buchanan, Richard (1998), “The Study of Design: Doctoral Education and Research in a New Field of Inquiry”, Doctoral Education in Design, Proceedings of the Ohio Conference.
4 Ibid.

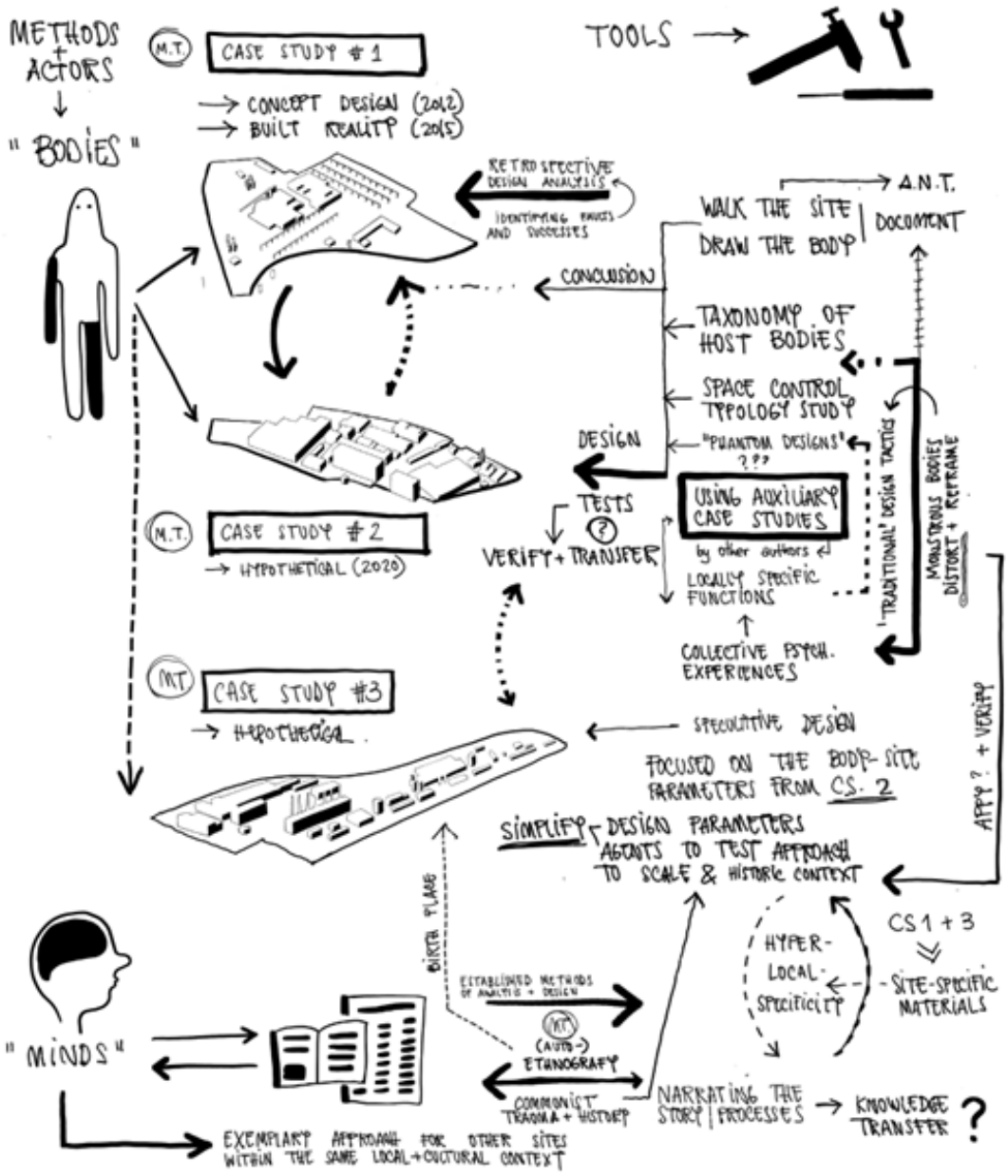

FIGURE 1. interplay of research subject and applied methods

clarifying circulation[5] (3), and design by removal and subtraction focusing on the voids and interstitial spaces.

These conclusions arose with increased clarity after a number of other design strategies (for example additive actions with formal architectural intention) had been tested and had proven either too generic, or unfitting within the cultural context the research operates.

5 Koolhaas, Rem (2014) “Preservation is overtaking us”, GSAAP Transcripts series.

The designs are meant to describe methods of tactical approaches and critical care, rather than illustrate finished models, that would intrinsically be hyper-specific and thus non-transferrable, or too generic, thus contradicting one of the primal objectives of the research: to counteract imitation and artificial grafting of strategies employed elsewhere, onto a hyper-particular site, both cultural and physical.

The argument building in interplay with the socio-cultural inquiries of the research, is that it is precisely this reduced approach to design that is appropriate and viable in the context of Romanian industrial wastelands.

Regarding the design tools used, the predominant use of hand drawings and watercolours is chosen to illustrate the exploration of the imprecise, speculative nature of the surveyed objects and the subsequent design proposals[6] (4). Computer aided design drawings have been consciously excluded from this process, as these will impose a level of precision which might give the impression of a finalized action upon an object that isn't in a constant state of change and decay.

The other method of capturing the intricacies of the sites is filming particular scenes, as this allows a juxtaposition of aural elements, and photography during site visits. Annotated sketches are forming a bridge between the narrative, written component in the research collage and the design drawings mentioned.

6 Pallasmaa, Juhani (1988), "The Thinking Hand", John Wiley & Sons Ltd.

Examination of the three case studies with their vastly different design approaches, currently suggests the most viable course of action is one that proposes doing “barely anything,” or rather more radically, “undoing”[7] (5).

As the success of a design proposal for Case Studies 2 and 3 cannot be verified a posteriori (and while fruition of a hypothetical proposal could be deducted from other similar case studies, these are few and far between in Romania), the epistemological aim had to be reformulated. The research no longer intends to showcase a comprehensive catalogue of interventions strategies of clearly defined transferability, but has shifted its course towards a design-driven procedure that illustrates how conclusions were methodically drawn, in order to cement the relevance of a novel approach to decaying bodies of industrial ruins: not as “urban development assets” but as entities whose ties to a shared past have to be nurtured.

The research is proving to be an ongoing conversation between the designer and the objects designed, focussing on this recursive process rather than on a finished architectural product.

7 Catillo Sanchez, Alejandro (2020), n'UNDO en profundidad, http://vimeo.com/379081205

EMBEDDED MOVEMENT - RESPONSIVE SHAPE-CHANGING SURFACES

Paula van Brummelen
Technische Universität Berlin

Supervisors:
Ignacio Borrego Gómez-Pallete, Ralf Pasel, Technische Universität Berlin;
Christiane Sauer, Technische Universität Berlin in cooperation with Kunsthochschule Berlin Weissensee

The early-stage PhD-Research Embedded Movement explores the potentials of material combination and material interaction for the design of kinetically responsive surface systems. The study consists of two parts. Within the first, the focus lies on the development of methods for reversible motion generation by the precise combination of two materials and their material properties. The second part deals with the careful design of the material behaviour and investigates the influence of responsive material movement on the perception of and the interaction with surfaces. It is planned that the study of plural material combinations will form the basis of my research.

My first and current series of experiments within Embedded Movement explores how surfaces made of Shape Memory Alloy (SMA) and Thermoplastic

Polyurethane (TPU) can be given kinetic potentials. Using 3D printing, the SMA-wires, which shorten when exposed to heat, are placed inside structured shapes made out of TPU. Within this assembly, the TPU, through its material tension, defines the direction of the deformation and forms the reset force. Whereas the wire triggering the shape-change (sensor) and provides the pulling force needed for the movement. The investigation of my two main research areas within this first tested material combination requires different research strategies, whereby design methods, which are used among others in textile-, material-, product- and interaction design, currently prove to be particularly suitable. Indispensable are analog material experiments and artifacts that can be experienced and compared in physical space and with which one can interact directly.

The creation of surface movement through material combinations is only possible by an in-depth exploration of the material properties of the two materials and the following exact assembly to surface structures. Within Embedded Movement, this is made possible through an intensive analog engagement with the materials, CAD/CAM strategies, an iterative workflow and last but not least (in this first series of experiments) due to many years of hands-on experience with shape memory alloys. Series of experiments start with the three-dimensional, CAD-based sketching of a shape with integration potentials for SMA. Through the printing process and the insertion of the SMA, the digital shape becomes an analog one, which can be experienced in its movement. The observation of this material sample allows me to define parameters that influence the deformation.

FIGURE 1. Material Experiments with kinetic functional Potentials, by van Brummelen, Paula (December 2020), casted and 3d printed material experiments with kinetic functional potentials

Repeating this process enables me to understand the physical and geometric principles that influence the shape change. Within this research process movements are not digitally simulated in advance and material forces are not calculated. As a result, this open-ended, explorative approach also leads to unexpected results.

In addition to the direct observation of the findings, video recordings in a strict setting (same view, activation length, etc.) of the results have proven to be an important tool to define the design parameters of the movement. By superimposing video recordings, the samples can be compared exactly in terms of their transformation and the

FIGURE 2. Touch sensitivity. van Brummelen, Paula (March 2021), Touch-sensitivity of a 3d printed material experiment

repeatability of movements as well as the possible movement decrease in case of multiple activation can be tested in this way.

Based on this motion catalog, my second focus lies on the behavior of these materials and surfaces. The question of how the character of a movement and reaction patterns of a surface influence our perception of and the relationship to a surfaces/ material, guides my research. Standing at the very beginning of my doctoral research, it is currently qualitative observations of human-material interaction alternating with physical prototyping that inform my research. Here, in contrast to the first part of the study, attention is shifted from the two states of a shape changing surface to the in-between motion and the design of interaction possibilities.

Of the samples that have been designed so far, the ones that seem most interesting to me in terms of material behavior, perception and interaction are those that seem to be organic in their movement and close to the living. To understand this, I am currently looking at existing transforming surfaces in the animal and plant world. Not in order to copy the found examples and their movement mechanisms directly, but to derive design principles that allow to create analogous movement and interaction possibilities.

REFLEXIVE PRACTICE

Maja Zander Fisker
The Royal Danish Academy

Supervisor:
Henrik Oxvig, The Royal Danish Academy

The PhD project is called *Reflexive Practice – Trans-medial Process and Method in Architectural Education*, and as the title implies a reflected approach to the artistic aspects of the creative process is of great importance. The creation of architecture deploys an array of different media practices, and it is thus an inherently trans-medial practice. This PhD project explores the interactions and transpositions between specific media: text, drawing, photography, film and model.

The investigations are conducted through three different components: a series of experimental inquiries, targeted didactic interventions with students at The Royal Danish Academy, and a theoretical study. The components inform each other, and together they contribute to the production of the project's deliverables: an exhibition, a teaching portfolio and a theory-driven dissertation.

FIGURE 1. Excerpts of the experimental component. SIMULTANEITY – Scapes & Elements. Excerpts from photographic montage, photos by Maja Zander Fisker, 2020

The project investigates how trans-medial practices contribute to operate complex conditions in architectural creation, and how different creative practices inform and challenge each other in the development of architectural core competencies. The assumption is that trans-mediality – the transpositions between different media – plays a seminal role for the articulation and teaching of architectural creation. In accordance with this, the project will provide insight into how this approach to the process can become operational as architectural pedagogy by developing a didactic methodology based on the trans-medial architectural practice.

The work presented at the CA²RE / CA²RE+ conference in Ljubljana departs from the project's experimental component, which progressively develops templates for the didactic interventions. To identify specific medial affordances, the inquiries establish sets of specific media environments, here instantiated as an encounter between different medial articulation through a photographic montage. The exhibited work includes a film and a series of six booklets with selected photographic fragments. It opens a discussion on the relations and deviations between the various modes of expression employed.

This discussion is brought forward and nuanced in and across the different components of the project. As experimental inquiry it unfolds in the systematic production of material articulations, which forms basis for an examination of the relation between the work's artefactual qualities – the work as series of singular events – and its generative potentials in a process – the work as sequential events of

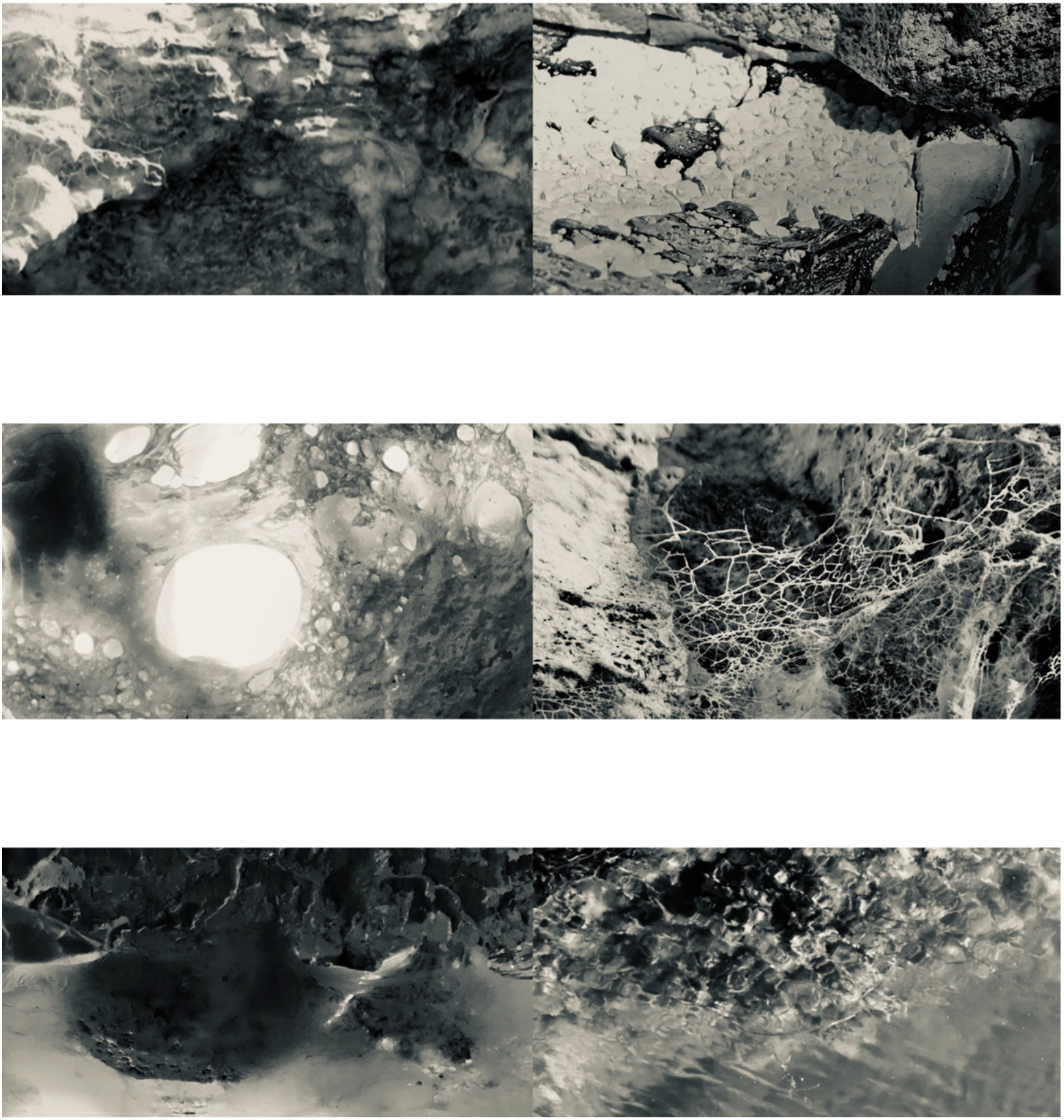

FIGURE 2. Excerpts of the experimental component. SIMULTANEITY – Scapes & Elements. Excerpts from photographic montage, photos by Maja Zander Fisker, 2020

multifarious interpretive possibilities – towards an architectural proposal. Furthermore, attention is drawn to the reciprocal relationships between the formation of meaning in and between the different media and the development of linguistic enunciations in correspondence with the material articulation, as a means to interpretation and denomination of the work.

In a pedagogical context it is essential to accommodate a similar approach to the trans-medial process wherein the various medial modes of expression engage equivalent modes of operation. Through forthcoming teaching interventions, the project provides a methodological discussion of the medial affordances and transpositional consequences. The interventions are organized in workshop formats, focusing on practical exercises in parallel with lecture series on *Aesthetic Practices*, performed by practitioners of different aesthetic disciplines, each providing insight into distinct creative practices. The purpose is to consolidate the discussion and perspective of the students' architectural practice to nuance a continuous reflection on the trans-medial process and the material produced.

Departing from the empirical data produced in the practice-based components, the project examines how the trans-medial practice influences the creator's imagination and creative process on a theoretical level. The theoretical study establishes the conceptual framework and assesses the import of the experimental inquiries and didactic interventions. This component will conceptualize the relationship between trans-mediality and architectural representation and consider the

FIGURE 3. Excerpts of the experimental component. SIMULTANEITY – Scapes & Elements. Excerpts from photographic montage, photos by Maja Zander Fisker, 2020

aesthetic practice as a possible rupture in perceptual social-spatial order, which opens up new spaces. The study thus contributes to create knowledge of creative practices and forms of representations, including e.g. their transitive, communicative properties, as a prerequisite for understanding the aesthetical and ethical implications of the different architectural media and their modes of expression.

Observations

Jacopo Leveratto
Mona Mahall
Claus Peder Pedersen
Maria Topolčanská
Markus Schwai

OBSERVATIONS ON VIKTORIJA BOGDANOVA'S PRESENTATION

Jacopo Leveratto
Politecnico di Milano.

Title:
Places Built by a Character Transforming a Literary Tool into a Design-oriented Perspective Multiplicity

Presenter:
Viktorija Bogdanova, University of Ljubljana

Supervisor:
Tadeja Zupančič, University of Ljubljana
Paul O Robinson, University of Ljubljana

Panel Members:
Lidia Gasperoni, Institute of Architecture, Technische Universität Berlin
Claus Peder Pedersen, Aarhus School of Architecture; EAAE, ELIA
Esther Venrooij, LUCA School of Arts

Topic: The exhibition and presentation focused on the re-formulation of the characterization experiences of the candidate's design practice in the past few years, **involving architectural designs, art therapy experiments, and a consistent mass of elaborations emerging from daily deliberate practice in poem-drawing.** The presentation tried to trace a link among different modes of characterization, emerging from both hypothetical projects and interviews with real personalities, which communicate between each other in an elusive way.

Presentation: The candidate started with an experiment for the audience, a sort of exercise of visualization. The presentation stopped once because of technical problems, but the candidate was able to manage the situation. The presentation went on fluently through a remarkable interplay between physical exhibition and online presentation.

First round: **The first panelist asked a precise question on the entanglement among the different modes of characterization, concerning how the space in-between the interpretative drawings, but also the memories activated by them, and the architectural ones was.** Or, in other words, how the transition between the two dimensions could be represented both in terms of consistence and process. The candidate answered in an articulated way about the impossibility of tracing a clear border.

The second panelist made a remark about the drawings, which, in her opinion, are very architecturally oriented, whereas they seem less interested to people, even when the character is the protagonist of the drawing. She also asked whether the candidate considered drawing from others (the characters themselves) to be included in the collection, in order to compare the different interpretations. The candidate replied by making clear her process of interpretation and the possibility of transfer.

A last remark was made by the chair of the session, concerning the idea of possibly reformulating the candidate's work as a sort of ethnography, or better, the definition of an ethnographic tool, but there was no time to deepen the topic in detail.

Observation: **The candidate showed a strong awareness of the conference's topic, as reformulation was very well and explicitly tackled during the presentation, by means of different tools and media, including exercises, sketches, drawings, architectural projects, and a website project**. The presentation also

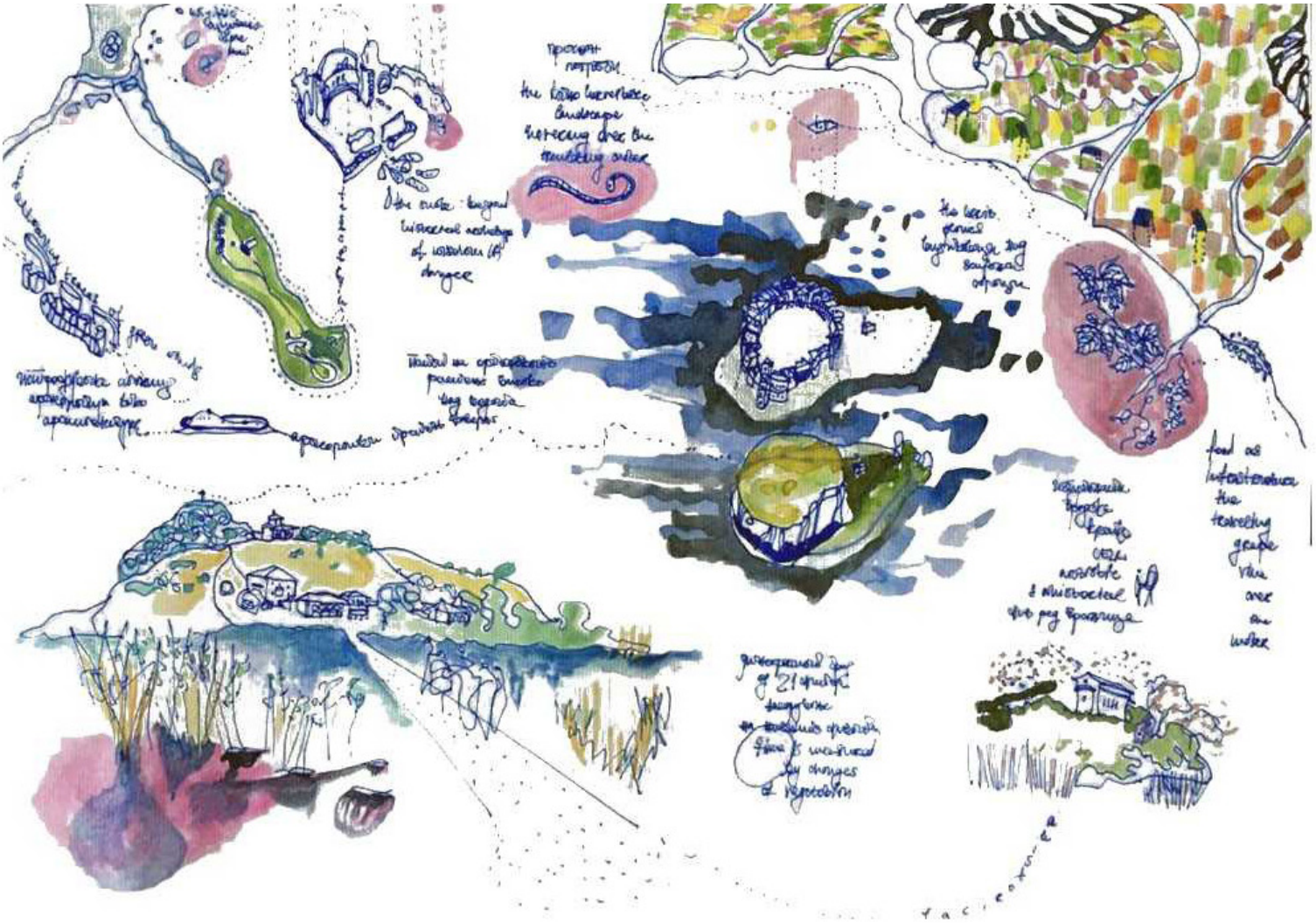

FIGURE 1. The Taste of Ruin: Reconstructing the Narratives of the Snake Island in Lake Prespa, illustration by Viktorija Bogdanova

included the personal outcomes of the workshop of the previous day, thus helping the candidate further clarify the terms at play. The discussion then focused on the different attempts, conducted by the panelists, to encourage the candidate to reformulate her work, or the way in which different characters of her work were entangled, from both a disciplinary and an interdisciplinary standpoint.

OBSERVATIONS ON ROSE-ANN MISHIO'S PRESENTATION

Mona Mahall
Hafencity University Hamburg

Title:
Healing Homes A Search for a Future Home that Fosters Wholistic Wellbeing

Presenter:
Rose-Ann Mishio, Politecnico di Milano

Supervisors:
Alessandro Rocca, Jacopo Leveratto, Marco Bovati, Politecnico di Milano

Panel Members:
Débora Domingo Calabuig, EAAE; Faculty of Architecture, Technical University of València
Maria Topolčanská, ELIA; Akademie výtvarných umění v Praze
Nela Milić, Design School, London College of Communication, University of the Arts London

Rose-Ann established her research on the pronounced aim to reformulate a radically inclusive architecture of health and well-being. Therefore, she introduced a general (even universalist) understanding of "holistic" well-being, deduced from mostly sociological sources and including aspects of physical, social, mental, and emotional health. **While her research was reductive in itself (neither historicizing nor critiquing the concept of health in modernity as a mechanism of exclusion) she could so far not reformulate a design driven approach.** Concerning her idea of a checklist of abstract qualities that architects could follow to achieve "healing homes," the panelists advised her to return to the analysis of particular design cases, to question the notion of

health used as a concept of every architecture, to introduce geo-cultural differentiation, and to contextualize her research at a particular location. **Thus, they actively encouraged Rose-Ann to move on in the direction of a situated design driven approach that might be able reformulate a particular architecture of health as well as its design process.**

OBSERVATIONS ON WIKTOR SKRZYPCZAK'S PRESENTATION

Claus Peder Pedersen
Aarhus School of Architecture; EAAE, ELIA

Title:
Systemising Spatial Affects. In the Search of the Ontolotical Class Encompassing the Experiences of Movement and Architectural Space

Presenter:
Wiktor Skrzypczak, HafenCity University Hamburg

Supervisor:
Matthias Ballestrem, HafenCity University Hamburg

Panel Members:
Jacopo Leveratto, Politecnico di Milano.Tadeja Zupančič, Faculty of Architecture, University of Ljubljana
Anđelka Bnin-Bninski, Faculty of Architecture, University of Belgrade; ARENA

The candidate presented his research as a reformulation of previous engagements with his topic. Previous research explorations focused on bodily engagement (movement, possibly also dance?) to acquire spatial knowledge to inform architectural design. This approach had been substantially reformulated for this presentation. The interest in how embodiment can support spatial awareness and architectural design remained but was explored through student design exercises. The students had been asked to make a composition with wooden elements expressing balance/unbalance and extension/contraction. The students were asked to do the exercise twice before and after a (not described) re-embodiment exercise. Externals graded the quality of the

PRESSURE ?			Gothic: the dissolution of the whole building into functioning members - seeking to feel every muscle in own body (Ibid. 177)	Greeks: Delight in the vertical force encountering the resistance, the action of the mass (Ibid. 177)
		The transfer of others' rhythm of breathing to us (Ibid. 156)	The elegant, forceful, slim, unstable, restless, eternal expression of the increasing height (Ibid. 168)	The ungainly, compacted and then the free, relaxed and dissipated expression of the increasing width (Ibid. 169)
External moment of form: limitating, demarcating the space (Ibid. 162 cf. F. Vischer)	Harmonising the respiration with narrow or expansive space (Ibid. 155)	**EXPANDING vs. COMPRESSING**	The mean proportion of the form and its aberration experienced as expansion or contraction (Ibid. 171)	Pulling ourselves together in a serious posture vs. attaining a comfortable extension, a comfortable relaxation. (Ibid. 169)
Vastness: impossibility of relating, the sublime, weakening limbs, fear (Ibid. 157)	The relation of narrow and wide proportions to the rate and depth of breathing (Ibid. 169)	Breathing as the organ of expression. Seeing someone suffocating (Ibid. 156)	Carrying, resisting, collapsing, spreading out (Ibid. 151)	**ASCENDING vs. DESCENDING**
Relaxing the strict regularity for a cheerful expression (Ibid. 174)	Intellectual, geometric lawfulness vs. physical, lived regularity, as in the gait sequence or breath (Ibid. 163)	Proportion as a qualitative progression from bottom to top, a refinement vs. a numerical proportion (Ibid. 165)	Mere gravity and rigidity vs. living, upward striving (the will of the form) (Ibid. 159-160, cf. Schopenhauer)	Formative force from within the architectural creation; the self-determination (Ibid. 161)
Pure form: necessary variety vs. chance (Ibid. 167)	**REPEATING vs. COPYING**	Instant satisfaction by the apparent self-determination of numerical proportions vs. the expressive value of mechanical proportion (Ibid. 167)	the vital feeling of architectural form and the physical state it induces in us (Ibid. 154)	Expecting in everything the conditions of our own well-being (Ibid. 152)
The emphasis within the rhythm. The light, gliding and cheerful expression of the 3/4 rhythm vs. strictness of 4/4 (Ibid. 174)	The lack of restraint in non-harmonious rhythms (Ibid. 175)		bodily emotion in considering architectural work (Ibid. 154)	Expression of a mood as a physical manifestation of a mental process, extending into whole organism (Ibid. 155)
Seeing orthogonal and diagonal lines (Ibid. 150, cf. Wundt)	**TRACING THE LINES**	Short and long ondulations, the impression of their speed and their effect on the breathing (Ibid. 170)	Willessness, the loss of self-awareness as the condition for creating and enjoying a work of art (Ibid. 157)	**META-PRACTICE**
Experiencing wavy and zigzag lines (Ibid. 150)	The analogy of line and temperature, warm wood cut, cold steel engraving (Ibid. 158)	The analogy of line and sound, short wave of a high register vibrato, the straight line of stillness (Ibid. 159)	Individuals can create successfully only by immersing themselves in the universal (Ibid. 184)	One can work exactly only when it ispossible to capture the stream of phenomena in fixed forms. (Ibid. 184)
Visual tracing the outline of things (Ibid. 153, cf. Volkelt)		The quiet simplicity of antique architecture (Ibid. 159)	Self-assertion, preventing of giving-in to the impression (Ibid. 156)	Children abandoning themselves to every strong impression, forgetting oneself (Ibid. 155)

FIGURE 1. Preliminary coding and categorising of movement practices in empathy theory. Analysis of “Prolegomena zu einer Psychologie der Architektur” (Wölfflin 1886), by Wiktor Skrzypczak

Architectural composition: the self-purpose of the members and their detachment from the undifferentiated mass (Ibid. 161)	Harmonious form: articulated, not amassed. (Ibid. 166)	Harmonious form: the unity of the purpose of its parts, nothing is missing, nothing is too much. (Ibid. 166)	The free, light and happy effect of the independence of the limbs from the central body. (Ibid. 172)	The dependence and subordination expressed by the limbs hold closely by the body (Ibid. 172)
Stimulated by powerful, carrying columns (Ibid. 154)	The bulky, heavy, contented, plain, good-natured and stupid expression of the square (Ibid. 168)	**ARTICULATING vs. AMASSING**	Architectural creation: evolving, articulating, differentiating (Ibid. 161)	
TENSING vs. RELAXLING	Cheerful, quiet and content expression of the round arch vs. effortful and restless pointed arch (Ibid. 177)	Quiet surfaces vs. decoration demanding of each muscle a pulsating life (Ibid. 182)	Niches and plasters of a wall enlivening it and expressing disquiet (Ibid. 182)	The vertical articulation of openings and their increase in size; from unbroken and massive expression to refined (Ibid. 175)
Looking at the golden ratio: vacillating between the repose and ascent (Ibid. 168)	What does roundness want? Nobody knows. (Ibid. 183)	**THE EXCESSIVE FORCE**	Suspended ornaments - rings, hangings, bands adorning the finished form. (Ibid. 181)	Ornament as an expression of excessive force of form, blossoming of the form that has nothing more to achieve (Ibid. 179, 181)
The force of form that holds us upright and prevents from the formless collapse (Ibid. 159)	Asymmetry perceived as an accidental assemblage of parts rather than organic combination; cheerful vs. serious (Ibid. 173)	Asymmetry as imbalance, movement and excitement. (Ibid. 173)	The anxious unrest of something that cannot achieve a stable form (Ibid. 173)	
VITALITY	The comfort of finding symmetry in every structural body (Ibid. 164)	**BALANCING**	Disagreeable condition induced by looking at something unbalanced (Ibid. 155)	The inorganic expression of bipartition splitting the form apart in the center. (Ibid. 172)
The sympathetic affection of internal organs and respiration (Ibid. 156)	Attributing the expressive value of the eyes and face to the windows and cornices (Ibid. 176)	Asymmetry as missing limb, injury, pain (Ibid. 155)	Perceiving the forced symmetry of a cup (Ibid. 164)	The impact of the imbalance on the posture and the regularity of breathing and circulation (Ibid. 173)
Measuring the perfection of architecture by the same criteria we apply to living organisms. (Ibid. 162)	Sharp pain of looking at an operation (Ibid. 156)		**REACTING TO LIGHT AND COLOUR**	The pleasant light intensity (Ibid. 151)
Blindfold sensing of the room, its direct bodily feeling (Ibid. 155, cf. Goethe)	**MIMICKING, IMITATING**	Hearing horace voice and reassuring the own voice clarity (Ibid. 156)	The analogy of dark colours and low tones, their common emotional tone (Ibid. 158)	The analogy of colours and lines, red zigzag, blue wave (Ibid. 158)
Wall without opening appearing as blind, trapped in the insensitivity (Ibid. 176)	Reflecting the expressive movement of the face in the whole body. Rising the brows and rising the shoulders. (Ibid. 177)	Imitating the expression, experiencing the emotion (Ibid. 155)	Being filled with cheerfulness, the sense of well-being by a light-filled portico (Ibid. 157)	

CA^{2}RE+

resulting compositions to investigate whether the embodiment exercise had improved the quality of the outcome. The gradings were inconclusive in demonstrating that the re-embodiment training improved the compositions. **The candidate argued for this research approach by stating an interest in systematising embodied knowledge through quantitative data. He aimed to address a gap between theories of embodiment and the practical application of embodied knowledge in architectural design. In the perspective of design-driven research, the candidate appeared to have reformulated his position from being directly engaged in the embodiment. Instead, he explored a position where he is designing a setup that enables students to explore design by using embodiment and provides the candidate with input in the form of the student's compositions and the data of the external assessors.**

The panel challenged the experimental setup in various ways. **They questioned the lacking discussion of the goals of the exercise and the definition of the notion of quality. There was a discussion of the relevance of including particular experiences and design outcomes in DDDr.** This could be an alternative to establishing generalised or objective data often associated with research (and which the candidate aspired to arrive at. There was also a substantial discussion of the translation or reformulation taking place in the design exercise. The panel questioned the act of reformulating an embodied experience into an (almost) two-dimensional composition. They wondered how and in what way this translational act could represent the bodily experience. They

also questioned how the compositions could be translated into architectural designs addressing the complexities of the program and spatial relations while being based on the translated bodily experiences. One panel member suggested looking at choreographic notations aimed at directing bodily movements in space through notation as an alternative to the planar representation of an embodied experiences. One panel member engaged more positively in the design experiment but suggested breaking it down into more incremental steps and provide more reflection and explanation about the steps being taken.

OBSERVATIONS ON ALBERTO PETRACCHIN'S PRESENTATION

Maria Topolčanská
Akademie výtvarných umění v Praze; ELIA

Title:
Ark Architecture. Space Suspension Strategies

Presenter:
Alberto Petracchin, Politecnico di Milano

Supervisors:
Sara Marini, Alessandro Rocca, Politecnico di Milano

Panel Members:
Mona Mahall, HafenCity University Hamburg
Florian Dombois, ELIA; Zurich University of the Arts
Graça Correia, Universidade Lusófona do Porto

Alberto Petracchin´s performance at the conference was excellent in a quest to formulate his research via consistent visual arguments, An archive of or/and a history of Ark Architecture.

The theorem is missing or stays invisible still – what is it that Alberto is asking (us to see, to understand)? **Reformulation is an exercise to be done more on the level of primary motivation behind this captivating research**. What Ark Architecture, if made visible and formulated, changes?

Also, it can be nothing, would the answer be: Ark Architecture is a concept of delusion not expectation. But is it?

From the perspective of design driven research, there is a very legible and clear design protocol already inscribed in the research work: the Ark

strategy (3 parts strategy: before flood – the flood / next future – the end of flood/ humanity?) is possibly a kind of designed protocol too. Is it?

With all that was exposed to the panel as images and narrative, there is a big source of (purposeful) ambiguity what is Ark in Ark Architecture? Is it a noun? An object of research as an ancient figure and archetype researched in the contemporary field? Or is it an adjective? A quality, an attribute through which architecture as the object of research can be approached vis-a-vis past, contemporary and future floods or ends? It also can be a verb! An invitation to Ark Architecture! Is it?

OBSERVATIONS ON VALERIA WIENDL AND SILVIA ALVES'S PRESENTATION

Markus Schwai
Department of Architecture and Planning, Faculty of Architecture and Design, NTNU Trondheim

Title:
School Patios The Influence of Architecture on Childhood Development; The Concept of the Third Teacher / Vila Nove de Gaia

Presenter:
Valeria Wiendl, Universidade Lusófona do Porto
Silvia Alves, Universidade Lusófona do Porto

Supervisor:
Edite Rosa, Universidade Lusófona do Porto

Panel Members:
Ilaria Valente, European Association for Architectural Education
Johan Van Den Berghe, Faculty of Architecture, KU Leuven
Margitta Buchert, Faculty of Architecture and Landscape, Leibniz Universität Hannover

In a hybrid situation of the conference, here both the candidate and the panel were online, which guaranteed a equal access to the "discussion space". Some technical problems in the beginning highlighted the necessity to trial before, to make maximum use of the presentation.

The candidate started by asking the audience two questions regarding their perception of the school space as children and as professional. I think it was not given enough space/time to let the audience/ panel reflect upon these two questions. Also, the sum-up at the end left it understandable what the questions could have led to.

In the discussion of the work the main re-formulation discussion was in the field of investigation and representation methods. Where Photography was considered an appropriate

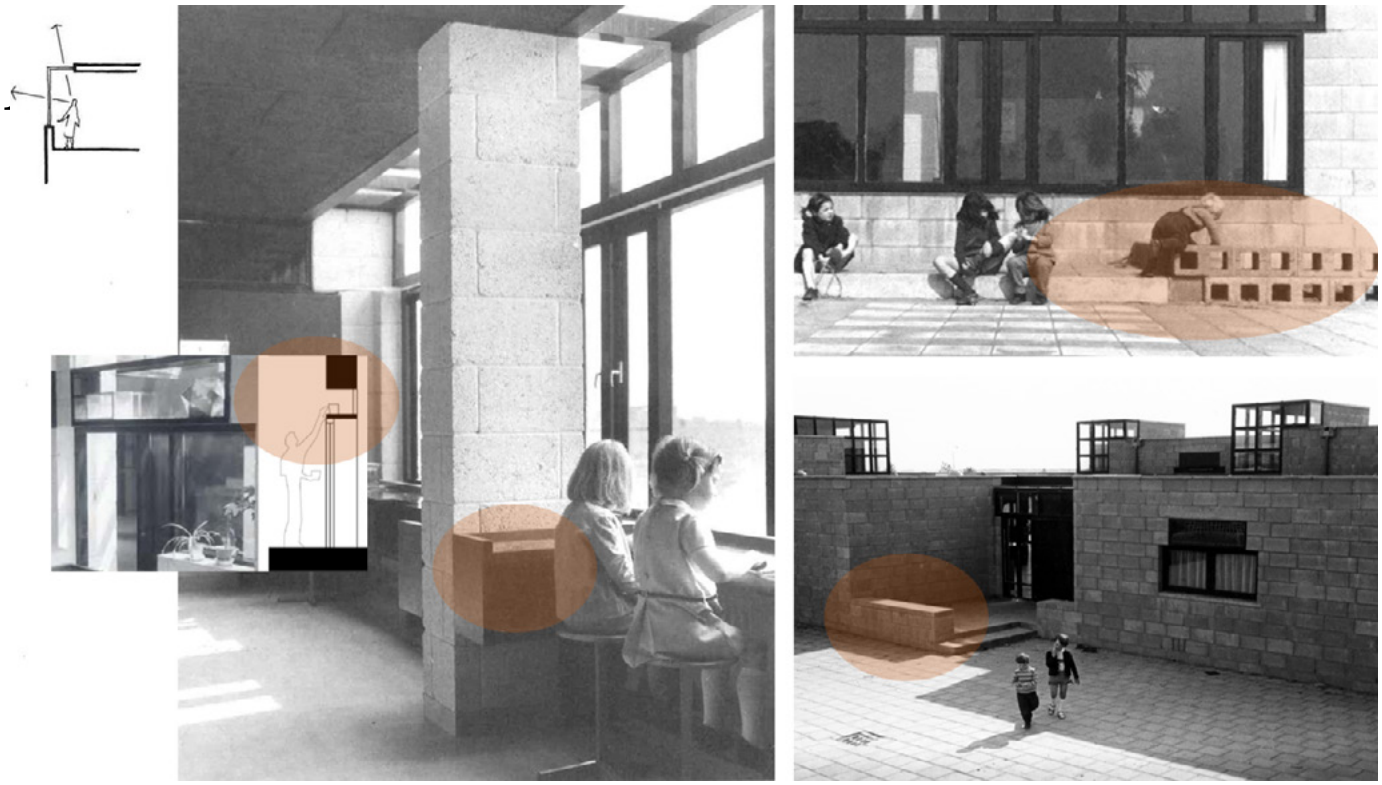

FIGURE 1. Montessori School, Delft (1960), Herman Hertzberger, presentation slide by Valeria Wiendl and Silvia Alves

way to go. The panel helped the candidate to imagine different ways of how to use this tool. **The second was the reformulation of the actual space to research**. Whereas the majority of the shown examples and situations dealt with the outdoor space in educational environment, a special attention was drawn to the connection between inside and outside and also between the school space and the urban setting it is in.

Also, the relation between the stakeholders here, teachers...teacher/parents – peers – environment was highlighted as an important area to be included.

A reformulation reflection from the observer is if not the, rather traditionally approach of best-case studies of these spaces (Hertzberger, ...), which should lead to good school spaces now, one

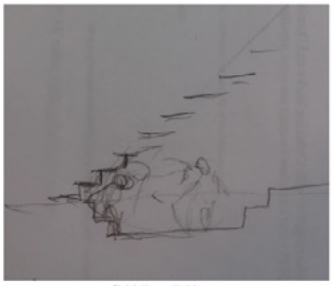

FIGURE 2. Montessori School, Delft (1960), Herman Hertzberger, presentation slide by Valeria Wiendl and Silvia Alves

could have used other? Co-design for example. Methodologically the use of photography could be reformulated by analyzing the spaces/pictures regarding a set of (to be developed) variables drawing conclusions therefrom, rather than only showcasing them.

Delft

A Glimpse into the CA²RE+ Delft Conference

Roberto Cavallo
Faculty of Architecture and the Built Environment, TU Delft; EAAE, ARENA

The CA²RE+ project is strengthening a great community of scholars working on Design Driven Research, spreading the interest to other colleagues and institutions through its main carrier, the conference series. The event in Delft addressed the topic of RECOMMENDATION for Design Driven Doctoral research (DDDr). The theme builds on the topics explored at the previous CA²RE+ conferences: OBSERVATION and SHARING (STRATEGIES), COMPARISON and REFLECTION (EXPERIENCES), and REFORMULATION. Both REFORMULATION and RECOMMENDATION constitute the third phase of the project named FRAMEWORK, which is also the overall purpose of this book. For this conference, the stage was the Faculty of Architecture & the Built Environment, Delft University of Technology, one of the largest architecture faculties in Europe. The multidisciplinary character of the academic community in Delft, covering various fields of expertise, provided an outstanding platform to interplay with the diversity of themes and facets involved with design-driven doctoral research.

As in the other CA²RE / CA²RE+ conferences, the main axis of the event is formed by the panel sessions. Here takes place the exchange between local PhD researchers and DDDr researchers' experience. The discussions on each specific DDDr learning/supervision presentation are enriched by findings and perspectives brought forward by panel members as well as other views coming from other attending participants. Furthermore, the conference included four keynote lectures, one of which was in collaboration with The Berlage, a talking / walking tour in the city of Delft, and two workshops, at the

FIGURE 1. Workshop 1, presentation by Fabrizia Berlingieri and Enrico Miglietta

start and the end of the event. For a full insight into the program, please look at the conference website (https://delft.ca2re.eu/).
The following questions provided the thematic frame for Delft's event. Which approaches, tools, techniques, methods, testbeds, and principles are established and can be recognized as common ground across the CA²RE+ institutions? Can the diversity in DDDr be made consistent in a common frame? In which ways DDDr can be distinguished from other doctoral research practices? Where do we see resemblances and overlaps to other disciplines and research practices?

Taking into account these questions and looking back at the various experiences, discussions,

FIGURE 2. Presentation by Hinnerk Utermann

and matters that came about during the CA²RE+ project, the Delft's conference has been set up to scrutinize the results achieved so far, striving to draw up guidelines and recommendations for the establishment, introduction, development, and evaluation of DDDr. To actively elaborate on the findings of the entire CA²RE+ network, the starting workshop of Delft's conference provided the stage and the opportunity for the partner universities to illustrate their positions and bring them into the debate. More specifically, for each CA²RE+ institution, we asked the responsible tutor and one doctoral candidate involved in the CA²RE+ network to present and discuss their views on DDDr with a special focus on recommendations. Some of these positions were intelligible in the

work of certain doctoral candidates and have been the subject of debate during the concluding workshop on the last day of the conference.

Next to keeping the emphasis on the lessons learned through the views within the CA²RE+ community about DDDr, the CA²RE+ Delft has been a very fruitful encounter, for the forty-five doctoral candidates presenting their research as well as for the other participants, whether online or face to face. This book contains a selection of the participants' contributions to the Delft event, mainly their written statements on design driven research. In terms of atmosphere and vibe, but also content wise, the conference in Delft has been a special experience. Many attendees were passionate and delighted during and after Delft's event. Hopefully, will this resonate positively for the continuation of the CA²RE / CA²RE+ project and the further enhancement of DDDr.

Selected fellow presentations

Nina Bačun
Đorđe Bulajić
Mariacristina D’Oria
Gianluca Croce
Marta Fernández Guardado
Teresa Cunha Ferreira
Claudia Mainardi
Enrico Miglietta
Marie Porrez
Taufan ter Weel
Maureen Selina Laverty
Hinnerk Utermann

MOVING IMAGES AS A DESIGN METHOD

Nina Bačun
Faculty of Architecture, University of Zagreb

Supervisor:
Mia Roth Čerina, University of Zagreb

Within the broader method list, “Spatial narratives in film” research explores and emphasises on heterogeneous and polyfocal montage perception. Observing montage in various ways, not only as a creative process of making a composition whole, but (re)introducing montage as a meaningful instrument for exploring space. By combining “montage of montage” with linguistic montage, narrative montage and acoustic montage, one is able to reconstruct “spatial memory”. Exploring through – and in – the medium of film, moving images are used as a tool, and as a research method through which one can confirm or disprove an initial hypothesis. This approach, at the same time combines the method of intuition and observation, synthesising them in counter forms and manifestations. Alongside a practice-based method of exploring montage practices, “spatial narratives” and the “instrumental

role of architectural space in film," the main idea becomes to question if the use of (de)contextualised cinematic techniques can lead to novel readings of architectural space. Through the process of making, writing, reflecting and critically evaluating the work, one is contributing to a new method of spatial research. Additionally, the aim of the research is the development of new tools for reading architecture. By using fragments from the New Yugoslav Film one is able to explore the various roles of cinematic architecture and landscape in film narration. The presentation will outline a research method that utilises the film essay "Bonding Humanity (Perhaps Manifesto)" as an instrument for discursive practice.

Reflecting on the experience of *CA²RE+ Delft* has reminded me how important it is to reinvent the creative process by unlearning, encountering other approaches and seeing research as an "incubator". I was able to rethink what role(s) does design take in my research? Moreover, it made me question the collective dimension of research. How to find balance between subjective and collective? How can the use of individual experience become a tool for reaching the collective? In particular, if moving images can complement or suppress other moving images, can they then liberate (de)contextualised cinematic techniques that can lead to new perspectives on cinematic spaces? Following rules, even the trivial ones, be they structural and surreal at the same time, can lead to the method. However, this "method" can be dreadful for the creative process and explorer's intuition, thus one needs to take a good care of how to approach it. By learning how and in which moment of the process to forget "method," it made me realize the terms of openness and vigor, and how distinct they should appear in different stages of research.

FIGURE 1. Stills from the Essay film 'Bonding Humanity (Perhaps Manifesto)', directed by Nina Bačun, https://mubi.com/fr/films/bonding-humanity-perhaps-manifesto

MONTAGE DRIVEN RESEARCH STRATEGIES: THE CONSOLIDATION OF GENERATIVE, SYSTEMATIC AND ANALYTICAL

Đorđe Bulajić
University of Belgrade

The relationship between design and research is a lively debate in our discipline. Ever since the first issue of the Journal of Architectural Education (JAE) from 1947, this complex but extremely significant relationship has been increasingly questioned. This debate is also hardly unique to architecture, as Groat and Wang underline: “Some of the very same discursive positions are found in many other creative or professional fields, including the visual arts, product design, business and consultancy, planning, landscape architecture, and urban design, among others.”[1] However, even after a broad array of studies undertaken by various scholars, researchers and practitioners, we are repeatedly trying to explain and properly understand this

1 Linda N. Groat and David Wang (2013), “Architectural Research Methods”, Second Edition, New Jersey, John Wiley & Sons, 24.

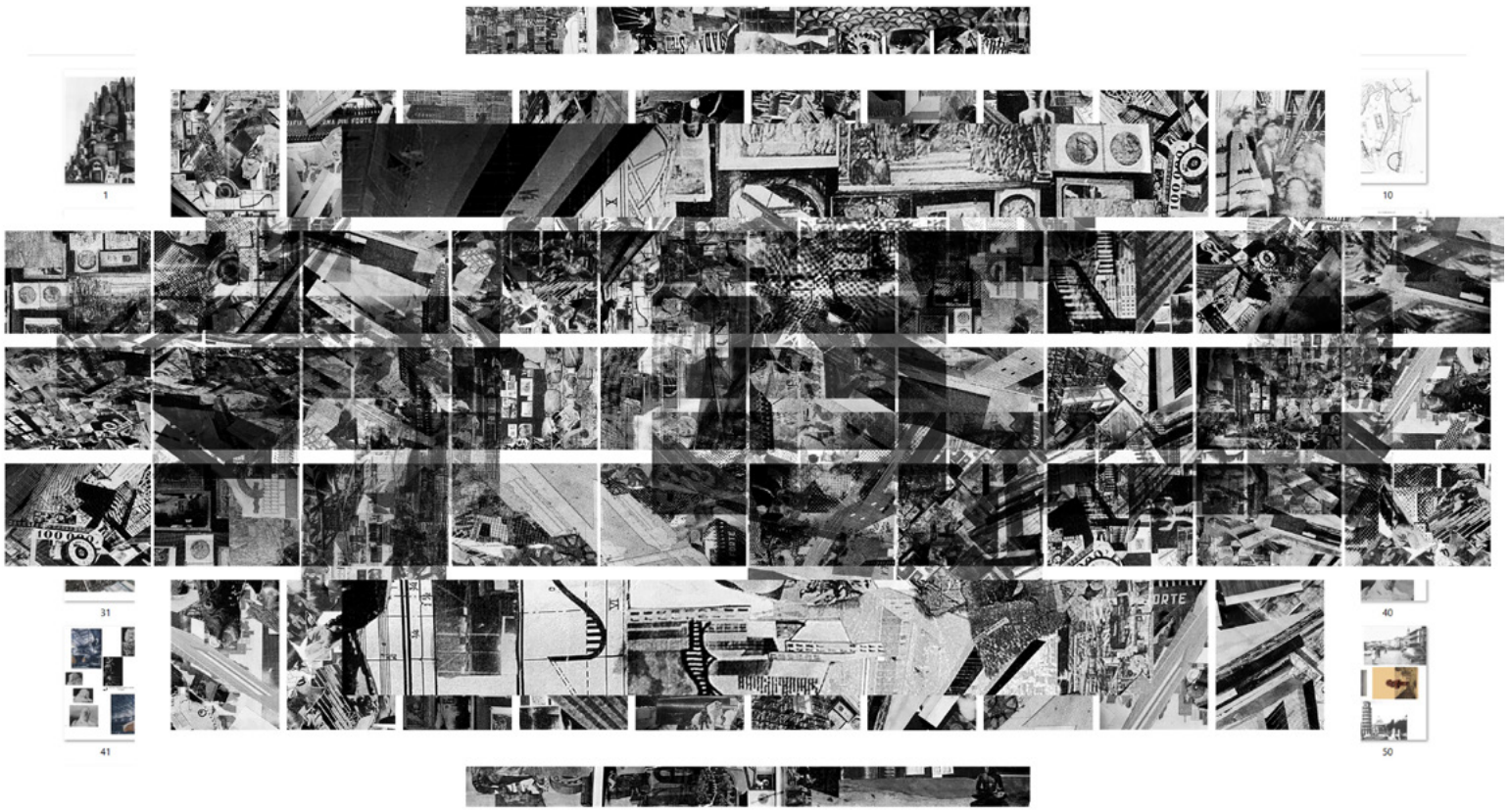

FIGURE 1. Image Representing the Outcomes of First Four Phases of the Research (The Atlas of the Research, Photomontage, Zooming and Framing, Cinematic Montage)

intricate relation. I take the stand that architectural design and research are mutually complementary, hence there is no architectural research without design, and there is no architectural design without research. Nevertheless, this does not mean that every process of architectural design is *a priori* research, to the same degree as not every research within the architectural discipline can be considered as architectural design. The two activities are not equivalent, they are fundamentally distinct, but they embody many complementary and overlapping qualities. I believe this exciting relationship is a focal point of contemporary architectural research, and in a wider perspective, it will substantially affect the path in which our discipline is developing.

FIGURE 2. Image Representing the Outcomes of Last Three Phases of the Research (Hand-colouring / Over-painting, Collage, Montage)

At the *CA²RE / CA²RE+ DELFT: RECOMMENDATION* conference, I presented a part of my research titled *Composing Images: Architectural Montage as Design-Driven Research Tool.* As the title suggests, this research project aims to thoroughly investigate the capacities of architectural montage in the design-driven research framework. The reason for this research derives from the fact that in architectural history and historiography, architectural montage has been mostly perceived as a purely representational technique, neglecting its other enormous potentials. However, with the development of the design-driven research framework, which focuses on the research strategies that are based on design procedures, montage potentially gained another, extremely

important role. Therefore, the main hypothesis of the research is that architectural montage is not merely a representational technique, it is rather a research tool that is able to produce new meanings and new knowledge within the architectural discipline.

As a starting point of the research project, an artistic design-driven research experiment was conducted through seven interdisciplinary phases. All seven phases of this experiment, which all together form a research methodology, included design procedures that were done by hand. Moreover, the whole design-driven research process was uncertain, non-linear, highly intuitive and empirical in nature. It consisted of very distinct operations, from collecting different types of images and constructing the digital atlas of the research, to selecting and hand-colouring images with a brush and watercolours. However, the core element of this process was architectural montage. As montage was present in various forms in all seven phases of the research, it emerged as a comprehensive layer of the whole experiment. Montage was not only employed as a main compositional and logical principle in design procedures, rather the combination and juxtaposition of elements was also used to deliver answers in the same way as any classical analytical method would. Therefore, architectural montage was applied as both design and research technique in the creative process.

The implementation of design into research strategies brings architects back to the familiar territory. We are given a chance to use skills and abilities that we have finely developed through

our architectural education and training. Design-driven research teaches us how to value design thinking and design methodology as research and represents the combination of intuition and science, as Kieran underlines: “Research brings science to our art [. . .]. To move the art of architecture forward, however, we need to supplement intuition with science.”[2] As architectural montage is mainly a design technique, meaning it aims to “change existing situations into preferred ones”[3], this research showed how highly intuitive generative processes can consolidate with both analytical and systematic ones within the research undertaken in the architectural discipline.

2 Stephen Kieran (2007), “Research in Design: Planning Doing Monitoring Learning”, Journal of Architectural Education (61) 1, 31.
3 Herbert Simon (1996), “The Sciences of the Artificial”, 3rd ed., Cambridge, MA: MIT Press.

TIME-CAPSULE TRANSCRIPTS
AN EXPERIMENTAL TAXONOMY OF FORMS AS A VEHICLE FOR A DESIGN OPERATION

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University of Trieste

Supervisor:
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Mariacristina D'Oria
University of Trieste

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The project for an architectural time-capsule was born in 2019 from a common interest of three doctoral students concerning the themes of time, crisis, and catastrophe. What was initially felt as an idea sui generis ended up being an extremely pertinent reflection of our contemporaneity, above all due to the appearance of new and more dramatic events such as the pandemic and the war in Ukraine, bringing out the awareness of the need to preserve our existence traces, away from their probable disappearance: hence the need to question ourselves on how to address this issue in architectural terms.

Our research aims thus to investigate the concept of the “time-capsule” in its most disparate forms: protection, conservation, communication, and spatial configurations; we have found recurring features that only apparently seem random.

The construction of a genealogy that brings together disparate objects in time and space – from the monumental tombs of antiquity to the nuclear deposits of the modern era – intends to demonstrate how different functional needs resort to the use of the same formal configurations. Furthermore, this genealogy lends itself to being a useful repertoire for constructing time capsules of our contemporaneity which are, in their conception and architectural definition, “time-capsules of the time-capsules of history”.

The taxonomy of time-capsules traces an inhomogeneous and disconnected set of architectures with different purposes and functions but that share, at the same time, some common formal aspects about the characteristics of preserving their content and communicating their very existence. Six categories emerged from this set of objects: the proper time-capsules, the burial, the archive, the bunker, the spaceship, and the nuclear waste deposit.

The analysis conducted through the formal synthesis of the selected structures and objects shows how each time-capsule presents itself with an easily recognizable configuration, often in the shape of a simple monolith: the container also performs the function of a distinguishable symbolic element that conveys the message.

The operation of critical reading, evaluation,

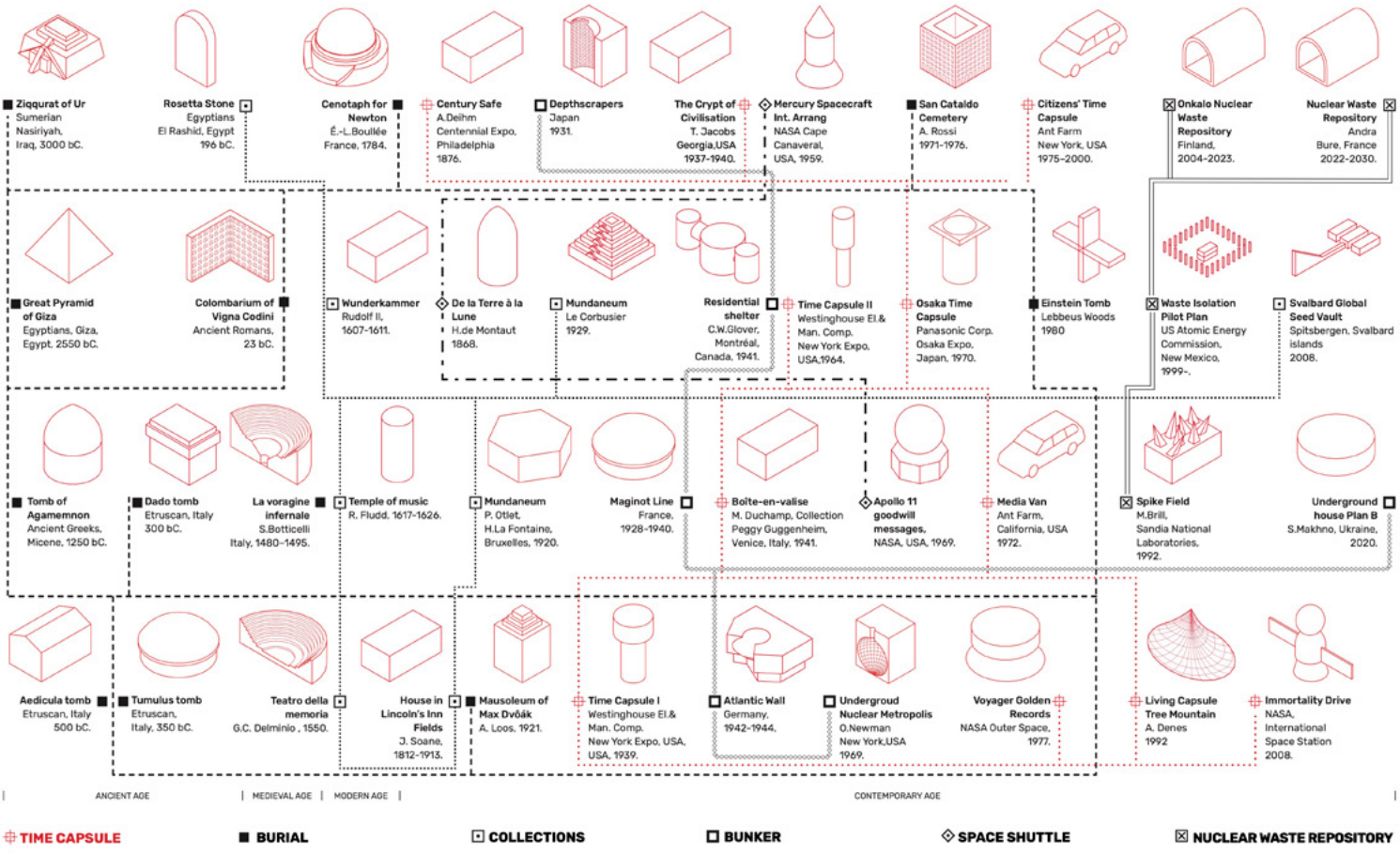

FIGURE 1. Retracing the time–capsule taxonomy. The taxonomy of time–capsules traces an inhomogeneous and disconnected set of devices and bunker, spaceship, and nuclear waste deposit. The reduction of the devices analyzed into pure forms, or of their assemblage, therefore suggests that the object's shape considered a "time–capsule" must necessarily present itself as a recognizable element, even when this consists of a monolithic or a simple parallelepiped. Especially in some examples, distant in space and time, that recognition of the container that conveys the message

redesign, and synthesis of the examined objects, and the consequent reconstruction of their taxonomy, have constituted a formal critical archive through which to explore, experiment, and formulate the project of a series of time-capsules, a sequence of transcriptions.

The project, intending to sever the traditional separation between container and content, employs concrete as the constructive material enabling, on the one hand, integration of meaning and signifier – by so incorporating the maquettes of the projects we intend to archive – and, on the

other, electing durable but still fragile materiality. In the awareness that concrete undergoes the same inexorable fate as all things, namely degradation, we welcome this aspect as the inevitability of time in space and as an additional philological feature of a reflection on the archeology of the future.

Our time-capsules are located in five symbolic and extremely different contexts, chosen because of their peculiar condition of urban fragility or environmental disaster. In this way, we decline and explore the potentiality of our taxonomy within Venice (Death in Venice), Yucca Mountain (Sacred Toxicity), Mirny mine (Diamonds are a dead's best friend), China-Kazakhstan border (Hyporborea's gate), and Cujubim (Savage Hades).

DDR STATEMENT AND CA²RE DELFT CONFERENCE EXPERIENCE

The idea of developing this project can be intended as a way of experimenting with an approach that is purely architectural: doing research through design is something that, consciously or not, is always specific to our discipline. Through the elaboration of a sequence of projects, the investigation aims to detect the points of friction and criticality that have characterized the issue of transmitting a message through the architectural discipline, questioning and analyzing topics ranging from material obsolescence to formal expressiveness, from archiving (theoretical and planning) to the specific disciplinary relevance.
The project is characterized as an open-ending process which – collecting the results of the elaborated operations through the various artefacts

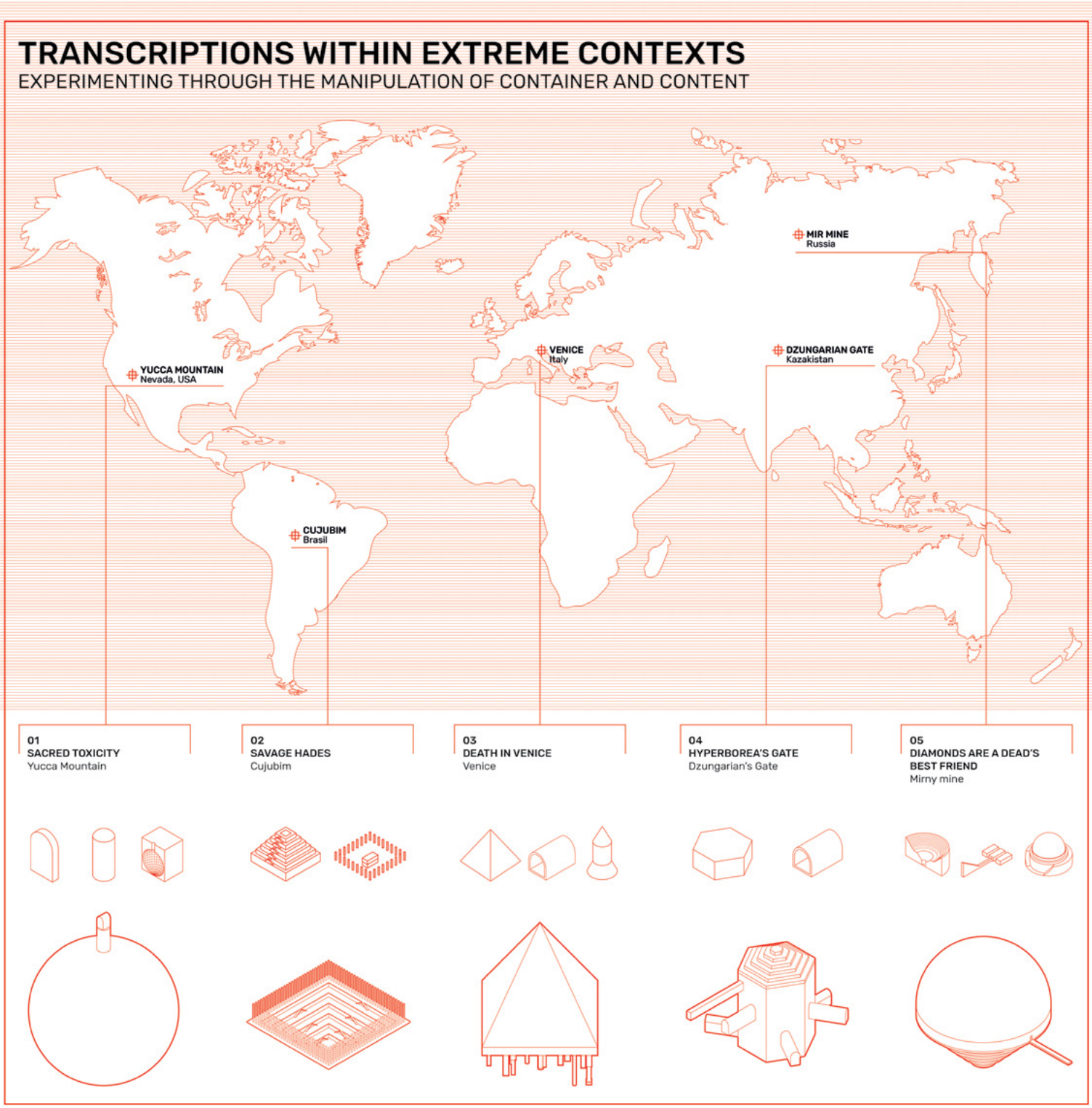

FIGURE 2. Five significant places in the world are chosen for their specificity in environmental fragility or catastrophic conditions. In each context, five different Transcrypts are generated by the assembly of archetypal forms analyzed through the taxonomy and chosen based on their symbolic representativeness in evoking the specific controversies of these places

developed – leads to a critical reflection on the condition of architecture at and for the end time. Our first investigations led us to look consciously at the fact that every architecture is in itself a time-capsule, but at the same time, we recognized its ability to preserve and transmit the message

through a semantic repertoire that we have traced through an analysis that we have called “architectural transcripts”.

On the occasion of the CA²RE conference in Delft, new themes and design stimuli emerged. The research aims to address them during the upcoming events.

The first focuses on the power of the image, on the possibility of de-contextualization as a means to avoid purely constructive issues and to be able to range more freely within the field of theoretical criticism. A reflection on the ambiguous relationship between the rhetorical and cognitive object: is it possible to resort to pure, essential forms, overcoming the rhetorical and political meaning with which they have been loaded in the course of history, and manipulate them in such a way as to exploit their cognitive potential effectively? Is it possible to define a project capable of taking the form of an archeology of the future by depriving it of the monumental connotation and, therefore, of any political or ideological trait?

Finally, a further provocation to which transcripts intends to react concerns the possibility of increasing critical experimentation concerning dimensional and material issues of architecture. For example, to transmit to a distant future, an archive of projects is indispensable for building huge-scale architectures. On the contrary, is it possible to condense this knowledge to the interior of a single object with minimal dimensions? Furthermore, can we adopt the use of artificial materials, as the

trinitite, in a highly critical push of the project, turning it into a hyper object where the transmission issue would emerge with renewed insistence?

We have often been asked why our archive does not include digital media or technologies that compact information. In addition to the impossibility of predicting which media would make digital content readable in the distant future, we think that architecture is a communicative fact that transcends time even before being, or trying to be, a performing or decisive phenomenon. We believe that its formal and physical immanence is the only transmissible element, which is why we have understood our time-capsules as tangible physical objects strongly characterized by a symbolic repertoire. We know that architecture does not necessarily coincide with building, so we have included much theoretical production, but at the same time, we understand construction here as its medium *par excellence* as it is physically transmissible to the future, even the most uncertain and dark one. Its monumental dimension, which we have foreseen to erode over time in a consciously significant way, is intended to celebrate the discipline's heroic attempts to deal with catastrophe and its absolute failure.

HOME: THINGS & BODIES. A THING-BASED EXPLORATION INTO PERSONAL SPACE. REFLECTIONS ON DDDR.

Marta Fernández Guardado
HafenCity Universität Hamburg

First supervisor:
Prof. Dr. Matthias Ballestrem, HafenCity Hamburg

Second supervisor:
Prof. Dr. Ignacio Borrego Gómez-Pallete, Technische Universität Berlin

We live among, together, within and through things. From a phenomenological perspective (which defines the relationship of the body we inhabit with other bodies and things as defining and transforming the experience of home) and following new material and topological approaches (ANT, Thing Theory, Sociology of Space... focused on the relationships between more-than-humans and their agencies), I seek to formulate a thing-based conceptual and methodological design-tool for the identification and consolidation of the personal experience of inhabiting.

My proposal arises as counter-action to the current tendency towards sameness, shortage and detachment from domestic space of the social individual, in a time when it starts to become clear that there are less reasons to build, and more

reasons to make better use and enjoyment of what we have. My aim is to transform and adapt existing dwelling by working with the relationships, scale and arrangement of things, in order to activate social processes of human engagement with space. My goal is not to redefine static standards but to develop individual “domestic repairs”, which will surely relate to others, not by generalisation but from the acknowledgment of a diversity of identities and ways of living.

I define “repair” as an arrangement, mending or reconstruction, understood in relation to the concept of “affair”, related to an inappropriate affection and intimate relation between coinhabiting entities. For me, a “domestic repair” is a design intervention that manages (with some breakages, few resources and standard components) to accommodate a current need or desire in a non-ideal but successful way, alluding to the specific dispositions and abilities of the entities involved, and at the same time, making the particular need or desire clearly manifest, so it can be celebrated and shared with others that enter the relation.

The notion of “domestic repair” is built up through my experience as inhabitant and architect, studying and reflecting on history, theory, methods and practice, along a series of design cases in which I work on specific domestic scenarios. There, I document misfitting people-things interactions, and I translate them into design interventions that produce a “repair” (Fig. 1): the rearrangement of a material and social setting that recognizes, supports and communicates a previously-misfitting set of events and practices in order to create home.

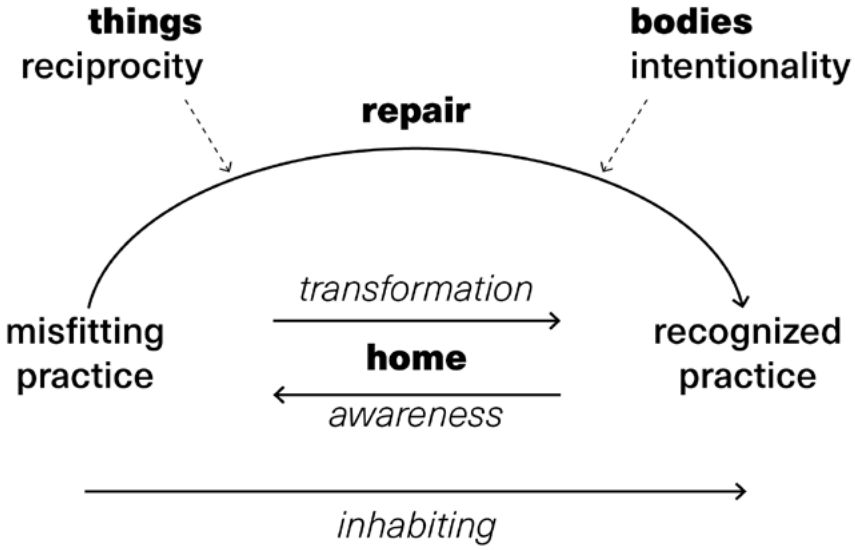

FIGURE 1. Diagram of the sought-after tool by Marta Fernández Guardado , based on Fig. 1.2 in Boccagni, Paolo. "Migration and the Search for Home: Mapping Domestic Space in Migrants' Everyday Lives." New York: Palgrave Macmillan US, 2017

The design case *Inga and Petri* establishes a final method for rearranging thing-body relations into "domestic repairs" and their evaluation. It is an apartment renovation based on the documentation of the shared-parenting routines of a father and his child. The entry wardrobe is transformed into a kid's room that works as performative spatial device for conciliating wants and responsibilities among family members with very different needs for independence and care (Fig. 2).

My method follows a 'thing-ethnological' approach. Whereas traditional user-centred design methods assume that creativity is exclusive to people, already integrate the notion that people shape things as much as things shape people. A thing-centred design method brings this interrelation forward by "relying on the collaboration with things as a way of solving problems" as argued by projects such as the Thing Tank (project funded by the Skoltech Institute of Moscow, 2014–2019) for design and digital fabrication, or the Object Research Lab (project by Yvonne Dröge Wendel, 2009–2010) on

FIGURE 2. Inga and Petri, project and photos by Marta Fernández Guardado

materially-engaged artistic practice. In my case, this means that a thing can embody a specific relation, which can become visible, shareable and transformable through design practice of repair.

My thing-centred research starts in the body of the inhabitant, and navigates through the domestic network, connecting with other things, of which I elaborate “object-portraits” that include typological conventions as symbol and signal, spatial relations and particular object life. I photograph their interactions, and select the images that present the widest range of discrepancies and coincidences with the corresponding “object-portraits”. I investigate the nature and effects of the mismatch through interviews with the inhabitants, which enables to process the information into line-drawings and codes (Fig. 3). The line-drawings and codes define the form of reparation of the selected thing(s), which once repaired, is placed again within the domestic network. I photograph the new interactions, and repeat the process again, in order to evaluate the achieved adjustment of the earlier variance (Fig. 4). The result assesses the extent to which the terms of interaction have become intentional and reciprocal, supporting and manifesting the particular way of life.

This relational design method strengthens human engagement with space by developing some-thing that supports and manifests the needs and desires of a specific character, and in doing so, it becomes a character itself, ultimately drawing attention back to the design artefact (Fig. 5).

I am currently on the drafting process at the final stage of my dissertation. At the last CA²RE/CA²RE+

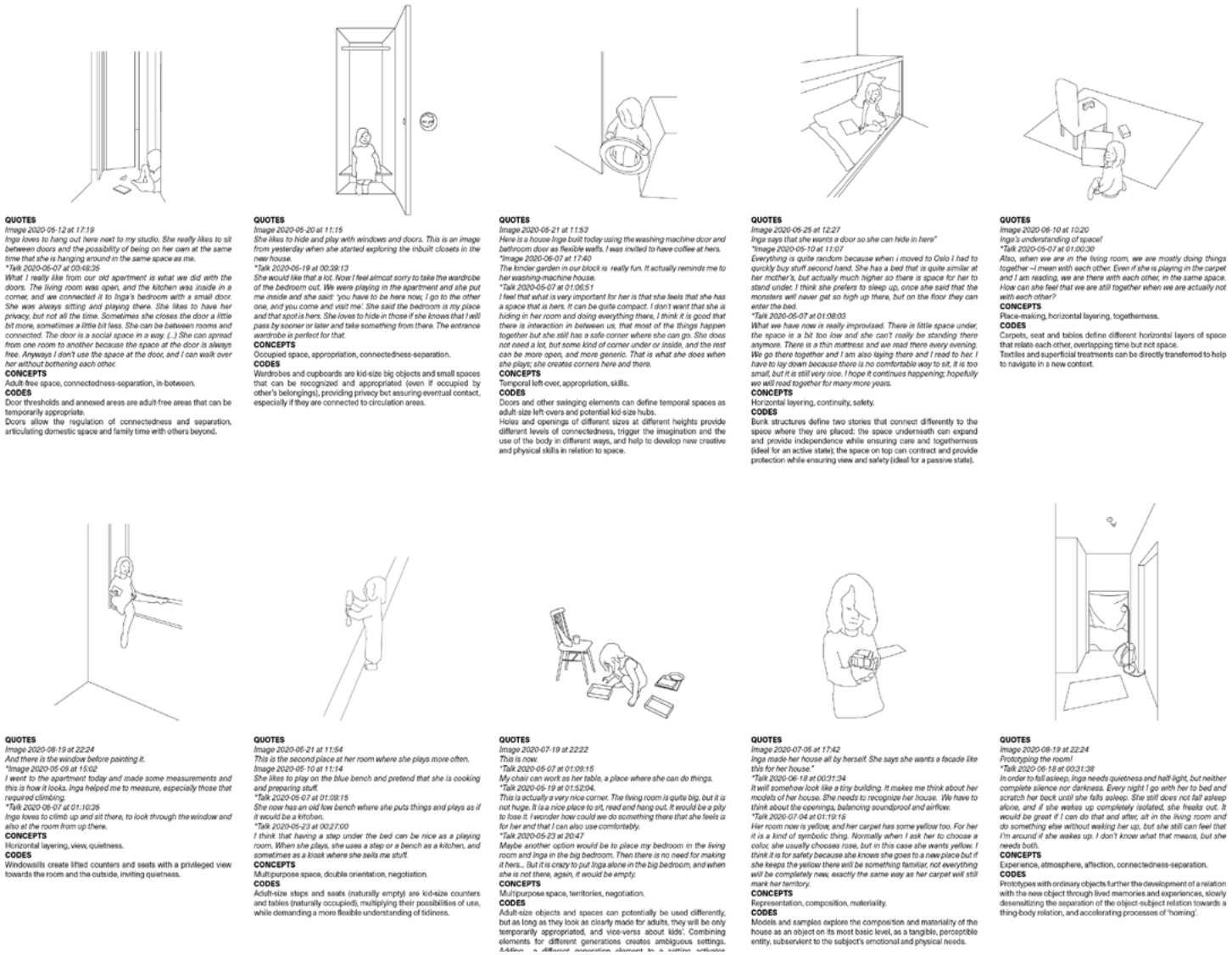

FIGURE 3. Inga and Petri. Project, line-drawings and codes from the 1st phase of Inga and Petri's project, project and drawings by Marta Fernández Guardado

congress in Delft, I tested the overall arch of my dissertation journey: from the reflection on my experience as a designer prior to the start of the thesis, through my motivation and initial objective, over the four entangled conceptual structures of my design-based research (the historical investigation of the contribution of the material world of objects in the production of personal space, the theoretical study of concrete contemporary notions of material agency, the practical exploration of those notions in specific domestic material contexts and the methodological formulation of the reparation tool for the transformation of home), towards the evaluation and contribution of my work.

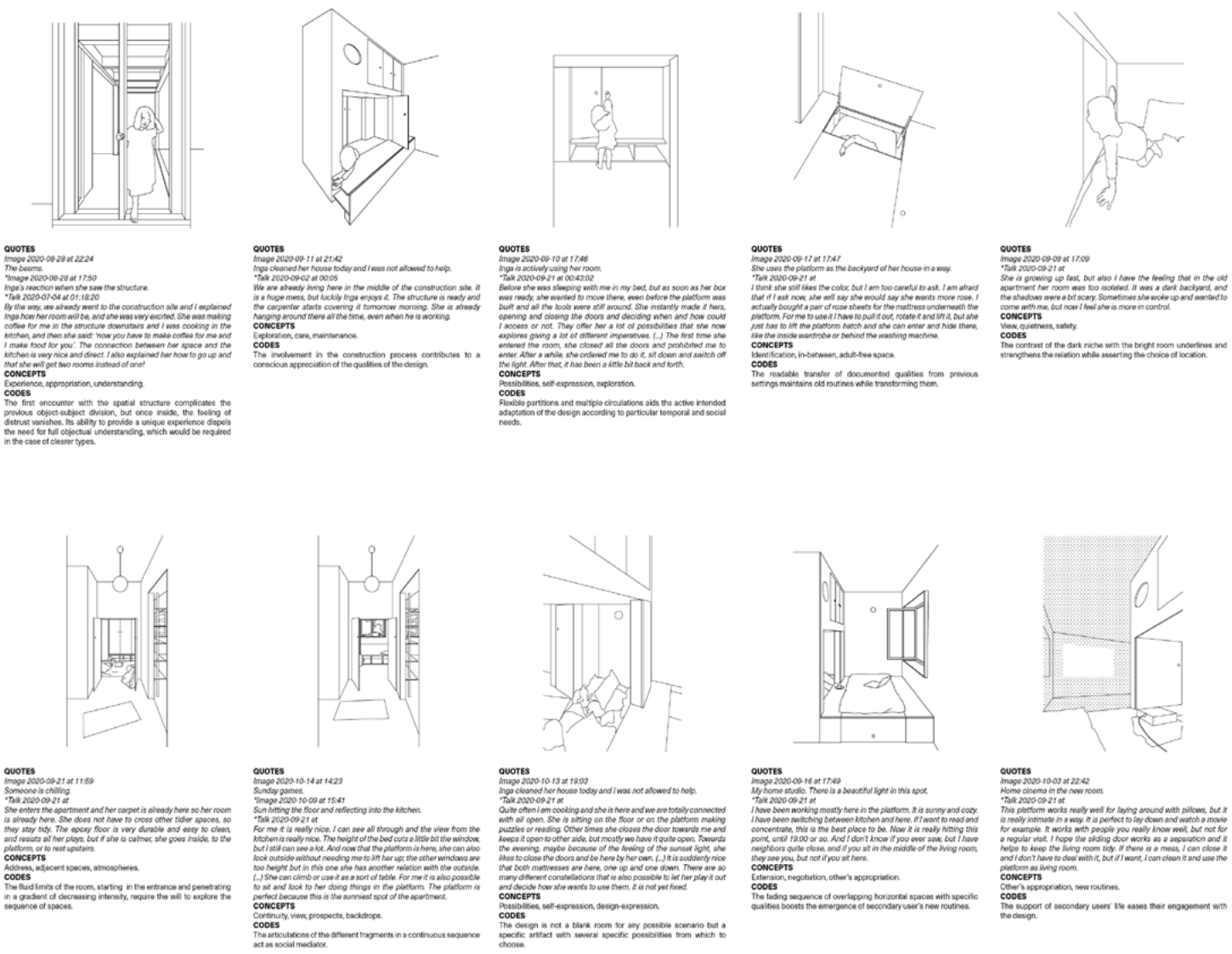

FIGURE 4. Inga and Petri. Project, line-drawings and codes from the 2nd phase of Inga and Petri's project, project and drawings by Marta Fernández Guardado

The preparation of the presentation helped me to link fragments of my work that were still disconnected, and further clarifying the synergies between the different frameworks (history, theory, practice and method). The presentation itself served me to prioritise the essential information necessary to communicate the research in a more structured and compressed manner, increasing my ability to share and discuss my work with the scientific community and beyond. The discussion after the presentation made me aware about the evolution and current position of my discourse during this journey, sharpening the similarities and differences with other practitioners, and

FIGURE 5. Inga and Petri, project by Marta Fernández Guardado, drawing based on user Inga's self-portrait, model in collaboration with prop-maker Ana Aguilera

contextualising it more and more clearly within the current state-of-the-art.

After the critical reflection on my presentation, there is one specific aspect that I would like to particularly pursue. Having succeeded in interconnecting the different conceptual structures of my research, rather than describing my architectural practice in terms of these other disciplines, I aim to make explicit what is the specific contribution of it not only to the field of architecture but also to these other fields from which I have investigated it.

ATLAS OF ARCHITECTURAL DESIGN IN BUILT HERITAGE: CONTRIBUTIONS FROM THE SCHOOL OF PORTO

Teresa Cunha Ferreira
Faculty of Architecture of the University of Porto

The Design Driven research (DDr) project “Atlas of Architectural Design in Built Heritage: Contributions from the School of Porto” (H-ATLAS.Porto) aims to introduce new insights on interventions in the built heritage carried out by architects of the so-called “School of Porto” (Fernando Távora, Álvaro Siza, Eduardo Souto Moura, among others), who left an important legacy and pedagogy in architectural heritage intervention. New perspective is allowed by documenting the whole process (before, during, after) and not only the final result, as it is common practice in specialist publications. However, as Carlo Scarpa states “the ‘final solution’ is as important as the ‘critical points’ that are resolved in the design process and in the building site”[1].

1 Scarpa, Carlo (1984), Interview Dal Co, F. & Mazzaroli, G., *Carlo Scarpa:* 1906–1978. Milão: Electa.

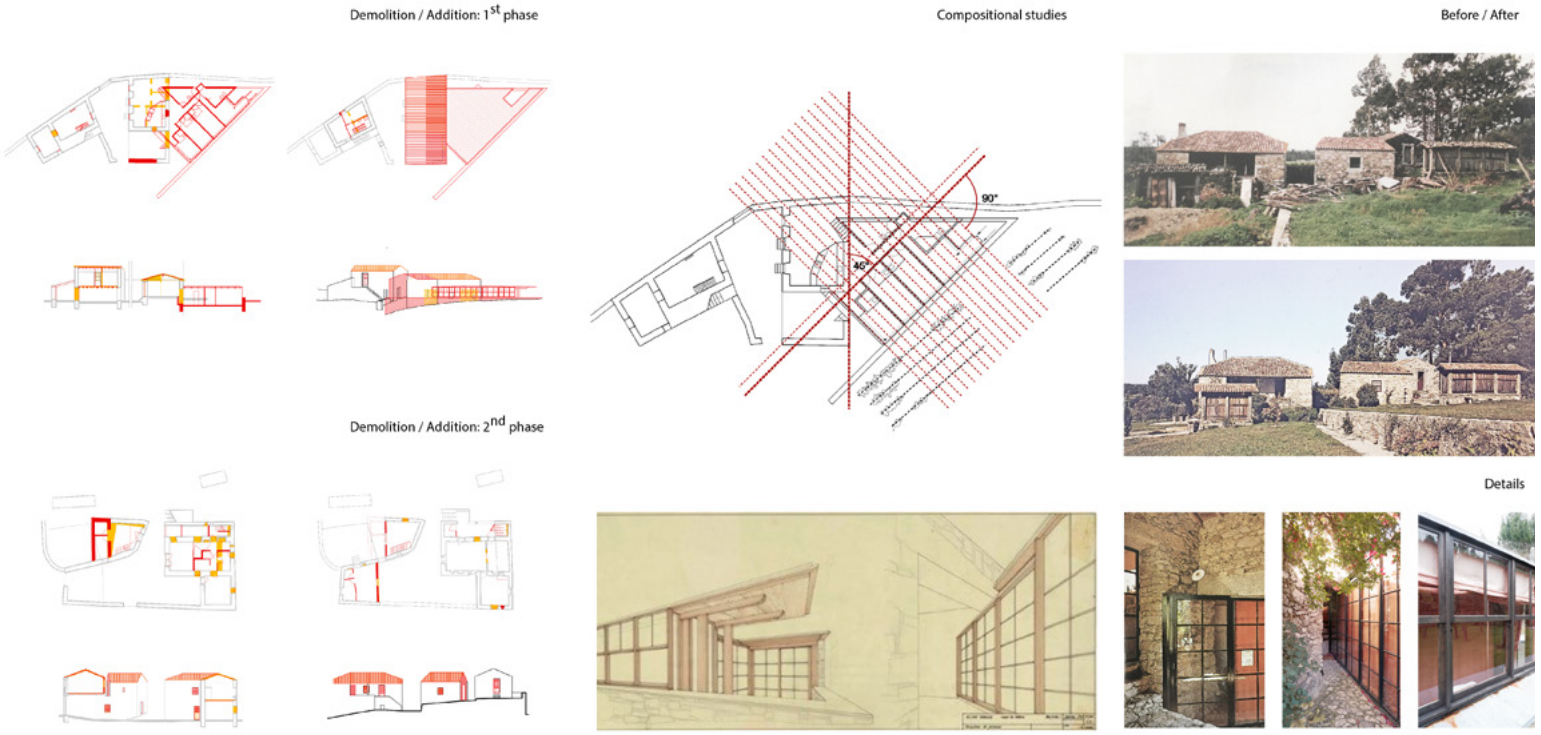

FIGURE 1. Alvaro Siza, Alcino Cardoso House, 1971,
drawings by Eleonora Fantini

The novel approach proposed in this research project is supported on crossed methodology based on the analysis of information currently scattered across public and private archives, on *in situ* observation and on the collection of oral memories at risk of being lost. Adopting drawing as a research tool, graphic contents are produced, including reds and yellows (essential for any deep understanding and communication of the transformations effectively carried out on the pre-existence), interpretative schemes of the construction phases and of the compositional and geometric principles in the relationship between new and old, and even of the analysis of constructive details.

Bearing in mind the difficult relationship between theory and practice and refusing aprioristic and preconceived approaches, H-ATLAS.Porto

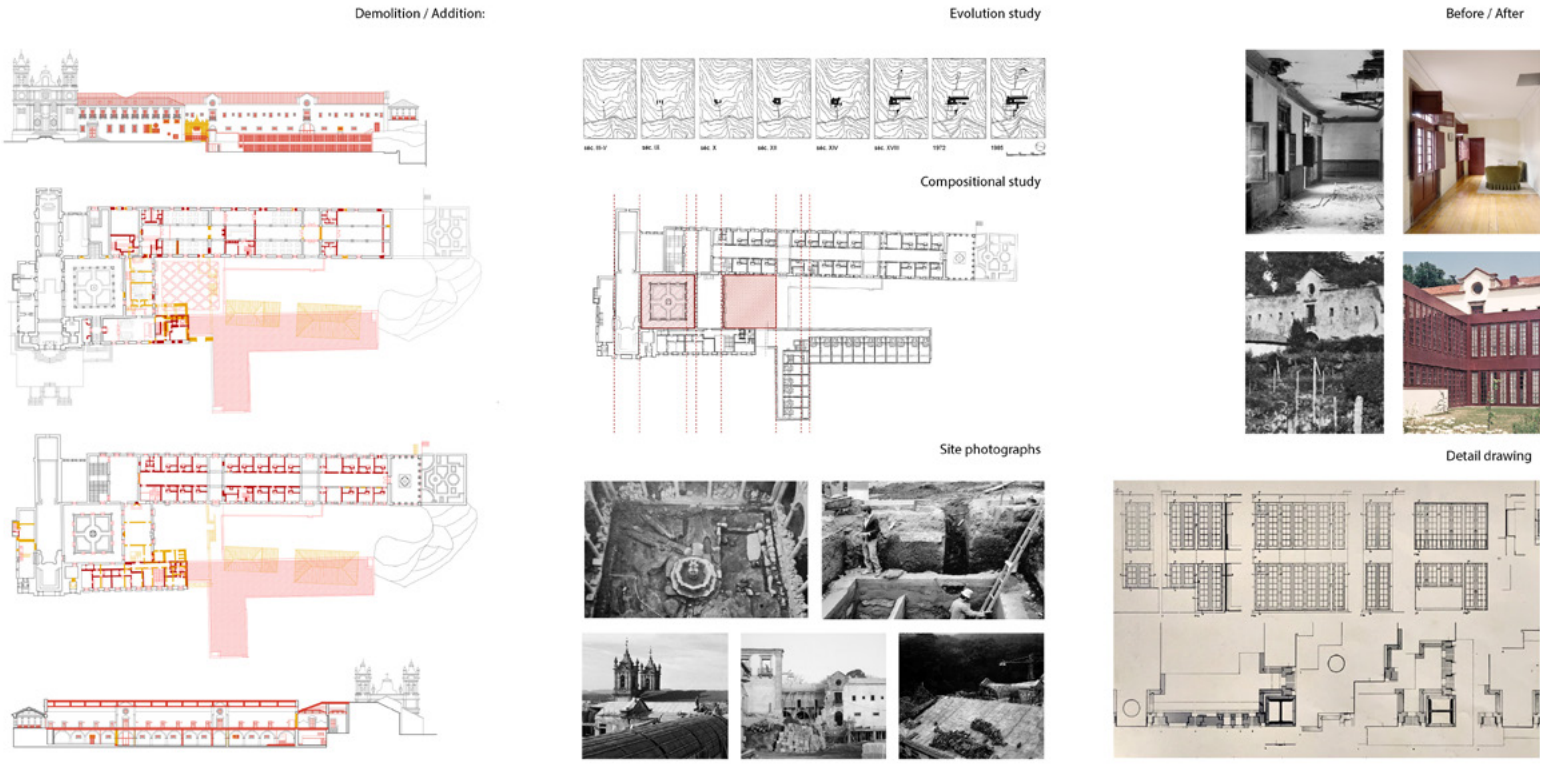

FIGURE 2. Fernando Távora, Santa Marinha da Costa, Pousada 1972–1985, drawings by Eleonora Fantini

proposes a case-by-case approach, where each object constitutes a specific circumstance and starting point which may not be subject to generalisation. This inductive methodology incorporates the individual study of each design and construction process through a simultaneously chronological and general-to-detail sequence visual narrative: map location, images before intervention (historic images, photographs, drawings, surveys), drawings before intervention, design sketches, design and/or construction report extracts, demolition/additional drawings (red/yellow), construction site photographs, as well as built drawings, photographic reportage of interior and exterior (including plans with the location of photographic catches), architectural details complemented with photographic illustrations, comparative photographs of before and after, image credits and a selected bibliography.

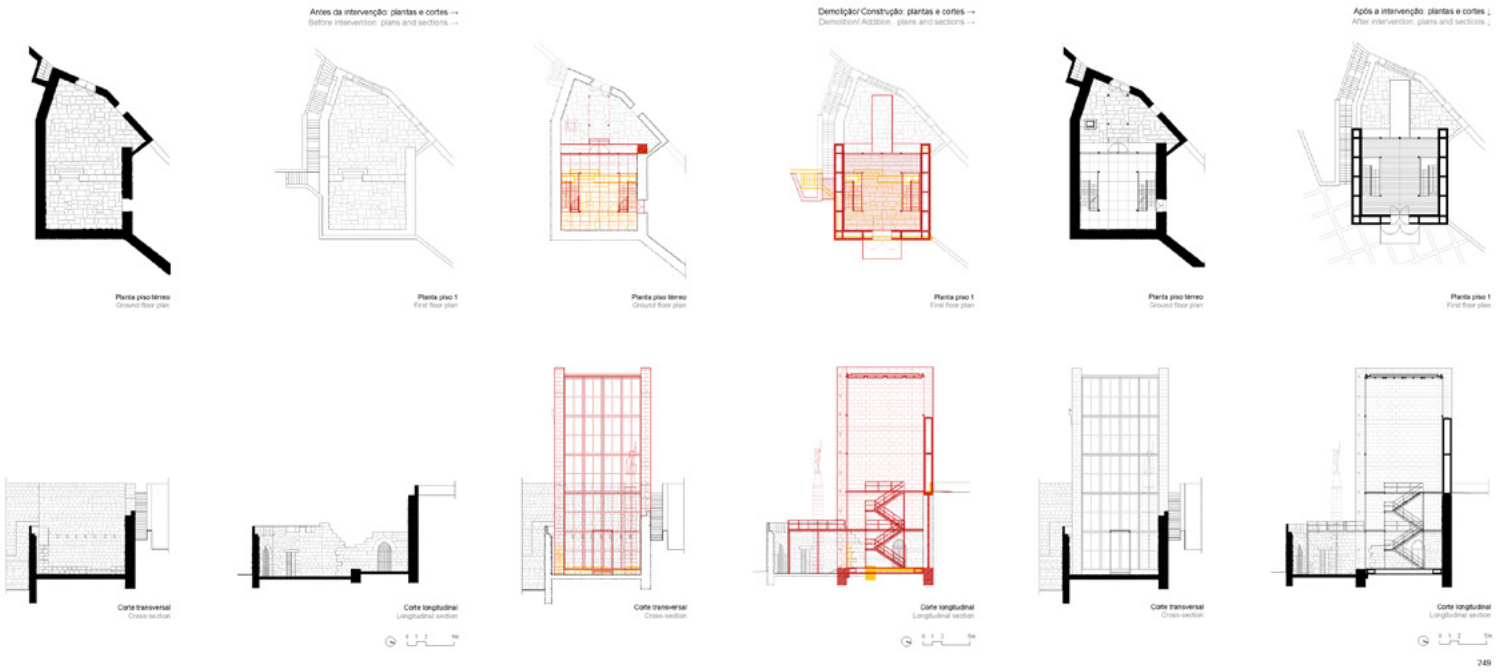

FIGURE 3. Fernando Távora, Old City Council (Casa dos 24), 1995–2004, drawings before, demolition/addition and as built,drawings by Eleonora Fantini

This DDr project deploys the production of drawings (with predefined and normalised Autocad layers) of the architectural works i) before intervention, ii) demolitions/additions (red/yellow) and iii) as built, which are executed with the same layout (selected plan(s), section(s) and elevation(s) according to each case), so that they may easily be compared and thereby provide a direct architectural comprehension of the intervention.

In this way, this research project proposes drawing as an essential tool for DDr - *"Drawing is the desire of intelligence"*[2] – allowing for observation, interpretation and communication of architectural artefacts. This research approach as already been experimented in Master and Doctoral Thesis[3,4]

2 Siza, Álvaro (1995), "Construir uma Casa". In LLANO, Pedro e CASTANHEIRA, Carlos (eds.). *Obras e Projectos.* Centro Galego de Arte Contemporânea / Electa Espanha, p. 61.

3 Fantini, Eleonora (2021), "Patrimonio storico e progetto nell'architettura portoghese. Riflessi della cultura italiana nell'opera di Távora, Soutinho e Siza.", Phd Thesis (supervisors: A. Ugolini, A. Esposito, T. Cunha Ferreira), Universitá di Bologna; ORDOÑEZ-CASTANON.

4 David, Fernando Távora (2022), "La modernidad enraizada: innovacion e contibuidade como estrategias de la intervencion en la arquitectura tradicional.", Phd Thesis (supervisors: S. Santi ago-Baetia, T. Cunha Ferreira), University of Pais Basco.

as well as in the preparation of books and other dissemination outputs which, within the moto “Learning by (doing) drawing!”, can provide insights for teaching and practice on contemporary intervention in the built heritage.

This DDr Project is thus designed as both a tool kit to assist students and practitioners and an overarching narrative, capturing trends and positioning this body of work within the wider culture of architecture and heritage intervention.

AKNOWLEDGEMENTS

The author acknowledges Eleonora Fantini and David Ordoñez-Castanon for the collaboration in the research project. The study was co-financed by the European Regional Development Fund (ERDF) through COMPETE 2020 – Operational Programme for Competitiveness and Internationalisation (OPCI) and by national funds through FCT, under the scope of the POCI-01-0145-FEDER-007744 project and FCT Project EXPL/ART-DAQ/1551/2021.

EVERYDAY PRACTICE AS PARADIGM TO STUDY ARCHITECTURAL CONTEMPORARY CODES

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Gennaro Postiglione, Politecnico di Milano
Gaia Caramellino, Politecnico di Milano
Christoph Grafe, Bergische Universität Wuppertal

The contribution presented at the CA²RE Delft conference has been a significant opportunity to discuss my doctoral research that, dealing with the present history[1], proposes an empirical approach: without aiming to achieve a definitive response, yet disentangling processes while being formed. In this perspective, requiring an experimental approach that accepts mistakes and approximations – aware of the possibility of failure – reflection is adopted as an opportunity to step back from specific expectations and requirements through a high degree of open-endedness[2].

Methodologically, it has been shown how the research moves in the lines of micro-history[3],

1 Robert, François (ed.) (1993), "Ecrire l'Histoire du Temps Présent.", Paris: CNRS.
2 Buchert, Margitta (2014), "Reflexive Design: Design and Research in Architecture.", Berlin, Jovis.
3 Levi, Giovanni (2001), "On Microhistory." in New Perspectives on Historical Writing, ed. Peter Burke University Park, The Pennsylvania State University Press, 97–119.

FIGURE 2. Excerpts from in-person ethnographic investigation held from September 2020 to February 2021

thinking through cases [4], researching the architecture of the recent past, and uses an ethnographic approach searching for the everyday and its object[5] as a way to disentangle the more implicit and embedded knowledge of an architectural practice. More in general, in fact, the research argues that each office has its own accumulated knowledge made up of recurring references, idiosyncrasies, characteristic lexicon, particular aesthetics, etc. In other words, each office harbors a series of more or less

4 Passeron, Jan Claude., Revel, Jaque. (2005), "Penser Par Cas.", Paris, Ehess.
5 De Certau, Michel (1980), "The Practice of Everyday Life.", Berkeley and Los Angeles, University of California Press.

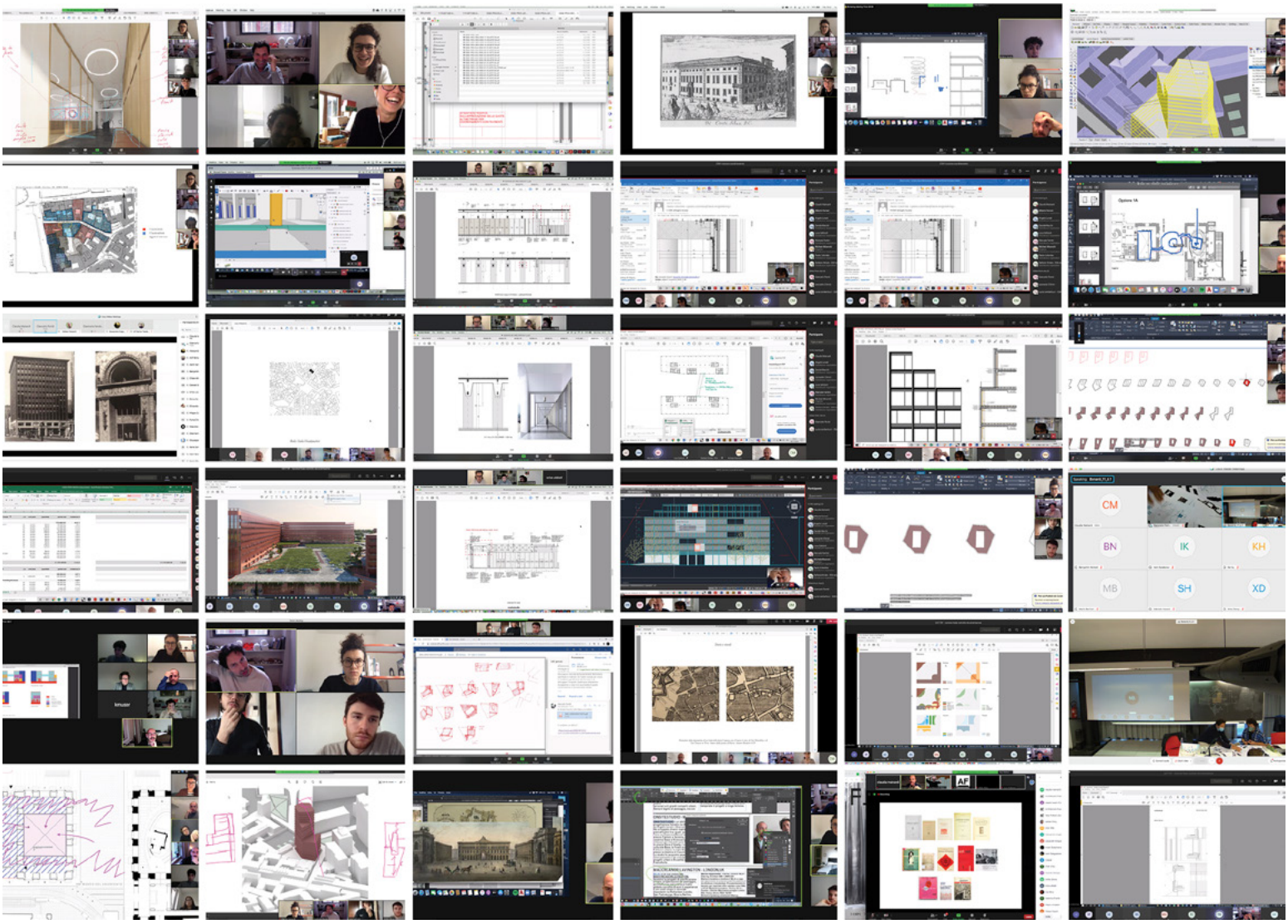


FIGURE 3. Excerpts from digital ethnographic investigation held from September 2020 to February 2021

conscious – and/or more or less stated – aspects that define its character and subsequently inform the way it operates (from research to project execution). In this perspective, the close observations – thanks to the direct sources these allow – aim to experimentally reveal an internal and hidden knowledge.

THE MATERIALISATION OF THE JOINT. RE-READING THE BRION CEMETERY THROUGH THE AGENCY OF THE DRAWING. DESIGN DRIVEN RESEARCH AND FURTHER REFLECTIONS.

Enrico Miglietta
Politecnico di Milano, KU Leuven

Supervisors:
Gennaro Postiglione, Politecnico di Milano
Annalisa de Curtis, Politecnico di Milano
Jo Van Den Berghe, KU Leuven
Thierry Lagrange, KU Leuven

Positioning on the slipstream of operational criticism, the PhD research aims to formulate a methodology for the interpretative reading of existing architectural works and, starting from its findings, systematically describe a design attitude that sees in exploiting the agency of the joint the foundation of a design strategy. In this sense, the investigation through drawing of some paradigmatic architectures showed the emergence of a transcendental schema, therefore the possibility of defining project 'recommendations' that work regardless of personal styles or languages, but super-historical and applicable towards a specific design economy and coherence.

The initial part of the interpretative analysis, of which an extract is presented in the preceding essay, represented a fundamental phase for the

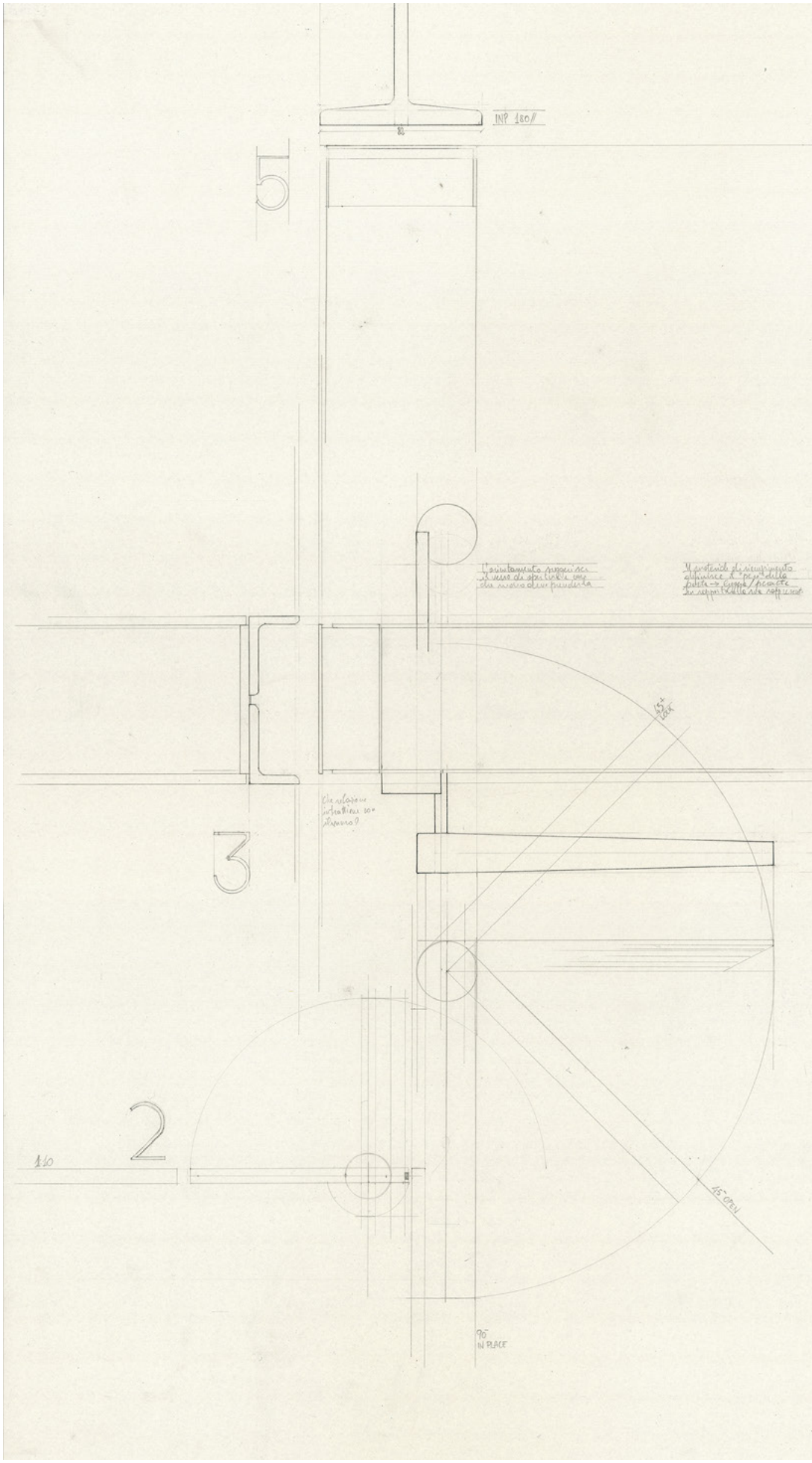
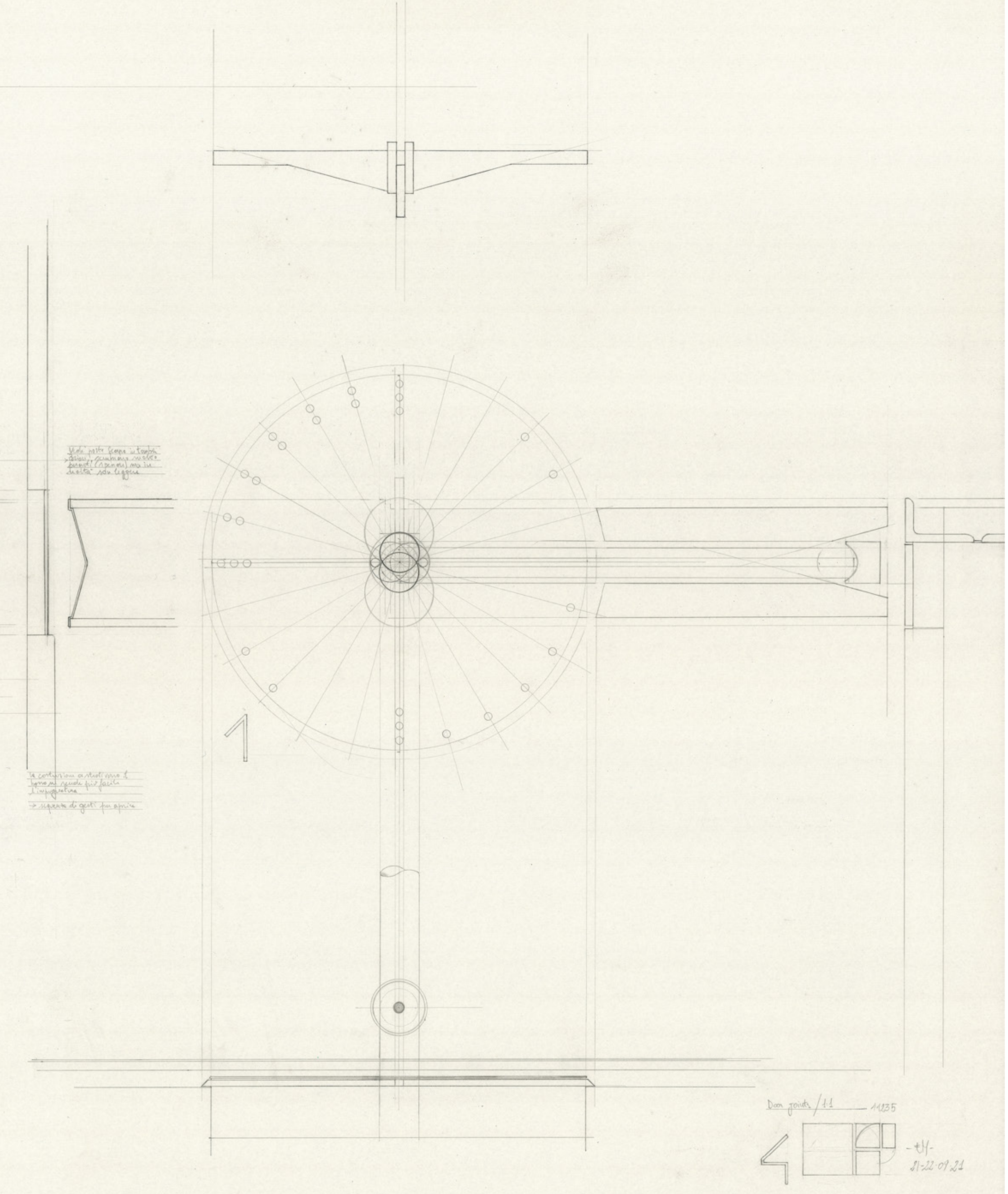


FIGURE 1. Research by Design. Door joint and pivoting mechanism (own design), drawing and project by Enrico Miglietta, pencil on paper, 1000x760 mm, scale 1:1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Door joints / 1:1
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emergence of the first findings of the project, insights for the construction of a reflective practice which, although explicitly partisan, proves to be relevant and usable by researchers, students and professionals to varying degrees. Moreover, the process also showed another type of findings, of a procedural nature and embedded into what we could define the “agency of the drawing”, or how these ways of proceeding are closely intertwined with a particular way of operating on the drawing board, to how the draughtsman uses the tools at his disposal.

The final phase of the research is testing and verifying these findings through an analysis of the design process, with personal research by design and then a test in an academic studio as a controlled environment.

As a result of the discussions that took place during and after the panel session, further reflections on the process of Design Driven research emerged, particularly with respect to the intertwining of the parts of research through drawing (on case studies) and by design.

One of the fundamentals concerned the status of the act of drawing within the research. In fact, hand-drawing not only assumes the role of an instrument to conduct the investigation, but also becomes a subject of investigation through reflections based on subjective experience. If a rigorous description of the tools and ways of doing design may appear anecdotal, it can also constitute the basis for the formulation of valuable suggestions to explicit the ways of seeing, and therefore of “internalising” the architectural project.

The experience clearly manifested the necessity to show and reveal the drawing process to the audience through the description (verbal, visual and corporeal) of the experience and not only the finished product or the presentation drawing, manifesting the reasons leading to the choice of a specific drawing precision, the use of one type of projection rather than another, the use of a specific paper support, a pencil of a certain hardness and, in general, the specific tools of the discipline at hand. In addition, it again helped to highlight how some very personal attitudes can be found to be inexorably common, and how a confrontation on the "thinking hands", their unconscious automatisms, can be fertile ground for study opportunities on an often-neglected form of knowledge.

In this sense, the discussion had a tangible impact on the ways of framing the research and presenting its findings, also producing greater awareness about the essential questions it is addressing.

INTERIORITIES, EMBEDDEDNESS AND THE DWELLING

Marie Porrez
KU Leuven

Throughout my research, the act of drawing was the ultimate tool in each stage of the investigation. Initially, the act of (hand)drawing was used to analyse and better understand the different characters that were being studied. Then the drawings evolved and made adjustments and reflections to the existing. This led to translations of what was already there and resulted in new insights. This process defines the true core of the research as a specific Design Driven research (DDr) approach to identify, to uncover and to lead to new insights and entities through the explicit act of (hand)drawing. This brings one, as a researcher, in a haptic contact with the studied objects or subjects, which resulted in this research as a highly thorough and consistent way of working and investigating.

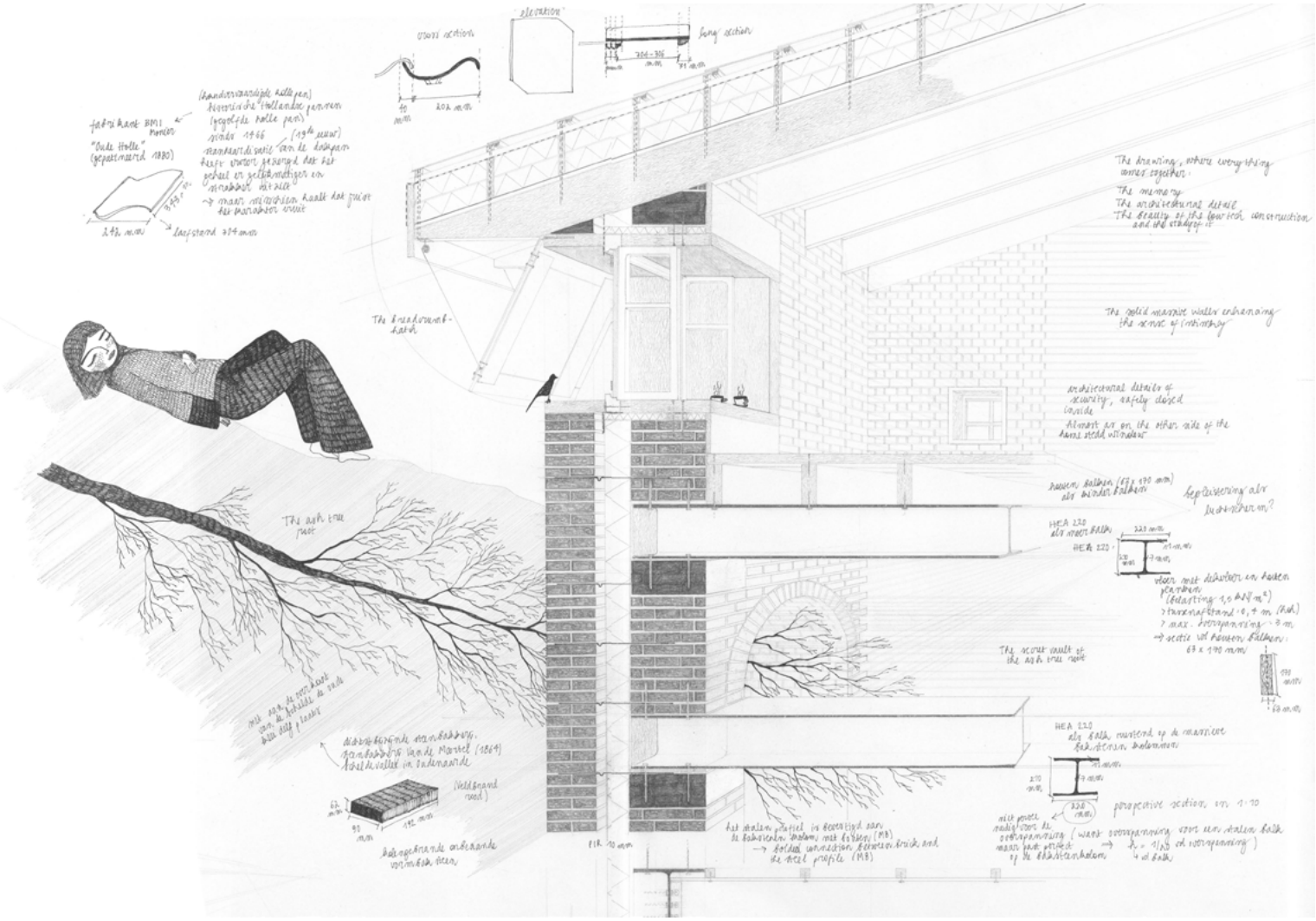

FIGURE 1. Annotated drawing: Through the hatch and the vault scale 1:10, 500 x 350 mm

Doing my research, the importance of this Design Driven research approach became evident. By strategically using hand drawings, new steps could be taken and new insights were generated repeatedly. The immersive drawing techniques that were used: (1) Annotated Drawing; (2) the Atmospheric Perspective; (3) Critical Sequential Drawing[1] and (4) the Perspective Section, thus led to a clear research approach and method. This proves the value of drawing as a guiding force in the thinking and research process. Through the slowness and precision of the drawing, certain

1 Van Den Berghe, Johan (2021), "Critical Sequential Drawing: a drawing method to close the gap between the Poetic Image and its Material Presence.", in Stoa Journal, 2, Napoli: Thymos Books, 168–179.

elements come to the surface; while drawing, one thinks about each individual part, difficulties are exposed and space emerges and becomes tangible.

The aforementioned immersive drawing techniques hope to form a decisive and driving approach that wishes to offer the beholder the opportunity to gain insights and new perspectives.

By attending the CA²RE conference in Delft, I had the opportunity to present my work, expose certain difficulties and discuss these with the panel members and the audience in order to gain feedback and recommendations. It proved highly valuable to obtain insights from many different experts within the architectural and artistic fields. This raised questions that opened up new perspectives and could therefore be an incentive for continuing the research. What was very intriguing to me was the question on what the role of the observer means or can mean, a research question I had not really focused on

FIGURE 2. Atmospheric Perspective: Landscape of memory, 1000 x 700 mm

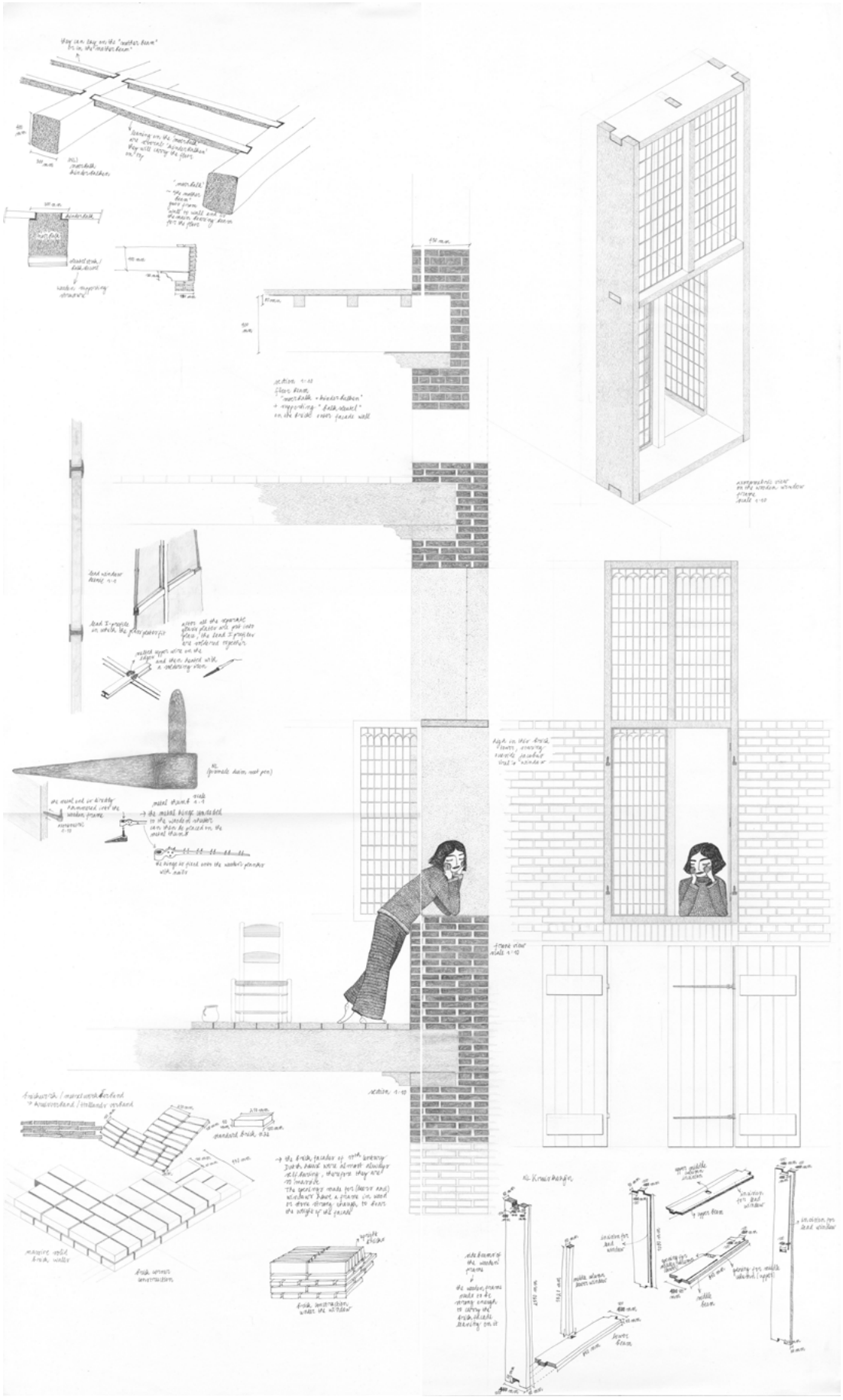

FIGURE 3. Critical Sequential Drawing: Study of Jacobus Vrel's window, scale 1:1 / 1:10, 1000 x 600 mm

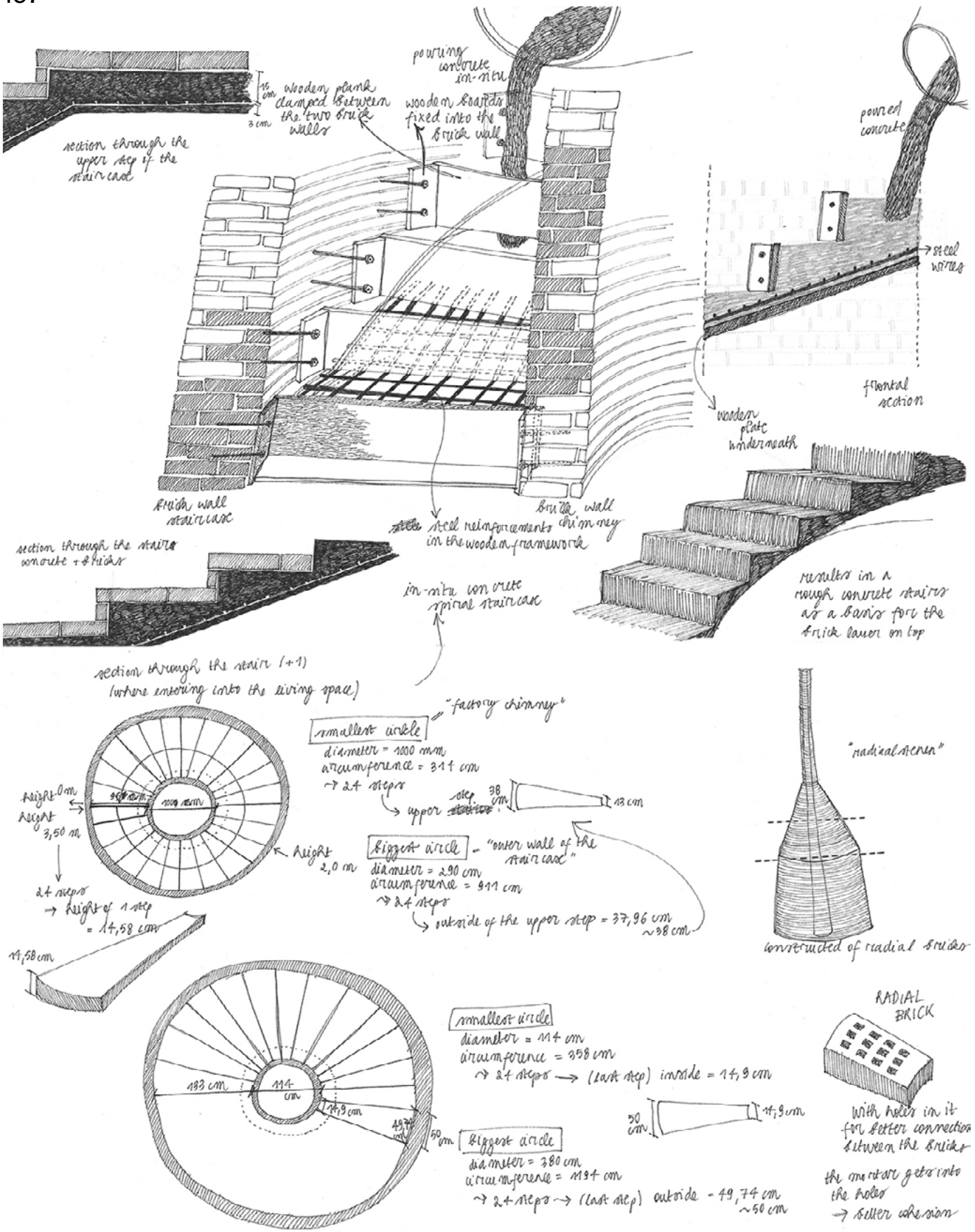

FIGURE 4. Critical Sequential Drawing: Research of the staircase, 420 x 297 mm

until then. Is the observer outside the drawing? Are the characters, objects or you, yourself as draughtsman, positioned inside or outside of what is drawn? One can become a highly active observer through the drawing. The surfacing of this question during the discussion of my presentation immediately brought out several ideas from the audience. For me, this showed that there was an opening for further research, where interesting approaches could emerge.

In addition, a second important question came up: How can the drawing, which already has certain qualities (e.g. strong narrativity), incorporate other sensory dimensions as well? How can the drawing or research become multisensory? This was another aspect that I had not yet considered and might open up different research tracks.

I would like to cite these two examples from my experience in Delft to show how beneficial this experience was for my research. Moreover, the amount of perspectives and variety of research presented is an exceptionally valuable input. Whereby the discussions with experts and PhD students were an important contribution. This makes me very grateful for this experience and eager for the next CA²RE projects and conferences.

ARCHITECTURAL PLUG-IN EXPLORATIVE MACHINE FOR THE SONIC RECOMPOSITION OF SPACE

Taufan ter Weel
TU Delft

Supervisors:
Roberto Cavallo, TU Delft
Heidi Sohn, TU Delft

My research explores the relationships between bodies, media technologies, and lived environment through a spatial and diagrammatic approach based on sound and signal processing. It starts from the notion that the human use of electromagnetic energy as carrier of information – that is, signal processing, from early electric telecommunication and radio to global computing networks – changes and complicates these relationships. Transmission with the speed of light brought about a shifting sense of space and time (e.g., through real-time and mobile telecommunication, navigation, localisation). Ubiquitous computing changes the modes of governance. The increasing dependency on media technologies to carry out or automate activities (to sense, build, and change our environment) and the interdependencies between them, coupled with the

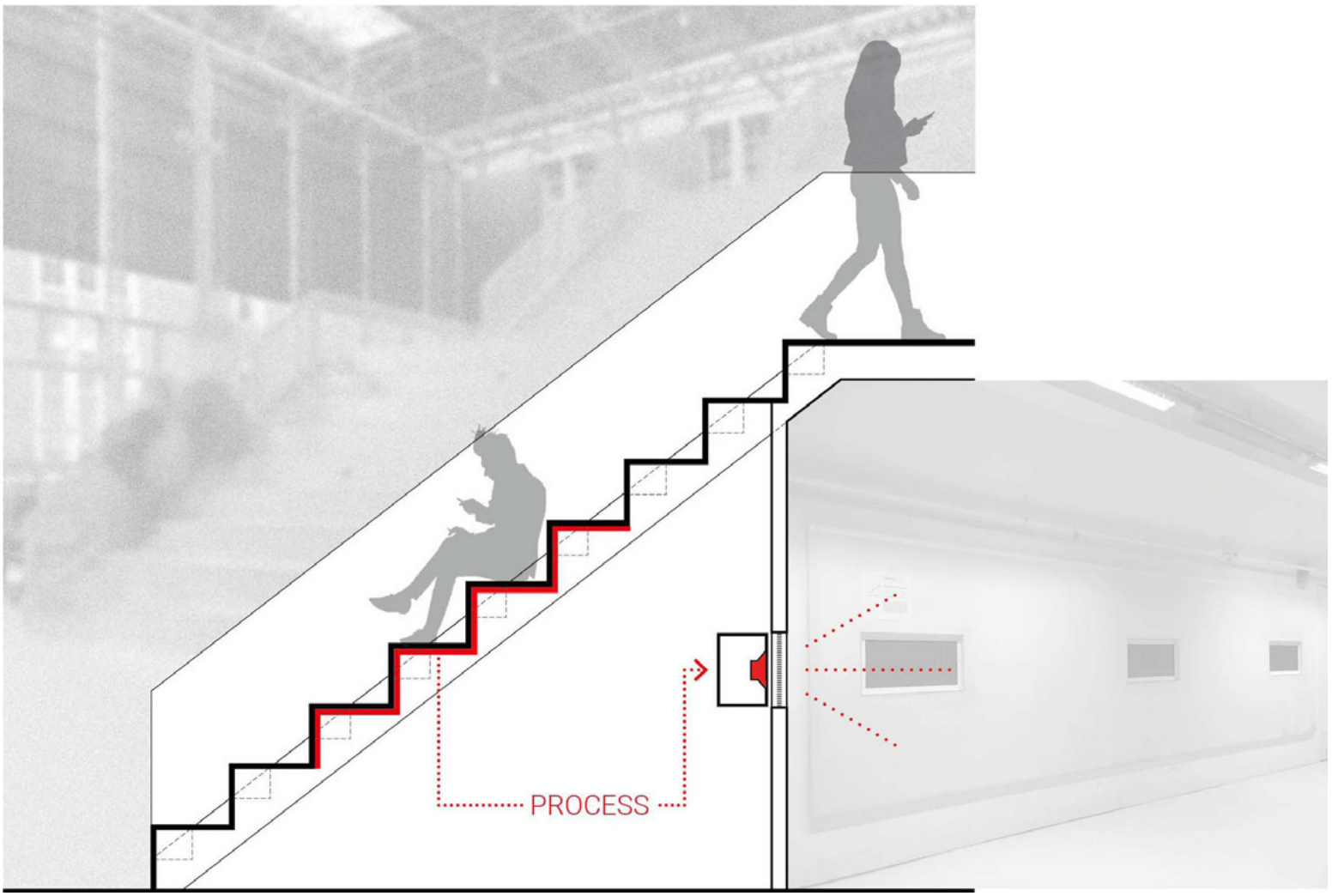

FIGURE 1. General drawing for Architectural Plug-In

decreasing clarity of their inner workings, which is in part inherent in their expanding complexity, creates unprecedented forms of automation and control.

There are many ways to approach this problem and there is vast body of work in this domain, across various disciplinary fields. My research is transdisciplinary and combines a theoretical and design-driven path at the intersections of architecture, sonic practice, sound studies, and the philosophy of technology. It focusses specifically on sound and signal processing in spatial practice, which enables a process-based and diagrammatic way of thinking and making to explore the inner workings of media technologies in relation to bodies and lived environment. A signal in its most basic form can be understood as carrier of information transmitted through a medium.

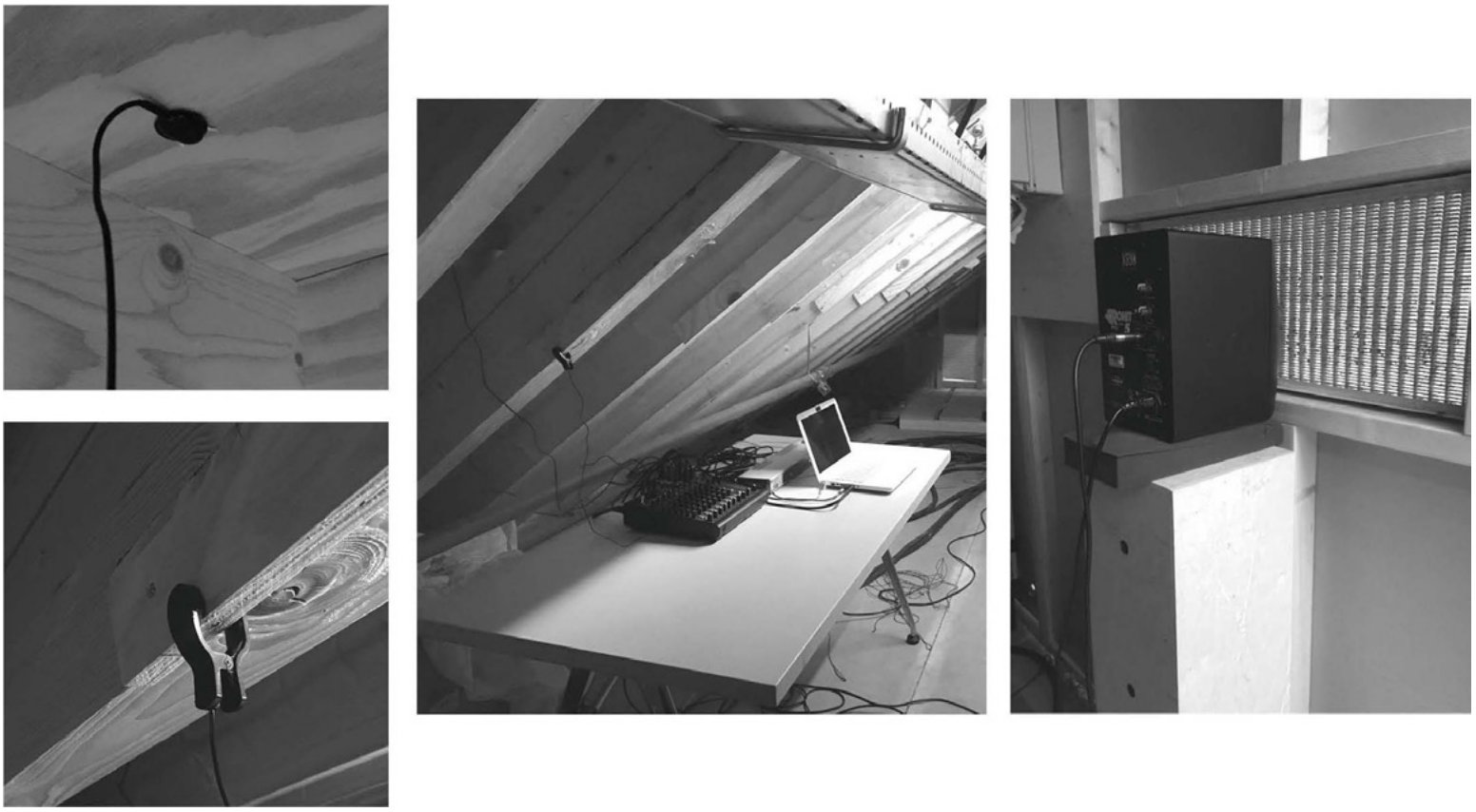

FIGURE 2. Photos of setup

The information is impressed into a carrier wave (electromagnetic energy) through the process of modulation. A received signal, in turn, needs to be demodulated (or decoded in digital terms) to retrieve the information, which is precisely what complicates technological mediation.

In the design-driven research the diagram is a means to explore, expose, and design processes of technological mediation. In turn, the realisation of a series of spatial or site-specific sound installations is a way to put the diagram into operation, to spatially articulate these processes and produce new configurations. Employing the capacities of sound and signal processing in spatial design allows for producing spatio-temporal manifestations in a dynamic, instant, and real-but-abstract way, articulating abstract relationships and

operations such as algorithmic processes sonically and spatially.

The site-specific sound installation *Architectural Plug-In,* presented at CA²RE Delft, was situated in the servant space between tribune and presentation room. Ambient noises and structure-borne vibrations were picked up by means of contact microphones. The resulting audio signals were processed in real time and spatially redistributed to loudspeakers placed behind three wall openings. The audio signals were not only treated as sound material. Their properties (intensities, densities, envelopes, frequencies) were also sensed to trigger and modulate stochastic processes, articulating the machine's inner workings. Short extracted waveforms generated new sounds that followed the textures of and responded to the input signals. The acoustic environment and generative processes cross-modulated and mutually affected one another in a continuous re-composition.

AUDIO 1. Link to audio excerpt: taufanterweel.nl/work/architectural-plug-in

SENSORY NOURISHMENT CONSCIOUSLY CRAFTING SENSATIONS IN CLOTHING DESIGN TO SUPPORT DIVERSE SENSORY NEEDS

Maureen Selina Laverty
Norwegian University of Science and Technology

Supervisors:
Trond Are Øritsland, Norwegian University of Science and Technology
Pauline van Dongen, Eindhoven University of Technology

My design-driven doctoral research (DDDr) collaborates with people on the autism spectrum to examine the connection between how they feel, both physically and emotionally, and the sensations that are crafted between their moving body and the clothing they wear. In many ways this connection might seem obvious yet its consideration is glaringly absent from both academic research and dominant fashion design practices. The traditional visual methods and language used, in both fashion research and practice, lacks attention to the felt experiences of clothing. Furthermore, I have been dismayed by the disconnect between fashion research and fashion design in practice. In particular, the static conception of clothing is at odds with the multi-layered multi-sensory lived experiences of wearing.

FIGURE 1. Sensory ethnography through wardrobe studies with participants

The aggressive and rapid processes that dominate commercial fashion design practices fail to see the value in slowing down to give attention to these felt experiences. I see my DDDr project as a very privileged opportunity that allows time and space to slow down to question and reflect on such felt experiences. I do so by borrowing from sensory ethnographic methods, which in itself is not original, however the insights gathered through such exercises are rarely assimilated back into the design process by designers. It is this link, that design-driven research facilitates, that I believe creates real meaning.

Human beings are complex. Real life is dynamic with continuous transitions between movements and emotional states. In many corners of academia,

FIGURE 2. Sensory ethnography through performative engagement with garments

I have found a desire to reduce this complexity to one specific problem. The CA²RE+ community's encouragement and support to embrace a holistic approach has been very significant. Through constructive conversations with my panel, I was challenged to dive deeper into the complexity. In my abstract I had stated that I was prioritising felt experiences over visuals, however, the panel's critique was that the visual sense cannot be ignored. I discussed these comments with my participants and they agreed that their clothing choices were always a negotiation between the appeasement of their kinaesthetic-tactile needs and how they desired to be visually perceived by others. Furthermore, they acknowledged the contribution of this visual perception to their felt experiences.

Within the CA²RE+ community, I have found great camaraderie with those daring and struggling to unravel the emotional well-being of their users within scientific frameworks. Through earlier conferences I was introduced to Silke Hofmann's *Needs Based Clothing Design* that elevates the voices of females affected by breast cancer. I am inspired by her determination to challenge the status quo and assimilate her insights back into fashion design practices to affect real change.
My biggest take-away from CA²RE+ has been the realisation that DDDr should, by its very nature, pose more questions than it answers. The pursuit of these answers should extend beyond a doctoral project. It is a lifelong pursuit. Although I am working with a specific case study, my research should be collectively beneficial to universal well-being. The real value will lie in how my DDDr will inform my future design practice and hopefully that of other designers, disciplines and user groups.

TALKING HOUSE CONSISTS OF A SERIES OF THREE BUILDINGS, EACH CONCEIVED AS AN EXPERIMENTAL APPARATUS TO STUDY THE PHENOMENON OF PROXIMITY.

Hinnerk Utermann
University of Applied Arts Vienna

Supervisor:
Jan Svenungsson, University of Applied Arts Vienna

To present my PhD project during the CA²RE Delft conference allowed me to see and understand my work in a new context. Responding to the framework of the conference, based at the Faculty of Architecture at TU Delft, I presented my project from a more applied and architectonical perspective. (My PhD is originally part of an artistic research program at the *Angewandte*/University of Applied Arts Vienna). This enabled me to reconnect with my experience as a craftsman, architect and teaching architect and caused a significant shift in my research focus:

Talking House is a design-driven research conducted within the field of architecture. The building process and the buildings themselves as a medium for research take center stage:

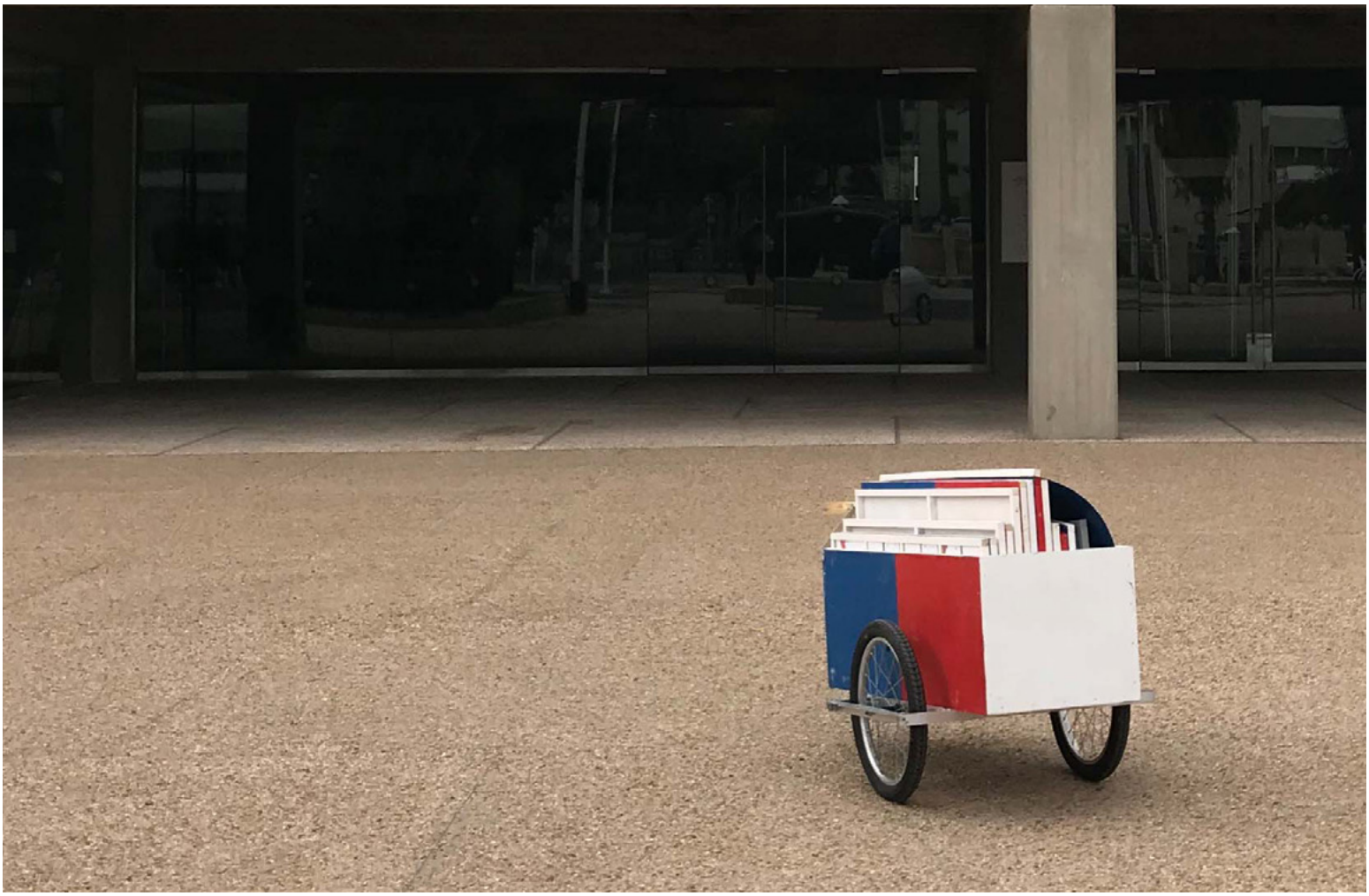

FIGURE 1. Talking House (Handcart), Tel Aviv, 24.03.2020, photo by Hinnerk Utermann

What is proximity? How can it be described, constructed, defined from a design and architectonic perspective? How to build a situation that allows for proximity between two strangers? How is proximity experienced in different spatial configurations?

Buildings provide a limitation and framing through material, structure, size, orientation, lighting, etc. *Talking House* explores these boundaries to study spatial behaviour by borrowing methods from the field of proxemics. Originally coined by the anthropologist Edward T. Hall, proxemics suggests that “people will maintain differing degrees of personal distance depending on the social setting

FIGURE 2. Talking House, Tel Aviv, 24.03.2020, photo by Hinnerk Utermann

and their cultural backgrounds." Hall differentiates between four distance zones (intimate, personal, social, public). My aim is to develop my own system and protocol to describe proximity.

The modalities of construction, the tacit knowledge of building as well as the dimension of in-built knowledges and their impact on those who inhabit spaces are usually underrepresented in architectural education. By reconsidering these topics and looking at them as actual practices, *Talking House* hopes to actively contribute to the discourse of design-driven research in the field of architecture.

Observations

Thierry Lagrange
Claus Peder Pedersen
Edite Rosa

CLOSE OBSERVATION AS A LEARNING MOMENT

Thierry Lagrange
Faculty of Architecture, KU Leuven

Title:
Designing Preservation. integrating the architectural project to UNESCO tools to tackle territorial fragility: the Tivoli case as a pilot experience

Presenter:
Sara Ghirardini, Politecnico di Milano

Supervisor:
Pier Federico Caliari, Politecnico di Torino; Politecnico di Milano
Francesca Lanz, University of Lincoln

Panel Members:
Oya Atalay Franck, Director of the ZHAW School of Architecture, Design and Civil Engineering; EAAE, ARENA
Pedro Guilherme, Departamento de Arquitectura, Universidade de Évora
Ralf Pasel, Institute of Architecture, Technische Universität Berlin

The observation started from an attentive registration of the whole. It concerned a clearly structured presentation followed by a conversation with the three panel members (one of them moderated as chair). The observation focused on how the conversation developed.

From this one case, it is difficult to make any real recommendations, although I did observe a few things.

The conversation went as follows. After the presentation, the first panel member immediately went off and tried to summarise the whole thing. You clearly noticed that the panel member had difficulty doing so and was thinking while he was speaking. This led to a searching monologue rather than a dialogue. It was a monologue without a

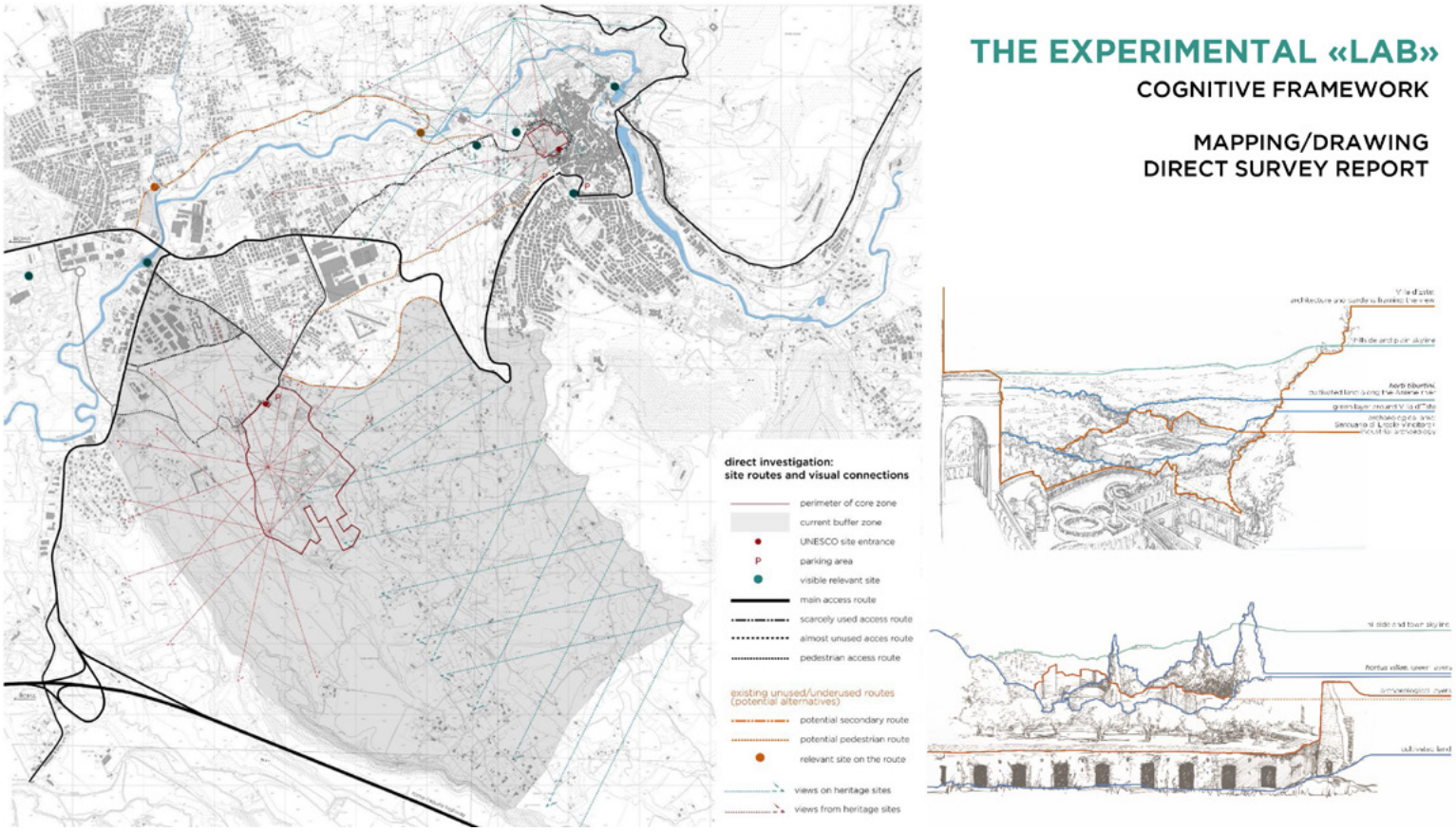

FIGURE 1. Graphic elaboration of data from the direct survey on the buffer zones of Tivoli UNESCO heritage sites, plans by Sara Ghirardin

precise intention. During this intervention, several questions had been formulated which were eventually reformulated into one question.

The second panel member could in a way use the situation to reflect on the whole. His intervention, delivered appreciatively, was sharper and pointed out some weaknesses in the whole. He also took the time to thank her for the clear presentation. **His intervention dealt with both methodological aspects ('lack of poetic moments' as a possible guiding principle in the research) and a critical questioning of a so-called key reference that does not fit into the research.** It is about this second part that a dialogue does emerge. In which researcher and panel member exchange thoughts.

FIGURE 2. Photo report on the pedestrian connection between Villa Adriana and Villa d'Este through the territory of Tivoli, photos by Sara Ghirardin

After this, the chair comes into action. He anticipates the dialogue and the lack of an answer to the first part concerning methodology. In this way, the researcher could respond to this and both panel members were also involved in the conversation. Only now does it become a conversation among the four of them. The ice has clearly been broken and the candidate can now talk about the doubts and moments of confusion she has had during this research project.

As an observer, I notice a few things. The panel members may have seen the project beforehand. But they mainly rely on the communication during the presentation. Otherwise, they are not prepared. A few guidelines would certainly help the panel

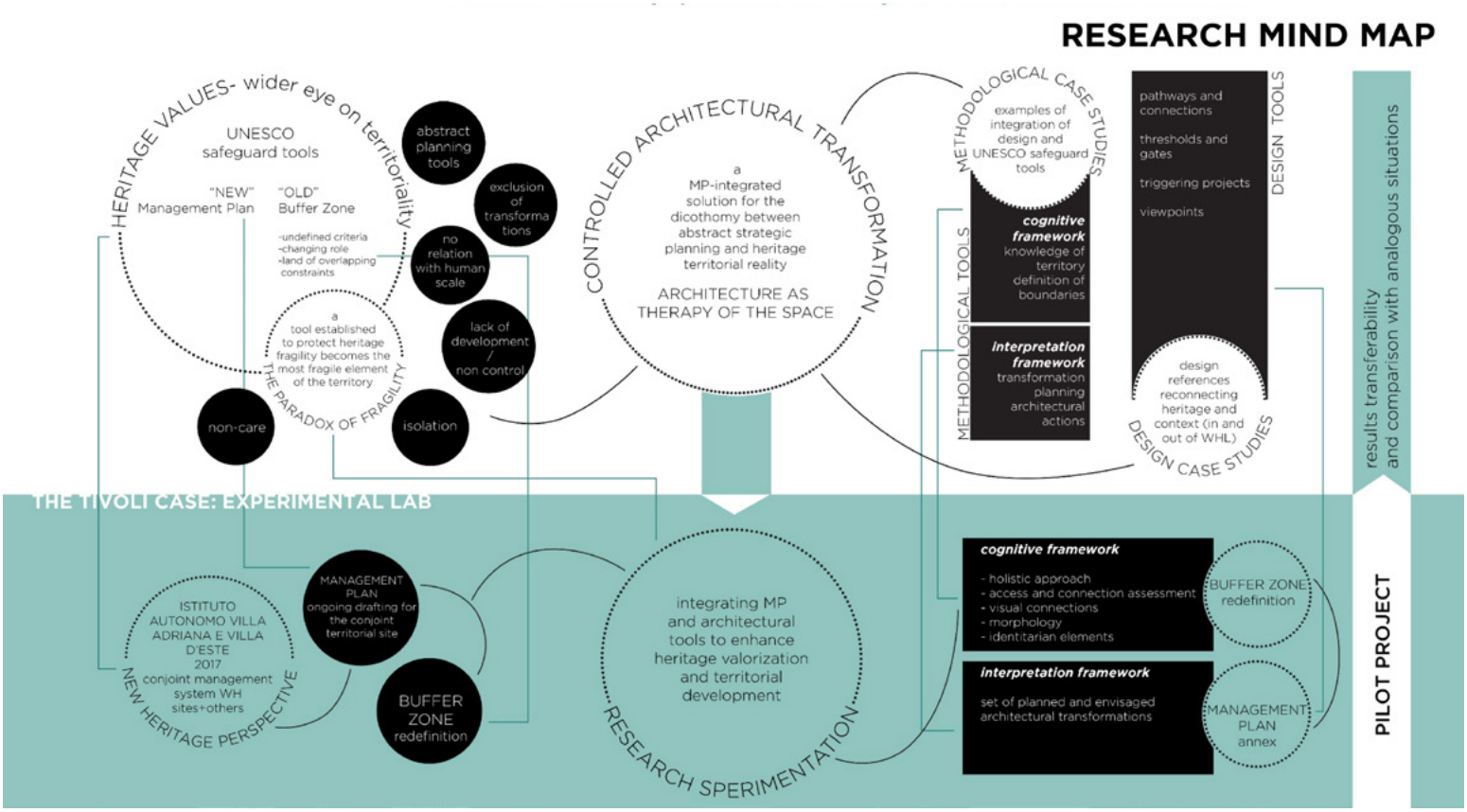

FIGURE 3. General mind map of the research, concept by Sara Ghirardin

members (what should they pay attention to, what type of questions can they ask depending on the stage the candidate is in, etc.).

What also struck me is that, as an observer, you yourself are also involved in a learning process. You look and listen in a totally different way to what is happening there. This may have been one of the most important considerations I had. The role of observer teaches you how you yourself could/ should act in the panel. It makes you an even more attentive panel member with more feeling for the situation.

OBSERVATIONS ON MAR MUÑOZ APARICI'S PRESENTATION

Claus Peder Pedersen
Aarhus School of Architecture; EAAE, ELIA.

Title:
Unfinished Thresholds Experimenting with Public Building's Agency in Hybrid Cultural Building re-design

Presenter:
Mar Muñoz Aparici, TU Delft

Supervisor:
Roberto Cavallo, TU Delft
Maurice Harteveld, TU Delft

Panel Members:
Lidia Gasperoni, Institute of Architecture, Technische Universität Berlin
Joaquim Almeida, Departamento de Arquitectura, Universidade de Coimbra
Liselotte Vroman, Faculty of Architecture, KU Leuven

Mar Muñoz Aparici's presentation was theoretically contextualised by focusing on public space and spheres as introduced by, among others, Zygmunt Bauman. The discussion of changing relations between public buildings, private initiatives, and civic society was used to argue for a redefinition of public spaces and question how to design these spaces. The contextualisation was supported by an elaborate taxonomy of public areas that identified the library as a distinct public educational building type.

The research was presented according to a relatively traditional model: A literature review framed the study and informed the selection of case studies and the subsequent design experiments. The designs were real-world interventions in public libraries that provide empirics and insights for cross-case comparisons, identifying the research findings. However, Muñoz Aparici briefly questioned

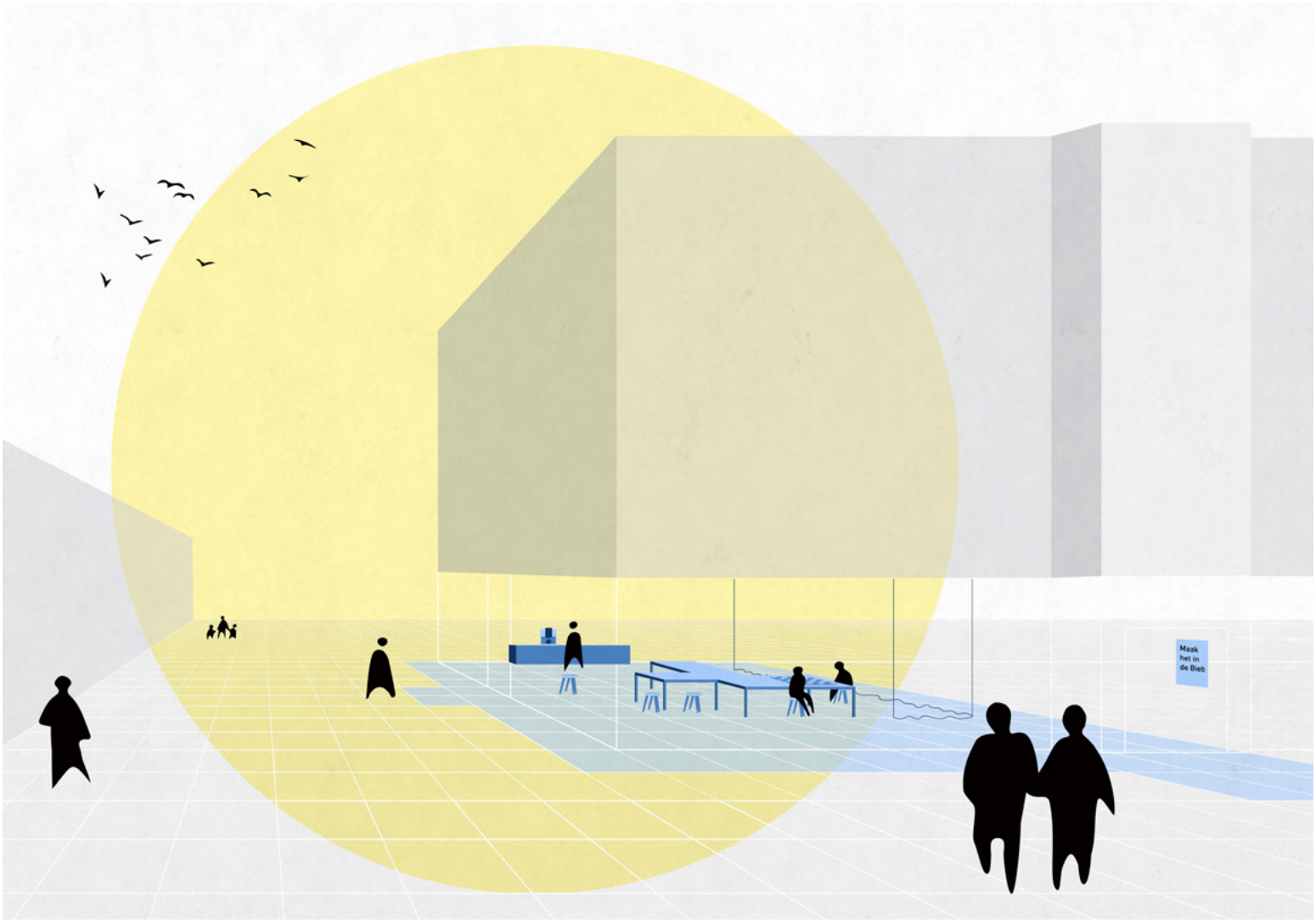

FIGURE 1. Public Building Activation: beyond the indoor-outdoor dichotomy by Mar Muñoz Aparici

this linear research model by reflecting on how the research develops simultaneously as theory studies and design experiments intertwine. The panel did not address the difference between the ideal research model and the experienced process. Still, it would have been interesting to discuss whether this gap is particular to design-driven research or a natural stage in any research process.

The design experiment developed a makerspace for the public library in the Dutch town Gorredijk. The project development was characterised by an

open-minded approach where the design was conceived in a co-creative process with the library's users and employees. This led to 'design advice' before designing and building the actual spatial interventions. The interventions aimed to create a spatial, material and programmatic ambiguity to break down thresholds and stimulate the curiosity and participation of the library's users.

The commenters appreciated the exciting topic and comprehensive presentation. They addressed the research from three perspectives: 1. how the theoretical framing and the design interventions were linked. **2. how design processes and architectural representation techniques were used as research methods** 3. how the real-world design was analysed to identify and substantiate the research findings.

1. The panel discussed the relation between the theoretical framework and the design experiment. One panel member questioned if the broad theoretical framework and elaborate taxonomy of public spaces provided a productive framework for the design experiment or became too complex for the limited scale of the building transformation.

2. **The panel critically discussed the somewhat schematic presentation of the finalised design. The members asked how architectural representation techniques could help unpack the co-creative design process that led to the built project and explore the concept of thresholds in design. They debated how to examine the library as a building type to reflect on how the project might be**

transferred or transformed into other public building types. They missed detailed design drawings and especially sections to explore and develop the space and ambience of the intervention in more detail.

3. The panel asked how the built project was examined to identify and substantiate the research findings. One panel member missed the presence of the library's users and employees in the presentation and questioned what methods (questionnaires, observations...?) could help examine the effects of the deliberate blurring of spatial and programmatic thresholds.

RECORD AS OBSERVER IN CA²RE+ DELFT RECOMMENDATIONS

Edite Rosa
Prof. Dr., Departamento de Arquitectura, Faculty of Architecture, University Lusófona of Porto

Title:
Bodily Movement in Architectural Theory and Its Implications for Spatial Composition

Presenter:
Wiktor Skrzypczak

Supervisor:
Matthias Ballestrem, HafenCity Universität Hamburg

Panel Members:
Mark Pimlott, TU Delft
Katrine Wiberg, School of Archiotecture of Aarhus
Esther Venrooij, KU Leuven

This text taken as an observer, of the session *Bodily Movement in Architectural Theory and Its Implications for Spatial Composition* focus on significant aspects emerged from the presentation and panel comments, underlining the design research themes that the CA²RE+ *consortium* elected as DDDr main parameters[1]: *approach, method and techniques.*

APPROACH

The panel acknowledged the research starting point in a performative design problem, not on the performance product but on its design movement-space reflection, with abductive questions and reasoning crossed with inductive ones.
An approach that explored the dialectic between the positions in movement theory that uses

1 CA²RE+ Book 2 (2022) – Evaluation of Design-Driven Research, Edite Rosa (Main editor), Publishers COFAC / Lusófona University of Porto, ARENA (Architectural Research European Network Association), EAAE (European Association for Architectural Education), ELIA (European League of Institutes of the Arts), 1st Edition.

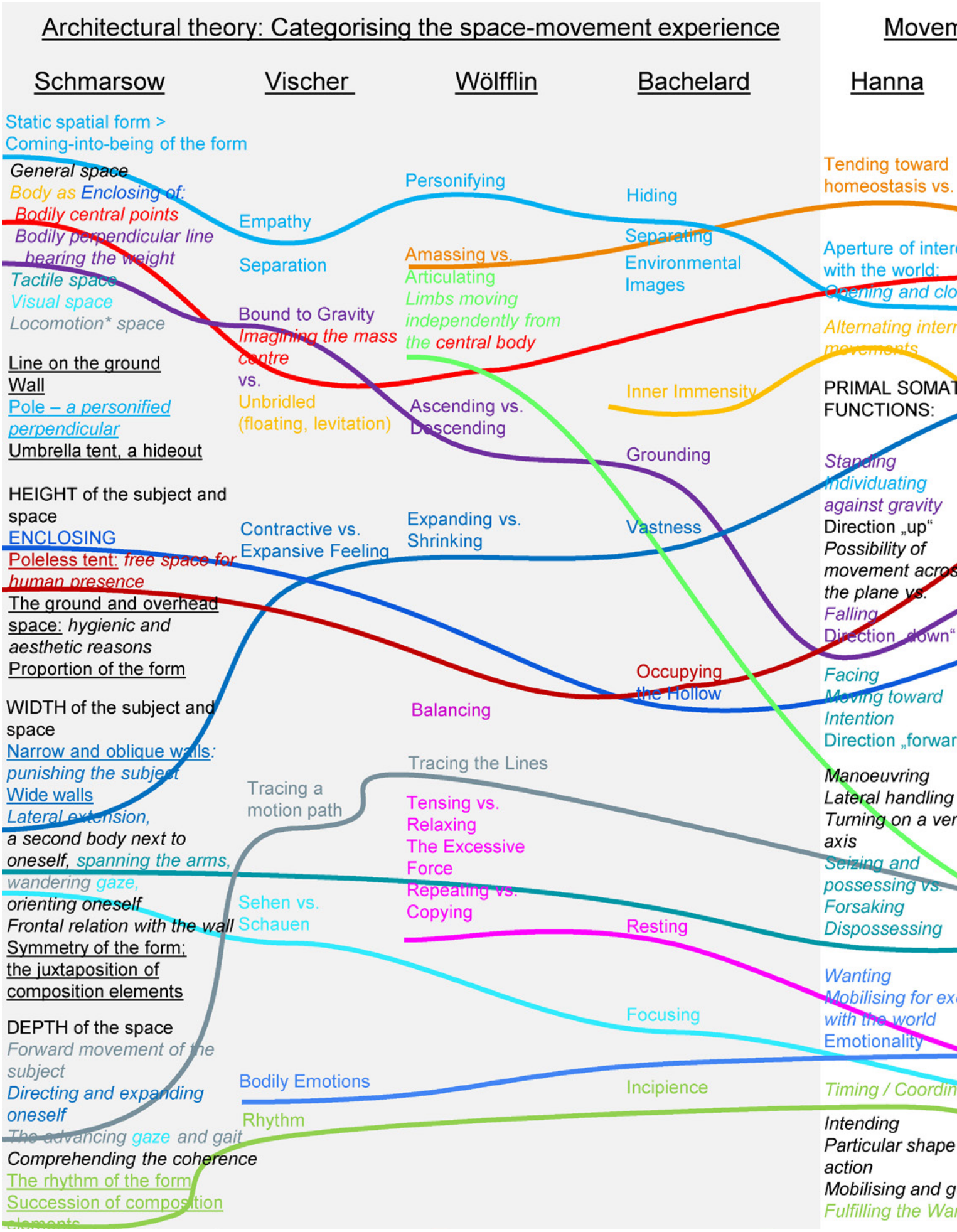
Architectural theory: Categorising the space-movement experience
Schmarsow
Vischer
Wölfflin
Bachelard
Hanna
Static spatial form >
Coming-into-being of the form
General space
Body as Enclosing of:
Bodily central points
Bodily perpendicular line
bearing the weight
Tactile space
Visual space
Locomotion* space
Line on the ground
Wall
Pole – a personified perpendicular
Umbrella tent, a hideout
HEIGHT of the subject and space
ENCLOSING
Poleless tent: free space for human presence
The ground and overhead space: hygienic and aesthetic reasons
Proportion of the form
WIDTH of the subject and space
Narrow and oblique walls: punishing the subject
Wide walls
Lateral extension,
a second body next to oneself, spanning the arms, wandering gaze,
orienting oneself
Frontal relation with the wall
Symmetry of the form;
the juxtaposition of composition elements
DEPTH of the space
Forward movement of the subject
Directing and expanding oneself
The advancing gaze and gait
Comprehending the coherence
The rhythm of the form
Succession of composition elements
Empathy
Separation
Bound to Gravity
Imagining the mass centre
vs.
Unbridled
(floating, levitation)
Contractive vs.
Expansive Feeling
Tracing a motion path
Sehen vs.
Schauen
Bodily Emotions
Rhythm
Personifying
Amassing vs.
Articulating
Limbs moving independently from the central body
Ascending vs.
Descending
Expanding vs.
Shrinking
Balancing
Tracing the Lines
Tensing vs.
Relaxing
The Excessive
Force
Repeating vs.
Copying
Hiding
Separating
Environmental
Images
Inner Immensity
Grounding
Vastness
Occupying
the Hollow
Resting
Focusing
Incipience
Tending toward homeostasis vs.
Aperture of inter
with the world:
Opening and clo
Alternating intern
movements
PRIMAL SOMAT
FUNCTIONS:
Standing
Individuating
against gravity
Direction „up“
Possibility of
movement acros
the plane vs.
Falling
Direction „down“
Facing
Moving toward
Intention
Direction „forwar
Manoeuvring
Lateral handling
Turning on a ver
axis
Seizing and
possessing vs.
Forsaking
Dispossessing
Wanting
Mobilising for ex
with the world
Emotionality
Timing / Coordin
Intending
Particular shape
action
Mobilising and g
Fulfilling the Wa

FIGURE 1. Preliminary mapping of the common movement notions in architecture theory and movement analysis, by Wiktor Skrzypczak

space to address the movement with positions in architectural theory that uses movement to address the experience of space. A dialectic linking two categories, space and movement, through core notions used by space theorists (Vischer, Wölfflin, Bachelard) and movement theorists (Laban, Bartenieff, Bainbridge Cohen and Stark Smit). However, their transposition into, drawn simulations of the bodily movements to the designed space, objects and system, were still unclear. Recognizing the DDDr approach results from selected primal movement and exemplary drawn compositional forms of the concepts analyzed, the panel however requested, the selection criteria of each theory key concept, its terms and design operations as well as the reduction of the primordial movements, excessive in number and in different state of importance.

METHOD

The panel suggested emphasizing the most adequate methods used, as the most relevant for the discipline, to clarify the movement and space terms and concepts as well as to help reduce the number of primordial movements. A synthetize essential for the correct comparison of the concepts of movement and space theories, indispensable to improve architectural schemes and sketches of space-movement examples.
A method of comparative analysis drew connection between each primordial concepts of both fields, movements and space, presenting visual maps discovering unique transversals lines. The employment of design-led procedures developed a taxonomy of maps linking theories and a set of

drawings of movement-space forms. The focus was on the process, a design-driven method, which sets the framework for iterative rehearsals facilitating an immersive spatial perception of architectural theory.

TECHNIQUES

The panel enhanced the high level of techniques, describing an autonomous dimension to produce visual material of the topics covered reinforcing the quality by generating original works of spatial aesthetics qualities important for the research findings.

The drawings used in several forms, visual maps, schemes, design sketches took an interpretational perspective and some, a more speculative one. The maps acted as a visual set, analytical and descriptive, the explorative sketches interpreted strategical aspects. They confirm the use as a synthetic experimental tool, format, and media, useful for exploring the covered issues theoretical and practical acting also as interdisciplinary tool. The main final recommendation stress a clear communication not yet achieved on the presented spatial simulations, even if the findings are articulated. A clarification of the most appropriate tools for the research process and presentation of the result information to the scientific community with a greater integration of media and technological procedures. The assessment role of the panel attempts to bring the presenter closer to the core of the research results and improve its transmission.

Testimonial

Sergio Martín Blas

TRUE FREEDOM. OBSERVATIONS ABOUT DESIGN DRIVEN DOCTORAL RESEARCH

Sergio Martín Blas
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The results of the CA²RE+ conference in Delft confirm the rich diversity of approaches to what Design Driven Doctoral research (DDDr) means and its potential to disrupt the rigid conventions and empty academic formulas that hinder the advancement of knowledge. Some of the works in progress use design practices as a source, as an intuitive initial step to unveil hidden patterns and relations, to offer unexpected perspectives, to glimpse potential limits, features, constants and variables of a research problem that might otherwise remain out of the radar. Instead of following the classical research stages, in this case an answer, a specific solution, comes before the question is properly formulated and contextualized. The passage between the specific answer and the general problem or question, including the context, conditions and patterns that define it, is crucial in those cases.

In other cases, design is integrated in the research process through the unavoidably interpretative (projective) act of representing reality by drawing, photographing, filming, recording, etc. Even if drawing and design are not the same, it is interesting to explore the imbrications and divergences between them, ultimately considering whether mere representation can be a distinctive feature of DDDr or not.

A third group of researchers use design as a tool to test a series of alternative future scenarios, a resource which is known in many other fields. What sciences call experiment is nothing more than the systematic observation of a piece of reality altered by controlled physical or virtual actions. Design, the prevision of a future chain of actions that leads to an altered reality, a reality that includes new objects, places, situations, is not as alien to research processes as we tend to think, especially if we use it to produce alternative models which are systematically controlled, observed, and tested.

DDDr can include all these practices, and maybe even the use of design as a true driver, as the force that leads the research process. Such role is usually assumed by the nodal creative part we call hypothesis. The understanding of what a design hypothesis could mean seems to be elusive, compared to the use of design as a catalyst or as an experimental tool, and by the same reason it is worth exploring it.

In any case, design can lead to new ways of doctoral research, and even to a redefinition of what a doctoral thesis is. In this sense, the most challenging question is probably how the personal work, the specific places and discourses developed through design, can be linked to the collective dimension of shared accumulative knowledge which is at the core of research. The need to overcome misunderstandings and misleading positions seems urgent if we want to face such a crucial question, avoiding the perils of isolation and self-assertion. In the last years, these perils are increasing in a wider cultural and political picture, confirming the urgency to identify and point

the reactionary positions that encroach behind apparently disruptive manifestations in almost every field.

It is ironic how, in our context, many of the positions that claim to be rebellious and heterodox, calling for subjectivism, imagination and intuition in the face of the supposed rigidity of scientific conventions, are often instrumental to support prevailing thought forms and to promote a *status quo* anachronistically dominated (in architecture) by the authority principle and a frequent detachment from social interests. The resistance to change adopts, in this as in other fields, apparently antagonistic forms: ancient and modern, rhetoric of the past and rhetoric of the future, converge in an unspoken defense of authority. Whether it be the authority of the "master" or the authority of the "subject" who aspires to become a master, it makes no difference. After all, power is only absolute when it is subjective and arbitrary, when every collective convention is banned, while the objective observation, the collective doubt, have the potential to strip all hierarchies, as Bertolt Brecht's Galileo explained:

> "All the world says: yes, that's written in books but now let us see for ourselves. The most solemn truths are being tapped on the shoulder; what was never doubted is now in doubt. And because of that a great wind has arisen, lifting even the gold embroidered coattails of princes and prelates, so that the fat legs and thin legs underneath are seen; legs like our legs. The heavens, it has turned out, are empty. And there is a gale of laughter over that."

The advance towards an understanding of the collective, cumulative, systematic condition of research depends on our ability to build and use a shared language, a language that facilitates the exchanges between researchers, theses, programs, disciplines, and increases the external impact of our research works. This collective dimension demands from us true openness and true freedom. Openness to other people's voices and discourses, building on previous works and committing to produce a work others can build on after us. Freedom in the acknowledgement of common rules and limits, far from the tyranny of personal authorities and judgements. All this can and must, of course, be faced through design. Remembering Brecht, again, Lina Bo Bardi seemed to incidentally approach the question in this passage from "Tempos de grossura":

> "If the problem is ultimately political and economic, the task of "acting" in the field of "design" is, nevertheless, fundamental. This is what Brecht called "the ability to say no". The artist's freedom has always been "individual", but true freedom can only be collective. A freedom aware of social responsibility, which breaks the boundaries of aesthetics, the concentration camp of Western civilization; a freedom linked to the limitations and great achievements of Scientific Practice (Scientific Practice, not technology descended into technocracy)."

Recommendations

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Building a Disciplinary Methodology

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CA²RE+

The three years of the CA²RE+ project that were building on the previous years of CA²RE conferences and the adapt-r program have been very successful at building a lively and stable community that represents the diversity of research traditions of the European schools and partners involved in the project. The feedback documented in the post-conference surveys shows that CA²RE+ has created a fruitful and caring environment for the assessment and discussion of doctoral projects. Through the project steps of observation, sharing, comparison and reflection and reformulation, we have built a common ground for what has yet to be done: the formulation of a common framework.

In our grant proposal for the CA²RE + strategic partnership, the description of the framework book reads as follows: “The FRAMEWORK book offers a reformulation of the methodology of design-driven research, along with guidelines and recommendations for the introduction, evaluation, and development of design-driven doctorate programs, based on the design-driven doctorates that have been undertaken at universities and investigated during the CA²RE + Strategic Partnership events”.

Although originating from architecture, the CA²RE+/ CA²RE Conferences have cultivated an openness towards all academic fields engaging in design-driven research. We have always considered this as a great gain for the diversity of the community. It has created a culture of an open curiosity towards new and unknown research setups and methodologies. At the same time, it comes with the cost of a certain stagnation, as

in every conference, the presenting researchers have to clarify the foundations of their research approaches and methods.

If the framework will categorize relevant fields of Dodder research, methods and potential outcomes, it would help to establish a common ground for the assessment of the research projects in the community. Furthermore and maybe more important, it could become an effective document for the establishment of DDr in the European science landscape. We know from our experience that declarations and policy papers like “The ‘Florence Principles’ on the Doctorate in the arts” (ELIA), the “EAAE Charter on Architectural Research” (EAAE 2012) or even “The Frascati Manual 2015” (OECD 2015) carry great weight in debates. Besides their important content, it is also because they formulate a common official position of associations and institutions.

The unique opportunity of the CA²RE+ framework should be its contribution to the methodology of DDr, as it can be built on the considerable amount of data and experience between the participating institutions and people. A categorization of successful research setups concerning their methodologies in relation to the field of research, the research interest and question and the expected outcome will form the base for a generalization that can deliver the promise of a framework for both researchers and PhD programs in Dodder.

It is very probable that this process will lead to a differentiation between the two main approaches

in DDr: One that employs original creative design as a process of knowledge production and the other that uses design practices, techniques and media for research in specific phenomena. While the latter will aptly lead to a PhD – a Doctor of Philosophy, the first misses a fitting title, at least in the discipline of architecture. A doctorate that puts the design of physical places in the center of its research process positions itself between the fields of the arts, humanities and engineering. Through the specification of the distinct research paths undertaken in the various PhD projects presented, the CA²RE+ framework offers a great opportunity to build the disciplinary methodology of the “Doctor of Architecture”.

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Design-Driven Research by its Ways of Knowledge Production. On Preliminary Findings and Future Trajectories for CA²RE

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The three-year experience of CA²RE +, although strongly conditioned by the pandemic still ongoing, has undoubtedly brought inputs to the debate on design-driven research in the sphere of doctoral studies (DDDr). Specifically, the contribution stands in the strong 'operational' character that the project demonstrated since its foundations. These were based on the dense cooperation between the consortium members, the applicative response given by the PhD training, the openness towards external experts both from institutional and interdisciplinary levels. In particular, the project progressively developed along with the several conferences, which followed subsequent steps visible in the events' titles: *Sharing* (Ghent, October 2019); *Observation* (Trondheim, March–June 2020); *Comparison* (Milan, October 2020); *Reflection* (Hamburg, March 2021); *Reformulation* (Ljubljana, October 2021); *Recommendation* (Delft, March 2022). Thanks to this methodological structure, the various debate moments allowed and even forced the CA²RE community to focus on some fundamental aspects of DDDr.

FIGURE 1. Studio d'artista, Roma 2004, photo by: F. Berlingieri

The first one concerns the diversified composition of the partners' consortium, introducing a plurality of knowledge on what DDr is and how it has been developed comparing the various institutions. A turning point in that sense was the online workshop organized as part of the *Comparison* conference, hosted by the AUID PhD program of Politecnico di Milano, where we addressed the diversity of methods, approaches, and techniques in an afternoon dialogue with the consortium and extended it to the audience of experts and PhD students participating (Berlingieri, Zanotto, 2021).

The workshop succeeded in defining the souls of the working group, enlightening the specificity of the research paths. Indeed, the diverse positions returned as a representative sample of the numerous facets that characterize design-driven research fields and the range of experiences presented: some experimenting and prototyping through inductive approaches (TU Berlin, NTNU Trondheim); others grounding on contemporary phenomena observation – from Climate Change to social inequalities and inclusion – with a highly interdisciplinary character (Politecnico di Milano, TU Delft, University of Ljubljana, Universidade Lusofona); others attempting to probe the silent relation between research and practice (HFC University, KU Leuven). Several other nuances resulted from the aggregation and participation of research groups from schools external to the core consortium. The subsequent events of the project have gradually addressed the central issues of evaluation and contribution's specificity of DDr in scientific arenas, mainly along with the conferences in Hamburg and Ljubljana, which results have been recorded in the second book – *Strategies*. On that occasion, together with Matthias Ballestrem, we deliberately asked the consortium to reflect once again, in a sort of reiterative action, on research preconditions for DDr in their scientific fields.

A central aspect of our contribution (Ballestrem, Berlingieri, 2022), focusing on common traces emerging from the several statements, relates to recognizing the importance of the media and techniques applied for architectural and artistic research. As architects/designers/artists, we are familiar with non-verbal communications deriving

from an endogenous aspect of the disciplines, that is to be constantly trained in vision, in visual projections rather than in the verbal ones, also more conventionally identified with the textual medium. This peculiarity is still considered an obstacle to recognizing and transmitting research results in wider networks. However, it is nevertheless an essential and specific component of our discipline, the betrayal of which only weakens our contribution to scientific knowledge development. In that sense, the CA²RE+ project fundamentally questioned cognitive processes and traditional scientific criteria in architecture and visual arts doctoral research paths. The attempt was brought through texts and partners meetings and the PhD research training. Indeed, the CA²RE+ project had the purpose of bringing together senior staff and early-stage career researchers to improve research quality through intensive peer-reviewing at the key stages – initial, intermediate, final. For example, a DDr statement from PhD candidates and presenters was introduced for the Milano conference and became mandatory for the following ones. It has been a fruitful action, directly engaging the participants to deepen their position and the design-driven approach's specificity in their research path. Moreover, during the panel discussions the consortium pushed forward the heuristic value of the media and non-verbal techniques implied in the research, and its representation through artifacts or visualizations.

A second aspect that strongly emerged along the project is the joint engagement to further develop and promote unconventional research paths within the various doctoral schools, where the methodological specificity of DDr can be more

clearly formulated. The keynote speakers have undoubtedly played an important role in exemplifying the possible research methodologies based on the heuristic speculation of the design media or the use of transdisciplinary approaches and research techniques as privileged points of observation. But above all, the candidates' moments of discussion have been the most fertile ground for asking and clarifying sometimes unconscious leaps and a coherent approach to design-driven topics. The talks have been recorded by "observers", joint staff trainees and consortium members external to the panel session, allowing a specific reflection on the panels' dynamics and feedbacks addressed during the presentation. The aim was to focus on more innovative approaches and evolve the projects' awareness from a state of the art to a focused positioning in DDDr. This reflection also includes observing the research process – and progress – of the PhD candidates, thanks to the continuity of the training courses offered to participants attending several conferences according to the different stages during the biennium. It allowed us to observe whether and to what extent the researchers benefited from the project, with reiterative reflection on the quality process despite the clear plurality of approaches.

A final important aspect is the effort to clarify evaluating unconventional research. In fact, by clearly accepting the need for scientific rigor and relevance in doctoral studies, the question is how to address, as highlighted in the CA²Re community, a massive presence of plurality and diversity of approaches, themes, and methods. This task precisely relates to the balance between the research personal interest and the relevance in

design field that ultimately remains the observation – and transformation – of reality. Architectural research primarily refers to phenomena and society, and their related dynamics of change. In a broader sense, we look at things and try to read them:

"If it is assumed that the art of reading is confined to the printed page, we cannot go far. But if we broaden and quicken our sense of reading until it appears to us, in its more vital aspect, as a science, an art of interpretation, we shall go very far indeed. In truth, there will be no ending of our journey; for the broad field of nature, of human thought and endeavor, will open to us as a book of life, wherein the greatest and the smallest, the most steadfast and the most fleeting, will appear in their true value. Then will our minds have escaped slavery to words and be at liberty, in the open air of reality, freely and fully to deal with things. Indeed, most of us have, in less or greater measure, the gift of reading things".
(Sullivan, 1906)

For the conference *Reformulation*, the hypothesis launched by Ignacio Borrego, Ralf Pasel, and Jürgen Weidinger consists of tracing a methodological taxonomy on the sample of the PhD CA²RE community (Borrego, Pasel, Weidinger, 2021). I find this hypothesis an indispensable aid to move towards possible innovations in the methods of evaluating research that can reveal the specificity of the disciplinary fields involved. Especially regarding the problem of the relevance and originality of research in the DDr. But this proposal should be extended to another question, namely the heuristic value of the media.

Often, research in architecture and art becomes original through unconscious discoveries, that is, through those sudden leaps that the heuristic process allows. It is a sort of action's praise where our thinking evolves through the media we use. In that sense the research relevance – and maybe also its originality –, relies not on the correctness of the research setting or the completeness of the process, but on the tools and the ways in which they lead to unexpected discoveries. The tools hide processes of acquiring knowledge that are often overlooked. For example, drawing is never a mechanical action but a selection and therefore includes knowledge production. As an act of choice, drawing identifies a clear perspective through which the researcher looks at the phenomenon or object of study while defining a proper cultural positioning. The relationship between tools and process is an essential aspect of our work; this relationship's coherence or heuristic value should assume greater importance in the evaluation processes. Precisely these aspects restore the specificity of our discipline in the general contribution to knowledge and its transferability. The connection and awareness between action and critical reflection remain central nodes for marking a specific contribution to further revise design-driven research's scientific criteria.

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Design-Driven Research at the Conference for Artistic and Architectural Research (CA²RE+)

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Design-Driven Research is a systematic practice to produce and to explicate knowledge. It consists of the collection, analysis and re-configuring of design-based information on one side and an added creative argumentation by means of an actively conducted design process on the other. By applying design-driven research, we increase our understanding of highly complex problems, that are multi-directional by its very nature. It is thus above all, an added research method in the scientific field, that allows to address specific topics from a different perspective.

Research is a systematic work developed to produce knowledge. It consists of the collection, organization and analysis of information to increase our understanding of a certain topic. It can be a new enterprise or an expansion of previous work in the field, as long as new outcomes are achieved.

Scientific research is the general denomination of the research process that is following scientific method to try to explain specific observations and hypothesis. The main characteristics of a valid scientific method are: falsifiability and reproducibility of the results. That means that any conclusion out of a scientific process should be able to be tested by observation or experiment, and should happen in the same way if repeated under the same circumstances. These aspects can be supervised by a peer reviewed process.

We can find at least two ways of confronting the artistic and architectural research. The first level is considering the discipline as a research frame. The research object is in the field of art or

architecture and the methodology to approach to it is shared with other social sciences. We can call it research on design.

The second level is using the artistic creation and architectural design as a tool to produce knowledge and we refer to it as design-driven research (DDr) or research by design. Design is a means of acquisition scientific knowledge especially specific to prospective disciplines such as art, architecture and landscape architecture. The goal is to use this capacity as a research tool. In design-driven research, the implicit knowledge that is inherent in the creation process of design, which is mostly based on practice, is made explicit. Design-based research reflects on self-design practice as such and is reflected on the basis of one's own projects and design processes. Both design-driven and the more specific practice-based approaches are suitable to produce knowledge. The materialization implied in practice-based research introduces a deeper immersion in the design process, but the core of the knowledge production is situated at any design level.

INTUITION VS. DEDUCTION

To arrive to first hypothesis, there are different types of methods to face reality and take conclusions from the observations, that are basically approached through deduction or intuition or a combination of both abilities. Deductive reasoning, is the process of conscious reasoning from several statements to reach a logical conclusion. Intuition is the process

to produce knowledge without the use of the conscious reasoning. Any research, any scientific research demands a creative approach, but the deductive or intuitive component of its methodology classifies it in very different approaches.

The main characteristic that we can read in DDr is the predominance of intuition in the interpretation of the research object. This intuition is at the same time the Achilles heel and strength of the design-driven method, because it does not certify successful results but it allows to confront complex contexts where a controlled deductive process is not possible. Design and its intuitive approach are a holistic key for complex and new environments. The fact that creation and design is the core of artistic and architectural research and it is a specific and excusive tool of these disciplines, turns this type of research especially relevant for art and architecture. Artist and architects can recognize complex connections and explore them with design methods. They are able to produce knowledge and develop research using their own capacities. They do not have to borrow tools, abilities or methods to other disciplines.

This specific intuition is not a random idea or a genius moment, but a densified experience of knowledges and methods. Intuitive vision pops up to identify and understand complex design phenomena because time is limited. Therefore, DDr and practice-based research can only be achieved by persons with a certain mastery.

If this mastery is a precondition for DDr and practice-based research the question of how to evaluate it can be raised. Deductive reasoning demands certain abilities, and intuitive approach to DDr demands design skills.

The action of design is intuitive and the project as a result is a complex substrate with endless interpretations. It is only when the designer analyzes and makes explicit the acquired knowledge, when this process becomes valuable from a scientific point of view. The knowledge must be univocally transferable. In order to bridge the gap between this intuitive process and scientific knowledge, the audience must be able to perceive and understand the same message that the author is producing. There should not be space for external interpretations.

The relevance of DDr goes beyond these disciplines as design has a catalytic effect on the built environment, and has an immediate and direct impact on social aspects and social coexistence. The outcome of this type of research is a contribution to improving our habitats and has the potential to become an interface between classical research and social change, leading to transdisciplinary research. Design plays a key role here, since creative processes possess different qualities than any quantitative research. DDr is therefore the necessary expansion in the research field to anchor research in society and to contribute to changing society.

The frame created by CA²RE+ has offered an academic environment where a diverse variety of artistic and architectural researches have been welcome and leaded toward a scientific path of falsifiability and reproducibility supervision of the results with the participation of a wide community of specialists and peer reviewers. The intervention of the peer reviewers has had a double rol. On the one hand they have become blind reviewers of anonym submissions and on the other hand they have been panelist in public crit sessions (in presence and online), so that the authors have received several inputs to test the evolution of their researches, and bringing in the processes the profit of a collective intelligence.

The achieved large-scale networking shows a clearly recognizable trend: DDr takes up an increasingly obvious social necessity. In times of political discourse and the failure of conventional research formats as a validation basis for social change, DDr proposes concrete solutions to improve the built environment. The rapidly growing practice-based design community not only reflects the great interest, but also explicitly shows the importance of DDr. International (especially European) networking, makes it clear that the current social challenges cannot be solved at national level, but require a more global perspective, which is taken into account with our DDr network.

CA²RE+ has become a collaborative structure where the size of a working group allows not only

to gain experience, but to multiply their individual capacities.

The experience of those who have gone before us and the ability to store and transmit the inheritance that represents the greatest potential in our species over other, intelligence beyond. This approach has been understood until recently as an essentially vertical flow from generation to generation, which was understood as culture sedimented knowledge that transferred through learning.

However, the current capacity to inform and communicate through extensive and agile knowledge networks[1] has produced a horizontal transmission of knowledge, bringing collaboration up to unprecedented levels of efficiency. The former unidirectional and vertical process turns today to a horizontal and bidirectional.

The speed of propagation of knowledge has reached such a magnitude that is no longer conceived as a hermetic and linear investigation, but the interaction and exchange among different groups with similar interests produces an exponential increase of the findings and resolution of problems.

The whole is greater than the parts.

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Breaking Contraindications: Strengthening Design Driven Doctoral Research

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CA²RE+

INTRODUCTION

In the previous text contributions for the CA²RE+ publications, my focus has been moving from providing a kind of overview towards more personal stands regarding Design Driven research. The 2020 CA²RE+ Milan conference essay (Cavallo and Alkan, 2021) is an attempt to give a wider insight into the matter, interrelating the main paradigm shifts that took place throughout the international scholarly scene with the Design/Research development pathways at the TU Delft, particularly at the Faculty of Architecture & the Built Environment. Next to that, the framing of the CA²RE+ project out of the perspective and agenda of the ARENA network (Architectural Research European Network Association) characterizes the written piece (Cavallo and Hirschberg, 2021) for the first CA²RE+ book on Strategies of Design Driven Research. Meanwhile, the text for the 2021 CA²RE+ Hamburg conference (Cavallo, 2021), as well as the written contributions for the 2021 CA²RE+ Ljubljana conference and the second CA²RE+ book on Evaluation - the last two publications are upcoming - are more based on my personal viewpoints, observations and experiences. Up to a certain extent, in this new text I will set out some of my findings and clues in conjunction with more general considerations related to peculiar aspects of Design Driven Research.

Although to date several publications, projects, examples and various initiatives – among others and certainly not the least, the CA²RE+ project itself - can be found supporting necessity as well as values of Design Driven research, it is evident

to me that carrying out such research remains somehow an adventurous endeavour, especially in the framework of academic studies such as a doctoral research degree. This situation can be sensed in many of our institutions, in which putting forward design as a pivotal act in scientific research still encounters a considerable dose of scepticisms. For these reasons, I've decided to start the title of this contribution by *breaking contraindications*. While touching upon a few intricacies and dilemmas related to design in the framework of scientific research, the goal of this piece is to create awareness about some of these *contraindications* and outline possibilities to turn these challenges into vantage points to enhance and encourage Design Driven Doctoral research.

DESIGN DRIVEN RESEARCH; PERCEIVING DESIGN IN SCIENTIFIC RESEARCH

It is undoubtedly true that design is a central matter in architecture. Nevertheless, the question of whether it can be considered a central matter also in research, as a scientific activity, remains a persistent concern in our discipline. Design has many facets and connotations, follows very often non-linear pathways of development, frequently combining diverse aspects, as well as various objective and subjective perspectives. These are just some of the reasons due to which considering design as being a sound scientific activity will, up to a certain extent, continue to be controversial. In general, design doesn't follow a predetermined and widely shared set of rules that usually are the main characteristics at the base of scientific research processes (Rheinberger,

2021). Thereby, these misgivings are somehow amplified by this kind of dual identity syndrome that is typical of architecture, at the one hand the practice-oriented design and at the other hand the academic discursive discipline.

Design is commonly regarded as an activity meant to solve problems and achieve a particular product for a project and its implementation, in this way getting close to the usual objectives of design in professional practice. In my opinion, this is a crucial matter that needs to be turned around. Perceiving design mainly as a way to reach a targeted product and focusing too much on problem-solving can turn into a pitfall. Therefore, to enforce design as a research activity, the focus needs to switch towards knowledge. Undertaking Design Driven Research should imply committing to an 'inquisitive use' of design (Elkjaer, 2009), in which problem-solving can play a role but doesn't have the upper hand. In this way, the process of inquiry is more experimental, a process in which all steps are meant to contribute to the development of the thinking. Consequently, the goal of the inquiry is getting to know, about knowledge, and it can be transferred as such to ensuing activities (Elkjaer, 2009). While linking various matters into synergic interconnections, an inquisitive use of design enhances design as a knowledge-oriented activity, promoting creativity processes towards the emergence of new knowledge.

DESIGN DRIVEN DOCTORAL RESEARCH; MAKING USE OF DESIGN IN SCIENTIFIC RESEARCH

In research, and especially in doctoral research, the most important general requirements to take into account can be summarized under the headings of motivation, research questions, relevance, approach and methodology, novelty and transferability. Although these terms in a row are looking quite straightforward, spelling them out in the guise of Design Driven Doctoral Research demands specific attention. By the fact that design features many different facets and connotations, design driven research obviously cannot be characterized by univocal and objectified ways of inquiry, but rather by singularity, own position, situatedness, context-dependency as well as the use of specific research strategies and techniques (Blythe and Stamm, 2017). In addition, as doctoral research is typically an individual activity, the above-mentioned specificities that apply in the case design is involved, must be extended also to Design Driven Doctoral Research. It is therefore a basic premise that each doctoral researcher involved in Design Driven Doctoral Research develops its position in relation to the above-mentioned peculiarities, clarifying its distinctive individual range of ways to conduct the research (Blythe and Stamm, 2017). Even in the case the research is very specific and with a high degree of singularity, the researcher should make the effort of positioning him- / herself and contextualize (part of) his / her research in the interlocutors' framework in which the inquiry at stake would have an impact and be relevant. Following this

pathway, it should be possible to point out the differences, the additional or adapted points, that are characterizing the individual (part of the) research vis-à-vis the realm of research it refers to. This relates also to the concept of *Reflexive Design*, regarding specific questions of design research, with the goal of adopting more open research approaches in comparison with methodically predetermined scientific investigations (Buchert, 2021).

DESIGN DRIVEN DOCTORAL RESEARCH; MODES AND TYPES OF COMMUNICATION

Following the line of thought outlined in the previous paragraphs of this contribution, the specificities involved with *Design Driven Doctoral research* dictate that doctoral candidates define and enlighten their own position. This implies that researchers should be first aware of the things they are intending to do or are doing and in which context. For example, what is exactly the research and / or practice laboratory (Blythe and Stamm, 2017) of the individual researcher? Where and at which point the researcher / designer formulates his / her own findings via 'reflection on', 'reflection in' (Schön, 1983), and 'reflection for' (Blythe and Stamm, 2017) his particular (part of) work?

At the same time, the researchers should be strategic regarding the potential and opportunities of bringing forward and communicating their research, paying special attention to the design driven aspects of their inquiry. Like in the case of presenting a design proposal to other peers or clients, all types of

communications, verbal, non-verbal, written and visual, are playing an important and specific role also according to the specific types of audience. Terms such as *hidden premises, saying /showing distinction, evidencing claims, experiential knowledge, transformative triggers*, and many others (Blythe and Stamm, 2017) emerge in the glossary to facilitate expression and articulation of the various steps that such types of research journey entail. Without dwelling too much on the various 'new words' and their meanings, the important matter in Design Driven Doctoral research, as it is for every doctoral research, is the contribution to knowledge and its transferability. Also on this account, in *Design Driven Doctoral research* several matters can become pivotal, ranging from personal matters such as, among others, own position, own motivation, own context, and individual triggers, to more external issues like the contextualization of the research, external transformational stimuli, or sharing and testing.

DESIGN DRIVEN DOCTORAL RESEARCH; DOCTORATENESS AND ACADEMIC RESEARCH ENVIRONMENTS

Research environments play a fundamental role in this discussion. When we specifically look at universities as the institutions wherein most doctoral research programs are taking place, there are some perhaps obvious challenges that we should bear in mind. Universities are places where academic knowledge and research traditions along with their scientific conventions are residing, and where, at the same time, experimentation, innovation and cutting-edge

should be nurtured. It is not my intention to start here a discussion involving the bureaucratic complexity of these organizations, but when talking about doctorates it seems obvious to me that ingrained scientific conventions and their accompanying regulations can often be perceived as burdensome, particularly in relation to innovative, experimenting and ground-breaking initiatives entailing non-conventional ways of working and often requiring new pathways of assessment. Many of these issues connected to the various challenges and questions regarding *doctorateness* are constantly a matter of concern throughout the wider academic community in the creative fields (Nilsson et al, 2017). Therefore, in order to strengthen design driven research in particular at the doctoral level, it is key to establish and keep alive a fruitful interplay among all research perspectives in architecture and its flanking disciplines, including every form of design or practice.

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CA²RE+: Strengthening and Improving the Resilient and Resistant Capacities of a Fragile Framework within DDDr

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In our community the framework is being composed by early researchers, PhD candidates, postdocs, junior and senior researchers, decision makers and a periphery of an interested audience. In our opinion the framework looks rather scattered and fragmented at first sight. However, looking at it more closely this framework much more resembles to a mycelium or a rhizome (Guattari, Deleuze) that weaves itself into the research topography (Besse) with a complexity that makes it much more internally integrated and externally embedded hence through which it becomes less vulnerable. Even if this framework must endure a local stress test it appears to demonstrate a self-healing and self-calibrating capacity through which it seems to establish new equilibriums very quickly. A strong example of how such self-calibrating organisms operate can be found in and has been tested through this project is the concept of the concentric circles of observation (see CA²RE Gent 2019).

This raises the important question of how and where this framework finds its content and momentum. This framework is conceptualized as an open-source system that seems to further develop itself organically. In that the framework is not only the established vehicle of all the partner institutions of this project but also allows incoming and outgoing contributors and stakeholders. By doing so the framework is constantly being refreshed and critically re-evaluated, hence it can be considered as a continuously self-calibrating system (Guattari, Deleuze). The open-source system refers also to the ‘respiratory model’ (Christofol, Findeli) of inhaling-exhaling. This emphasizes both the

fragile character and the organic strength of this framework as a living system. The open-source nature of the framework enables the constant inflow of new content that generates momentum.

A critical assessment of the project in our view can be formulated in the form of the following question: are we developing, as a community, sufficient mechanisms and procedures in order to capture, systematize and accelerate these ‘moments of momentum’? It seems to us that this aspect of the project can be improved significantly.

In order to deal with these critical observations, we would like to formulate the following recommendations that mainly revolve around the acute necessity to activate these three levels of stakeholders: PhD students, supervisors and decision makers at universities.

On the level of the PhD students, we recommend that they more accurately formulate their questions and responses and more assertively address not only their own supervisors but also other stakeholders within the framework. Simultaneously we recommend the framework to communicate with the PhD students more actively and explicitly, which is possible and acceptable within the research culture of the framework. Hence this mutual readiness and its capacity to grow should be more explicitly present as a constitutive part of the discourse and supervisory protocols of our environment.

On the level of supervisors, we recommend that they should be invited and encouraged to

challenge their capacity to empathize more, not only with their own students, but importantly with other members and stakeholders of this research framework to share more and more effectively their content, experience and their specific research cultures. In that respect we recommend supervisors to look at themselves as nodes of exchange in which candidates can easily dock in and out travelling from supervisor to supervisor to establish and strengthen the underlying rhizome. As one of the objectives of this project the exchange between local research cultures could be more effectively addressed this way.

On the level of the decision makers of universities and governance we recommend firstly the facilitation of high trust environments to capture and nurture the previously mentioned necessity for empathy and to consolidate this ambition radically in the reformulation of their policy notes and secondly to translate this ambition in appropriate financing models. Can we consider this binary approach as indispensable for true innovation in science?

We can already observe this high trust environment and the momentum it generates in the PhD candidate – supervisor interactions per institution (micro level). We firstly expect this project to establish more momentum between candidates and supervisors from other institutions and between the project conferences (meso level), and secondly, we await this project to facilitate and establish a more continuous and less momentary momentum in order to overarch all the events and conferences of this Erasmus+ project and this DDDr as a whole.

Finally, this project should not miss the opportunity to transfer these concerns and recommendations to decision makers of universities and governance as part of the advocacy that is needed for the DDDr paradigm.

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Considerations upon DDDr Reformulation and Recommendations

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IDENTIFYING THE BOUNDARIES OF DDDR RELEVANCE

Through an introspective review upon the event CA²RE+ Ljubljana REFORMULATION, a main inference stands up, its particular focus is the identification of the boundaries of Design Driven Doctoral research (DDDr) relevance.

In order words, identifying when the DDDr is understood as specific enough to be distinctive and generic enough to be applicable. Meaning to take in account, the inherent nature of the design field (features, characteristics, qualities, properties, attributes) and simultaneously to achieve the “generic” character of the universal knowledge recognized as the ultimate objective of a Ph.D. research.

Design Driven Doctoral research is, therefore, undertaken to obtain new knowledge and although the meaning and context of the demonstrations must be described in words, in turn, its core lies on the full understanding that this type of research can only be obtained with direct reference to the means or products of the design practice. These reviews upon doctoral thesis based on design driven research are important to stake that they seek to establish new paradigms with disciplinary contributions to the advance in knowledge related to creative field and its results, for architectural designs, music, digital media, etc.

However, beyond the understanding of the design practice realm that is located in the sphere of empirical experience, unrepeatable, diffuse and

fragmented, the research of a Ph.D. in design, being specific, in the aim to establish new design paradigms, has also to be, due to its doctoral and research character status, explicitly pertinent, rigorous and original with a generic scope, necessary in its quest for the construction of a collective and universal knowledge.

"Clearly, no matter whether a piece of research is about practice, or is conducted for the purposes of practitioner activity, or is conducted through practitioner activity, its status is determined by the conventions and standards of the class of research to which its procedures belong. Its reliability is determined by its methodology."[1]

Following Archer thoughts, the doctoral research core is seen as a process of rigour, a systematic process of enquiring, objectively reasoned and argument-based demonstrated whose final goal is communicable knowledge advance. As the Design Driven Doctoral research is most of the times sustained on non-objective or artistic design scope with its idiosyncratic issues, the pursuit for of the reliability level of its achievement and outcomes are therefore determined by its procedures and methodology. On one hand, the DDDr must raise design questions, can use design tools, but for sure must search for answers through rigorous demonstration of reasoned design arguments based on critic, conceptual, theoretical and practice credited state of the art, in a systematic verification, point by point. On the other hand, the specific character of our Design Driven Doctoral research more than constituting

1 Archer, Bruce (1995), "The nature of research", Co-design, interdisciplinary journal of design, January 1995.

the conventional Design Doctoral research about design practice, where the processes of practice are merely observed, is as intended and seen through the CA²RE+ events, sometimes closer to research for the purposes of practice or even closer to research through practice, where practice serves a research purpose from the design tools.

Summing up in DDDr design practice and design tools serve as a research purpose for trustworthy "universal" meaningful design-based results.

THE DDDR PROCEDURES AND METHODOLOGIE

If the research through practitioner action is as mostly non-objective and almost certainly situation-specific and if for academic recognition purposes, a practitioner's activity can rarely recognize itself as a research activity, how can then the DDDr procedure, with a strong design practice based elements be trustful?

The answer to this question lies in the DDDr main procedures. On one hand, it is essential to acknowledge the "personality" design competences of the design culture awareness and design practice skills/experience of whom conducts the individual doctoral research. One the other hand, it is essential that the thesis supervisor must be much more concerned with the trustworthiness of the methodology than with the usefulness of the findings. In addition to these procedures the doctoral research data and methods must be transparent and rigours

its knowledge outcomes transferable and transmissible.

This way DDDr acts as a paradigmatic open-ended procedure, easily suitable/applicable to the non-conventional scientific or humanities fields, as design or arts, as a research process, a dialectical spiral between action and reflection that combines design theory and practice for the same purpose. Action-research that seeks to transform the experience from a particular design practice to give rise to general knowledge, applicable to an indeterminate number of concrete objects. Even being in principle the ultimate goal of the doctoral research the establishment of a universal condition based on the raised hypothesis; the final result may be that the methodology is in itself the final universal reliable design driven based outcome.

Regarding the specific methodologies of DDDr when comparing with the conventional research methodologies in humanities or pure scientific fields, most of the of the times, due to design artistic, idiosyncratic, experience or practice-based scope, Design Driven Doctoral research raises more often abductive hypothesis, than inductive ones and even less deductive ones. But, although all scientific and rigorous methods are possible to be combined in DDDr maybe the most differentiated feature is the use of specific design tools, used as methods, instruments or just demonstration techniques.

The purpose or perhaps the relevance of the DDDr lies, therefore, above all when taken as a supportive action-research process, inexhaustible

in the particular universe in which it expresses itself, in infinite Design Approaches, Methods and Techniques. Its structure aims at its applicability and universality to be taken as a resource of disseminating knowledge and contribution to the renewal of the architecture/design field.

So, we recommend that DDDr can and should be an academic research procedure in its own right, one that both agrees with accepted doctoral research criteria, but at the same time properly applies and adequate them to the design field in question. There is some urgency to this, because as long as design areas as for example architecture is on the boundaries of the scientific research debate, it will be confined to the periphery or even hollowness of development of knowledge.

HOW CAN WE QUALIFY THE DIFFERENT LEVELS OF REFORMULATION AND RECOMMENDATION ON THE RESEARCH TO EVALUATE THE QUALITY OF DDDR? HOW CAN WE IMPROVE OUR UNDERSTANDING OF THE PROCESSES OF DDDR?

We understand the Design Driven Doctoral research as a worth work process of a quite large representative number of participants when compared to other projects or to each partner institution alone. Also, we are aware of the project interest with an increasing evolution, since the beginning in, results events and specially the number of participants. So, we do have some recommendation to the several actors.

To the institutions, to have a monitoring process developed in form of a written recording of the overall outcomes whether in the form of platform database, reviewer's critics, external reporters and intellectual outputs.

To the supervisors to consult the CA²RE+ intellectual outputs, proceedings, books and others, where it is possible to view the analyses of the best practices of DDDr works chosen by the *consortium*, as well as the recollection of the main observations and reflection on and about each of the several events.

In a very brief way what has mostly raised from the events reflections through the recording and reactions thoughts, is the specified evaluation of the presenter's works and points of view of the reviewers, is the diversity of DDDr works in content and forms. For this matter we recognized that over time the in the student's doctoral research works have been transiting mainly from closer to research about practice to research for the purposes of practice and a lot now to research through practice. However, in this common recognition of several possibilities inside all the DDDr works the *consortium* recognized and characterized a main set of three existing types of DDDr. These are mostly settled upon three key aspects, the Design Approach, the Design Method or the Design Techniques all relevant to the design field. These three types of DDDr are taken from its intrinsic and singular set of procedures implicit in the above-mentioned nature of the design driven research.

Although, all the former above mention written records have transcripts, descriptions and their arguments exposed of what may be missing in the final Book 3 : *Framework: Reformulations and Recommendations*, to evaluate, more sharply, the quality of the DDDr process, it may be necessary to highlight from the overall elements some specific ones, carefully chosen, with its DDDr results and criteria explanations. Meaning what *consortium* considers as key contributions to knowledge, advanced, experimental, conceptual, theoretical or reflected-based design practices and its understandings as possible epistemologies an adding value to this field and its general competence.

RECOMMENDATIONS QUESTIONS TO BE DEBATED DURING THE OUR LAST CA2RE+ DELFT EVENT

Finally In this text we would like raise some final urgent questions to be debated during the our last CA²RE+ Delft event (workshops, presentations and meetings) in order to rewrite the final reformulated recommendations, as well as the selection clarifying PhD work examples. Being these questions the following.

Taking the DDDR Approach, Methods and Techniques as essential to a DDDr research which are the *consortium* common specific procedures and which do we as partners share to recommend? How can we reformulate our actual CA²RE+ DDDr procedures?

The DDDr procedures must question now not so much why, taking this as granted answered but mostly how and when does the design process is involved in the research? The CA²RE+ Delft debate should engage in these types of questions. This can be achieved by collecting and contextualising the most important findings of the DDDr procedures of the CA²RE+ network events done so far, as for example, the most relevant of each different type of DDDr work of the students.

The key questions reading for the *modus operandi* of a DDDr, CA²RE+ at the moment stands on more than the importance of *Why s*hould design fields recommend the DDDr process, should be *What* design, at *Which* phase of the design processes the research concerning. By what means of design is the research supporting itself, which methodology and tools of design are being used. Why did the selection recall on those (the selection criteria)? how to use design methodologies and design technique to support a doctoral research? when to use them and when to combine with conventional/generic doctoral theses methodologies?

These may come up as short question marks in CA²RE+ Delft event. They will allow us to inquire about the design subject, object, context, reasons, logical structure, methods, and tools. They present themselves as conditioning factors of a fact, action, artefact or issue on which there is still a lack of knowledge. To better understand it, these conditions have and still must be invoked, one by one and one in relation to the other, in

their components, but also the processes that supported them and gave them meaning and relevance to achieve design outcomes, or main results.

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Expanding the Scope of CA²RE+ Cross-Disciplinarity and Post-Doctoral Research

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As the CA²RE+ Erasmus funded network is coming to an end, it is relevant to reflect on possible future steps that can develop and expand the direction of the network. However, before doing that, it is pertinent to summarise and reflect on the goals and planned outcomes of the network. The project partners have aimed to explore and qualify 'Design-driven Doctoral research' (DDDr) from a shared interest in the relevance and contribution of design-driven research methodologies to architectural and artistic research. We recognised the entangled nature of design activities addressing wicked problems and open-ended processes. We also realised that artistic researchers apply highly individual strategies. It was an important point that although we consider this diversity a characteristic and a strength to the field, it also remains a challenge to developing a coherent and systematic understanding of the field. A challenge emphasised by the diversity of research traditions and even the recognition of the research field across Europe.

To address these challenges, we set out to develop a collaborative learning environment through the evaluation of DDDr. We aimed to evidence a learning environment and build evaluation materials through progressive project steps that first identified research strategies and then explicated evaluation processes before finally preparing a future framework for design-driven doctoral research.

This aim has largely been successful. CA²RE+ has developed and consolidated a robust platform for sharing and discussing design-driven doctoral research. The biannual CA²RE+ conferences

are cornerstones in the learning environment. They all share a methodological rather than a topical focus and invite the discussion of in-progress design-driven research rather than finalised research outcomes. Generous amounts of time are set aside for the presentation and discussions. Various presentation formats based on abstracts, papers, or exhibitions are critical elements to establishing the learning outcomes of the conferences. The ambience created by curious and open-minded engagement and feedback by panellists and audiences has also been crucial. Workshops and plenary discussions further contribute to learning outcomes.
Critical components of this format were already established before the CA²RE+ Erasmus project through the initial CA²RE conferences and preceding ADAPT-r Marie Curie project that involved some CA²RE+ partners. The CA²RE+ network has, however, allowed us to capture and analyse feedback to develop further and finetune the organisational framework of the events (Pedersen 2021). The format was also developed through the unexpected need to adapt to online and hybrid conferences during the COVID pandemic. The online conferences gradually matured during the CA²RE+ events in Trondheim Spring ‘20, Milan Autumn ‘20 and Hamburg Spring ‘21 to a well-functioning and efficient format, although the possibilities of engaging socially and with exhibited materials were sorely missed. The Ljubljana Autumn ‘21 event provided the first experiences with a hybrid format that has not yet fully matured.

The format has also developed through newcomers and reappearing doctoral candidates

and panellists. The network has successfully expanded to include a broader disciplinary scope of artistic researchers beyond the boundaries of architecture. This broadening has so far primarily appeared in panels where the cross-disciplinary feedback has opened up relevant new perspectives. Reappearing candidates has provided opportunities to experience how the doctoral research projects have developed in different institutional contexts. In some cases, it even appears that the CA²RE+ network has provided doctoral fellows with a research community that they might not find at their home institutions.

In the interim period of CA²RE+, the network has made progress by mapping different methodological applications of design-driven research at the partner institutions. Shared mapping exercises at the CA²RE+ events and position papers by key project partners have provided insights into the partner's various research methods. They range from interest in drawing as a driver of research to processual methodological focus to a particular interest in qualifying experiences from successful professional practices as research.

In short, the CA²RE+ network has been very successful in establishing and consolidating a shared learning platform. It has also progressed in mapping diverse design-driven research traditions and models across Europe. However, more work is arguably needed before a coherent and systematic overview is established. Further work is also required to establish a robust framework for evidencing the relevance and

impact of design-driven research. The exploration and qualification of these questions would be a valuable and relevant next step for the CA²RE+ network and will undoubtedly remain a focus for future development.

The scope should be broadened and expanded in two directions towards cross-disciplinarity and post-doctoral design-driven research to advance the network further. The move towards cross-disciplinarity has already started. A growing number of panel members from different artistic disciplines has joined the latest CA²RE conferences, where some of the most memorable conversations have taken place across disciplinary boundaries. These conversations demonstrated productive engagement with doctoral projects from different artistic perspectives and frames of reference. So far, most doctoral presentations have come from an architectural background with few cross-disciplinary research projects. We should prioritise expanding the cross-disciplinary approach and include doctoral fellows from other artistic disciplines to advance the network. We should invite new institutional partners from different artistic disciplines to expand the network beyond the current architecture-centred focus. The CA²RE+ model could offer a robust institutional framework around this exchange that might benefit from developing artistic research in other fields and undoubtedly benefit from the plurality.

However, it would also make sense to strengthen a cross-disciplinary approach from a more narrow architectural perspective. Architectural design

unfolds in increasingly complex and entangled contexts that include experts, consultants, and users to respond to social, technical, and sustainable demands. CA²RE+ candidates occasionally research design processual entanglements, but panels consisting mainly of architects might not address them holistically. A range of expertise from sociology, geography, engineering, anthropology, and economics would help unpack the cross-disciplinary entanglements of design processes.

A strengthened cross-disciplinary engagement would also support the critical examination of creativity and design authorship. Currently, CA²RE+ primarily focus on the doctoral candidates' design processes. It enables a close link between designing and reflecting on the design process and should remain an essential element of DDDr. A strengthened interdisciplinary perspective could reinforce the focus on collective design processes and distributed authorship. It might contribute to a more complex understanding of contemporary architectural practices and the roles of designers as architectural practice diversifies. It might provide models for an emerging generation of architects that seeks alternatives to the romanticised person worship of yesterday's starchitect and increasingly embrace collective and communal design practices.

The CA²RE network should also establish a broader academic outlook beyond the current focus on doctoral training. At the CA²RE conferences, experienced researchers offer their reflections to early-stage researchers who qualify

their research to a doctoral level. This model often imbues the feedback with a hierarchy between junior and senior researchers. Participants have occasionally questioned this authoritative model, although most presenters have responded positively to the input they perceive as inclusive, supportive and open-minded (Pedersen 2021). However, the feedback model is less suited to engage research beyond the doctoral level. This became evident at the Ghent CA²RE Conference in October 2019, where post-doc researchers presented their design-driven research. The panels often struggled to respond appropriately to these presentations where presenters expected a discussion between equal peers rather than advice about developing their research.

As the design-driven research community grows and matures, it becomes increasingly important to develop new formats to present, engage and discuss post-doctoral design-driven research. This discussion should include the challenge of establishing non-hierarchical peer to peer exchange. It should critically challenge how design-driven research into a personal artistic practice can develop after completing a doctorate. Practitioners who use doctoral research to establish or reimagine their artistic or commercial practice would probably not face any problems. However, for those design-driven researchers that stay in academia to pursue a research career, it might be challenging to develop the research sufficiently if the object of study remains the researcher's practice. A focus on the practice might also make it challenging to establish research collaborations and compete for research grants that Increasingly demands

inter-institutional and-disciplinary applicant constellations. The CA²RE network could actively support the career planning of early-stage researchers and the development of design-driven research strategies for the partners. However, it will be essential to expand the network's scope with caution. We have carefully constructed a space that allows design-driven researchers to unfold, explore and discuss their artistic and architectural intentions, design processes and research findings with engaged peers. This space provides a rare opportunity for both design practitioners and academics that should remain at the core of the CA²RE community.

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Risk and Opportunity

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Design-driven, practice-based and artistic research is broad and catches the context?

There are many ways of doing research in architecture and writing a research thesis. At the faculty of Architecture and Design, here at the Norwegian University of Science and Technology in Trondheim, we know and use at least three different ones; A “traditional” PhD in architecture/design; a practice-based research (still following the same study program as the PhD in Architecture) or a PhD in artistic research. Design-driven/practice-based research, which can be executed following the latter two directions, is a rather recent initiative at our faculty. The initiative to start practice-based research was started, also to investigate and outline different forms of research in architecture. In addition to traditional PhD research and the practice-based approach, a third way was facilitated as well; the possibility to follow the artistic doctoral research program also for architects. Some years ago, two architects took the invitation, applied and succeeded in the competition to participate in the program. This was challenging the program, but also, they and their thought approaches were challenged. This short text sketch is also based on ongoing discussions with candidates, supervisors, and other stakeholders reflecting on the learning from these initiatives.

The wider goal of research is to generate new knowledge, ready to be used. Traditional research is, by definition, narrow and deep. And this it also must be, being able to produce results; often these results are far from implementation. Our society, also scientific society, doesn’t like

the unforeseen, we do not like risk; the fear of activities not being controllable or not having the ability to foresee the possible outcomes. Most of the societal rules and regulations are to control the possible outcomes and it is enough to get a “decent” result for the input into an activity. Design-driven/practice-based and artistic research do not follow this logic, because they are not “mainstream”, maybe the total amount of money for this type of research is still low; maybe because “tradition” does not believe in these ways of generating knowledge, still lets it happen as a kind of scientific decoration. Projects following that path have the possibility or necessity of working with a high degree of risk. Design-driven and practice-based research is broader and catches the context. The risk in and for projects working in the real world is high, also because of the big number of variables/factors which are steadily changing. The impact, on the other hand, is direct and continuous.

To exemplify this wider approach and opportunity, I want to name Bjørn Inge Melaas’ PhD project at our faculty – *Ecologies of urban gardening*, which he was presenting regularly at CA²RE+ conferences. His project took a d(e)tour, starting from urban agriculture as spatial discussion, through investigating and highlighting its pedagogical potentials and necessities, ending at the core question (of existence) – soil, its use, quality, abilities, but also necessities. This again was followed up by an urban development discussion. He used design-driven/practice-based research as a tool to advance. There is a lot of research on what happens in urban gardens, both the social, the physical and the mental. His

initial thought was to investigate and supplement one or more of these fields, but it became an opener for other, new discussions. He knows too little of each field, but enough to see connections and interpolate them. It was the eureka situations in the project, which triggered changes in the direction; the change from a garden (planting boxes) towards discussing soil and later from soil to discuss urbanisation. These changes/ moments will not have happened without an open approach of what to follow. When trying to grow vegetables in one of the project gardens at the start, the realization of the soil being the problem could be followed up much further, than following traditional research design, also because the goal outlined was a discussion of the themes, not a decision of which in particular. Only after different process parts does one realize that following certain directions was good, but one does not know this when the situation occurs. The openness to be able to allow different directions along the way and follow them widens the picture. Allowing the understanding of something else. Also, in traditional research, this situation will happen, where you first in aftermath realize their importance, only design-driven/ practice-based research is in the field, in reality to a far greater extent than other forms of research (in architecture).

There are different forms of risk to be taken on different levels. In addition to known tasks, in design/practice-driven research the role of the supervisor is to help define the framework, challenge the presented and ensure the freedom of liberal choice. The traditional role of the supervisor must be made explicit. A debate about

distributing risk onto the institution is part of the supervisor's responsibility. Another directly linked theme is architecture education and it has mutual gains and learnings with design-driven/ practice-based research. Many design-driven research projects/"design built" projects have a physical result and educational overlay. Design-driven research connects to "ongoing" reality and therewith relates to (and catches) more dimensions of knowledge and the relation between them. Still, the discussion on risk is valid here as well, so I would like to open discussing the need for risk and context-dependency.

Still, also many of the ongoing CA²RE+ design-driven projects are narrow and personal and do not use the potential to be able to focus on e.g. answering questions, which are helping in answering societies core problems. The opportunity is projects which dare to risk, they open new approaches and important fields for the respective research, increasing the relevance of the research and/or results. If we want to impact, and I assume we do; if we want (to) change, I know it's necessary, there is a need for a new understanding and acceptance of this kind of research approach. To extract knowledge from design-driven, practice-based and artistic research work or through reflection is in all cases outside the classical/traditional research tradition. This traditional research tradition has a resistance to change. So, it is a battle of traditions, the opportunity is a mutual gain, which strengthens, especially when it comes to implementation. So, it is not about describing and certifying the possible outcomes, but to opening up, allowing for the unexpected.

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Reformulating Design and Artistic Practice-Driven Research to Reach Out

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CA²RE+

During the previous CA²RE+ events, some key relevance-related questions were formulated:

- What belongs to design/artistic practice-driven research? Or:
- What is relevant for design/artistic practice-driven research? And perhaps:
- Is what is relevant for design/artistic practice-driven research still design/artistic practice-driven research or something else?

The CA²RE/CA²RE+ Ljubljana aims to focus even more on the hybrid core(-s) of design/artistic practice-driven research. On the other hand, it wants to reach out with the findings of and from within that ‚core'. While the user-oriented researchers (architects, landscape architects, urban designers, industrial designers...) usually share the practical level of their findings with their users, their research (meta-level knowledge) often stays in the ivory tower of the research community involved in the discussions. The research language of other artistic researchers focused on their creative world (painters, visual artists...), can be even more cryptic for the people outside ‚their world'. To reach out, the CA²RE community needs to reformulate the question of ‚What belongs to design/artistic practice-driven research?' into:

- Where design/artistic practice-driven research belongs? How?
- Where is it relevant?
- How is it possible to achieve that relevance?

The LJUBLJANA CA²RE/CA²RE+ event thus

addresses the topic of REFORMULATION.[1] “The event builds on the topics: OBSERVATION, SHARING, COMPARISON, and REFLECTION explored at previous CA²RE+ events. It represents the first step in building an extended DDr FRAMEWORK”. The event aims at the reformulation of the idea of the design/artistic practice driven (doctoral) evaluation training as an event and process. It translates and expands ,the DDr STRATEGIES and EVALUATION processes to increase their relevance to related disciplines that have previously informed DDr. This step redefines the experiential DDr knowledge explication through performances and discussions with the broadest possible audience. It aims to identify the boundaries of DDr’s relevance:

- When is the approach specific enough to be engaging and generic enough to be transferrable, or, in the case of intersubjective knowledge transfer, clear and explicit enough to enable immersion?

The event raises the question of what the CA²RE community needs to reformulate to strengthen DDr:

- How can the community qualify the different levels of observations and reflections on the research to evaluate the quality of DDr?
- How can we address general research criteria of relevance, rigour and originality in ways that make them stimulating for researchers and strengthen the intersubjectivity of DDr?

1 CA2RE/CA2RE+ LJUBLJANA (2021), Theme: Reformulation (2021): https://ca2re.fa.uni-lj.si/reformulation

- How can we improve our understanding of the processes of ongoing DDr?
- How can design questions be reformulated into research questions and aims, and how do we assess the research relevance of these questions and aims?
- How can relational and situational design activities become relevant research

FIGURE 1. Research Impact Diagram (by EAAE: European Association of Architectural Education – Research Academy)[2]

2 EAAE European Association of Architectural Education – Research Academy – (2019): Research Impact Diagram, Zagreb RA Workshop document (2021), https://www.eaae.be/event/zagreb-ra-workshop/

contributions outside their specific context, and how does this become relevant for other research approaches?
- How can individual researchers approach their research to make it accessible for new panellists?
- How can the CA²RE community translate the common ground and shared understandings that are developed through DDr to new audiences?

To rephrase, redraw, reconstitute, retransform, reconstruct, regenerate... are all actions described during the last CA²RE/CA²RE+ event in Hamburg.

- What do they reformulate, why, how and when?

The CA²RE/CA²RE+ Ljubljana discussion engages in these types of questions.
To discuss the potential relevance and impact of design/artistic practice-driven research we can adapt the research impact diagram, prepared by the EAAE Research Academy:

- What are the areas of relevance and (potential) impact on/in – the areas, defined by scale (local, regional, national and global)?
- What are the audiences addressed (individuals, groups, institutions)? And what are the timeframes we have in mind? What are the strategies to address the timeframes discussed?

During the previous conferences, I observed a shift from long-term impact identification toward

impact-while-thinking and acting awareness. The trigger of that shift was the questionnaire about the impact of the event on participants.

- What is the nature of relevance and potential impact of design/artistic practice-driven research in terms of accessibility, engagement and effectiveness?
- How do we know what research is accessible (when and to whom), engaging, who is engaged and how, and how effective are we as researchers, trying to engage ‚others'?

In order to assess the nature of relevance and impact (potential) in various areas and on multiple audiences, appropriate bodies of evidence are needed.

- What are the referential bodies of evidence and "measurement" types?

Not only publications (and their ‚impact factors') and funding, but also practice recognition (awarded projects and artefacts, impact on other projects proved), public presentation (influences traced), community engagement (before-during-after project action monitoring) and curation (curatorial impact, teaching impact, management impact traced...) need to be taken into account.

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