

Review

Department of Architecture



SUSTAINABILITY @ AR

We, a grouping of students, lecturers, and researchers, are the Sustainability Research Group of the Department of Architecture at the TUM. Together we wish to make our Department and University more sustainable. Various subgroups deal with the challenges and opportunities that are specific to our field, launch concrete projects, and help shape our Department from the bottom up.

92%

of the students surveyed find the topic of environmental sustainability important (42%) or very important (50%)

90%

of the employees surveyed find the topic of sustainability important (25%) or very important (66%)

3% of the students surveyed drive to the university by car

2% of the employees surveyed drive to the university by car

7% of the students surveyed walk to the university

7% of the employees surveyed walk to the university

45%

of the students surveyed cycle to the university

52%

of the employees surveyed cycle to the university

50%

of the students surveyed take public transportation to the university

39%

of the employees surveyed take public transportation to the university

7.800 m²
of plotter paper

24.000 ml
of plotter ink

are consumed
in one semester
at the Design Factory

In May 2020, we conducted a survey among members of the Department of Architecture, in which a total of 310 people took part. Many responded with ideas and expressed their interest in becoming involved.

one semester
2000
models

made by
250
students:

4000
pieces of cardboard

250 l
of glue

100
cans of
spray paint

1700
hours spent
on the laser

Would you also like to shape things?
nachhaltigkeit@ar.tum.de

IN NUMBERS

Preface

Dear Students, Alumni, Partners, and Friends,

Change is the only constant. Quite unexpectedly, the COVID-19 pandemic transformed our patterns of collaboration, the ways we teach, and our private lives. Our students and colleagues have successfully tackled the challenges with patience, much passion, and many additional working hours.

Meanwhile, the number of applicants for our study programs has continued to rise; for this winter term there were more than 1,600 applications by prospective students—more than ever before. We achieved the 26th position in the QS World University Ranking by Subject 2020 and 6th position in the Best Architecture Masters Ranking (BAM), which underlines the high attractiveness of our location. For these reasons, our Department of Architecture continues to develop at high speed—even at this peculiar time.

The current issue of REVIEW proudly presents a selective overview of our activities of the past few months. As part of the Venture Lab Initiative of TUM and its affiliated institute UnternehmerTUM, the mission of the “Built Environment” Venture Lab is to become a top platform for young companies. Technologies and solutions in the context of design and architecture are to be developed. We are striving to make our department the most entrepreneurship-friendly architecture school in Germany.

In addition, we are looking forward to new opportunities by collaborating with the Georg Nemetschek Institute Artificial Intelligence for the Built World at TUM. The Nemetschek Innovation Foundation will provide €50 million. The upcoming research projects will significantly influence our professional profile as architects.

We also celebrate the foundation of the Design Factory 1:1 in Kreativquartier Schwere-Reiter-Strasse in cooperation with the TUMwood research network and the Empfangshalle artist collective. The Werkhalle is dedicated to the specific development of innovative ideas in building construction to a 1:1 scale. Five professorships—Kéré, Doerfler, Nagler, Kaufmann, and Ludwig—are already on site.

From 2020, the Bayerischer Bauindustrieverband e.V. will endow three new university prizes to be awarded to: outstanding doctorates and master theses in civil engineering, and architecture graduates. The Bavarian construction industry has been, and remains, a loyal and important patron of teaching and research at TUM.

The TUM has appointed Pierluigi D’Acunto from the ETH Zurich to the professorship of Technology Design. The young, promising architect and engineer seeks to promote the incorporation of structural engineering and building technology within the architectural design process. One of his goals is to encourage a paradigmatic shift in current building design practices and trigger a technological breakthrough within the discipline of architecture.

Stadtbaurätin Prof. Elisabeth Merk was appointed an honorary professor. Moreover, we were able to name Prof. Manfred Schuller and Prof. Fritz Frenkler as Emeriti of Excellence. Likewise, Prof. Kees Christiaanse was appointed a TUM Distinguished Affiliated Professor. All of these eminent personalities will play an important advisory role for future development decisions.

Despite the pandemic, “Pavilion333”—the exhibition and workshop building—will be handed over on schedule to its users (TUM, Architekturmuseum der TUM, Pinakothek der Moderne and Sammlung Brandhorst) in December 2020. This DesignBuild project was realized by professors Hermann Kaufmann and Florian Nagler together with TUM students as part of their architectural studies.

Within the framework of the Excellence Strategy of the Federal and State Governments, the Munich Design Institute (MDI) will be set up in 2021. The institute will cross-link Architecture & Design with other TUM disciplines, in particular informatics, engineering, and management. In this context, the Department of Architecture is coordinating the call for five new design professorships, which are to play a particularly important role across MDI activities.

The foundation of the School of Engineering and Design is making great leaps forward. As of 1 October 2021, the Department of Architecture will hopefully be able to position itself successfully within this huge new academic unit.

We hope you enjoy reading this issue,

Andreas Hild, Dean

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The "room as a model"
A veritable room intervention
by Mirko Schütz, winner of the
Department's model photo
competition "homemade".
More on page 38.

Doctoral course “Approaching research practice in architecture” commenced

The PhD workshop “Approaching research practice in architecture” marks the beginning of a collaborative doctoral course by the KTH School of Architecture, the TU Delft, and the TU Munich. The course gives a perspective on the theoretical and methodological trajectories of practice-oriented research in architecture. It provides an overview of how theory and methods concerning forms of knowledge in architecture are addressed, with a focus on explorative, reflexive, and critical research methods rooted in the humanities, social sciences, and STS. It discusses notions stemming from different scientific traditions, paradigmatic shifts, and interdisciplinary and transdisciplinary research. Course participants are provided with an understanding of selected key concepts and topics; the relationship between epistemology, ontology, and methodology, and the linkage between research questions, objectives, methods and outcomes, through lectures, literature seminars, workshops, and collaborative and specific tasks. On completion of the course, participants will acquire tools to critically reflect on the epistemological and ethical challenges inherent to their research practices.

Prof. Regine Keller appointed as “Affiliate Professor” at RCC

How can we collaborate on environmental issues in urban areas in a target-oriented and interdisciplinary manner? In the coming two years, Regine Keller will conduct some research as part of the “Urban Environments Initiative” (UEI) in order to find answers to this question. In November, the Rachel Carson Center (RCC) appointed her as an honorary “Affiliate Professor.” The “Urban Environments Initiative” was founded in October 2019 by Christof Mauch, Director of the RCC, as a joint project between the Ludwig Maximilian University of Munich (LMU), Technical University of Munich (TUM), University of Cambridge, and New York University. Together with Eveline Dürr (LMU), Prof. Regine Keller will coordinate the new initiative. The aim of the UEI is to bring together researchers working on urban environmental issues and related topics. The Rachel Carson Center for Environment and Society is an international, interdisciplinary center for research and teaching on environmental issues in the humanities and social sciences.



Prof. Em. ir. Kees Christiaanse (Photo by Markus Bertschi)

TUM Distinguished Affiliated Professorship awarded to Kees Christiaanse

Prof. Em. ir. Kees Christiaanse has been appointed a Distinguished Affiliated Professor of the Technical University of Munich (TUM). This honorary title acknowledges the outstanding achievements of the architect and urban planner in international teaching, research, and practice. The appointment also commends the longstanding ties and project-related collaboration with the TUM Department of Architecture. Since 2007, with the honorary title of “TUM Distinguished Affiliated Professor,” the Technical University of Munich has paid homage to internationally outstanding scientists who have led the way in developing a scientific field and pursued long-term collaborations with their TUM colleagues. As a professor of architecture and urban development at the TU Berlin (1996–2003), followed by the ETH Zurich (2003–2018), as well as the founder of the internationally-operating KCAP office, he has been in charge of numerous completed projects and urban master plans—including HafenCity Hamburg and the Europaallee in Zurich. Two TUM professors of urban design, Prof. Mark Michaeli and Prof. Dr. Benedikt Boucsein, both worked under Christiaanse at the ETH Zurich. Several collaborative research and teaching projects have also shaped his ties with the TUM Department of Architecture over the years. In the future, Kees Christiaanse will work at TUM on various topics—in particular with Prof. Mark Michaeli (from the Chair of Sustainable Urbanism) and Prof. Benedikt Boucsein (from the Professorship of Urban Design)—for instance in the “Airport & Cities” research field, which has already led to a publication, *The Noise Landscape*.

New Design Factory 1:1

The Department of Architecture has founded the Design Factory 1:1 on the site of the Kreativquartier in collaboration with the Department of Civil, Geo and Environmental Engineering and the TUMwood research association. The Design Factory 1:1—a third-party funded project initially limited to two years—extends the existing training profile in the fields of architecture and civil engineering at TUM through application-oriented teaching. The new workshop is to be used for the concrete development, implementation, and review of innovative ideas, and the application of new technologies in the field of building construction and fabrication to a 1:1 scale. These should arise through collaboration between departments within the university as well as with external vocational schools, artists, and craftspersons. The coordination team of the Design Factory 1:1 includes Prof. Kathrin Dörfler, Martin Luce, Prof. Florian Nagler, Johannes Sack, and Gerhard Schubert.

Blue-green infrastructure—Completion of Impulse Project in Stuttgart

Since 2018, INTERESS-I, a research and development project led by the Professorship of Green Technologies in Landscape Architecture, has been dealing with strategies, schemes, and designs for the development of urban blue-green infrastructures in the city of the future. An important building block is the Impulsprojekt Stuttgart, which creatively combines

Prof. Elisabeth Merk (Photo © Landeshauptstadt München)



existing technologies for the storage and treatment of water with established vertical greening systems. The starting shot for the Stuttgart Impulse Project was given in February 2019, and construction began in November of that year. The project, which is funded by the Federal Ministry of Education and Research, has been implemented in collaboration with the Technical University of Kaiserslautern, the University of Stuttgart, and Helix-Pflanzen GmbH. At the local level, the Impulse Project is backed by the Wagenhalle art association, the ARGE Tunnel Cannstatt, and Stadtacker, an urban gardening project. Its realization in the immediate vicinity of the newly emerging Rosenstein District is an opportunity for knowledge and technology transfer in Stuttgart’s largest urban development area.

Launch of TUM’s Built Environment Venture Lab

As part of the Venture Lab Initiative of TUM and its affiliated institute “UnternehmerTUM,” the mission of the “Built Environment” Venture Lab is to become Europe’s top platform for young companies. Technologies and solutions for the urbanity of the future, the construction and maintenance of buildings and infrastructure, and socio-technical systems in the context of design and architecture are to be developed. The Venture Lab is open to researchers and students from the disciplines of architecture and civil and environmental engineering, as long as the venture idea relates to the field of the “built environment.” After pre-selection, teams displaying potential for a successful start-up will receive intensive support with product development. The necessary infrastructure is also provided by TUM—in Munich’s Urban Colab and at the UnternehmerTUM.

Prof. Elisabeth Merk appointed as an Honorary Professor in Planning Practice

After being a full professor at the University of Applied Sciences in Stuttgart, Merk has held the office of Planning Director for the state capital of Munich since 2007. Merk has already been involved in the Department of Architecture for thirteen years through individual contributions and, since 2013, her teaching of planning practice. She stands out with her considerable practical experience. As a Planning Director, she has established new planning approaches and formats, as well as expanding collaborations with research institutions and other European cities. In 2016, she was elected President of the German Academy for Urban Development and Regional Planning.



Master Project: “Neues Giesing”

Chair of Urban Architecture | Prof. Dietrich Fink
 Students: Mirjam Elsner, Luis Huber, and Pino Heye
 Summer Semester 2020

Munich is growing—forecasts assume a population of up to 1.8 million in 2030. Rising rents, the housing shortage, and the demand for urbanity in the city of Munich have shaped both the social and architectural discourse for years. This trend raises the question of whether the city can still live up to the image of an authentic, cozy, and down-to-earth cosmopolitan village with a heart that it is eager to project. The Giesing district, formerly disparagingly referred to as the “broken glass district”, is also experiencing change. A small farming village, it was incorporated in the mid-19th century into the city and developed into a densely populated working-class district. Today, Obergiesing and Untergiesing are regarded as attractive residential areas—with a correspondingly strong demand and growth.

Our proposal for a new Giesing envisages a neighborhood characterized by density and diversity. A linear development? A development along lines? would determine its urban visual appearance. Like the needles of a compass, individual structures are aligned with an invisible magnet. They stand along the Candidstrasse and its busy road traffic, thus shielding the area; at the same time, it is made possible to pass through the neighborhood to the Auer Mühlbach Park, located to the east. The resulting intermediary spaces qualify as alleyways of different widths, which in some places expand into public square-like structures. On ground floors, there is an incremental transition from public to private use, starting from the Candidstrasse up to the adjacent neighboring development. A multiple-use market hall and a swimming pool, together with a small sports field, form the center of the neighborhood. In the southern part, apartments are also provided on ground floors, but they are always stand clear from the alley and its perpendicular access lanes thanks to a raised sill. As regards apartments on upper floors, the aim is to attract a mixed population through a diversity of floor plans.



Experience in Action! DesignBuild in Architecture

05/19/2020 - 09/13/2020

With "Experience in Action!" the Architekturmuseum der TUM presented the largest and most comprehensive exhibition on the DesignBuild topic to date. The term describes a teaching method that is applied at numerous architecture schools around the world in which students plan, design, and then execute projects to a 1:1 scale. Various construction projects result from this, such as residential buildings, cultural institutions, schools, kindergartens and even hospitals. Most of these DesignBuild projects are implemented in the Global South, but also occasionally in deprived areas of the homeland. DesignBuild has been gaining in significance over recent years because an increasing number of universities are using this method to convey a higher level of practical relevance to their students as well as familiarize them with the social dimension of planning and building.

The exhibition, curated by Vera Simone Bader, displayed sixteen projects from five continents—using plans, graphics, photos, films, and interviews. Rather than the finished products, the associated process occupied the foreground and was divided into four phases: research, dialogue, design, and actual construction; these aspects structured the contents of the exhibition. Project processes were meant to give the visitor a more comprehensive understanding of the method and, at the same time, provide the basis for an in-depth examination of the topic, which may always be subjected to criticism. In addition to interviews with students, teachers, and users, the catalog, which was published in two language editions, gave the impetus to a thoroughly contentious debate about the DesignBuild methods.

The exhibition was funded by the Sto Foundation.



Experience in Action!
DesignBuild in Architecture
Vera Simone Bader and
Andres Lepik (Ed.)
Edition Detail, 2020
ISBN: 978-3955535148



Multihalle and Possible Palladian Villas in the exhibition. Photo Credit: Laura Trumpp / Architekturmuseum der TUM



Photo Credit: Laura Trumpp / Architekturmuseum der TUM

The Architecture Machine The Role of Computers in Architecture

10/14/2020 - 06/06/2021

For the first time in the German speaking countries, the Architekturmuseum der TUM presents a large-scale exhibition on the computer's influence on architecture. Beginning in the 1960s and ending in the present, the show recounts this fascinating history in four chapters, which sum up key developments of the so-called digital revolution: The computer as a drawing machine, the computer as a design tool, the computer as a medium for storytelling, and the computer as an interactive platform. The fundamental question that guided the two-year research project on which this show is based is simple: has the computer changed architecture, and if so, how?

The exhibition is curated by Teresa Fankhänel and contains more than forty international case studies and projects by architects, artists, engineers and researchers, many of which are collected in such an overview for the first time. In addition to individual projects the show presents a newly researched software timeline, which details the development of all major architectural programs which architects are using today as well as an overview of historical input devices for drawing on the computer.

The research project was supported by the Gerda Henkel Stiftung.



The Architecture Machine.
The Role of Computers in Architecture
Teresa Fankhänel and Andres Lepik (Ed.)
Birkhäuser, 2020
ISBN: 978-3-0356-2154-9

“Update Architecture”

That was the great topic of the “AJA” – our Department’s annual exhibition.

Missed the exhibition?

All AJA contributions can still be found at www.aja-tum.de

In the semester just gone, we experienced a sudden and radical update in the teaching of architecture. Digital lectures, seminars, and project presentations became standard and Zoom is now the new meeting platform within our university.

The crisis, which is far from over, has already left its mark on society and raised many new challenges for architects and planners: for example, private outdoor space is gaining new significance, home office facilities are questioning office buildings, and the need for medical facilities is arising fast and all of a sudden.

This year’s annual architecture exhibition (AJA 2020 for short) asked the following central questions: which challenges will we, as architects and planners, have to face in the near future, and how will we deal with current social and political issues in our discipline? Is our architecture teaching and research system up to date as regards current possibilities? Are we up-to-date? We had already chosen the Update Architecture topic in January owing to the change of decade. With the onset of the coronavirus crisis, it became more topical than ever.

By definition, an “update” is a modernization, an improvement to the system. Hence an architecture update does not mean that we have to reinvent architecture in order to meet today’s global challenges—climate

☰ Suche

AJA

en | de TUM

Logbook

Name auswählen ▾

Amerika
Asien
Europa

Das Logbook Munich zeigt studentische Architekturzeichnungen, die im



Left page:
Screenshot from one
of the project pages at
www.aja-tum.de
This page, top left:
Team of the AJA 2020.
Top right: AJA 2020
in the making.

change, resource scarcity, demographic change, housing shortages, and rural exodus, to name just a few.

We have to take a critical look at architecture, assess defects in various areas of our discipline—the planning of cities and rural regions, public buildings and residential construction, building within the existing stock, construction and material use, as well as our job profile and building practice—and, in a second stage, eliminate existing problems. As numerous contributions to the annual exhibition demonstrated, space-saving, crisis-resistant urban and rural development, maintenance and conversion, the use of renewable materials, recycling, inclusive planning procedures, and a greater social responsibility of architects might constitute such improvements.

AJA 2020 was a beginning, addressing Update Architecture themes and making visible various positions within the Department. At the same time, with its presentation style in digital space and the fact that it was independently organized by students, the AJA was a radical update of previous exhibition styles at the TUM Department of Architecture. Desiring to establish a recurring annual architecture exhibition at the TUM, in 2019 a group of students joined forces with the Chair of History of Architecture and Curatorial Practice (Prof. Andres Lepik) to develop a new, sustainable exhibition scheme. Due to the coronavirus pandemic, AJA 2020 turned into a digital exhibition, which constituted both a challenge and a great opportunity for our new exhibition scheme.

In its digital presentation form, the AJA offered both more and less than previous annual exhibitions. More, because it opened up to digital space, so that visitors could access the website, lectures and discussions from anywhere. And less, because it dealt with a single topic, i.e. was curated and contents were deliberately selected. Our team took an important decision: not to sort the AJA according to professorships, i.e. specialized fields, but according to thematic areas. Students and researchers



from all professorships positioned themselves with their design and theoretical projects, research work, and publications in various themed rooms on issues relating to the topic. We hoped that this would lead to stronger cross-linkages and an overview of how we deal with similar issues within various professorships.

We are delighted that the exhibition was well received within the Department and, also, that it was able to achieve a wide reach internationally—the AJA had almost 2000 visitors with over 44,000 hits from a total of 93 countries. We very much hope that the AJA will be able to establish itself as a standard event at the TUM and to develop further—in the future including face-to-face events—and are therefore looking forward to AJA ‘21!

Anna-Maria Mayerhofer and Annkathrin Schumpe

Bottom: Photo of one
of the many AJA-
displays in the city
of Munich. Photo by
AJA-Team





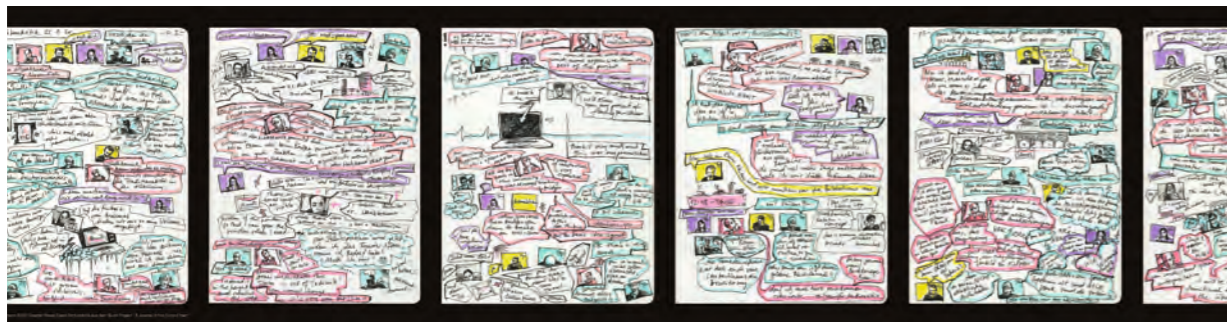
Corona Graphic Novels

In 1665, Daniel Defoe recorded in his "A Journal of the Plague Year" how the plague had hit London again, which—apart from the old-fashioned English—feels extremely topical; the parallels with the Covid-19 pandemic are striking.

My "Journal of the Corona Year" alludes to this title and summarizes my impressions of teaching in pandemic times in book form—an e-publication is planned, entirely digital just like the Corona year. The project is intended to describe Corona everyday life between telework and professorial chair. It makes a collage out of e-mails, absurd excuses made by students, screenshots of Zoom meetings, personal thoughts and sketches, and images of education and emptiness. When Zoom turned out to shape the entire semester, I began to take notes about students' drafts during the bi-weekly assessments. Out of what was happening on the screen, the participants' tiny window frames, the displayed status of designs by torsoless participants, and conversation fragments, a series of graphic novels emerged, which unexpectedly proved popular both with colleagues and boss. These "proceedings" will also find their way into the Journal of the Corona Year.

The sequences presented here are transcripts and drawings taken from the summer semester's final reviews at the Professorship of Architectural Design, Rebuilding and Conservation.

Barbara Brinkmann



Strengthening Architecture and Built Environment Research (SABRE)

A project of BauHow5 – the European alliance of five leading design research-driven universities.

BauHow5

Partner universities:
Chalmers University of Technology
Delft University of Technology
Technical University of Munich, University College London
ETH Zurich

SABRE Project:
Erasmus+ Strategic Partnership



Duration:
2017-2020

Website:
www.bauhow5.eu/sabre



The Architecture and Built Environment disciplines have been taught at European universities for over a century. Yet they still bear many of the characteristics of an emerging field of knowledge: their specific research outputs have not received proper recognition; they lack sufficient research funding; design has only recently started to gain acceptance as an academic activity; and the doctorate title is still held in comparatively low esteem.

Consortium Partners

Strengthening Architecture and Built Environment Research (SABRE) is an Erasmus+ Strategic Partnership co-funded by the European Union whose aim is to embed Architecture and Built Environment research more deeply into higher education institutions as well as outside academia. The project was carried out from 2017 until 2020 and developed jointly by the universities of the BauHow5 alliance; with additional input from ETH Zurich and stakeholders from industry, practice, professional organizations, and public administration bodies. The broad objectives of the SABRE project were:

- To enable exchanges between those involved in education, business, policy-making and research & development in the field;
- To establish partnerships for transnational research and innovation partnerships among higher education institutions, industry partners, professional communities, and local as well as regional authorities;
- To raise awareness of the value of research and entrepreneurship in the field for the wider benefit of the economy, society, and cultural life;
- To extend the role of research outcomes within the marketplace – namely, creative industries, the construction industry, policy-making bodies, government, and public and professional bodies – and make them more relevant to research funding organizations;
- To open up knowledge and information exchange between researchers in the field at various stages of development in their careers, both in academia and in practice;
- To expand innovation culture in the field, including improving research infrastructure (facilities, education programs, equipment, and research centers).

Intellectual Output 1

The project developed a European PhD Core Curriculum for Architecture and the Built Environment. The results of a survey on doctoral education among the universities involved (roughly 200 doctoral participants) were highly

illuminating in terms of courses and educational needs of doctoral students. The survey was complemented with an extensive report on doctoral education, which was published on the project website, and provides an impressive and informative inventory of courses in a number of leading architecture schools. As part of the project, a pilot MOOC (massive open online course) was developed by UCL on advanced digital fabrication, as well as joint doctoral courses – such as “Approaching Research Practice in Architecture” (TUM/KTH) – which are open to doctoral students across Europe and worldwide. The consortium has been expanded to the Research Schools in Architecture in Sweden and will continue to work together on doctoral education.

Intellectual Output 2

The SABRE project also tested five structured, competitive, rapid, and collaborative innovation methods taken from other disciplines or industries for their suitability in the context of Architecture and the Built Environment. These were: Design Sprint, Business Game, Design Thinking Workshop, Makeathon, and a Community Design Lab. Over 100 students from different disciplines participated in workshops. The different activities linked academia and construction/creative industries. Detailed reports on each method were produced and are available on the project website for further use by other universities and organizations.

An achievement of this output is that a new format has been developed and is being continued in teaching at TUM. The new Urban Prototyping Lab will re-think and re-construct inner city areas of Munich. Together with the Munich Urban Colab, the Urban Prototyping Lab is run as a structured, interdisciplinary design workshop with impulse talks and insights from urban activists, decision makers, developers, architects, retailers and teams of Master’s degree students from architecture, design, management, informatics, engineering, and sociology.

A further achievement of the output is its contribution to the newly established TUM Venture Lab Built Environment. The venture lab will foster entrepreneurship and start-up ideas with pre-incubation and structured mentoring of selected teams of researchers and student teams from different disciplines, such as engineering sciences, robotics, information technology, architecture, design, and management.

Intellectual Output 3

Aiming to make the knowledge triangle work, the project developed, elaborated and refined a method for collaboration on real-world problems called “Design Dialogues” by updating and adapting knowledge/methods for different societal situations across European countries. Four design dialogues with a focus on healthcare were held in Gothenburg, Munich, London, and Delft, involving roughly 100 participants. The achievement of the output can be summarized through the feedback from an external review: “Overall, the

outputs of the four workshops provide a relevant and interesting model for developing design knowledge in conjunction with external stakeholders and in relation to real-world problems. While in itself this is not new [...] the contribution of this output is to make tangible the value of the interaction between stakeholders, professionals and design education, while also providing a clear format to structure this type of real-world explorative design workshop. As such, it provides a convincing model for activating the knowledge triangle of research, education and innovation.”

Intellectual Output 4

The main aim of the “Applied Research in the Marketplace: Architectural Design Research” output was to develop a model for highlighting, articulating, producing, and disseminating the design research going on in architectural practices, primarily elaborated from the publication model of the Bartlett Design Research Folios already developed at UCL. The output produced and used applied examples of design research that involves SMEs and external stakeholders from the cities of London and Gothenburg, focusing on designing new social housing projects on two respective sites within their run-down former docklands areas. The major achievement is the creation of a substantial design research portfolio about how to design socially affordable housing in sustainable ways, using UK and Sweden as case studies. This portfolio describes a way to frame and disseminate the complex process involved in architectural design research so as to help architects/academics develop their own design research work; hence the output is inherently transferable. The research portfolio is available on the project website.

Impact and achievement

The fundamental achievement of this project as the recipient of an EU Erasmus+ networking grant is the establishing of an effective research network between the five partners in the BauHow5 alliance. The project resulted in stronger transnational research partnerships—among higher education institutions, industry, practices, and local/regional authorities—by looking at current real-world challenges and increasing the potential for research, innovation, and entrepreneurship. It fostered the exchange of information, data, knowledge, and policies between researchers and practitioners in Architecture and the Built Environment at various career stages in both academia and industry.

What next?

The SABRE project was one of the first concrete actions of the BauHow5 group. In the meantime, the alliance has signed a joint Memorandum of Understanding to define the kinds of collaboration involved, and to shape areas of common interest. Partners at the different locations will continue with all of the Intellectual Outputs produced during this project and, wherever useful, will develop them further.

Yolande Schneider

Multiple Realities | Mixed Perspectives

INFORMATION:

Chair of Architectural Informatics
Prof. Dr. Ing. Frank Petzold

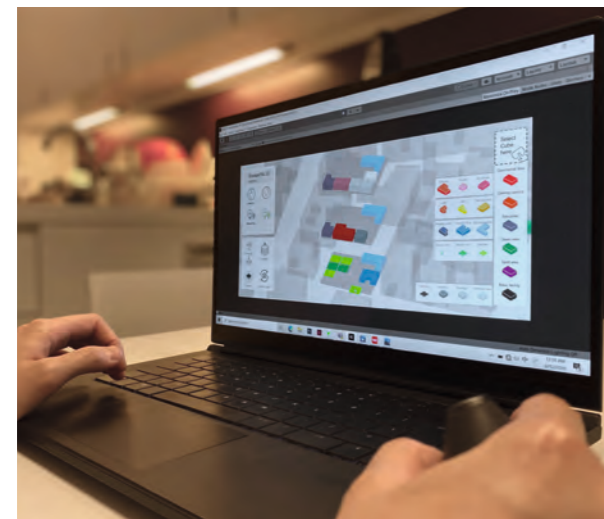
Supervisors:
Ivan Bratov, Nick Förster, Sarah Jenney

Master's Project,
Summer Semester 2020

"Multiple Realities | Mixed Perspectives" focused on experimental digital applications and platforms fostering citizen engagement. During the course, students discussed different concepts of public participation, gamification, and immersive data visualization. In the following phases of ideation, prototyping, and implementation, they developed collaborative design tools, explorative participation games, and crowd-sourced consultation platforms.

İlayda Memiş: "Urban Diplomacy"

Urban development literacy is the foundation for active citizen engagement. "Urban Diplomacy" conveys information about negotiation, collaboration, and actors of urban development through a computer role-playing game. During the game, different parties (the municipality, planning authorities, developers, and the local community) negotiate a future planning measure. Depending on individual roles, players can influence the shared plan by: defining zoning laws and use ratios, situating buildings and infrastructures, financing or rejecting projects, voting, and protesting. Thus, Urban Diplomacy provides a playful approach to urban planning controversies.

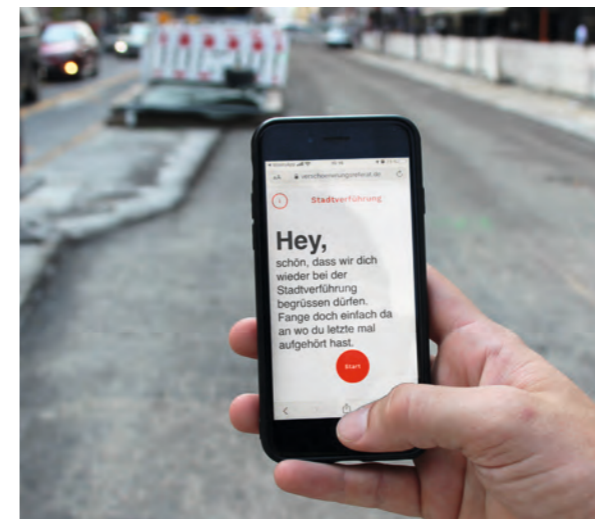
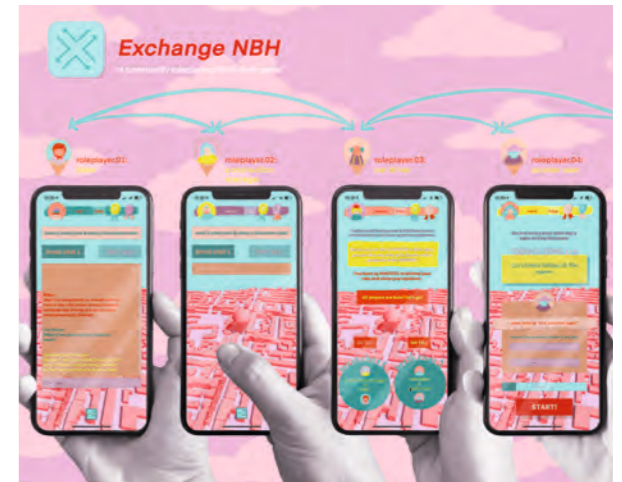


Cong Liu and Rong Peng: "Co-Design Community"

Participatory co-design workshops benefit from open-ended interactions with mood boards, abstract shoe-box models, and open discussions. However, these tools are limited to a small number of participants and require physical co-presence. The project "Co-Design Community" exploits computer-game mechanisms—such as game physics and point systems—to structure the collective negotiation of building programs. User interactions are reduced to a few intuitive mechanisms: Participants drag new elements (e.g., shared workshops, cafés, or kindergartens) from a pallet onto a shared 3D-model. These elements only remain in the model if they receive enough "likes" from other participants who agree on their relevance. Furthermore, users can add or remove weight from each element. Light ones can be dragged to a different position easily, while heavy ones can only move slowly. Hence game physics supports the negotiation process on the placement of rooms.

Begüm Saral: "Exchange NBH"

The Exchange NBH project proposes a playful platform for citizen participation in concrete urban issues such as converting a parking lot or installing public furniture. The tool encourages participants to negotiate local planning solutions in a chat-based role play. During several game rounds, participants discuss which actors are involved in the discussed issue and the problems related to it. In the following game phases, players embody relevant actors (e.g., shop owner, inhabitant, commuter, or bicycle driver). Ultimately, the player's score not only reflects the quality of their argumentation but also whether they embodied their role convincingly. By this, the platform incites players to assess a problem from several perspectives and engage with arguments different from their individual positions. In this way, the tool fosters a productive and consensual debate among citizens while serving as a think-tank for district authorities.



Michelle Hagenauer, Annika Hetzel, Magdalena Schmidkunz, Linus Schulte, Maximilian Steverding, and Markus Westerholt: "Stadtverführung"

Providing public information is one of the core functions of organizations engaged in urban development discourses. Besides a critique of current developments, this task involves articulating visions for an inclusive, sustainable, or innovative urban future. The Stadtverführung mobile application explores the potential of audio-augmented reality for this purpose. As a case study, the application presents a hypothetical transformation of the Schwanthaler Straße in Munich into a car-free street. The application tracks the user's location and plays a site-specific audio file. Thus, the application augments the physical and visual city with an auditive and hypothetical future. The tension between these worlds hints at a sense of contingency and the possibility of change.

Climate Active Bricks

How robotic fabrication technology can contribute to improving urban microclimates.

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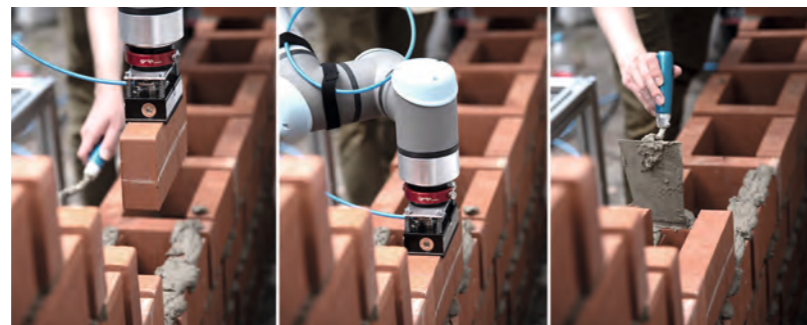
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Chair of Geodesy, TUM Department of
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Leipfingler Bader Ziegelwerke;
Empfangshalle

What role do urban microclimates play in our experience of cities?

On a hot summer day, one of the most refreshing experiences for a Munich city dweller is to enjoy a cool drink on the meadows of the river Isar or escape to the English Garden. According to the latest WHO projections, the frequency of extreme events driven by climate change will increase in future—and Germany will be no exception. This phenomenon can have severe effects on human health and wellbeing in urban environments. While recreational areas such as the English Garden or the banks of the Isar offer citizens the opportunity to recover from heat stress, such cooling areas only affect their immediate surroundings, i.e. the micro-environment. For buildings and urban exteriors with primarily sealed surfaces, other measures will be needed to improve the ambient climate. Architecture can help transform our urban realm into a space worth living in.

One of the main strategies to decrease heat stress inside cities is ample vegetation, for example along sidewalks. This has been proven to improve human comfort levels and encourages people to actively use public space. Another option, especially for dense areas where the amount of greenery cannot be increased, is to consider the shading of building structures or create surfaces with minimized exposure to solar radiation. During the Climate Active Bricks project, developed in August 2020 as part of a design-build summer school, we investigated whether we could apply digital design and robotic fabrication technology to directly improve the exterior facades of buildings. We explored whether customized, site-specific self-shading effects on the external facades of buildings might reduce exposure to solar radiation and thus decrease heat storage and radiation, thereby improving the ambient climate in urban areas.



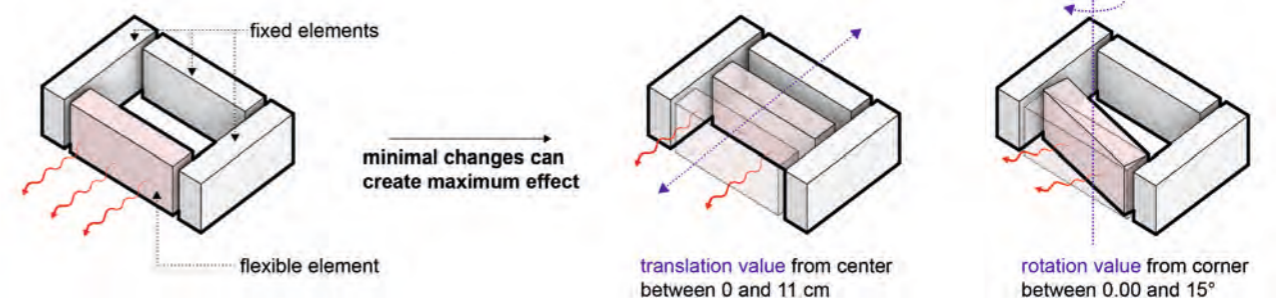
Craftitude meets robotic fabrication: While a person mixes and applies the mortar, the cobot lays individual bricks according to the digital model. The consistency of the fresh mortar allows the robot to easily press the brick into place, whereafter the person removes any excess mortar and grouts the joint.

Re-imagining facade design

The Climate Active Bricks project was carried out in Munich's Kreativquartier, where we used a south-west facing facade to design, construct, and test the behavior of an architectural prototype, which was two-meter high and three-meter long at 1:1 scale. This prototype allowed us to explore how integrating the potential of computational design, climate simulation, and robotic fabrication unlocks the climate-active properties of bricks in exterior building envelopes. We also wished to expand the notion of integrated architectural functions in the exterior of building envelopes, for which we relied on Leon Battista Alberti as a historical reference. The social impact of architecture and consciousness of the urban realm were Alberti's major objectives. The Palazzo Rucellai in Florence, flanked by a continuous stone bench, visibly demonstrates his purpose, which is still evident today; This bench once served as resting place for visitors and passers-by and the façade's external formulation is thus an archetype of an integrated function.

We developed the design of the facade prototype on the basis of the rat-trap bonded brickwork, a modular type of four bricks that are rectangularly arranged and laid on edge, thus creating a cavity in between. The rat-trap bond uses 40% less mortar and 20% fewer bricks without compromising strength compared to conventional brick masonry with a similar wall thickness. By rotating and shifting the front brick of the bond, we can create a self-shading structure and hence achieve a reduction in exposure to solar radiation and surface temperature compared to a conventional flat brick wall.

By performing digital simulations, we analyzed various designs that affect the exposure to solar radiation of brick constellations. Without any modification, the original flat front surface of the bond is, as any other flat surface, directly exposed to the sun. By shifting the front brick toward the back, the amount of exposed surface is reduced through shading by adjacent protruding bricks. To reduce solar reflection even further, we can rotate the front brick; this changes the angle of incidence and fall-out in reference to sunlight. The wider the angle with respect to the sun's location, the lower the value of the absorbed radiation, which results in a decrease in solar radiation and heat stress. To allow an existing tree to blend into our site-specific design, we followed Alberti's archetype and integrated a bench to invite lingering and to provide a recreational spot.



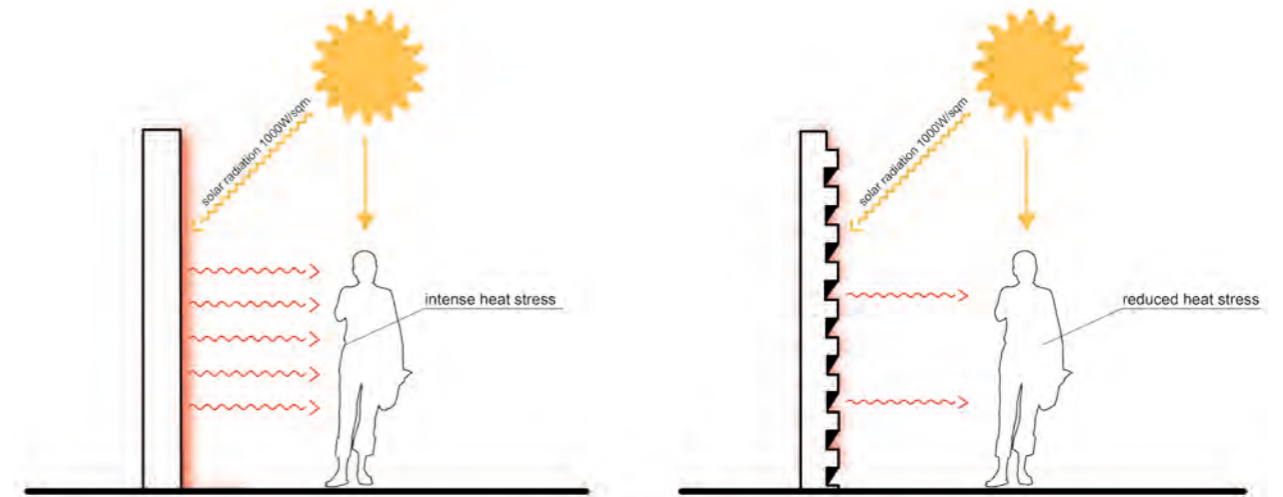
Cobots on building sites—it works!

A collaborative robot—a cobot—that can work hand in hand with people was brought on-site to do the brickwork jointly. The laying of the bricks into the customized rat-trap bond, in which each individual position was precisely defined by the digital model, was performed by the cobot. The mixing, packing and cleaning of the mortar joint, a process that requires great dexterity, skill and adaptation to external conditions—such as humidity, wind or air temperature—as regards the mortar setting, was carried out by a person (in this case, by students involved in the workshop). This enabled an intuitive workflow between the computational precision of the cobot and the realm of manual craft.

The wall was divided into individual sequences composed of step-like courses of brick within the reach of the cobot arm. Each of these pre-defined sequences was then built from an individual cobot location. Our digital model comprised priorly digitized survey points of the building site, which were then recorded on-site for each new cobot location by the robot arm. By matching recorded points with survey points, the cobot's exact current location could be estimated, enabling a seamless alignment of the bricks of the current sequence with the previous one.



Taking a rest at the *Climate Active Bricks* building envelope prototype.



Are our assumptions correct?

We measured the wall exposed to solar radiation during a hot summer day in Munich (August 10, 2020). The day provided cloudless solar radiation onto the brick wall and air temperature reached 32°C at peak time (14:00). As shown by the infrared thermal images, we were able to record a significant reduction in surface temperatures. The left part of the brick wall displays no self-shading geometry, which leads to a high level of absorption of incident solar radiation; thus, overall surface temperatures are over 42°C. However, thanks to the self-shading effect, the right part of the brick wall's surface temperature decreases by more than 40%. In the morning hours until 12:00, almost 85% of the brick surfaces are shaded, which results in lower solar absorption and, therefore, lower surface temperatures. The average surface temperature of bricks with self-shading geometry (right side) is a maximum 4.8°C lower than that of bricks with a flat geometry (left side). This implies that city dwellers would experience reduced heat.

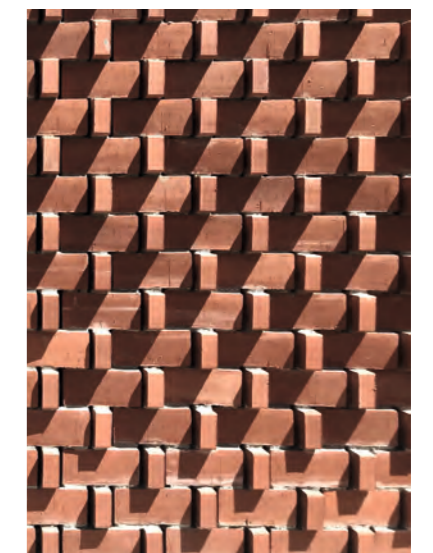
You want enjoyable cities? Here is one way to achieve this

To make city life enjoyable, we should engage in highly informed design and construction processes that are carried out in cooperation and exchange with many disciplines. Climate Active Bricks is an attempt to bridge knowhow and expertise from the fields of architecture, robotic fabrication, and climatic simulation, leading to the creation of highly customized and site-specific architectural solutions. As the constructed prototype shows, the project is also an example of seamless links between simple and straightforward design ideas; and it harnesses the opportunities that technological innovations offer. This is intended to foster easier access to digital tools and, thus, the application of technology to architecture where it can be the most effective.

Julia Fleckenstein, Philipp Lionel Molter, Ata Chokhachian, Kathrin Dörfler

Top: Flat surfaces of urban walls that are directly exposed to the sun tend to radiate heat and thus create heat stress for city dwellers. Decreasing the exposure of such facades to solar radiation, e.g., through self-shading effects, can help reduce the heat and thus improve the ambient climate for residents.

Bottom: Close-up of self-shading effect of facade built with *Climate Active Bricks*, shot on August 07, 2020, 13:02. The rat-trap bond, a brick wall masonry construction method in which bricks are laid on edge instead of the conventional horizontal flat position, thus creating a cavity (hollow space) within the wall, was used as the starting point of the design parametrization. While the side headers remain fixed, two parameters of the front stretcher—rotation and translation—could be modulated in order to create a self-shading effect and thus reduce the exposure of the entire surface to solar radiation.



Memory, connections, souvenir

Chair of Architectural Design and Conception | Prof. Uta Graff
Student assignments of the 2nd semester of the Bachelor's program
Summer Semester 2020

The special circumstances of the summer semester—during which students worked alone instead of in a team, and at home instead of at university, and the obligatory drawing trip, the “Grand Tour”, was called off—offered an opportunity to find alternative ways to deal with architectures, spatial connections, and the seeking of specific places.

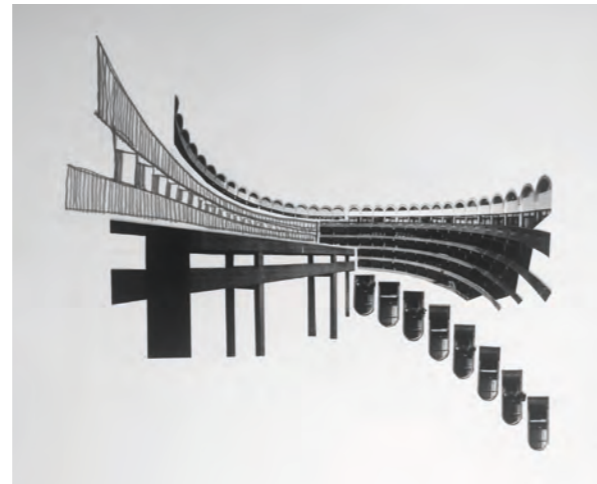
The starting point for semester work is a memorable architectural experience. Using their memories, students return to the building and its location; they use different tasks and questions to explore the distinctive quality of the remembered architecture.

Metéora Monasteries
Model and drawing (bottom): Sarah Däbritz



Remembrance

During the first assignment, students draw from the treasure trove of their memories, sum up the remembered spatial connections of the architecture by graphic means and transfer this (usually fragmentary) memory into a spatial model.



LPR 2020

Connections

The second assignment consists of checking what was remembered. Research about the building and the drawing of all the plans required to understand the architecture condense knowledge about the building and complement the memory. We pay particular attention to spatial connections within the building, as well as to thresholds and transitions between the architecture and the surrounding urban or rural area.



Quinta da Regaleira
Drawing (left page, bottom right) and model (right page, bottom): Leo Petri Rocha

Souvenir

Having examined the concrete conditions of the location and architecture, the third assignment can begin: identifying specific architectural qualities. As a souvenir of the remembered architecture, it is now time to clarify the conceptual essence of the building and convert it into a model whose maximum size is the palm of a hand and that stands as a memento of the architecture.

Barbican
Collage (left page, top right) and model (right page, top): Nemo Akkermann



An investigation into one-century-old gridshells

Wide-span lamella roofs of the interwar period.

The doctoral thesis, supervised by Prof. Rainer Barthel, Prof. Kai-Uwe Bletzinger and Prof. Ralph Egermann, was completed in July 2020 and graded "summa cum laude".

Joram Tutsch is a structural engineer and senior lecturer at the Chair of Structural Design. His passion for the history of building technology is driven by his key research areas: parametric modeling and nonlinear analysis of structures.

Innovative building systems comprising slender lamellas made of steel sheets are the focus of the work. Their historical development can be tracked in detail on the basis of contemporary documents and own findings on site. By using digital tools for differential geometric analyzes as well as static calculations, a deeper understanding of the constructions and their load-bearing behavior has been gained. The research provides a scientific basis for the evaluation of these structures' stability and for future maintenance strategies.

Construction history

The development of wide-span supporting structures in the 1920s was characterized by repetitive roof systems made of slender timber or steel lamellas that were only a few meters long and arranged in a diamond grid. The modular designs of three German patent holders—Friedrich Zollinger for timber, Hugo Junkers and Emil Hünnebeck for steel—were marketed and built across the world. Hundreds of these roofs still exist today. In contrast to timber constructions, those made of steel were only occasionally designed as pointed arches; mostly, they consisted of segmented arches with spans of up to 60 m. Most frequently, they were used as aircraft hangars, industrial, sports and assembly halls, or large garages and exhibition rooms. Although further technical developments made new, larger and more slender structures possible as early as the 1930s, lamella roofs mark the beginning of modular construction in the form of barrel-shaped gridshells.

Until now, little information has been available for an investigation, condition assessment, and repair planning of Junkers' and Hünnebeck's steel structures. For this reason, their construction and load-bearing behavior were the focus of the research project.

Current condition of the roofs

The surveys carried out show that in some cases considerable changes have been made to the structures, both planned and unplanned: Some roofs have been relocated, others extended or shortened. Almost all structures have been re-covered or complemented by new elements in the course of their service life. Deformations of individual components or entire roof areas can be detected in many structures. In a few cases, some components have even completely vanished. A total of four documented collapses could be identified.

Approximately three quarters of the structures are still in active operation; they display varying structural conditions. Some roofs have only

Right page, top: View of the interior of a multi-aisle aircraft hangar in Oberschleißheim near Munich, Photo by J. Tutsch, 2016
Right page, bottom: Geometric development of the modular systems on the basis of helical lines and their constructive detailing.



recently been repaired while many are in a critical state, right up to an acute risk of collapse. Unused buildings are often prey to decay and vandalism.

Geometry, construction and load-bearing behavior

The basic geometry of the roofs is constituted by circular cylinder segments. Span, arch rise, and roof length are suitable for a parametric description because they are easy to ascertain in terms of building practice. The diamond grid can also be recorded with the help of the number of lamellas in the transverse and longitudinal directions. It is defined by a regular arrangement of opposing helical lines, the intersection points of which constitute the nodes of the construction. Since the helical lines have a constant normal curvature and geodetic torsion, but no geodetic curvature, all of the system's nodal intersections are identical.

The ends of Junkers' steel lamellas are bent in such a way that the overlap at the nodes lies in a plane parallel to the gable. There, the change in angle to the next lamella is absorbed structurally. In contrast to

Junkers', the Hünnebeck system is joined at the local lamella coordinates. Since the geodetic torsion of the system lines also occurs as actual torsion of the lamella, only the normal curvature has to be included by the construction details.

The outstanding importance of the gable bearing can be quantified through the structural analysis of plane arches, spatial grids and continuous shells with an equivalent stiffness. If the bearing is present, in-plane forces prevail over the bending moment, which promotes an up to four times lower stress level.

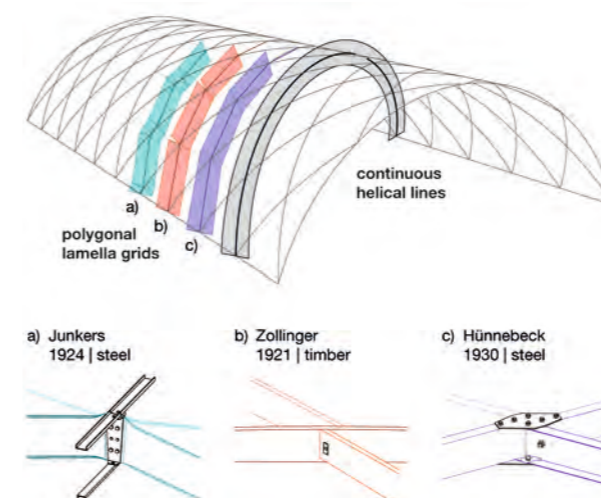
Although these structures are multiple statically overdetermined, the redundancy level in case of individual component failure is relatively low. Load shifts occur only locally and thus lead to considerable stress increases in areas adjacent to damaged or buckled components.

Maintenance

Strengthening and repair measures can be planned by taking the following findings into account: Point supports are to be avoided, the absorption of the arch thrust must be ensured permanently, and a homogeneous longitudinal bearing stiffness is also beneficial. An intact gable bearing must be maintained for roofs with spans wider than 25 m. Repair or replacement of individual components must be carried out in such a way that after completion they are still involved in load transfer in an equal measure. If such local interventions risk leading to a considerable loss of original material, large-size subsidiary structures may also be considered.

Fundamental knowledge gained by this research project has already been applied in the course of two current repair projects—and will hopefully be applied to many others. Thus, it has proven possible to make a scientific contribution to the preservation of a pioneering type of construction whilst fully complying with heritage requirements.

Joram Tutsch



Mapping Urban Transportation Innovation Ecosystems (TIE)

INFORMATION:

Involved researchers:
Alain Thierstein, Fabian Wenner,
Diane Arvanitakis

Principal:
EIT Urban Mobility, EU

Cooperation partners:
Technion – Israel Institute of Technology
(lead partner),
Budapest University of Technology and
Economics,
Czech Technical University in Prague, Institute
of Information Theory and Automation,
City of Munich,
Munich Transport Corporation (MVG)

Time frame:
January–December 2020

The TIE Project (Transportation Innovation Ecosystems) analyzes the actors, networks, and environments of innovations in the domain of urban transportation, i.e., the conditions that enable change with regard to the way we move in our cities. It does so comparatively in three European cities: Budapest, Prague, and Munich.

TIE is a term used here to describe the diverse nature of the system's components and resources that act as a driving force for innovation in urban mobility. TIEs have many components, related to history, culture, legal/regulatory frameworks, education, science, and finance of a place, thus they are city-specific. In addition, some of the innovation system's components are vital for the smooth functioning of the system—their presence and good working order are “necessary conditions.” Other components are “nice to have,” but not essential, and it is important to distinguish between the two.

It is crucial to understand how the TIE of every city works. Thus, we are constructing and implementing an innovative methodology to map, analyze, and enhance the TIE—a methodology that is applicable to any city or region. This methodology draws on existing expertise developed and successfully implemented to map National Innovation Ecosystems worldwide. It is based on interactive workshops; owing to the Corona pandemic, these have been supplemented by a web survey. In particular, the project aims to identify anchors (key actors, strengths) and processes in each city that are crucial to the development of transport innovation.

The aim is to create a strategic infrastructure for urban policy management in the field of urban mobility. This is done by defining tailored policy recommendations to improve the TIE in each of the investigated cities. The project suggests a service that enhances the ability of city leaders, policy makers, industry partners, entrepreneurs, scholars, civic stakeholders, citizens, and others to collectively agree on urban policy decisions that serve mobility interests, are system-wide in their nature, and exploit synergies to achieve agreed TIE goals.

The project is part of the EU-funded “EIT Urban Mobility” framework and its Strategic Objectives and City Challenges. In other words, this methodology will help identify creative, pro-innovation policies to enhance overall competitiveness in cities—toward meeting EIT Urban Mobility Strategic Objectives and City Challenges.

Fabian Wenner



Work in progress: On the construction site of the DesignBuild Pavilion. The completed building is to be used as a studio for art, architecture and design by several institutions. More on page 58.

Photo © Matthias Kestel

More architecture, fewer buildings!

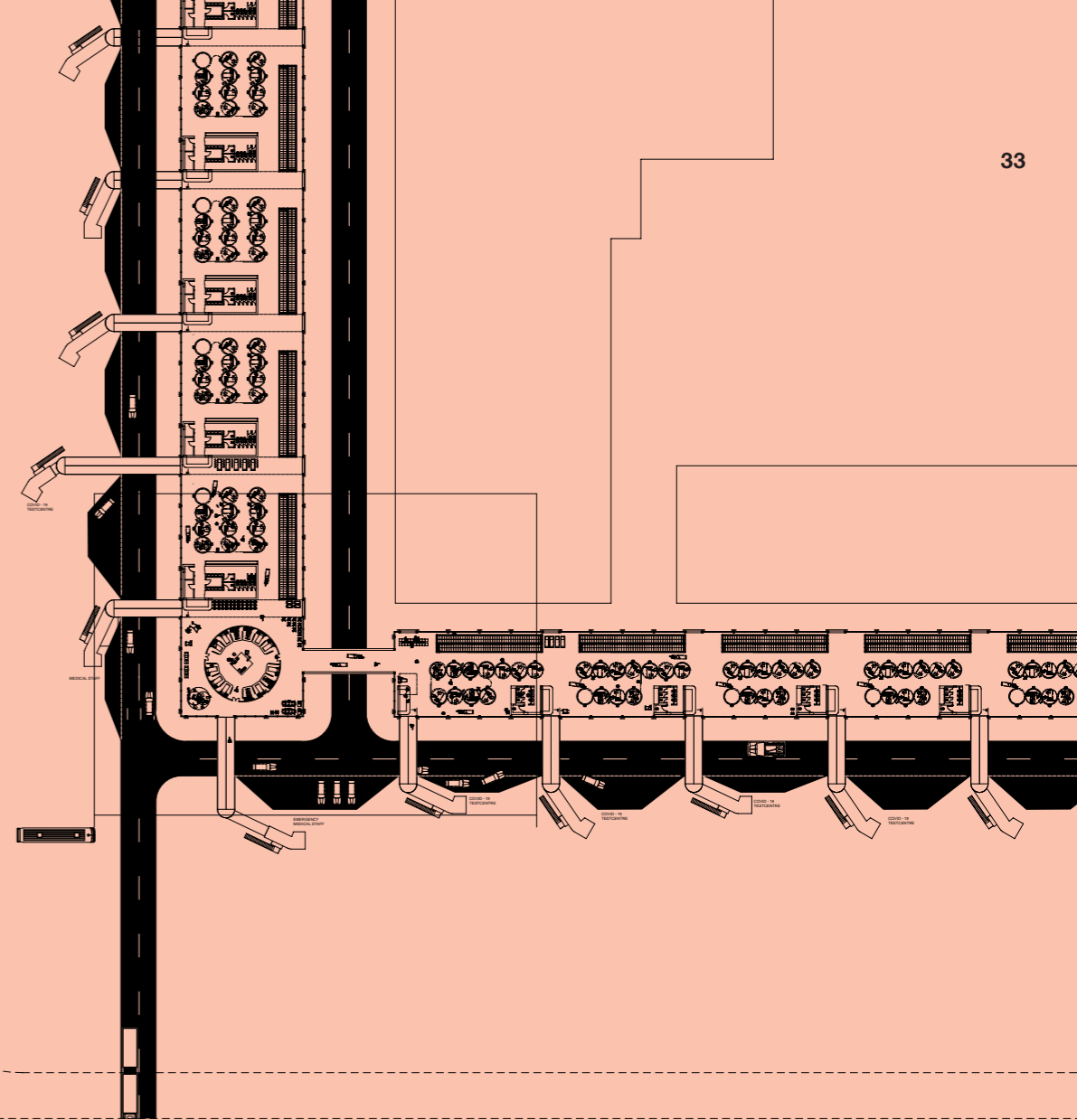
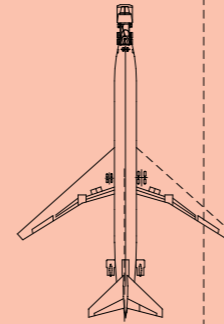
In conversation with Benedikt Hartl, research associate at the TUM Department of Architecture and founder of the Munich-based *Opposite Office*—on architecture, politics & society and, of course, the coronavirus. Interview by Sophia Pritscher.

Turning the not-yet-completed BER [Berlin Brandenburg airport] into a coronavirus clinic: With this design, as with the idea of turning Buckingham Palace into social housing, you attracted the attention of the specialist and daily press. They often call it provocative and critical of society but also pragmatic, or inspiringly different. In any case, your architectural designs give rise to discussion, they ask questions, they challenge. What is it all about according to you, what is your intention?

My primary concern is to take a critical look at the architect's occupational image. The fact that, in the history of architecture, architects and artists have always devoted their work to the improvement of social and political processes is increasingly being forgotten. Today architecture is far too commercial and far too regulated! Architecture is not just a service and does not stand in a vacuum, but always makes a statement about social conceptions of society. The architect has developed into a willing tool of capital. Architecture was and still is political! I believe that our world needs more architecture again, but fewer buildings!

It can be concluded from the above that the profession of architect has changed. In what way?

The profession of architect has traditionally been conceived in a generalist way: Master builders of earlier times were responsible for the design, structural engineering, construction process, and everything that went with it. Since the modern age, the field of activity has steadily shrunk and new tasks, which specialist planners now handle, have been created. Even if you look at university teaching, you will notice a large number of fragmented individual options—from architectural theory, structural theory, construction, design and planning, to urban planning. Moreover, instead of integrated teaching, each chair pursues its own architectural theory. There is seldom a common vision. The course may be very varied, but it often does not answer the fundamental question of what architecture actually is. Of course, one can argue that a multi-layered and diverse definition of architecture is necessary in a pluralistic society, but continual differentiation and specialization have led to an identity crisis within our profession. Instead of being generalists, we are increasingly degraded to being designers. We went from being an artist to being an engineer. Shortly thereafter we realized that owing to our limited technical knowledge, we could not do justice to that. So we were downgraded to planners. We have



Opposite Office has proposed transforming the unopened Berlin Brandenburg to a COVID-19 hospital.

not yet found a role in the 21st century! Other professional groups have taken on the role of architects. Even software specialists call themselves architects these days. The great social tasks inherent to the social visions of Vitruv, Alberti, and Filarete now lie with IT companies. The architects of the 21st century are Elon Musk, Mark Zuckerberg, and Jeff Bezos. Do we really want to leave it all to these disagreeable characters?

What do you propose?

Cancel your Facebook and Instagram accounts and stop shopping at Amazon! Now seriously: We have to place architecture more at the center of political considerations. We are facing the great task of climate change. Architecture plays a large part in our carbon footprint. If we really wish to become more climate-friendly in Germany, then we should design visions and ideas for our houses! In the conceptions of the political world, "environmental" architecture is still associated with a thermal insulation composite system and solar collectors on the roof. If we wish that something in the legislation changes here too, then architects must also go into politics!

Back to the airport: Meanwhile, the BER has opened. But the capital's airport is empty and heavily in debt. Now some people write that a Covid-19 swab site for test volunteers could fill hallways and cash tills. What do you think—with your conversion plan in mind—of such announcements?

I think that the situation is dramatic when I consider that the BER has already swallowed up over seven billion euros and is now being “saved” through tax-financed coronavirus aid. The new airport in Berlin fits in perfectly with German politics. In the paralyzed world of political conceptions, the future seems to have been abolished until further notice. In terms of the ruling parties, fundamental ideas about where we actually want to go are missing. Given the many imminent transformation processes, such as climate change, digitization, and migration, this is more than inauspicious.

In terms of construction planning, the BER was quite a disaster; is there any way to apprehend this major project as an opportunity? Should more interim, transitional, or alternative uses be possible (with and without coronavirus)?

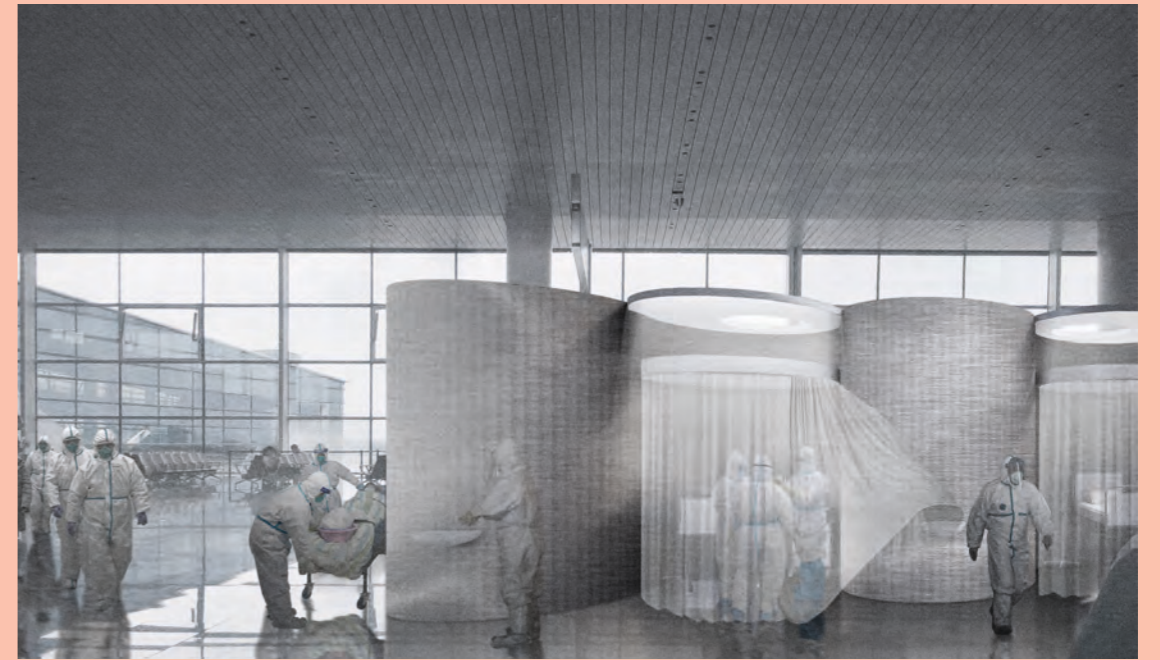
One opportunity, for example, would be to understand that our building legislation is somewhat overregulated. Meinhard von Gerkan is not exactly a rookie when it comes to planning. But building in Germany is too complicated! After all, it is not the first project of this size that has encountered difficulties.

The architecture critic Niklas Maak noted that “the Bauhaus with its maxim ‘light, air and sun’, with these almost clinically white rooms that sometimes looked a bit like a hospital” was a reaction to the social experiences of increasing industrialization in the city and epidemics like the Spanish flu after the First World War. What reactions and developments can we expect or hope for in post-Covid architecture?

For this question of the century—indeed, I could speak for at least an hour on this—the heavy artillery gets a chance: Perhaps we can hope that Mr. Scholz squanders even more money, so that “after Covid-19” a new thrift and abstinence will set in within architecture. Low cost, low tech... Back to the primeval hut! I’ve been saying that for a long time. As I mentioned at the beginning: We need more architecture but fewer buildings!

Could you explain this criticism of certain current political decisions in more detail? Isn't it so that many people are actually dependent on such support, one could argue? And what does all of this have to do with architecture?

Of course, many people are indeed dependent on financial help at this very point in time. But I do think that two criticisms may be levelled at current political action from an “architectural” point of view, which definitely includes systemic and conceptual thinking. First: If you see how much money is being handed out, then at least in retrospect you may well ask why this money was not available earlier for other crises and challenges? In order to convert to a sustainable economic system and equip our society for the great challenges of the 21st century—such as the climate crisis, social injustices, and integration—more sustainable investments are needed! The criticism thus relates to the question of the type of political design. Should I only take action during the crisis, when it is almost too late, or take action in advance?



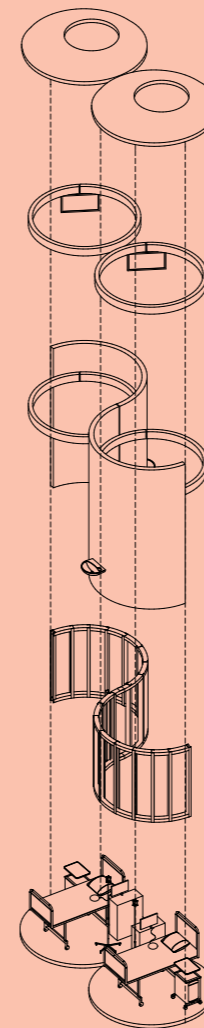
The modular, round emergency cabins are ideal for isolating Covid-19 infected people.

All images © Opposite Office

“Architecture is not just a service and does not stand in a vacuum, but always makes a statement about social conceptions of society.”

Benedikt Hartl

And here we turn to the second criticism, which relates to the type of financial help. Instead of a “financial watering can,” a political scheme should be developed about what is to be funded, and subsidies should be tied to ethical, social, and sustainability conditions. Denmark is providing an example of this: Companies based in tax havens are not receiving any support. Policy that is only selected for a four-year period tends to shift problems into the future! In “governance” the question is thus arising whether I should only “react” or also actively shape things. This is where politics could learn from us architects: Good architecture finds a solution to handle difficult external influences that, in the end, is even better or more interesting than without those influences. Transferred to politics, this could mean, for example, that instead of closing restaurants and compensating 75% of their turnover, it would be conceivable to demand takeaway deliveries to the needy, carers, doctors, and families in return for financial assistance. In this way, performed support would be taken into account and social cohesion would be strengthened in times of crisis.



Places for the Dying

Potentials and challenges in the design of architectures for the end of life.

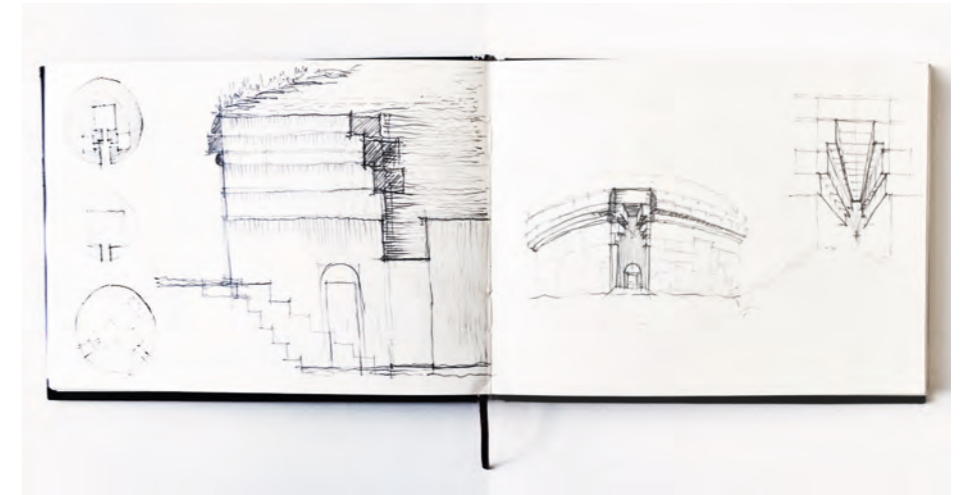
Katharina Voigt works as a research associate at the Chair of Architectural Design and Conception at TUM. She studied architecture in Hamburg, Munich, and Stockholm. Her work concentrates on the interaction of sensorimotor perception and corporeal spatial experience. Starting from her research on body related architectural experience in a state of physical disability and the process of dying, she develops positions for a deeper understanding of the dynamic aspect of architectural spaces and their activating potential, focussing on sensual perception and phenomenological attempts to architecture experience. The question how sensual, tacit and implicit body-knowledge of experiential architecture encounters can be made accessible and anticipated in the design process is addressed in her doctoral thesis.

“Places for the Dying. On a New Visibility of Dying in Architecture” (original German title: “Sterbeorte. Über eine neue Sichtbarkeit des Sterbens in der Architektur”) is a plea for the architectural reshaping of the dying process and the typological autonomy, legibility, and visibility of places for the dying. As threshold spaces between life and death, places of dying have a special significance. With the transfer of dying from private residential settings to medical and nursing institutions, the design and location of these places in the context of the built environment and in the social discourse has become an architectural task.

The book documents the typological genesis of places for the dying. It investigates the history of hospice architecture and the architectural task involved in the conception and design of institutions for the end of life, as well as the development of the hospice movement and of palliative care. It introduces contemporary artistic positions on the physicality, transformation, and spatiality of dying, on which it develops the foundations for an appropriate end-of-life space. Protagonists from various disciplines, including Barbara Camilla Tucholski, Charlotte Uzarewicz, Frère Alain Durand and Stefan Kaegi, discuss dying and both the potential of the design of end-of-life architecture and the challenges it faces.

“The design of places for the dying initially concerns the creation of a general space dedicated to the dying. Places for the dying are architectures for the end of life and thus include the private living setting as well as stationary facilities. With the institutionalization of dying, they are to be considered a specific architectural task. They include all in-patient facilities for care and accommodation in the last phase of life, including hospitals and care facilities or special forms of assisted living, and institutions for terminal care such as hospices and palliative care units. The latter are particularly noteworthy in that they are explicitly designed to accompany the dying.

The study focuses on the elaboration of design principles, especially for in-patient hospices in an urban context. These are regarded as exemplary for the design of places to die, since they are independent architectures whose functional objective is to accompany the dying. They have the potential to contribute to a new visibility of dying in the architecture of the city and, thus, to its increasing presence in public discourse, by forming a legible typology. ‘The sustainability of a society will also be measured by how it



Etruscan tombs in Cerveteri
Journey Sketches,
Katharina Voigt, 2019

deals with its weakest and most needy members’¹, i.e., how the care and nursing of the very old, sick or dying is organized and integrated into society.

At the center of a hospice design assignment is the question of how the uniqueness of each human individuality in dying can be enabled in the context of an institutional community. Furthermore, this architecture needs to meet the needs of all different users and interest groups, and enclose encase them like a framing, which thus creates a structure of rooms of with different characters, which as a whole, this forms the superordinate unit of the hospice. The hospice architecture has must to enable the relatives to feel invited to come and go at all times, and to be an institution for counselling, guidance, and support in for coping with grief. The staff must be provided with an appropriate, functional and practicable workplace. For the people the patients, who are at reaching the end of their life, it is a shelter, a place of attentive care and dignified dying.”²

“The design potential of institutionalized places for the dying is revealed where the autonomy of the architecture for the end of life is defined by its own characteristics. Dying in an institution follows parameters and organizational principles that are different from those that most people who wish to die at home would hope for. As places other than a private residential environment, institutions are bound by their own structures; a hospice, as an institutional place of dying, cannot fully meet the hopes and needs of people who would prefer to die at home: The familiarity of one’s own home, the freedom to lead an independent life or the possibility to surround oneself with possessions from one’s own past

without any restriction are missing. On the other hand, however, there is an opportunity to design spaces that are explicitly designed for the last phase of life and in accordance with the needs of the dying, their relatives, and the staff. These dedicated architectures have the potential to endow the end of life with an independent setting; through the prospect of professional, competent, and dignified care, it can reduce the fear of dying and prevent mutual obligations and dependencies between dying people and their relatives.

With regard to the people who live in the immediate vicinity of death, the possibility to meet the particular spatial needs of the dying only arises from the relocation of this last phase of life to specifically designed rooms. The design of the architecture of places where people are dying enables a conception of architectural spaces that meet these needs and gives abstract concepts – such as the desired “dignified” and “good” death – a related structural and spatial setting.”³

Katharina Voigt



¹ Borasio, Gian Domenico, 2011. Über das Sterben: Was wir wissen. Was wir tun können. Wie wir uns darauf einstellen, 10th edition. 2013, p. 37. Translation: Katharina Voigt.

² Voigt, Katharina, 2020. Sterbeorte. Eine neue Sichtbarkeit des Sterbens in der Architektur, transcript Verlag Bielefeld. p. 295.

³ Voigt, Katharina, 2020. Sterbeorte. Eine neue Sichtbarkeit des Sterbens in der Architektur, transcript Verlag Bielefeld. p. 267..



Model photo competition “homemade”

The first exclusively digital semester ended in summer 2020. This posed a particular challenge for students in architecture education. Closed studios and workspaces entirely relocated model-making to the home office. This was a task that required creative solutions, alternative approaches, and a more resource-efficient use of materials.

We wished to see the most exciting “homemade models” of our students! Hence our TUM Department for Architecture called for a model photo competition.

Not only model results, but also pictures documenting the development process and the challenges of model-building in your own home could be submitted. The models’ special features were to be shown, as well as options for a more sustainable model construction.

Heartfelt congratulations to the winners!

1st place: Mirko Johannes Schütz

“The model was created in my room as part of my Master’s thesis during the first lockdown phase.”



Model photo competition “homemade” 2nd place: Niko Endres, Elena Englmann, Ben Klages, and Max Messner

“We made it, the first digital semester is behind us. And despite the lack of workshops and workspaces, we turned as many places as possible into our own. Thanks to gracious neighbors and a few clear-out rides on the cargo bike, we were able to occupy space stretching from the attic to the courtyard and thus unfold our urban, interior, and façade models in their full glory. We are very enthusiastic about the process and the result, even though we did miss the large meetups at the university, the laser, milling cutter and, every now and then, an elevator. We achieved great results with pulley, cutter, and cutting mat.”



Build Simply 2

New impulses for the construction industry: Applied research for simplifying building.

INFORMATION:

Project team:
Anne Niemann, architect
Chair of Architectural Design and
Construction | Prof. Nagler

Laura Franke, environmental engineer
Chair of Building Technology and Climate
Responsive Design | Prof. Auer

Website:
www.einfach-bauen.net

The Build Simply 1 research project (see Review 2018–2019) examined the basic principles of building simply. In the follow-up project, Build Simply 2, which is running until the end of 2020, results were turned into guidelines that give interested parties a deeper insight into the “Build Simply” strategy. Their contents range from building shape to structural design, and from the overall picture to the very last detail. In each case, we explain which project parameters should be given special attention and why.

Guidelines—basic propositions

Six basic propositions underpin the Build Simply strategy. Let us briefly sum these up:

1. Compactness

Reduce the building envelope’s surface. Increase structural density.

The more compact a building is, the less heat will be transferred through the building envelope. Construction costs will also go down because the proportion of expensive insulated components is smaller.

2. Windows

Glass area of the window = 10–15% of the room area requiring daylight penetration. Do without sun protection glazing.

In addition to the thermal mass, it is above all the window size that determines whether the interior of the building will remain cool in summer. This value has been optimized for the pilot houses. The glass to floor area ratio is between 10 and 16%. This ensures a sufficient supply of daylight. External sun protection, such as roller shutters or awnings, is not needed.

3. Thermal inertia

Heavyweight construction stores thermal energy. The thermal mass cools down during nighttime ventilation

Solid, heavy materials behave sluggishly in relation to temperature changes in the environment. In comparison, air possesses only a low thermal storage capacity. This effect can be made use of by technical systems, such as component activation in combination with geothermal probes, but can also work without any assistance from technology.

4. Robust technology

Use robust and slimmed-down technical systems. Take into consideration the behavior of users.

Around 20% of the total life cycle costs of a building are incurred during the planning and construction phase. The remaining 80% of the costs can be ascribed to the operational phase. A large part of these costs are due to energy consumption. Instead of using even more insulation and more complicated technical systems, the Build Simply scheme provides for other measures: Rather than complex control technology that statically regulates interior comfort, users themselves should be able to adaptively regulate comfort according to their individual needs. Compared to complex systems, simple building technology is less susceptible to system errors, incorrect operation, and technical component failure. And finally: the less technology has to be operated within a building, the less energy is required for its operation.

5. System separation

Think about future uses. Plan for alternative options. Separate technical systems from construction.

We perceive houses as static. However, if you look at a building over a period of hundred years or more, it quickly becomes clear that many parts of the building go through several cycles of change. It is a good idea to make these cycles as long as possible, thereby delaying conversion. At some point, however, the time will

come when certain parts must be renewed or, at least, modified. A consistent system separation that is already envisaged in the early planning phase will make this a great deal easier.

6. True-to-material construction

Use few homogeneous layers of building materials. Use joining techniques leading to robust and long-lasting constructions.

The usual outer wall structure may consist of several layers, or of mixed materials. How much maintenance is required when different layers reach the end of their service lives? Will spare parts for the building still be available in the future? Can I reuse parts of the building or separate mixed materials from one another? In general terms: what about sustainability?

The following objectives are therefore pursued under the Build Simply heading:

- Few component layers
- Homogeneous use of mineral or renewable raw materials
- Component joining technique according to properties of the material in order to form robust and durable constructions



Fig. 1. Street view of the three pilot houses in Bad Aibling. Photo: Sebastian Schels

Fig. 2. Installation of the weather station on the roof of the lightweight concrete house. Photo: TUM staff



Supervising the planning of three pilot houses

The Build Simply propositions were applied to the planning of three pilot houses. The TUM research team worked in close collaboration with the Florian Nagler Architekten architectural office, who was responsible for the design.

This work resulted in three cellarless three-storey residential buildings in the following construction types: solid wood, lightweight concrete, and heat-insulating masonry. Buildings that require little heating and do not overheat in summer were created thanks to construction that is true to material and climate-responsive. The aim is to design buildings that are easy to build and easy to operate. We will find out whether this has been achieved or not during the follow-up research project, Build Simply 3, where long-term measurement results will be compared with the previous simulation. Consumption and comfort levels are to be recorded. The outer wall construction is to be examined as regards the moisture, temperature, and heat flow parameters.

Findings of the implementation of the Build Simply idea

Interviews with those involved in the planning and construction of the houses showed that the term “Build Simply” was interpreted in the same way by all in terms of reduced consumption of materials, increased efficiency, and resource-saving construction method. The perceived aim was to achieve the greatest possible success while using a small amount of material. Hence the first step, communicating the Build Simply idea, was successful.

The fact that, by forgoing many component layers, the construction process was not interrupted by other trades was considered positive. In addition, the simple construction, with only a few ceiling and wall openings, reduced the amount of reworking. The majority viewed the use of monolithic external wall constructions as an advantage. Thanks to simplification, the pilot houses were able to dispense with a basement. In addition to cost savings, this also shortened the construction schedule by one month. Central shafts and fresh water stations close to the apartment made it possible to avoid long hot water and circulation pipes, which is both hygienic and saves on material.

Since the Build Simply idea is new and has not yet been tried out extensively, many of the respondents stated that, admittedly, many points had not yet been simplified. To some extent, additional effort due to planning was even reported. Accordingly, the pilot houses may be considered prototypes or “experimental buildings.” In order to exploit the advantages of the Build Simply idea, it would be necessary to build in series. More experience with “simple” buildings would certainly help to dispel the concerns of companies or to create a new work routine.

We have to realize that the Build Simply scheme is still at the testing stage. The pilot houses may be viewed

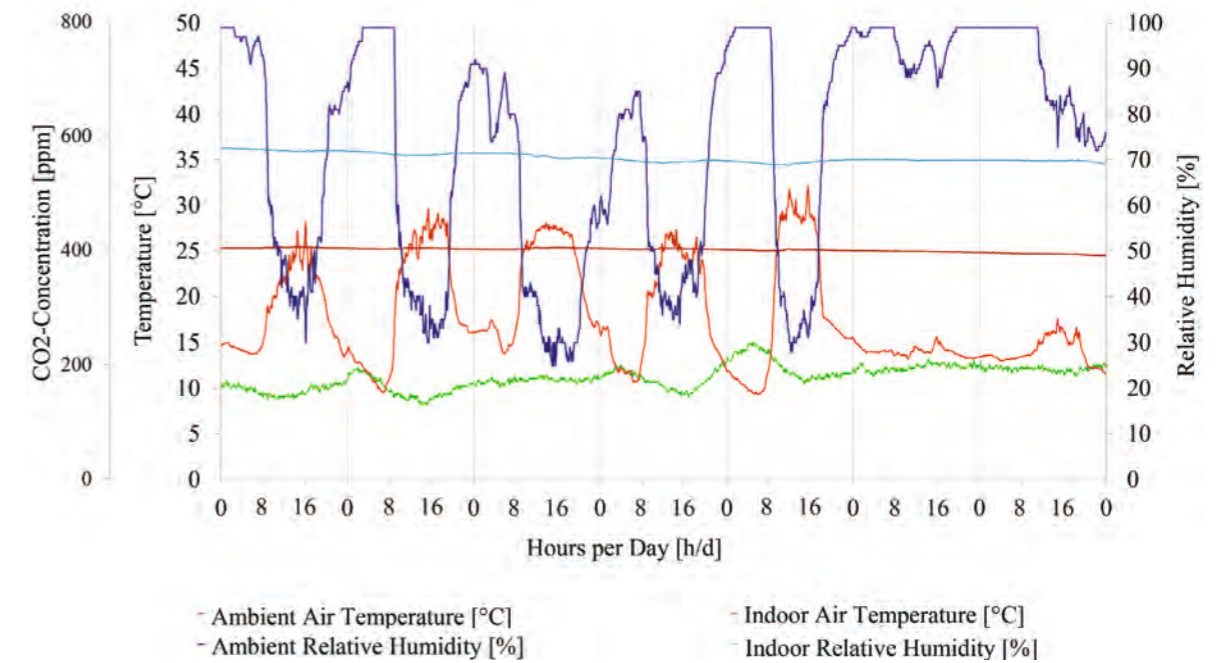


Fig. 3. Test measurement of the unoccupied one-room apartment on the second floor of the lightweight concrete house in Bad Aibling, August 2020. Graphic: Laura Franke, TUM

as prototypes or lighthouse projects. Valuable experience was gained during the construction process, which should be incorporated into further application. Early communication of the strategy to everyone involved in the planning and construction process also seems to be important in order to avoid misunderstandings and uncertainties with regard to legal protection. Overall, the idea seems to have met with great interest from planners and building contractors as well as users.

Measuring scheme

The first test measurements of interior comfort levels were carried out and a scheme for long-term measurement was derived from this, which is to be implemented from January 2021 to the end of 2022. At the same time, a simulation model was created in order to compare theory and practice.

A weather station was installed on the roof of the lightweight concrete house in spring 2020 (Fig. 2). The aim of the installation (at a height of 2 m above the ridge) is to minimize the effects of, for example, tree shade or heat reflection from the roof surface. The station measures the following parameters: air temperature, relative humidity, amount of precipitation, wind direction and speed, and direct and diffuse solar radiation.

Measurement results

A test measurement over the summer and autumn of 2020 on the second floor of the lightweight concrete house yielded the first results, whereby there were losses of measurement data owing to technical problems with data transmission. The research team is currently working on the new, more robust scheme presented above. The collected weather and comfort data were recorded in five-minute intervals, checked for plausibility, and evaluated. Figure 3 presents the analysis of a warm week from 24–30 August this year.

What is striking are the steady values for room air temperature and humidity, despite the fluctuating values regarding the outside air, which suggests an effect of thermal inertia. However, this may not be the sole reason, because there are several influencing factors: The room is oriented to the east, was vacant, and no-one opened the window. This also explains the low CO₂ content of the room air. Basic ventilation, through window rebate ventilators and bathroom ventilators, was not yet operational at the time of the measurement. In addition, the dehydration process of lightweight concrete releases moisture into the room air. It can be assumed that the high relative humidity values, averaging 70%, are due to the reasons mentioned above.

We are eagerly awaiting the results of the measurement and user survey over the next two years. After the adjustment phase of the building, these will show whether the expected levels of thermal comfort and energy consumption will actually be achieved.



Top and bottom, left: MA Semester Project by Nikolai Fischer, Marc Mair, and Björn Swedjemark
Center: BA Semester Project by Lilly Thomas, Jessica Pörsch, and Eliza Zeibote
Bottom, right: MA Semester Project by Ayoub Azzabi, Goran Travar, and Vanja Jovancic

Towards the Intelligent Ruin Multi-use open spaces in Munich and Seville

Chair of Urban Design and Housing | Prof. Bates, Prof. Krucker
Bachelor and Master Projects
Winter Semester 2019/20

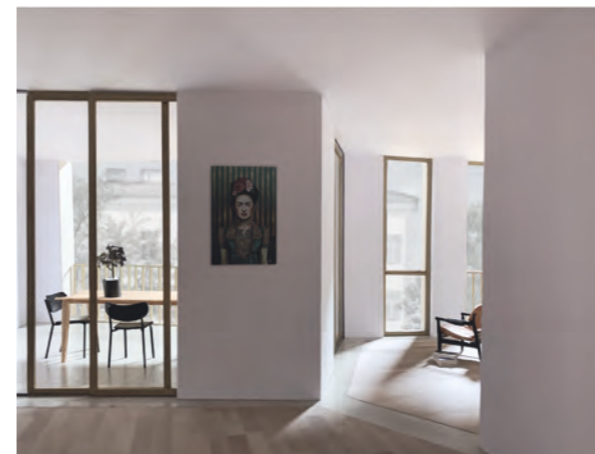
Buildings of the future should be “intelligent” and have a built-in capacity for addition and alteration. Intelligent buildings should be adaptable, re-usable, and capable of being reconfigured and re-organized. Yet they should also have a strong physical presence and be imbued with a specific urban character, so that they are a recognizable element of the city. While it may seem paradoxical, it is this strong physical presence, this “rootedness,” that allows a building to remain open to new interventions. Ultimately, the architectural ruin is the physical essence of a building, laying bare its structure when more vulnerable layers have decayed or been reclaimed by nature. We are confronted with the primal expression of protection and form in the exposed concrete frame and vaults, and the spatial complexity of the ruins still evokes a functional promise, a “yet-to-be-imagined” use.



The Architecture of the Block Test planning in Milbertshofen

Chair of Urban Design and Housing | Prof. Bates, Prof. Krucker
Bachelor and Master Projects
Summer Semester 2020

The urban perimeter block defines and shapes the European city. Consistent edges lay bare the threshold between public and private domains. The perimeter structure gives definition to the street—with façades that conform to certain consistent rules—and harbors an inner space, or courtyard, that provides air, sunlight, and recreational space to the inhabitants. The simplicity and directness of this urban figure endows it with great versatility in the organization and economy of space. Territory is clearly demarcated; everyone understands it: both the passer-by who might assess their journey across the city according to the number of blocks they walk past and the inhabitant who knows that, once they have crossed the threshold of the gate or the porch door, they will be at home.



Top, right: MA Semester Project by Julia Sophie Schultes and Tsvetana Vasileva.
Top and center, left: BA Thesis by Aigul Akhmetzianova, Konstantin Kirilov, and Eliza Zeibote
Bottom, left: BA Semester Project by Isil Alimoglu, Buse Nur Bagis, Raphael Braham, and Moritz Götzl
Bottom, right: MA Semester Project by Carsten Becker and Anastasiia Mitiukov

Seed Fund Research

In 2020 the Department of Architecture awarded five “Seed Funding” positions to research projects applying for third-party funding from within the department. The aim is to support the application process, generating independent and lasting third-party funding as well as increasing the publicity of the department within the research community. Members of the Jury were Thomas Auer, Alain Thierstein, Frank Petzold, Benedikt Boucsein, Martin Luce and Gerhard Schubert. Each project will be supported for one year.

Social-ecological research: the city, a transformation space

Chair of Energy Efficient and Sustainable Design and Building

Researchers: Dr.-Ing. Julia Brasche, Dr. rer. nat. Simone Linke

The aim of the seed-funding position is to successfully submit an application under the call for funding by the Federal Ministry of Education and Research (BMBF) for interdisciplinary and transdisciplinary young research groups in the field of social-ecological research (<https://www.fona.de>). Our funding application focuses on research into the development of viable strategies and planning tools for the transformation and design of sustainable and livable cities. On their own, our planning and engineering science disciplines (architecture, urban planning, landscape architecture, and spatial development) are insufficient to achieve a holistic approach to solutions. Rather, an interdisciplinary approach is imperative which, in addition to our own and closely related disciplines (e.g., landscape development, urban water management, hydrology, structural physics or transport planning), also integrates into the research the relevant specialist knowledge from the fields of psychology, sociology, economics, and politics. On the basis of the “Social Contract for a Great Transformation” outlined by the German Advisory Council on Global Change (WBGU), we would like to work in a transdisciplinary manner and, together with civil society actors and against the background of climate change, examine how cities can (must) be designed as places of transformation in order to enable a comprehensive improvement in quality of life.

In cooperation with: Chair of Sustainable Urbanism and Chair of Strategic Landscape Planning and Management

Collect / Research / Exhibit: Landscape architecture as a new field of curatorial practice

Chair of History of Architecture and
Curatorial Practice

Researcher: Sina Brückner-Amin

Landscape architecture was established as a new collection area at the Architekturmuseum der TUM only recently, supported by significant new additions, such as the estates of Gottfried and Anton Hansjakob or, lately, Adelheid Countess Schönborn and Regina Poly. The collecting, indexing, and presentation of landscape architecture is a comparatively new field of activity within the Architecture Museum. It requires a primary investigation with regard to issues related to recording, digitization, and presentation. The seed fund project aims, on the one hand, to classify the content of the estates and, on the other hand, develop a digital exhibition strategy together with an external partner from the field of web and graphic design. To this end, we would like to set up a student working group that will develop a digital exhibition: from registering archival material to curating the exhibition.

3D printing with salt

Chair of Building Construction and Material
Sciences

Researcher: Martino Hutz

It is believed that salt, which is a waste product of desalination plants and potash mining, has great potential in architecture thanks to 3D printing technology. With a suitable binding agent, salt can be turned into a pressure-resistant composite material. This interdisciplinary research field forms an interface between materials science and digital technology. With its flexible and customized production, 3D printing not only guarantees the rapid creation of prototypes, it also opens up a wide variety of domains of application in construction. For this reason, 3D printing is regarded as a future-oriented key technology in the sector. Within the framework of this research, we will investigate the extent to which salt, with its diverse properties, can meet the requirements for 3D printing when combined with a suitable binding agent. It is aimed to let the knowledge thus gained flow into a research proposal. In addition to the research, seminars will be offered during which students can learn the basics of 3D printing. Beyond that, physical testing of salt mixtures will be carried out in order to discuss the properties of salt in greater detail. The findings will be translated into a design.

Timber-loam Hybrid Floor Slabs

TT Professorship of Digital Fabrication

Researcher: Julian Trummer

In these times of global climate change, in which cement production alone accounts for 8% of global CO₂ emissions, the further development of timber construction as an alternative to reinforced concrete construction is essential for a sustainable future. One of the most serious problems faced by modern timber construction is the lack of adequate floor slab solutions for multi-story buildings with high requirements as regards fire and noise protection. The idea of a timber-loam hybrid floor slab promises to close this gap by means of a simple and inexpensive construction that meets high requirements for static performance, fire protection, and sound insulation. In this context, computer-aided planning and robotic-assisted assembly enable the efficient manufacturing (in terms of material and labor) of a timber structure that can then be filled with a new type of loam mixture based on excavated material.

In cooperation with: Chair of Architectural Design and Construction, Chair of Timber Structures and Building Construction

Quantifying Spatial Wellbeing. A study to understand comfort through biosignals

Chair of Building Technology and Climate
Responsive Design

Researcher: Bilge Kobas

At the Chair of Building Technology and Climate Responsive Design, it is a fundamental task to understand what comfort is. If people feel comfortable in their environments, they will be happy. If not, they will need additional tools to adjust their environments: to heat, cool, or ventilate them, and so on. If we can make people feel comfortable, we will not need to use any additional operating energy—leading to more energy-efficient built environments. The metrics of comfort that we have are built on data collected through lab experiments and/or real-world studies. However, a large portion of the data is based on self-reporting by people stating whether they are comfortable or not, and to what degree, at a given time. Unfortunately, self-reported data can be highly biased. In order to overcome this, we have been looking at ways to bypass verbal feedback from the subjects of our comfort experiments, and realized that looking directly into the body’s physiological responses might

have good potential for revealing numerical comfort thresholds in a more precise and unbiased way. SenseLab, a purpose-built test chamber in the Department of Architecture, is a controlled test environment where environmental conditions (temperature, light type/levels, and ventilation type/rate) can be precisely regulated. In addition, biosignals (electrical activity in brain, heart rate variability, electrodermal activity, and pupil activity) of six people can be measured continually and at the same time. The current hypothesis is that, by overlapping these two datasets and looking at physiological limits, we will be able to determine the boundaries of comfort and establish a new, more life-like perspective on comfort.

Deep Adaptation in Urban Design

Professorship of Urban Design

Researchers: Dr. Daniel Zwangsléitner, Elettra Carnelli MSd

The starting point of the project is the hypothesis that both within science and society the vulnerability of urban structures to risks, particularly those associated with global warming, has been underestimated, downplayed or suppressed. Looking for alternative and more realistic perspectives, Jem Bendell’s concept of “deep adaptation” comes into focus: He advocates to prepare for the collapse of some of the systems that are currently ordering our lives—and seeing this positively as an opportunity for change.

This change and the resulting challenges we face are primarily not technological, but also social, economic and organizational in nature. Moreover, they are highly interdependent and all-encompassing and require systemic change, profound transformations and adaptations of action. Therefore, it is not about developing technical solutions in isolation, but rather about fundamentally rethinking the way we live, operate, work, travel and interact.

The first six months of the funding period will be dedicated to publish a special issue of the journal SPOOL (TU Delft, Open Access) on the topic of Deep Adaptation. In teaching, students will be taught the importance of systemic change and the necessity of interdisciplinary thinking and acting. In the second half of the funding period an Individual Research Grant will be prepared and submitted to the German Research Foundation (DFG).

German Colonial Architecture from a Global Perspective

PD Dr.-Ing. Mag. Michael Falser was appointed DFG-Heisenberg Fellow to the Chair of Theory and History of Architecture, Art and Design at the TUM. His project, “German colonial architecture as a global project around 1900 and transcultural heritage today”, started in March 2020; it has been awarded a grant for a three to five-year period.

The DFG-Heisenberg Programme provides funding for outstanding researchers who meet all the requirements for appointment to a permanent professorship, to prepare for a future senior academic role, carry on with high-quality research and continue building their academic reputation. (www.dfg.de)

Despite its extremely short existence—a mere three decades—German colonialism (ca. 1884–1914) was geopolitically-speaking a global project spanning several continents (Fig. 1): from Africa (colonies of German East Africa, German South West Africa, Cameroun, and Togo) to Asia (back then Tsingtau and Kiautschou, today the Chinese city of Qingdao and the Jiaozhou Bay area) and Oceania (parts of today’s New Guinea and Samoa). Its urbanist and architectural production was surprisingly rich and much of it, from whole new towns to infrastructural networks and individual buildings, still exists today.

In this sense, it is rather surprising that in the field of architectural history, no comprehensive studies, first, conceptualize German colonial building processes from a historical perspective as a *globally connected project* and, second, thematize structures that are still standing from a contemporary viewpoint as a kind of *shared built heritage*.

This twofold scientific desideratum is now being tackled through a new research project funded by the Heisenberg program of the German Research Foundation (Deutsche Forschungsgemeinschaft—DFG). The project was conceived by, and awarded to Michael Falser, an Austrian art and architectural historian specialized in global architectural history and cultural heritage studies. Since March 2020, this new project has been embedded into the Chair of Theory and History of Architecture, Art and Design of the TUM (Prof. Dietrich Erben). It is planned to carry out extensive field work in Africa, Asia and Oceania, organize scientific workshops and conferences, contribute to publications (from themed issues in specialized journals to multi-authored volumes), and publish articles and a monograph. An exhibition presenting original archival material is another option to be developed.

From a general viewpoint, this project intends to introduce a methodologically innovative approach into the discipline of architectural history. This will be achieved by incorporating the global and transcultural turn, which has been discussed over the past years in the field of global history and global art history. Today, this approach is also hotly debated as regards the issue of how to deal with the German colonial era. However, while current provenance research comes with pressing claims to reconstitute colonially appropriated artefacts to former colonies in Africa and Asia, the remaining traces of German colonial architecture, urbanism, cultural

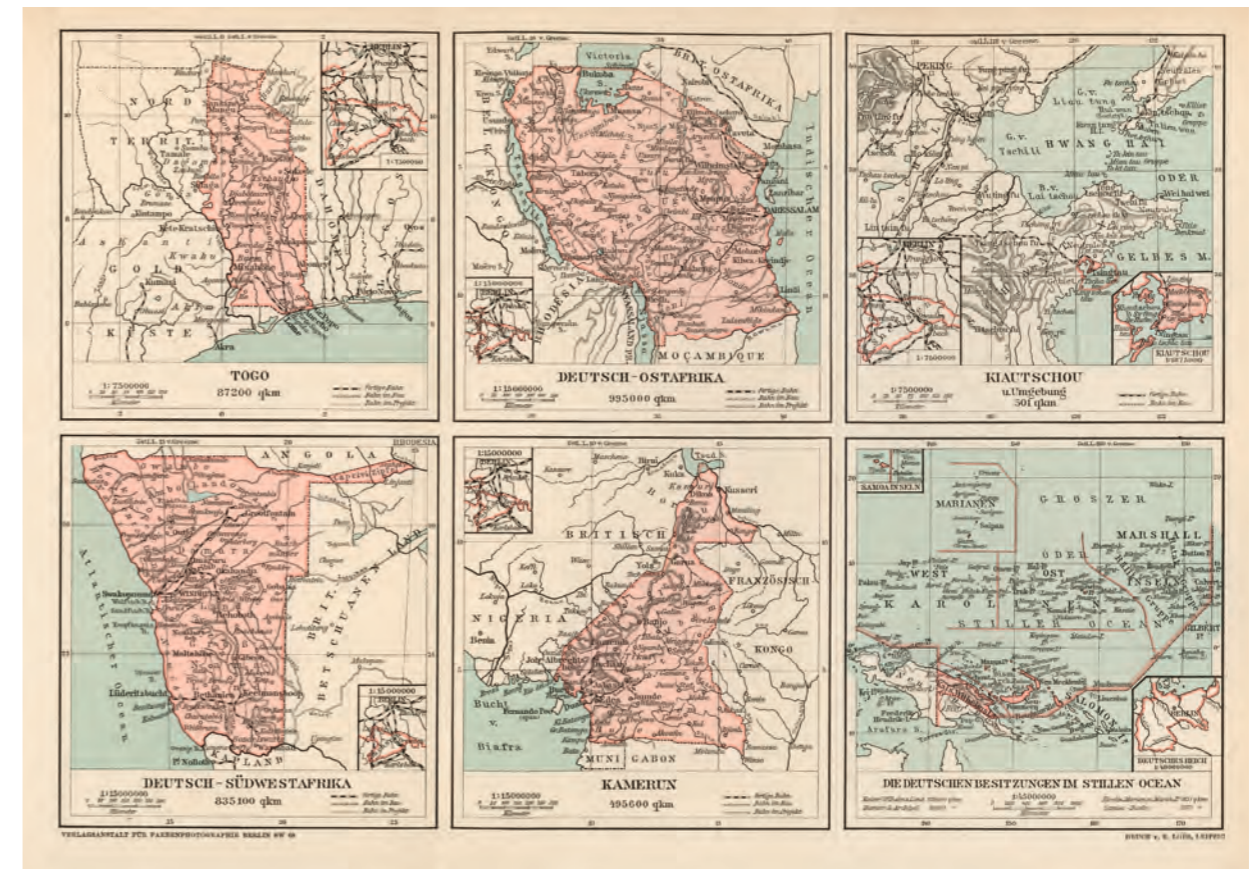


Fig. 1 An overview of all German colonies in Africa, China and Oceania, as depicted in Willy Scheel’s *Deutschlands Kolonien in achtzig farbphotographischen Abbildungen* (Berlin: 1912).

landscapes, and infrastructural planning are still strangely under-researched topics in architectural history and cultural heritage studies. This project is structured into two modules that aim a) to present the immense architectural production historically within a global overall structure, and b) to read its (today) contested legacy—across three continents and with its ongoing entanglement with Germany—as the formation of transcultural heritage.

Module 1: German colonial architecture 1884–1914 — a global project

With a view to the innovative methodology employed by the new discipline of Global Art History, this project on German colonial architecture goes beyond the old-fashioned narrative of a mere one-dimensional transfer of architecture from an imperial motherland into its colonies. It aims to free architectural history, as a discipline, from its classical area-based approach (Europe or Africa or Asia) and make it compatible with a truly global approach. To this end, German colonial architectural production processes will be broken down into three different dimensions (analyzed separately and

then re-connected), namely: *social culture*, in order to discuss the colonial production and the local adaptation and implementation of building knowledge; *material culture*—that is, the different scales, techniques, and typologies of colonial building procedures; and *mental culture*, charting concrete building practices and frameworks as regards terms and taxonomies, and conceptions of style and representation.

Module 2: German colonial architecture as transcultural heritage

More than one hundred years after the Peace Treaty of Versailles of 1919 (whose implementation officially ended World War I, whereby the German Empire lost all its overseas colonies), the “dispute over Germany’s colonial heritage [has] advanced to a central identity debate today” (Jürgen Zimmerer 2017). With the present outbreaks of racism and the related taking down of colonial-era memorials all over the world, this debate has finally reached the disciplines of architectural history and historic preservation in Germany. While experts discuss an appropriate strategy to deal with colonial-era artefact collections at the Humboldt Forum in Berlin

Figs. 2a & 2b, top: A depiction of the original structure in *Führer durch Tsingtau und Umgebung* by Behme and Krieger (Wolfenbüttel: 1904); Bottom: Reconstructed Qingdao railway station in 2018 (Falser 2018).



Fig. 3 The former *Gouverneurs-Wohnhaus* (1905–07) in its present condition (Falser 2018).



and many former ethnographic museums all over the country, this project questions Germany's colonial-era architectures, infrastructural remains, and urbanist fragments in Africa, China, and Oceania. How can we read them within their hundred-year transformation process (1920–2020) as a shared built heritage? Here, the overall aim is to develop a sort of morphology of transcultural heritage (inheriting/inheritance) in a postcolonial and global space. In this sense, the second module investigates the present-day remains of the German colonial period as a highly dynamic physical legacy of ongoing in-situ cultural-political negotiation (*social culture*), the specific practices and techniques of constant manipulation (*material culture*), and the value structure underlying these actions (*mental culture*), which is constantly being redefined.

Going back to German colonial Tsingtau (present-day Qingdao) in China — a preliminary field trip in December 2018

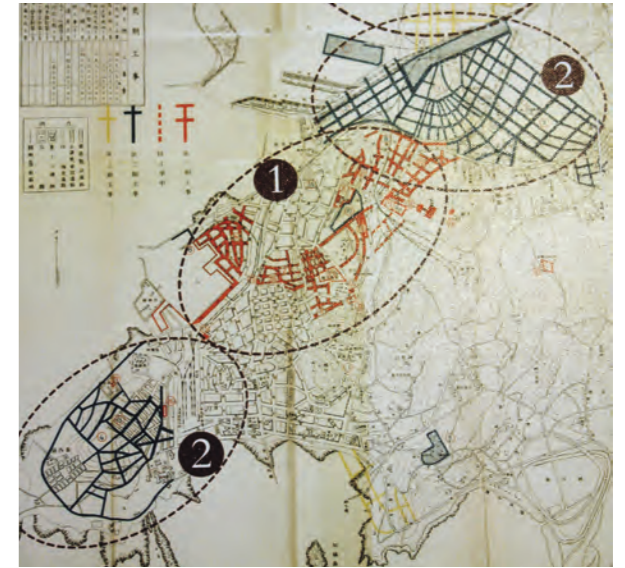
In order to exemplify some challenges within the above-mentioned agenda, a small collection of photographs is presented here. Most of them were taken during a preliminary field trip to a former German colonial marine base: Tsingtau (ca. 1898–1914), today the much appreciated Chinese harbor city of Qingdao on the shore of the Yellow Sea, situated between China's capital Beijing to the north and the former International Concession of Shanghai to the south.

When reaching the city by train, large signboards in Chinese, English, and Russian welcome the visitor with an aerial depiction of a surprisingly green cityscape; only experts would spot singular German colonial structures nested in this view. However, leaving the railway hall toward the central square opens up some more ambivalent architectural vistas, one of which is the train station itself. Only detailed studies back home while investigating historical travel literature would reveal that the current exterior is a recent in-style façade reconstruction of the last decade—the original landmark of the German colonial city having been demolished (Figs. 2a & 2b).

Approaching one of the former key buildings of German colonial rule, the *Gouverneurs-Wohnhaus* (1905–07) on top of the central hills (Fig. 3), reconfirms that a shared built-heritage construction is combined here with taxonomies and value judgments of architectural history, altogether an originally European discipline that travelled to the East more than a hundred years ago. While ascending the privatized road toward the well-maintained building, a series of educative signboards tells the story of how “Chinese Elements and Oriental Consciousness” were merged here into a strange stylistic mix of German regionalism, picturesque *Heimatstil*, and colonial attitude. After an architectural tour through the listed ensemble, the souvenir shop (primarily for Chinese tourists) provides a miniature of the same building next to a *Gartenzwerg Häuschen* and other excolonial fantasies.



Figs. 4a & 4b left: A German *Entwicklungsplan* of the marine base of Tsingtau around 1900; Right: A Japanese urban development plan after 1918 (Exhibition panels in the *Strand Hotel*, Falser 2018).



The path down to the once peripheral beach resort leads the visitor to another historical structure, the so-called *Strand Hotel*. Inside, an excellent exhibition displays a series of interesting photographs and maps. These indicate the important fact that a rational urban grid of streets and squares was not only implemented around 1900 for a totally new German town, which to this day has left a physical imprint of high-tech infrastructure, such as a harbor and a whole railway system: the former *Schantung-Bahn*, once departing into the Kiautschou hinterland and its coal mining sites (Fig. 4a); as if that was not enough, the urban fabric continued to develop within a new colonial regime after German troops had left when WWI broke out in 1914. After the war, the Japanese planned and partially implemented their own vision of a modern city with new urban subcenters inside and around the German time layer (Fig. 4b).

Today, Qingdao is a totally modern megacity with a new center around the inner bay, where Chinese couples stroll along a marina with food stalls and restaurants (Fig. 5a). However, the really uncanny chain reaction to this collage of former colonial styles and attitudes to power, with an interchangeable language of international investment architecture, is found around the monstrous new Chinese regional government quarter, on the southwestern seashore (Fig. 5b).

For this reason, a first site visit to the city fostered the working hypothesis that these contemporary building practices are far away from what proper architectural historians would call “traditional Chinese architecture.” *Coming to terms* with these past-colonial architectural hybrids is one of the many tasks of this project.

Michael Falser



Figs. 5a & 5b, left: The present-day view towards the new city center of present-day Qingdao; Right: Internationalist style fantasies for the new governmental quarter (Falser 2018).





Model photo competition "homemade"
 Recognition: Marie Gnesda, Theresa
 Zöllner, Maximilian Loeschke, Sofia
 Weidner — Design process in the
 courtyard.



Laura Betz: "immersion"



Melanie Sommerfeld: "discrepancy"

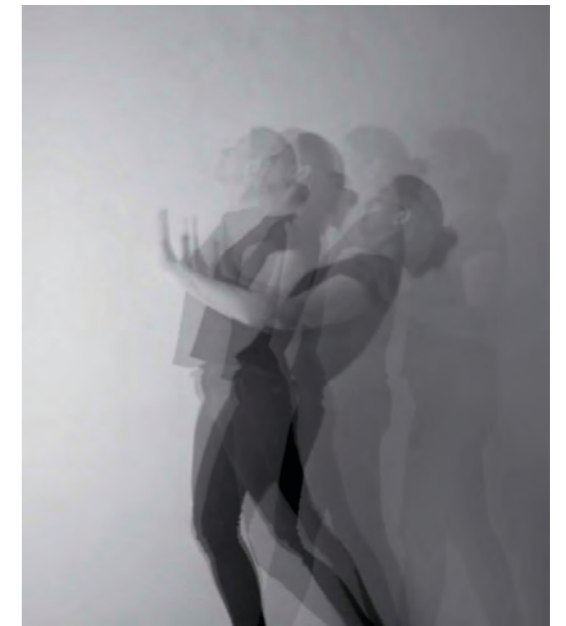
Lived Experience of Architectural Space

Lectureship of the Women's Representative:
 Questions of Science and Society in Architecture and Urbanism
 Lecturers: Virginie Roy and Katharina Voigt
 Summer Semester 2020

The "Architecture Experience" seminar focused on the live experience and embodied exploration of architecture, as well as on its overarching theoretical and scientific framework. A workshop on the multisensory experience of architectural space formed the starting point of the seminar. It invited students to question the predominance of vision in the perception of architecture, nurturing the lived bodily experience through sensorimotor and sensual exploration, tangible encounters with architecture, and tacit, pre-reflexive knowledge of space and experience.

The sensory experiencing of architectural spaces was explored in terms of phenomenological research. Various written sources from the fields of philosophy, psychology, architecture theory, behavior and performance studies, among others, were consulted to add the incorporated knowledge on architectural experience to overarching, rather abstract reflection. The relationships between body and architecture, and between human being and world, were discussed on the basis of one's own physical and sensual experiences as well as these additional sources; when considering architecture in phenomenological terms, the corporeality of the experienter appears to be of particular importance.

The experience gained during the workshop by means of bodywork and by using approaches from contemporary dance formed the foundation of embodied knowledge which, on the one hand, was examined through superordinate reflection and, on the other hand, discussed against the background of theoretical positions in the field. From the physical investigation of the architectural space, precise gestures were crystallized to emphasize architectural expression by corporeal means. The sensorimotor experience of space was therewith complemented by an enhanced acquaintance with one's own gestures and movements.



Friederike Drewes: "against the wall"

Gamification as a Communication Tool in Urban Planning

INFORMATION:

Project Partners:

Chair of Architectural Informatics
 Prof. Dr.-Ing. Frank Petzold, Dr.-Ing. Gerhard Schubert, Sarah Jenney, Nils Seifert
 Chair of Computer Aided Medical Procedures and Augmented Reality |
 Prof. Ph.D. Gudrun Klinker, Chloe Eghtebas

Funding:

Deutsche Forschungsgemeinschaft (DFG) through TUM International Graduate School of Science and Engineering (IGSSE)

Duration:

2017–2020

Together with the Chair of Computer Aided Medical Procedures and Augmented Reality, the Chair of Architectural Informatics has been examining the potentials of gamification and gameful design in urban planning communication and participation at early stages of the planning process — within the “Game.UP: Gamification as a Communication Tool in Urban Planning” research project. The project approach has a user-centered perspective, combining expertise from the fields of human-computer interaction and urban planning. The following research questions were addressed: What is the current state of gamification research in urban planning, what opportunities and challenges does gamification bring, and how can successful gamification and gameful design be measured? The research was funded by the German Research Foundation (Deutsche Forschungsgemeinschaft – DFG) through TUM International Graduate School of Science and Engineering (IGSSE) between 2017 and 2020.



Game.UP Application Planning Expert Interface Mock-Up

Urban planning problems are “ill-natured,” meaning that they have infinite solutions, solutions are neither right nor wrong and are dependent on problem framing, problems are unique to their situations, and you only have one shot at solving them. As a result, communication between stakeholders is of paramount importance to planning processes.

In democratic societies, our right to participate, our right to access information, the legitimization of planning processes, and helping the public understand decisions make communication with members of the public affected by planning an essential task. At a technical level, the integration of local knowledge and future users within the change process that is planning can lead to the generation of more resilient and sustainable planning solutions and support a sense of community. Furthermore, where communication fails, high financial costs, project delays, and loss of trust can ensue which, in the worst case, may lead to the failure of otherwise successful projects.

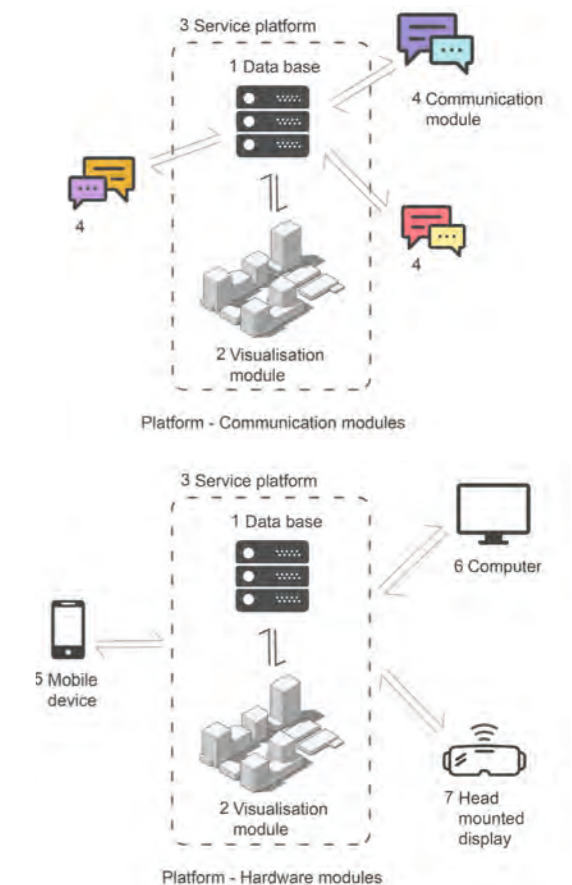
Digital participation tools and eParticipation tools seek to broaden the reach of more traditional communication and participation methods. They achieve this by raising awareness through advertisement and location-based notification, or aiding understanding by bridging the visual-semantic gap, as well as decoupling participation from specific locations and times. Nevertheless, issues such as participant attendance (and therefore participant motivation) and the improvement of user interfaces and experiences remain; it is precisely within this area that gamification is being increasingly applied.

In the Game.UP research project, we were able to consolidate research into gamification, human-computer interaction, and urban planning participation, identify participation issues that can be addressed through gamification, and propose an evaluation methodology measuring and comparing successful gamified participation applications. We emphasize how important it is to carefully consider game elements to be selected and implemented, together with the potential of other aspects of game design, such as game spaces, information visualization techniques prevalent in games, or taking player typologies into account when designing participation applications.

In our research, an urban planning participation prototype was developed as a case study, in consultation with the project driver of a real-world planning project; it was then evaluated on-site with members of the public. Through this, we were able to confirm the importance of taking a multiple stakeholder perspective when designing participation applications, and suggest a possible connection between gamification and perceived type and level of participation.

We are planning to publish more detailed results in 2021. Research into gamification within planning is a young but growing research field with many different potentials. In future, further empirical and comparable research will be required.

Sarah Jenney



Game.UP Service Platform Concept.

The diagram describes a service platform (3) that revolves around a central three-dimensional virtual model. The platform comprises of a database (1) that can be accessed and viewed through a web-based visualization module (2). Several devices (5-7) can feed and retrieve relevant data for their applications, the communication modules (4). The communication modules integrate gamification principles to address communication issues such as: accessing planning information, problem reporting, managing planning events, or submitting planning proposals; their purpose is to share planning information, enable exploration, inform, or motivate and incentivize.

Young Talent Awards

A Selection of Award Winners in 2020

Hochschulpreis Landeshauptstadt München 2020:

Taktiler Wohnen, Hanna Albrecht
Chair of Architectural Design and Conception

Senator Bernhard Borst Prize 2020:

Lena Probst

Christiane Thalgotz Prize 2020:

Agricultural Lighting Facade, Ekaterina Vyrodoва
Professorship of Green Technologies and Landscape Architecture

Hans Döllgast Prizes 2020:

Residential Giants, Lukas Brecheler,
Chair of Urban Architecture

Catching the Wind, Alexandra Huber,
Chair of Architectural Design and Participation

Hochschulpreis des Bayerischen Bauindustrieverbandes:

Robust optimization of load management potential and energy consumption, Martin Gabriel,
Chair of Building Technology and Climate Responsive Design

Ökonomische und Ökologische Lebenszyklusbetrachtung von Gebäuden, Anne Winkelkotte,
Chair of Energy Efficient and Sustainable Design and Building

Photogrammetric Point Cloud Skeleton Abstraction for Living Architecture, Qiguan Shu,
Professorship of Green Technologies in Landscape Architecture

Design Tool for Extrusion Based Additive Manufacturing, Fabian Jaugstetter,
Professorship of Digital Fabrication

AIV-Schinkel-Competition 2020 Special Prize:

Joint Future, Xiang Lin, Dihang Lin, Wen Yang,
Associate Professorship of Landscape Architecture and Regional Open Space

Stuttgart Lightweight Structures Award 2020

Honorable Mentions:

Active Grillage, Fredrik Justnes,
Chair of Structural Design

proHolz Student Trophy 2020:

AUFgewertet, Sofia Kholodkova, Yana Shcherbakova,
Katharina Kögl,
Associate Professorship of Architectural Design and Timber Construction

Architecture Thesis of the Year 2020:

ISTHME, Dafni Filippa, Meriam Sehimi,
Chair of Architectural Design and Participation

Pars pro toto

Lena Probst, winner of
the Senator Bernhard
Borst Prize 2020



Residential Giants

Lukas Brecheler,
winner of the Hans
Döllgast Prize 2020



Catching the Wind
Alexandra Huber,
winner of the Hans
Döllgast Prize 2020



Pavillon 333

www.pavillon333.de

Professorships:

Professorship of Architectural Design and Timber Construction | Prof. Hermann Kaufmann; Chair of Architectural Design and Construction | Prof. Florian Nagler

Project supervision + construction management:

Ferdinand Albrecht, Enrica Ferrucci, Matthias Kestel, Christian Schühle

Assistance construction management:

Bernard Hunt, Felix Niemeier, Jonas Pauli, Anne Carina Völkel

Participating students:

Anna-Maria Brendel, Nico Lewin, Vincent Schmitt, Max RittervonSporschill, Antal Strausz, Felix Waldner

Johannes Daiberl, Nils Fischer, Konstantin Flöhl, Frederick Gorsten Schünemann, Mengxue Guo, Lisa Hempfer, Jakob Köppel, Tonderai Koschke, Christophe Leick, Leoni Lichtblau, Yasemin Özdemir, Ansgar Stadler, Benedikt Stoib, Laura Traub, Konstantin Trautmann, Lukas Vallentin

Specialized planning:

Chair of Building Technology and Climate Responsive Design | Prof. Thomas Auer and research associate Tobias Wagner; Merz Kley und Partner - Structural Design - Collaborator Josef Amler

With kind support of:

PIN. Freunde der Pinakothek der Moderne Arte Generali Foundation TUM Department of Architecture

Fieger Lamellenfenster, Ehm Elektrotechnik, Breidenbach Metallbau, Felix Nistler GmbH, Festool, Jung, Krinner Schraubfundamente, Rothblaas, Rodeca, RZB Leuchten, Spax

What remains is the pavilion. Both in design and in name, it can be found again in the new temporary building built on the Türkenstrasse on a meadow next to the Türkentor. However, the term “pavilion” marked the beginning of the current structure at a completely different location.

For the 2018 Biennale, a group of DesignBuild practicing lecturers from the dbxchange.eu network came together with the TUM Architecture Museum in order to prepare an application for the German Pavilion at the Architecture Biennale in Venice.

The idea envisaged a live construction site which, furnished with students from various universities and colleges, would ensure a constantly lively, self-developing exhibition for the entire duration of the Biennale. Instead of this application, CRAFT—involving Marianne Birtler and the internal German border—won the race. Yet the idea of a live contribution to the exhibition was retained and transferred to Munich, as was the need for the DesignBuild teaching method to be made more visible in the form of an exhibition at a renowned location.

The construction site of the pavilion was to start at the same time as the “DesignBuild—Experience in Action” exhibition at the TUM Architecture Museum, and give exhibition visitors the opportunity for an own “experience in action.” The outbreak of the Covid-19 pandemic and the associated restrictions ruined the timeline and the direct connection with the exhibition.

Nonetheless, and in part this can be traced back to the other roots of the project, the building was still built despite the inauspicious initial situation. These roots lie in the combination of actors and their spatial needs, which have existed for a long time. Pavilion 333, as it will be called after the opening, will bring the various Pinakothek der Moderne collections, the Brandhorst collection, and the TUM Department of Architecture under one roof. These two museums had already articulated their needs for a space for art education when they opened, which would have been fulfilled by the second construction phase of the Pinakothek der Moderne, but construction is still not in sight, while the Department of Architecture of the Technical University, which is also part of the museum quarter, is squeezed on its edge and is striving for visibility in street space.

The task of building the pavilion on a prominent site in the city was generated from this dialectic of needs. The simultaneous juxtaposition of the exhibition, on the one hand, and the focused work atmosphere, on the other hand, forms the core of the design. The associated contrast between

Stage vs. Emptiness

visibility and concealment remains legible. In an urban planning interpretation, a curtain actually suggests somewhere to live, so does it conceal actual use, does it even invite people to live there?

Before you seek out answers to these questions, it is worth taking a step back to the empty meadow: the meadow as a place of longing for dog owners; emptiness as the optimal condition for Walter de Maria's Large Red Sphere and monument protection; the meadow as a place of invisible media in the soil; emptiness as an undesigned residual area around the Pinakothek der Moderne and as a placeholder for the second construction phase; the meadow, parking lot, and driveway as a field of tension and a stage for major urban points of contention—all distilled into an area measuring 15 x 15 meters. The needs of dog owners clash with those of car parkers, which in turn come up against the sun-hungry lunch crowd and the expectant audience of high culture, with its sponsors. Thus 15 x 15 meters, or some 1,300 cubic meters of enfolded air, now make up this podium; the space in front of the Türkentor comes to a standstill toward the south and no longer flows away. The ephemeral wooden structure, with its translucent shell interrupted by glass strips, arranged like a windmill, for viewing, creates the necessary degree of concealment for the art education program while the glass caesura prevents a cutting off from the surroundings.

The pavilion is thus intended to connect institutions located in the Kunstareal and form a first, low-threshold, open point of contact for the entire precinct. As early as during the planning period, the pavilion managed to bring together representatives of the four collections of the Pinakothek der Moderne, the Brandhorst collection, and the Department of Architecture—and get them

talking. Here, too, the shape of the building that was being created stretched into an almost amoeba-like structure.

Now the concurrence of numerous interests is per se an integral part of activity—in the construction context as in any other kind of project process. In this case, however, ideas, wishes, and projections all condensed on the polycarbonate of the façade and pearly off it before the first element was even positioned. Even in the so-called classic environment of DesignBuild projects, namely in the Global South, one is used to the fact that this type of construction project stirs people and softens boundaries; but how surprising was the force and, at the same time, bubblegum slowness with which this happened for one very small building in front of the TU's doors—compared with the neighboring structure.

At this point, it may be necessary to briefly sketch the time constraints of a DesignBuild project in general, and the legal peculiarities of such projects in connection with construction work in the western world. There are interfaces between two co-existing realities which, as the normal course or career of professional existence dictates, must follow one another. Hence if one wishes to widen the interface and enable bidirectional exchange, this quickly becomes a challenge, both in terms of time and organization. The perpetual tempo would be predetermined by the division of the academic year into two semesters and of these into lecturing periods and lecture-free periods, whereas involved project partners outside academia would naturally be suspended to other timelines. There are also the students—to whom a maximum of self-sufficiency and responsibility in the design process, and also in concrete planning, should be conveyed—who often still lack the tools of the trade with regard to their studenty, sometimes utopian design tasks.



Students and supervisors spent much time on the construction site during the summer of 2020.



Top: Final finishing inside the pavilion.
Bottom: The curtain is movable, can envelop the building from the outside and provide dimming on the inside.
All photographs © Matthias Kestel



from the first sketch to completion, within a limited time period—one year in the case of the pavilion.

But let us return to emptiness and the meadow. Without any doubt, both the pavilion and the creative process offered, and still offer, a source of friction for the city, the Kunstareal, and all those involved in its creation. Now the emptiness of the place on the Türkenstrasse is shifting a little further toward the Gabelsbergerstrasse, while the functionality of the meadow has been retained or even increased by the fact that the stage mentioned at the beginning is now becoming palpable and being constructed. The hope entwined with the opening of the pavilion—whose date cannot yet be set, another special feature of pandemic times—would be that discussions that arose through construction and are symptomatic of an urban society like Munich's can now be conducted in this very same building; that a space has been created that can be more than just an extension of certain functions of the institutions involved—a space that really flags the low-threshold contact point in the Kunstareal; and that a degree of accessibility enabling inclusion at all levels has been achieved.

In order to enable long-term acceptance of the project among the urban population and even, perhaps, break down existing prejudices, it is imperative to avoid exclusive, closed events, and turn the place into one that offers space in an exposed location, of which there are so few in this city—to offer a space for young, non-commercial, creative, art-loving ideas and their execution. It is only in this way that the building will become part of the urban public sphere and boundaries between outside and inside will become blurred, while the textile coating of the curtain will also shake off the isolation effect that it could have brought about if we were dealing with an exclusive place. It will be transformed into a translucent layer that suggests an interior and makes you eager to step in, to take part, and become part of.

Matthias Kestel

In contrast to a student job in a planning office, a DesignBuild project transfers the planning responsibility to the students but, and this is where the second interface comes into play, but only up to the point at which this country's legal reality prescribes that liability be assumed, or a certain timeline be adhered to. The extent of the balancing act conducted by project managers is defined by holding back and pushing students toward a tangible result. Hence the tightrope walk between, on the one hand, teaching and the resulting learning effect and, on the other hand, the need to adhere to schedules and deliver effective results, defines the project framework, especially for a DesignBuild project in an environment informed by rules and standards.

It is precisely because of the special nature of DesignBuild projects that it is easier to question existing processes and stretch boundaries which, in the case of a conventional building project, could quickly spell out the end. The temporary orientation of the building helps, as does the supposedly rigid temporal structure which, in the end, does make it possible to set up a building,

Scientific Success of Research Associates

Sandra Persiani Chair of Building Technology and Climate Responsive Design

Humboldt Scholarship

Arch. PhD Sandra Persiani has been awarded the Alexander von Humboldt Foundation Postdoctoral Research Fellowship. She conducts a research project on “Architectural symbiosis: emergence of new operating patterns as an effect of a human-plant-building association” in collaboration with the Chair of Building Technology and Climate Responsive Design and the Professorship of Green Technologies in Landscape Architecture. Persiani holds a PhD in Architecture from the Sapienza University of Rome and has been working under Prof. Auer at the Chair of Building Technology and Climate Responsive Design within a TUM Foundation Fellowship since 2019. As postdoctoral researcher of the Alexander von Humboldt Foundation, Persiani will engage in research in the field of indoor environment and green architecture, and document the combined effects of people-plant and plant-building technology interactions.



Meltem Çavdar Professorship of Recent Building Heritage Conservation

Wüstenrot Scholarship

Since May 2020, Meltem Çavdar, research associate at the Professorship of Recent Building Heritage Conservation, has received a doctoral scholarship from the Wüstenrot Foundation for her dissertation project: “Timber formwork construction in the middle of the 20th century and its influence on the quality of exposed concrete surfaces” under the supervision of Prof. Dr. Andreas Putz. The Wüstenrot Foundation supports doctoral projects on post-1945 architecture. Meltem Çavdar is the eighth doctoral candidate to receive this scholarship. The scholarship supports research projects that deal with postwar modernist buildings, ensembles or open spaces, or tackle issues linked to their renovation, the preservation of their authenticity, or their purposeful transformation. The aim of Meltem Çavdar’s dissertation project is to establish a new conception of brutalist concrete structures as the foremost product of formwork engineering.



Sarah Hegenbart Chair of Theory and History of Architecture, Art and Design

Young Academy Mainz

Dr. Sarah Hegenbart, research associate at the Department, was awarded one of the four-year memberships of the Mainz Academy of Sciences and Literature’s Young Academy. Through her admission, the outstanding achievements of the next generation of scientists are being recognized, and she is being aided on her future professional path. Key aspects of membership are active participation in the academy’s meetings and events, and dialogue with members of the established learned society. Hegenbart studied philosophy and art history at the University of Oxford and the Humboldt-Universität zu Berlin. Her doctorate dealt with Christoph Schlingensiefel’s Opera Village Africa as a post-colonial total work of art. Hegenbart has been a research associate at the Chair of Theory and History of Architecture, Art and Design since 2017 and is working on a habilitation project. Two years has more particularly focused on questions related to gender, sexuality, and the body in architecture.



Sara Fouad Chair of Landscape Architecture and Industrial Landscape

Humboldt Fellowship

The Egyptian researcher Dr. Sara Fouad was awarded a Georg Forster Research Fellowship by the Alexander von Humboldt Foundation for the postdoctoral study of “Historic Veins. Between Regeneration and Termination” at the Chair of Landscape Architecture and Industrial Landscape in 2020/2021. Together with Prof. Dr. Weilacher, Dr. Fouad developed the research proposal. In her work, the young researcher from Alexandria investigates how disused industrial channels in Egypt that are currently endangered may be successfully preserved, converted, and reused. To this end, she is carrying out the comparative study of analogous transformation projects in Germany. With her research project, Dr. Fouad will make an important contribution to the development of her country of origin, and contribute to the exchange of knowledge and methods between Germany and Egypt.

Nadia Alaily-Mattar Chair of Urban Development

Feodor Lynen Research Fellowship

Dr. Nadia Alaily-Mattar has been awarded the Feodor Lynen Research Fellowship for Experienced Researchers by the Alexander von Humboldt Foundation. She holds a PhD in Planning Studies from University College London and is a research associate at TUM’s Chair of Urban Development. Since 2014, she has been researching processes, outputs, and impacts associated with Star Architecture and has co-edited the book *About Star Architecture: Reflecting on Cities in Europe*. During her time as a Feodor Lynen Research Fellow at the TU Delft, Alaily-Mattar will research the processes used by architecture practices to enable their architectural artefacts to perform narratively. Under the title *The Making of Architecture for Narrative Performance—A View from Architecture Practice* she explores the nexus between publicly funded architecture and the production of collective identity. Uncovering these processes will meaningfully advance our understanding of the sustained political power of architecture.

Left page, bottom:
Sandra Persiani,
photo by C. Milutinov
Top: Meltem Çavdar,
photo by M.Dame
This page:
Sarah Hegenbart,
photo by I. Mühlhaus

Opera of Ambiguities

The Opera Village Africa by Christoph Schlingensief.

Dr. Sarah Hegenbart is an art historian and works as researcher and lecturer at the Chair of Theory and History of Architecture, Art and Design. She holds a one-year fellowship at the Alfried Krupp Wissenschaftskolleg of the University of Greifswald, where she works on the research project “Diagnosing post-truth politics: Dialogical art and black aesthetics”.

The Opera Village Africa will be ten years old in 2020. What has become of Schlingensief’s vision of founding an Opera Village in Burkina Faso, West Africa? Are Wagner operas now being staged thirty kilometers outside Ouagadougou, the Burkinabe capital? Or is the Opera Village turning into a dystopia of classic development aid that perpetuates neo-colonial power relations? This book took its inspiration from such questions and similar ones. The intention was less to provide concrete answers than to stimulate discussion. This is absolutely in the spirit of Schlingensief himself, whose work was one thing above all: an opera of ambiguities.

In my book, which is scheduled for publication in 2021, I approach Christoph Schlingensief’s “Opera Village Africa”, located in the West African state of Burkina Faso, from the perspective of art history and I investigate the inherent ambiguities that characterize the project. The project’s double meaning is immediately apparent in its provocative naming. This is because both the “opera” art form and the “Africa” label are inventions of the “West” and are imposed by Schlingensief upon a Burkinabe region. Inspired by Richard Wagner’s idea of a total work of art that would revolutionize political reality through art, Schlingensief originally planned to build a festival hall on the African continent. There, the concept of the opera, which he perceived as meaningless, was to be detached from its German reference points and loaded with new meaning through interaction with Burkinabe artistic forms of expression. On the occasion of the Opera Village’s tenth birthday, I examine how things stand.

In February 2010, when director and multimedia artist Schlingensief carried out the ceremonial laying of the foundation stone for his Opera Village, he had already exposed the neo-colonial connotations of the project in productions such as *Via Intolleranza II* and *Mea Culpa*. Only a few months after the celebrations, he conceived the play *S.M.A.S.H.—Suffocating in Aid*, in which he sketched out the somber future of his artistic experiment. In just three years, a thousand percent increase in development aid, driven by the industrialization interests of the free market economy, stifles the entire African continent and thus also the Opera Village. *S.M.A.S.H.* remained a fragment, as Schlingensief died on August 21, 2010, on the planned première day of *S.M.A.S.H.* But even the fragmentary sketch of *S.M.A.S.H.* already shows how aware Schlingensief was of the internal contradictions of his own project. Although it was clear to him that one-way financial flows could stifle local artistic and cultural expression, he nonetheless pushed for



the establishment of the Opera Village, which could not have come into being without any donations from the West. Accordingly, it is not surprising that critics often (mis)interpret Schlingensief’s last project as a neo-colonial gesture.

Ten years later, the Opera Village boasts a functioning school, an infirmary, houses for employees and even a recording studio. Buildings were designed by the architect Francis Kéré, who teaches at TUM. But there is still no festival hall. Here, instead of singers, schoolchildren stage their everyday opera: art takes place in everyday life. The last ten years have clearly shown how closely art is linked to political developments in Burkina Faso. The rapper Smockey, one of the supporters of the Opera Village, made a significant contribution to the establishment of a grassroots movement through which President Blaise Compaoré, who had already ruled for twenty-seven years, was overthrown. While China’s economic interests have triggered a kind of overdevelopment on the African continent, which is similar to the scenario outlined in *S.M.A.S.H.*, there is a tendency in Burkina Faso to revisit the socialist vision of the first President, Thomas Sankara.

In my analysis, the Opera Village functions as an “opera of ambiguities” that forces us to grapple with western stereotypes of “Africa”. The “opera of ambiguities” contrasts these stereotypes with a complexity of realities and, at the same time, involves an expansion of perspectives. My hypothesis is that Schlingensief’s Opera Village is calling for a realignment of the western canon. Schlingensief’s plea for reversing power relations that have been twisted by colonization and his focus on artistic forms of expression in African regions thus anticipated by a decade the need for a discourse on how to deal with the colonial past in Germany, which has climaxed in the current discussion about the controversial Humboldt Forum in Berlin. In my book, I examine the Opera Village as a platform on which transcultural ambiguities can be negotiated at a visual and artistic level. A design sketch that Schlingensief submitted during the competition to find an architect for the Humboldt Forum illustrates how fruitful the ambiguities of the Opera Village might be when it comes to thinking about postcolonial museums. In the sketch, he imagined the Humboldt Forum as a stereotype of an African village—possibly a village in need of cultural development aid from Burkina Faso.

Sarah Hegenbart

Images: The Opera Village Africa by Christoph Schlingensief



Projects of the Chair of Architectural Design and Participation develop a sensibility to contextual factors, out of which innovation can arise. Conceptual thinking combines with a hands-on approach for site-specific solutions.

Teaching Team: Prof. Francis Kéré, Alberto Pottenghi, Inês Dantas, Barbara Schudok, Katrin Riemenschnitter, Kevin Chen.

HOME OF GENERATIONS

Chair of Architectural Design and Participation | Prof. Francis Kéré
Winter Semester 2019/20

The current housing crisis in Lisbon provided the context to develop the Home of Generations project. Amid gentrification and a real-estate boom, Lisbon is changing at a fast pace. The project proposed shared accommodation for elderly people who live in the historic Lisbon neighborhood of São Vicente and are affected by the dramatic increase in rental prices. A child daycare center (Bachelor) or community program (Master) would complement this function, thus creating an intergenerational building.



Left page, top: Model by David Baumgartner and Tim Lauer, BA Studio 'Home of Generations'
Bottom: Design by Rebecca Heinzler and Tamara Speil, MA Studio 'Home of Generations'
Right page, top: Model by Robin Feys and Arno Geodefroo MA Studio 'Mix it up'
Center and bottom: Design by Dafni Filippa and Meriam Sehimi, BA Studio 'Mix it up',
Winners of Architecture Thesis of the Year 2020



MIX IT UP

Chair of Architectural Design and Participation | Prof. Francis Kéré
Summer Semester 2020

Accra, the capital of Ghana, is a booming city in West Africa. The task was to design a mixed-use building in Jamestown, a vibrant quarter that is one of the oldest and historically most important parts of the Ghanaian capital. Jamestown is a multifaceted place, with its popular boxing clubs, fishing harbor, and markets. Historical buildings, such as the Jamestown Fort, Jamestown Lighthouse, and colonial houses coexist with informal structures. The site is located between the seaside and the high street, one of Accra's main roads, offering a varied potential for living, commercial activities, sport, and leisure. The aim of the MIX IT UP studio was to design a multistory building that would fulfill several functions, providing apartments to Ghanaian families, space for commercial uses, and a community program—such as sports facilities.



Can we build with salt?

A Research Project by the Chair of Building Construction and Material Science.

INFORMATION:

Project management:
Prof. Florian Musso and Vesna Pungercar

Supported by:
Professor Dr. Johann Plank, Chair of
Construction Chemistry, TUM

Materialprüfungsamt für das Bauwesen
(MPA BAU), TUM

Prof. Dr. Aimilios Michael, University of
Cyprus

Students:
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Strenzke, Francesca Fogli, Yunus Emre
Günel, Merve Biyik, Zhou Jinchu, Li Tianxi,
Antal Strausz, Huu Duy-Anh Nguyen, Jonas
Kögl, Begüm Saral, Ines Ehrenbach, and
Yuan Desheng

Funding:
Fritz und Trude Fortmann Stiftung

Time period:
August 2019–August 2020

Salt, the “white gold”, has been a valuable material for many centuries and during the past decades has attracted wide attention owing to its availability, affordability, and material performance. The research project examines the potential of salt as a construction material in the building envelope.

The world population is growing and, along with it, the global consumption of resources. One of the most precious natural resources, without which the average person can only survive for one week, is fresh water. Although around 70% of the earth’s surface is covered with water, only 1% of this fresh water is available for human consumption. One solution to this water shortage is to desalinate seawater, which involves extracting drinking water from seawater and returning the extracted salt (NaCl) as waste into the sea. Another precious natural resource is soil. To guarantee a plant’s growth, various nutrients need to be added to soil. One important element is potassium, which is extracted from stones. The remaining (40–80%) of the stone is salt (NaCl), which—depending on the mining process involved—is disposed of on the surface or underground, or discharged directly into rivers or seas.

Desalination and potassium production supply us with water and food but, at the same time, cause environmental contamination. A change in salinity, temperature, and loss of biodiversity in marine and river environments have all been acknowledged in many scientific studies as negative consequences of salt disposal. If waste salt arising from these two processes were spread over the surface of the city of Munich (310.43 km²), then the city would be covered with an 11-meter-high layer of salt within a year.

To counteract this problem, our research project investigated ways of using salt as a building material. The use of salt in construction is usually associated with possible moisture damage, rather than in relation to its particular qualities: Salt is porous at room temperature, dissolves in water, and stores both thermal energy and moisture. Moreover, salt caves and salt rooms are believed to help treat sleep disorders, depression, and respiratory diseases. In Germany, there are already around sixty of these facilities.

The objectives of the research were to examine several salt-binder compositions experimentally, investigate the impact of salt on material properties (bulk density, compressive and tensile strength, and efflorescence on the surface), and explore the sensory perception of new material through smell, sight, hearing, taste, and touch.



Right: Student designing salt architecture inside a transparent box. Photo by Desheng Yuan.
Bottom: Clay-salt testing blocks ready to be removed from steel molds. Photo by Vesna Pungercar





Top: Research into the sensory perception of salt models inside transparent boxes covered with black wrap. The salt models were examined through a single opening through touch, smell, hearing, and sight. Photo by Moritz Heinzerling

Bottom: Study of efflorescence control through the use of additives on the surface. Photo by Desheng Yuan

The main part of the investigation identified potential binders mentioned in the literature, defined the mixing ratio of salt to binder, and built the first testing blocks (mixing components in the laboratory and drying blocks in a heated cabinet). After creating 43 test blocks, one important conclusion was that the mixture of materials had to be homogenous and not too fluid in order to be able to extract the blocks from the molds. On the basis of these 43 test blocks, bulk density, porosity, and efflorescence on the surface were observed and photographed with a microscopic camera. The mixing ratio of salt in the blocks ranged from 10 to 90%. The following binders were used: clay, gypsum, starch, alginate, and water. We found that the amount of salt, the drying process, and the amount of water used influenced the material properties of each binder differently. In order to better understand how salt re-crystallizes, several test blocks were exposed to different boundary conditions (air humidity, air temperature) for various lengths of time. In addition, we conducted further experimental studies into the controlling of efflorescence through the use of additives on the surface.

We researched whether salt might have the potential to substitute REA gypsum. Currently, REA gypsum represents around 50% of all gypsum used in Germany, but will soon disappear because of the planned closure of the country's coal power plants. Firstly, the properties of three different test blocks (100% salt, 70% gypsum-30% salt, and 100% gypsum) were analyzed through in-situ measurements of heat, light, humidity, noise, and surface texture. The first results showed that adding salt to the gypsum changed the latter's thermal capacity and its light and noise reflection properties, as well as its humidity absorption. All measured values of the 70% gypsum-30% salt block were found within the range of values of the 100% salt and 100% gypsum blocks.

Secondly, in addition to the material properties research phase, the sensory perception of salt was analyzed. Architectural models made of salt were designed and placed in transparent boxes (26 x 26 x 26 cm). Each box was covered with black wrap and the models were tested by 100 interviewees through touch, smell, hearing, and sight. Most interviewees perceived salt as neutral in terms of surface temperature (neither cold nor hot) and almost without smell (only in cases without glue). A change to the color or form of the salt resulted in a lower probability that the material would be recognized. In the questionnaire about the sensory perception of salt, people revealed a positive impression of, and attitude towards salt as a building material.

Our research with salt opened up further questions in terms of application opportunities and the specification of material properties. At the same time, it showed that building with salt has potential, both from the perspective of resource efficiency and building performance.

Caution: Hot! Hotter and Denser, the Anthropocene

Studies show how climate change is evolving and increasing the risk of certain extreme-weather phenomena. The effects of global warming is more intense in urban areas with a high population, where it can be a lot warmer than in surrounding rural areas owing to increased human activity, sealed surfaces, dense urban environments, absorbing materials, waste heat, or heavy traffic.

On June 26, 2019, Berlin reached a temperature of 38.6°C, the hottest June ever recorded in the city. Although this is not considered “typical” for Berlin, lately every summer seems to have broken new heat records, pointing to the fact that maybe these might be the new normal?

Researchers have already predicted what the climate of several cities will be like in the near future. Studies show that Europe will get considerably warmer by 2050, with an average increase of 4.7°C in summer compared to 2000. In fact, this is rather an optimistic climate-change scenario.

With this prediction in mind, we wished to create an installation where visitors could experience first-hand this shift due to happen over the next thirty years. The installation illustrates how Berlin’s climate in 2050 is going to be similar to Rome’s climate today—while raising the question: “What can we learn from Rome’s current urban strategies to enable Berlin to adapt to increasing temperatures?”

INFORMATION:

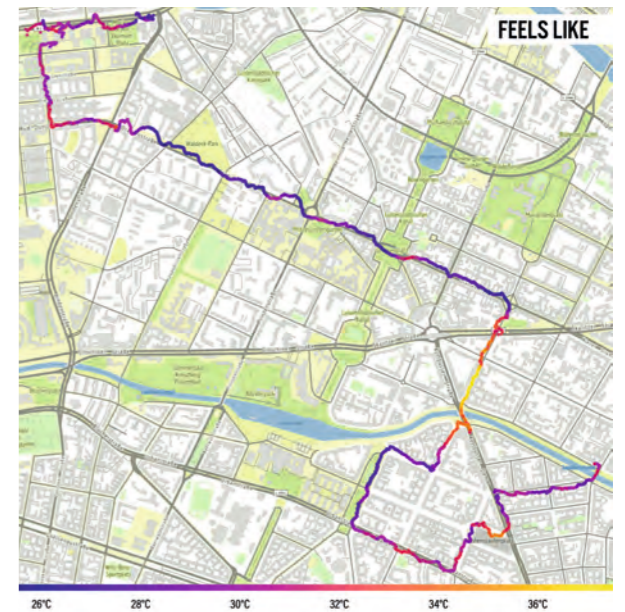
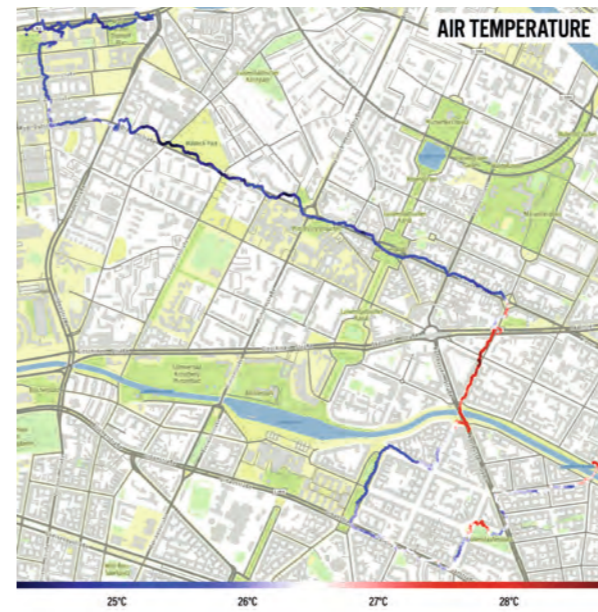
Exhibition pavillion of the exhibition “urbanable stadthaltig” at the Akademie der Künste, Berlin

By:
Thomas Auer (Transsolar & TUM),
Stefano Boeri (Stefano Boeri Architetti),
Ata Chokhachian (Climateflux & TUM),
Bilge Kobas (TUM),
Alessandro Melis (University of Portsmouth),
Daniele Santucci (Climateflux)

Exhibition team:
Ahmad Nouman,
Sebastian Koth,
Thomas Schmidt (TUM),
Sara Gangemi (Stefano Boeri Architetti)



The exhibition pavillion (Photo by Bilge Kolbas)



Top: A Climate Walk in Berlin on July 13, 2020. Maps showing air temperature (on the left) and what it feels like (on the right).
Right: A photo of the backpack designed to sense environmental characteristics.

Climate Walks are designed to sense microclimatic variations and outdoor comfort conditions in the built environment, employing portable devices with a high spatiotemporal resolution. Climate walks are experiments designed to demonstrate the effects of urban artefacts on human thermal comfort and evaluate the subjective behavior of people in transient conditions. The data is expressed using the UTCI metric (Universal Thermal Climate Index), which corresponds to perceived temperatures. UTCI is expressed in Celsius degree but does not refer to the actual air temperature; it is the temperature that it “feels like.”



The Key Role of Industrial Design at TUM

During the last fourteen years, Prof. Fritz Frenkler and his team at the Chair of Industrial Design engaged in design education and practice that combined a scientific and interdisciplinary way of working and thinking. Following the retirement of Prof. Frenkler at the end of the summer semester of 2020, the associated study program, MSc Industrial Design, is being phased out. This article briefly presents the Chair's design mindset and education, which will form the basis for the planned Integrative Research Center "Munich Design Institute" and the appointment of several design professorships. The TUM will expand its design research network and further develop its design education. It will give design an even more prominent role than before within TUM.

Why?

Shaping our society in a sustainable and viable way

There is nothing human-made that cannot be associated with design. Our world is designed. Reducing design solely to formal and aesthetic aspirations is outdated. The key factors are usability and a true need for products, product systems, and services.

Design requires an awareness of the societal context and of challenges of our time related to technological developments. It is about devising socially, environmentally and humanly appropriate solutions that have a positive effect on our society and environment. Technology cannot be political, but design (as well as architecture) must be political and take a position.

We must all join forces to meet the challenge involved in defending the interests of a decent life. This includes not only producing desired products or services, but also making it clear to companies, where necessary, that a product they wish to bring to market will not work or is not necessary—for example because it is socially questionable or raises environmental issues.

How?

Educating the next generation of accomplished designers

Designers thus become moderators for societal and industrial changes, arbitrating between usage, production, and environment. The objective is not merely to educate more designers but, rather, personalities who operate in areas where so far designers have not usually been present.

Top: The recently published book *The Report. Industrial Design at the Technical University of Munich*.
Open access publication: <https://mediatum.ub.tum.de>
Bottom: The exhibition *face the future*. at the Vorhoelzer Forum of the TUM Department of Architecture.
Virtual tour of the exhibition available on <https://facethefuture.iv.navvis.com/>
All images © Chair of Industrial Design, TUM



$$d_{\text{esign}} = \int \int \int \int \frac{(\text{T}_{\text{ech}} \text{E}_{\text{rg}} \text{S}_{\text{oc}} \text{E}_{\text{co}} \text{P}_{\text{sy}} \text{P}_{\text{hil}} \text{P}_{\text{in}})^{\text{brand}}}{t_{\text{ime}}} \times P_{\text{resentation}}^{4/3/2/1}$$

function form experience

The Design Formula © Chair of Industrial Design, TUM

Hence until now Industrial Design graduates at TUM have not merely been designers, but also managers, moderators, entrepreneurs, and scientists in a world confronting them with ever new challenges.

The Chair of Industrial Design was based on three pillars: teaching, research & development, and entrepreneurship, covering a wide spectrum ranging from the practical skills and abilities required from a designer to the systematization and promotion of a scientific working method. This was framed by the “New Functional Design” approach as well as by the Design Formula.

What?

Developing projects with added value for society

Design is much more than just the sketching out of products, product systems, and services—it is a fundamental part of our society. The projects developed and executed at the Chair show this: design conveys values, promotes entrepreneurial thinking and doing, and improves the dialogue between politics, business, and society, thus developing societal relevance which, at the same time, leads to economic impact.

A large number of projects were showcased in the *face the future* exhibition that took place during the MCBW 2020 at the Vorhoelzer Forum. The Chair of Industrial Design looked back on recent years and presented many designs from different research areas and fields of activity. To experience the exhibition, please visit <https://facethefuture.iv.navvis.com>.

To further summarize its achievements and mindset, the Chair published a book: *The Report. Industrial Design at the Technical University of Munich*. It can be downloaded at <https://mediatum.ub.tum.de>.

The future?

We will see...

Designing for our society and environment is a major challenge today. Designers thus need to gain a more important role both within society and within companies. Designers must take decisions, do so with scientific guarantees and enjoy close links to technology, engineering, and innovation.

For the next generation of designers and their educators, this means the following: first, we must learn to see, learn to situate what we perceive within systems, i.e., social, democratic, or ecological structures; second, we must learn to identify and analyze these. Moreover, such correlations are so complex that they require a university education and design research.

For these reasons, it was and still is the intention to expand the field of design at TUM. Together with even more designers, creators, and scientists, we wish to create a Design Institute that connects the various sciences and institutes of the entire university in order to possess a core set of competences for overcoming the problems we are facing today.

The scientifically minded Industrial Design is part of the TUM’s Excellence Initiative. We look forward to seeing the new “Munich Design Institute” emerge—building up on the foundation of the Chair of Industrial Design, taking it even further in its importance at TUM and as well as spreading design into various faculties and study programs, and vice versa. Something that is probably not happening at other universities in the world.

Susanne Dreyer, Mario Weissner, and Steven Stannard

The Self-Conception of the Chair of Industrial Design.

1

Industrial Design forms societal realities as a link between people, technology and economy.

Technology and business often do not focus directly on people. They lose sight of them by applying scientific approaches and business thinking. This is why technical developments and human needs often drift apart. It is the task of responsible designers to identify these complex needs, translate them into requirements for product development and represent them as advocates of the users.

2

Industrial Design mediates between discipline cultures and facilitates inter-disciplinary dialogue.

Designers translate technical terminologies, work out the specific requirements of different interest groups and link them together to develop the best possible solutions. Design creates adaptive interfaces and thus enables better collaboration between different company departments. Design reduces misunderstandings by translating technical jargon into generally understandable language. By visualising the development process of the different objectives, a vision of the overall system is created.

3

Industrial Design links science and design with the objective of improving societal structures and stimulating discourse.

Designers can make scientific findings visible by making them understandable and tangible for society. To achieve this, they translate the findings into user-friendly product systems, services, software or into the conception and implementation of socially relevant exhibitions.

4

Industrial Design makes plausible and resilient design decisions and, if necessary, prevents non-functioning products before they are developed.

Products with reasoned and true added value benefit people, industry and society. They increase the investment certainty of the industry, make it more efficient and preserve resources, which can thereby be used in a more important context.

5

Industrial Design combines analytical and creative thinking with constructive doing.

Designers evaluate different design solutions as objectively as possible and are at the same time aware of the subjectivity of all those involved in the design process. Awareness about the bias of those involved accompanies the design process. Within the process, thinking and doing alternate in order to approach the best possible solution in iterative loops.

6

Industrial Design represents the needs and interests of all people and the environment when developing new products and services.

In their role as “first customers”, the designers’ aim is to develop meaningful products for people against the background of different cultures, to reduce system-induced inequality through intelligent design and to promote independency. Through the sensible use of materials, they develop products and product systems that enable a circular economy.

7

Industrial Design creates holistic systems and not only individual products or isolated solutions.

Instead of dealing with surface symptoms, designers get to the very root of things and search for the underlying causes of a problem within its overall system. By looking at the individual components and their context, long-term acceptable solutions are proposed.

8

Industrial Design contributes to transforming technologies and inventions into meaningful innovations. It thus creates added value for society.

Research results and technical inventions alone do not create added value for most people. This is only possible through their transfer into products, systems and services. By combining previously unlinked technologies, solutions can emerge that people integrate into their everyday lives and thus become established worldwide.

9

Industrial Design creates a basis for discussion that enables decision-makers to maintain a clear overview despite complexity.

Designers concretise the status quo in development projects and show the different perspectives of all those involved. As generalists they are able to mediate between specialists and identify thematic and time-related dependencies and requirements. At best, different expectations of decision-makers are harmonised and brought to a common ground.

10

Industrial Design is aware of its responsibility towards the world.

Designers analyse the consequences of technology and prevent misuse of technology or at least make it more difficult. They engage with the cultures for which they design and know the history of the respective societies. A self-critical questioning and engagement with fundamental philosophical and ethical questions helps designers to develop a responsible design attitude.

Bachelor Thesis: Final Countdown II Intervention Class, Open Air

Chair of Urban Design | Prof. Benedikt Boucsein
Supervisors: Dr. Isabel Glogar, Matthias Faul
Summer Semester 2020

We explored the task that was set in the "Final Countdown" BA studio in the winter semester of 2019/20 in greater depth in the BA thesis. We started the semester on the premise that we only have ten years left to accomplish a profound transformation of our society and of the way we wish to live together. The rough thematic area comprised a location—the borough of Maxvorstadt—and a topic—"intervention"—while students had to work out the task description autonomously. Independently of this, hypotheses could also be formulated. The four works that ensued dealt with a wide variety of topics. The "Cultural Consumption versus Consumption Culture" intervention

transformed a supermarket into an art exhibition and erased the boundaries between art and commerce. Fictile "City Vases" were used in one student work to draw attention to the opportunities for transformation in the museum district. The "NewFutures" project developed a homeless-friendly street furniture catalog and tested it in the old botanical garden. The "Street of the Many" project, on the other hand, dealt with the transformation of the Türkenstrasse. Along with all other interventions, it was exhibited on five parking spaces in that street at the end of the semester.

All projects are available online: <https://interventionsklasse.tumblr.com>.



Left page, top:
Street of the Many
Johann Klause,
Kéan Koschany
Bottom: *NewFutures*
Moritz Neumann,
Paul Haas, Felix Röttger
This page, top:
City Vases Maïke Steidler
Bottom: *Cultural
Consumption versus
Consumption Culture*
Konstantin Molodovsky,
Tolga Bölükbaşı



Suddenly Online

All of a sudden, there it was: massive digitalization at the university. Six members of our TUM Department of Architecture reflect on virtual university teaching from different positions.

A shortened version of the conversation that took place in November 2020—via Zoom, naturally—is presented on the following pages. The talk included: students Davida Zimmermann (hereafter, Davida) and Santiago Nicolás Mancera Hinestroza (Santi), who were both in Munich at the time of the talk; Sebastian Haß (Sebastian), IT officer of the Department and advisor to the dean of studies, from his home office south of the state capital; Professor Thomas Auer (Prof. Auer), at home in Stuttgart during the talk; and Professor Mark Michaeli (Prof. Michaeli), our dean of studies, working from his office at the TUM main campus. The discussion was chaired by Master's graduate Sarah Seitz (Sarah), linked in from the city of Augsburg.

Sarah: “Let’s start by sharing our experiences. How did the last, i.e. analog, winter semester compare to the following, digital summer semester? What was positive about it and what was negative?”

Prof. Michaeli: “The beginning of the semester was of course different from what had been planned. We had an emergency semester, which is called ‘remote emergency teaching’ in our jargon, but actually has nothing to do with online teaching. On the whole, all things considered it actually went surprisingly well.”

Prof. Auer: “Indeed, to start with it was an emergency semester. At the chair, we offered many live lectures, but also recorded many teaching videos. Overall, I think that we can gain many good insights from it all. Now the question is to distill the essence of it.”

Santi: “I would say that learning achievements were not that successful, even though the results in the summer semester were good. Unfortunately, many activities could not take place, such as the drawing trip to Italy or furniture building. In the previous winter semester, on the other hand, you could not get away from architecture, if only through daily exchanges with fellow students in the drawing studio. And what’s more: Now the journey to the university has shrunk to 1 1/2 meters, from bed to desk.”

Davida: “I can only agree with that. In the previous winter semester you still had a very steep learning curve and hence went beyond the limits of your capacity. Nevertheless, you did have a place where you could discuss ideas every day.”

Prof. Auer: “I think that a big problem is the disappearance of student life. Both the TUM campus and, for example, our ‘Weißer Saal’ studio at the Department of Architecture have been deserted. A friend who is an architecture professor at the University of Stuttgart rightly said that, normally, most of the learning takes place in student workspaces. For my part, I also miss the interaction and exchanges with students. I wish to show and explain to the students, live, what they need all of that lecture material for, or why it is relevant for architecture.”

Sarah: “Absolutely right, daily exchanges have been missing above all. Also seeing and processing other work in workspaces. In my opinion, that influences your own design more than you realize.”

Sebastian: “I haven’t studied for a long time, but I think that you can also apply that to the world of work. There’s a lack of social contacts and interaction with colleagues. It is difficult to create a team spirit or a sense of cohesion when everyone is sitting at their home office.”

Prof. Michaeli: “I would like to know more specifically whether interaction was stimulated in the teaching itself. Santi and Davida, how were your task definitions formulated? Did you come into greater contact with each other as a result?”

Davida: “Most of the tasks were restructured into individual work, with the exception of the last design task for the timber construction project work.”

Santi: “There were big differences as regards project work. Some were lucky and others weren’t. Fortunately, my work partner also lives in Munich. But if your work partner lives in Hamburg, then it’s difficult. Then you have to split up the tasks, such as plan representation and model-building. Hence that also means that the learning effect is absent on one side.”

Sarah: “What became intensely visible this semester was the fixation of architecture with images. I create a picture, process it, and put it up. The two-dimensionality of renderings etc. is something I see with a very critical eye. Images get created and the point is no longer so much the depth of a project or the design itself.

This leads me to another important topic related to online teaching: technology. Everyone needs a powerful computer and a good, 24/7 Internet connection. What problems come along with digital technology, what were your experiences?”

David: “At the beginning of May, there were many problems with the Internet because, or so it felt, all of Munich was ,online’.”

Prof. Michaeli: “Many people may not be aware of this, but for us, as regards digital publication the greatest technical problem is copyright. We have unspeakable problems in using external material if we wish to make things available to you digitally instead of in the lecture hall. In Switzerland, for example, there is a university-wide online study portal. It has been technically standardized and archives are attached to it. Every enrolled student may access these archives. In this way, the problem of digital publishing and copyright has been solved.”

Sebastian: “I think that we’re falling into a dependence on technology. For example, a matriculation number must be available in time to enroll on a course or gain access to online portals. In the past, you could simply sit down at a lecture regardless of matriculation status. Today, participation stands and falls with technology. Moreover, maintaining such technology is a lot of work. Everything has to be inputted first and, as with everything, you have to grow into it.”

Prof. Michaeli: “Now we are all regretting that things didn’t go as they used to. But the question is, what stays behind on the positive side? Personally, I found working with students on Zoom to be much more concentrated. Lecturing online, even if we are used to it as professors, is clearly more difficult because there is no interaction. In my opinion, live lectures are feasible, but recorded lectures without any interaction are not. How can we regain the sense of interaction that we all miss in the teaching? This is why we wish to go for hybrid teaching, such as we partly have in the current winter semester. The difficulty here is the time it takes to prepare everything properly.”

Prof. Auer: “Indeed, here’s just one example: At the chair we need twice as much time to edit and prepare a teaching video than for a normal in-person lecture.”

Prof. Michaeli: “Exactly, digital eats up all of our time. If we say today that we wish to have stronger online teaching modules from the autumn of 2021, then we have to start with the practical implementation and preparation today.”

Prof. Auer: “But there are some positive things that I would like to keep. Our fundamental subject, *Building Climatology and Building Services* is, ultimately a dry, basic subject-matter. For this subject, we have now developed learning videos that students can watch whenever they want, i.e. they are flexible in terms of timing. There is also a foundation course in the master’s program because not every student is at the same level. Everyone can get some basic knowledge out of the videos and we can then discuss various topics during the lectures. In the future, I would like lectures to place discourse at the forefront.”

Prof. Michaeli: “To achieve that, you would have to change your teaching conception. Otherwise, it is a double workload if students have to watch the videos and then in addition there is also a normal lecture. Here too, surveys show that the student body is split in two. On the one hand, many find it difficult to learn without any daily exchanges; on the other hand, many find it good to have some flexibility and the opportunity to allocate work yourself. It is not possible to make a blanket statement for all students. A clear and colorful picture would be nice.”

Santi: “In my opinion, there were very large differences. If there was little contact with professors over the course of the semester, then the motivation to watch their videos was all the lower, and many only did this just before the exams.”

David: “That’s right! There was really a huge gap between the quality levels of videos. Some videos were two hours long while some 25-minute sequences repeated themselves. Hence it was noticeable that the person had made no effort at all. In some cases, coordination with our official class schedule did not work either. For example, a video might suddenly be uploaded on a Sunday afternoon without any notification whatsoever, although the event was actually due to take place on the Tuesday.”

Prof. Auer: “I do think, Mark, that we definitely have to point out to our colleagues once more that they should at least make an effort!”

“How can we regain the sense of interaction that we all miss in the teaching?”

Mark Michaeli

dialog

Prof. Auer: I have one more question addressed to you, students, about the year abroad: Mark and I come from a generation that engaged in significantly longer studies. Right now we do not yet know how, or whether, the next year abroad will take place. Do you think it might be better to shorten the year abroad and, instead, catch up on everything in one semester, such as the Italy drawing trip or furniture-building?”

Sarah: “I think that this would be shortening in the wrong place. The year abroad is worth its weight in gold. Many students actually come to TUM precisely because they wish to study abroad for one year at one of the partner universities.”

Santi: “Many students feel like getting to know another country. I believe that the quality of the year abroad would suffer a lot if it were shortened. I would rather study one semester longer in order to catch up on everything.”

David: “In my opinion, it makes a big difference how much time you spend in a place, especially when it comes to local contacts or getting to know the culture. After six months in a city, you are still a complete stranger.”

Sarah: “Whether we are talking about the year abroad or live interaction, we can sum up that a lot has been missing in the past few months.”

Let’s take a look into the future: What can we take away from these digital semesters?”

Prof. Michaeli: “I noticed that universities have been exchanging more information with one another again. Why, for example, are city planners from different locations not able to offer a common learning format? This would make specialist knowledge more accessible to students.”

Prof. Auer: “I see this topic with some ambivalence. Yesterday evening I lectured with Florian Nagler in Vienna and the week before I lectured in Santiago de Chile. That leads to something excessive, which in the end has little value. At university, however, online teaching formats can also affect learning achievements—and for the better.”

Prof. Michaeli: “The fact that students taught themselves to work differently at home has an added value. I think model-making is a wonderful example of this. At last, models are no longer built as museum-ready artifacts, but instead are improvised out of pasta boxes found in the kitchen. Models have again become a way to try things out, to look at something, and then to continue working on.”

Sebastian: “Regardless of whether everything went well or not, ultimately the experiment that we were all forced to undergo has been a positive one. And well, architects are particularly suited to learning from experiments and prototypes. We can definitely take away some positive things into the future.”

Master Thesis: Social Utopia

Chair of Urban Architecture | Prof. Dietrich Fink
Student: Lisa Häberle

By 2070, almost 70% of humanity will spend their everyday lives within urban agglomerations. But there is a lack of accommodation, especially as regards subsidized housing. In the welfare state of the Federal Republic of Germany, the postwar years (1949–75) led to intensive investment into property and the construction of 4.9 million publicly funded apartments. Some of these buildings not only feature a high amount of subsidized accommodation but also, to this day, a high level of resident satisfaction. The master project investigates the typology of large, postwar residential buildings as the basis for a reproducible architectural typology for the 21st century. Characteristic structural and conceptual features were adjusted to the current political, social, and architectural habitus.

The strained housing markets, the massive lack of affordable and subsidized housing, the consistently increasing social divide, as well as the strong presence of politics in the housing issue illustrate the parallels between the housing shortage during the postwar years and now. The thesis deals with the question of whether, and how, the typology of large-scale residential construction of the 1970s can be transformed in the 21st century to provide an answer to the housing question. In a first step, a catalog of the distinctive features of these buildings was compiled in order to convey the typology of large-scale, postwar residential construction and, in the next step, transfer it to the 21st century. In terms of sustainable urban development and the creation of new, city-owned construction areas, the large-scale residential typology forms a synthesis with the existing infrastructure and, at the same time, provides the basic framework for conversion into a car-free future.

The importance of science and technology, which has increased in recent years, and knowledge about how to access information channels, as well as the ability to filter the profusion of information, constitute a distinct dimension of contemporary social inequality. The integration of cultural areas that can be collectively and autonomously “played” by the district is intended to be a foundation for social justice and equal access to urban goods in subsidized housing; it becomes, as it were, a more visible, connecting element in urban space. The catalog compiled during the theoretical elaboration formed the theoretical framework for the architectural scheme. The typology of large-scale housing was then examined by using the ring road (“Middle Ring”) in Munich as an example. Various urban planning scenarios were developed, ensuing from five separate locations along the ring.



Visiting Professors

Fritz Auer

Chair of Urban Architecture

winter semester 2019/20

During the 2019/20 winter semester, Fritz Auer was a Visiting Professor who supervised a design at the Chair of Urban Architecture. Fritz Auer completed his studies at the Technische Hochschule (TH) Stuttgart and the Cranbrook Academy of Arts (Bloomfield Hills, USA). This was followed by positions at Yamasaki + Assoc. and at Behnisch and Lambert. In 1965, he became a partner at Behnisch & Partner, before founding the Auer Weber office with Carlo Weber, which today employs around 140 people. From 1985 to 1992, Fritz Auer was a Professor of Building Construction and Design at the Munich University of Applied Sciences (FH Munich) and, from 1993 to 2001, a Professor of Design at the Stuttgart State Academy of Art and Design. Auer has received numerous prizes, including the Leo von Klenze Medal in 2014.

Elias Knubben

Chair of Industrial Design

Sto Foundation Visiting Professor,
summer semester 2019–winter semester 2019/20

For the second time in a row, the Chair of Industrial Design hosted the Visiting Professor Elias Knubben, who is the Deputy Chairman of Festo and Head of its Corporate Research and Innovation Department, during the winter term of 2019/20. The Festo Group specializes in automation technology and bionics; it operates on more than 250 sites worldwide. Knubben pursued his studies in industrial design at the Academy of Fine Arts in Stuttgart before completing a PhD at the University of Stuttgart in 2014. He has worked for Festo since 2005 and was the Associate Professor of Product Design at Oslo Metropolitan University (OsloMet—Storbyuniversitetet) in 2018–2019. During his time as a Visiting Professor at the TUM, he held Master's design studios on automated homes.

Elke Reichel

Professorship of Architectural Design, Rebuilding and Conservation

winter semester 2019/20

The architect Elke Reichel was a Visiting Professor at the Professorship of Architectural Design, Rebuilding and Conservation during the 2019/20 winter semester. After graduating from the Technical University of Dresden, Elke Reichel worked for Behnisch & Partner and, later, Behnisch Architects in Stuttgart. Since 2011 she has been running the Reichel Schlaier Architekten office together with Peter Schlaier. The office has received several awards for the creation of the Winnenden visitor and customer center. Reichel is a regular lecturer at various educational institutions, for example as an honorary teacher at the Chair of Prof. Markus Allmann at the University of Stuttgart. She also sits as an expert on the design advisory board of the city of Konstanz.

Julia Schlegel

Chair of Urban Development

Sto Foundation Visiting Professor, winter semester 2019/20

Within the framework of the Sto Foundation Visiting Professorship, “The Changing Shape of Architectural Practice: View North”, Dr. Julia Schlegel, from the Norwegian architecture and design office Snøhetta, was a guest at the Chair of Urban Development. After completing her architecture studies in Germany, Julia Schlegel moved to Norway. In her doctorate, which she pursued in parallel to a full-time job, Schlegel dealt with applicable methods to generate recommendations for architectural practice that would adhere to academic standards. The dissertation was awarded a grant for practical relevance by the Norwegian Research Council. Today, Schlegel is a Research Director at Snøhetta, a transdisciplinary office for architecture, landscape architecture, interior architecture, and design with headquarters in Oslo. Her aim is to bring science and practice closer together.

Nicolai Bo Andersen

Chair of Architectural Design and Conception

Sto Foundation Visiting Professor, winter semester 2019/20

During the 2019/20 winter term Danish architect and researcher Nicolai Bo Andersen was Sto Foundation Visiting Professor at the Chair of Architectural Design and Conception. The Copenhagen-based architect is working in the

space between research, education and practice. His main subject is the transformation of, and additions to listed landscapes and buildings. Andersen studied at The Cooper Union (New York) and graduated at The Royal Danish Academy of Fine Arts' School of Architecture. He started teaching in 2000 and established his own private practice a year later. He has been the Head of the Master's Program in Architectural Heritage, Transformation and Conservation at The Royal Danish Academy's School of Architecture since 2016. He has participated in several exhibitions, such as the Venice Biennale 2016. His work is supported by the Danish Arts Foundation and is featured in the official residence of the Danish Prime Minister.

Wolfgang Roßbauer

Chair of Architectural Design and Construction

winter semester 2019/20

During the 2019/20 winter semester, Wolfgang Roßbauer, architect and professor at the Lucerne University of Applied Sciences and Arts, was a guest at the Chair of Architectural Design and Construction. Within the framework of studio work, projects for “living in rural areas” were developed for two selected municipalities in the Kelheim rural district. Prof. Roßbauer studied at the ETH Zurich, where he graduated in 2005 at the top of his class. In addition to managing his Zurich architectural firm, Roßbauer has been teaching at the Lucerne University of Applied Sciences and Arts since 2013. Since 2017, he has chaired the “Siegenburg Steering Group”, which is to launch the urban development of the Hallertau market town's center. In 2013 he was awarded the Swiss Art Award for architecture.

Aimilios Michael

Chair of Building Construction and Material Science

winter semester 2019/20

Dr. Michael was a Visiting Professor at the Chair of Building Construction and Material Science. His research priorities include Integrated Architectural Design & Technology, Energy & Environmental Design of Buildings on Contemporary and Vernacular Architecture, Adaptable Building Envelope Design, and Innovative & Sustainable Construction Components and Materials. His architectural work places emphasis on energy and environmental architecture. Michael has won several awards in European and international architectural competitions, and made presentations at several architectural exhibitions in Cyprus and abroad, including the 22nd Biennial of Industrial Design and the

12th International Architecture Exhibition of the Venice Biennale. During the winter term of 2019/20, Michael offered a seminar about bioclimatic architecture, in which building techniques using salt were explored. The possible uses of a material normally considered a waste product were investigated further in this course.

Mikala Holme Samsøe

Chair of Spatial Arts and Lighting Design

Sto Foundation Visiting Professor,
winter semester 2018/19 - winter semester 2019/20

For the third time in a row, Samsøe was a lecturer within the framework of the Sto Foundation Visiting Professorship at the Department of Architecture. She studied architecture at the Royal Academy of Arts in Copenhagen and completed an Executive Master's program at Copenhagen Business School. At the forefront of her career stands architectural quality as a strategic tool for the sustainable development of our society. Samsøe is a co-founder of Studio Force4 in Copenhagen. She then worked for the Danish Ministry of Science, with an emphasis on educational architecture and campus research. Until 2016, she was a member of the executive board of the international firm Henning Larsen Architects and later founded the SAMSØE office. The practice combines strategy and architecture; it works with both private and public clients during the first phases of planning and of construction projects, its aim being to do more with less.

Meike Schak

Professorship of Urban Design

Sto Foundation Visiting Professor, winter semester 19/20;
TUM-IAS Anna Boyksen Fellowship from summer semester 2020

Prof. Meike Schak has received the TUM-IAS Anna Boyksen Fellowship. This is awarded to outstanding scientists outside the Technical University of Munich (TUM) who intend to explore gender and diversity-relevant themes within the natural and engineering sciences with a TUM research group. Meike Schak is an architect, as well as an Associate Professor of Urban Studies and Urban Theory and a docent at the KTH School of Architecture in Stockholm. During the 2019/20 winter term, she was a Visiting Professor at the TUM Department of Architecture. During her two-year fellowship Prof. Dr. Benedikt Boucsein will serve as host professor. The fellowship will bring together a research group across several TUM professorships and fields, and collaborate with the Department of Sociology at the Ludwig Maximilian University of Munich (LMU) to examine how (in)equalities are

produced, embedded, and reproduced in architectural representations, discourses, norms, traditions, cultures, education, communication, material conditions, and working regimes. Activities include research-based teaching activities across TUM, the development of pedagogical formats, and the development of theory and methods for practice-based research. Meike Schalk is a real asset for the TUM Department of Architecture and will serve as a good starting point for closer scientific cooperation as well as student exchanges with the KTH School of Architecture.

Torsten Lange

Chair of Theory and History of Architecture, Art and Design

August Wilhelm Scheer Visiting Professor,
winter semester 2019/20 - winter semester 2020/21

Architectural theorist Dr. phil. Torsten Lange is part of the August Wilhelm Scheer Visiting Professor program at the TUM Department of Architecture. Starting in the 2019/20 winter semester, he has been instrumental in building up skills in the area of “gender and architecture” for research, teaching and organization. The most important strategic goals for Lange’s appointment are: the transfer of know-how in the area of gender-specific architectural approaches through research-oriented teaching; the consolidation of work by the BauHow5 Equality, Diversity and Inclusion (EDI) group through the preparation of a Horizon2020 application for funding; and the organization of an international symposium on the subject of “Gender and Architecture” by the Architecture Science Network in close cooperation with Doris Hallama, women’s representative at the TUM Department of Architecture and employed by the Chair of Theory and History of Architecture, Art and Design. Lange has been a lecturer in architectural theory at the gta institute of the ETH Zurich since 2017. He studied architecture at the Bauhaus-Universität Weimar and completed his Master’s and PhD in architectural history and theory at the Bartlett School of Architecture, University College London. His dissertation dealt with the theoretical foundations for late socialist urbanism and the production of mass housing in the former German Democratic Republic (GDR). Inspired by his involvement in institutional debates on gender equality, diversity, and inclusion, as well as by his being a key member of the Parity Group and co-organizer of the annual Parity Talks Symposium at the ETH Zurich, Lange’s research and teaching in the last two years has more particularly focused on questions related to gender, sexuality, and the body in architecture..

Ulrike Fukas

Chair of Urban Architecture

summer semester 2020

During the 2020 summer semester, Ulrike Fukas, from the Steidle Architects office, was a Visiting Professor at the Chair of Urban Architecture. This native of Munich studied at the Technical University of Berlin and EPFL Lausanne. She spent her first professional years at Allmann and Sattler in Munich, before becoming an assistant at the Chair of Prof. Uwe Kiessler at the Technical University of Munich. She has been in charge of public relations and competitions at Steidle Architects since 2000. She mainly deals with urban development projects, such as the Eiermann Area in Stuttgart, for which she won the first prize in 2016, but also takes part in high-rise project competitions, such as that for the office tower on Street Richard Strauss in Munich.

Sven Matt

Chair of Architectural Design and Construction

summer semester 2020

Architect Sven Matt offered a design project to students in the timber architecture mentoring program as part of his Visiting Professorship at the Chair of Architectural Design and Construction. Matt studied at the Technical University of Innsbruck and the Technical University of Vienna, where he graduated in 2007. He is a board member at the Vorarlberger Architekturstudieninstitut. In 2012, he founded the Innauer Matt Architects office with Markus Innauer. This Vorarlberg practice interprets assignments in close connection with the location, landscape, and local residents. During the summer semester of 2020, Sven Matt supervised the mentoring program. The Department of Architecture of the Technical University of Munich offers so-called mentoring masters as part of its “consecutive” master’s degree courses. These offer the opportunity to study with selected professors or chairs, as with the master school principle, whereby the curriculum is individually tailored to the contents of the main topics.

Alexander Fthenakis

Chair of Urban Design

summer semester 2020, winter semester 2020/21

As a Visiting Professor, architect Alexander Fthenakis will oversee a bachelor’s project at the Chair of Urban Design and Housing during the summer and winter of 2020. Fthenakis studied architecture at ENSA Strasbourg, the

Technical University of Munich and ETSA Madrid. During his studies, Alexander Fthenakis worked for Otto Steidle and for Herzog & de Meuron. After graduating in 2004, he worked in Switzerland at the offices of Peter Zumthor and of Roger Boltshauser. In 2008, he founded Fthenakis Ropee Architects with Rolf Berninger and Susann Weiland in Munich. In addition, between 2007 and 2012, Alexander Fthenakis worked as a research associate with Prof. Victor Lópes Coloto at the Chair of Architectural Design and Conservation, Technical University of Munich. Most recently, he published “50/60/70: Three decades of architecture in the Munich cityscape”, which deals with the legacy of post-war architecture in Munich.

Victoria Schweyer and Jana Wunderlich

Chair of Architectural Design and Conception

winter semester 2020/21

Victoria Schweyer and Jana Wunderlich completed their architecture studies at the TUM and in Paris. Two years ago they founded the “plucking” initiative. Since then, they have dealt with the issue of what living in old age might look like and how communication architecture can be used to develop a conversation between the generations. The “Good places, communication architecture under construction” master’s project, which the two will oversee during the winter semester 2020/21 at the Chair of Architectural Design and Conception, should also link up with this topic.

Reem Almannai and Florian Fischer

Chair of Spatial Arts and Lighting Design

winter semester 2020/21

During the winter semester 2020/21, Reem Almannai and Florian Fischer will represent the Chair of Spatial Arts and Lighting Design. The architects jointly manage the Almannai Fischer Architekten office in Munich. They are co-founders of the “Kooperative Großstadt” building cooperative and have already held a joint visiting professorship at the University of Antwerp along with, most recently, an interim professorship at the University of Kassel. Almannai and Fischer define their teaching approach as follows:

“We understand design teaching, at least in part, as the creation of connections where initially none were suspected—or where none are. These gaps create friction and demand personal answers, which cannot (only) lie in the mere imitation of (architectural) references but, from the very first day of the course, stimulate students to come up with their own answers.”

Anne Femmer and Florian Summa

Architectural Design, Rebuilding and Conservation

summer semester 2020

Anne Femmer and Florian Summa, business owners of Summacumfemmer, the Leipzig architectural office, were guests at the Professorship of Architectural Design, Rebuilding and Conservation during the summer semester of 2020. Anne Femmer worked for De Vylder Vinck Taillieu Architects after completing her master’s degree at the ETH Zurich. From 2015, she was an assistant at the ETH under Prof. Kerez and Prof. de Vylder. She has been invited by numerous universities as a guest critic and speaker. In parallel to her teaching activity, Anne Femmer founded the Summacumfemmer practice with Florian Summa in 2015. Summa completed his studies at the RWTH Aachen University, with a visitorship at the ETH Zurich. After graduating in 2011, he worked for Caruso St John Architects in Zurich and London, and as an assistant at the Adam Caruso Professorship at the ETH. In 2019, their “HAUS B” was shortlisted for the German Architecture Prize and the DAM Prize.

Lisa Yamaguchi

Chair of Urban Architecture

winter semester 2020/21

Lisa Yamaguchi is supervising a master’s project at the Chair of Urban Architecture during the 2020/21 winter semester. After her studies, Yamaguchi worked at the Institute for Basic Principles of Design at the University of Karlsruhe (TH). She also worked as an architect at Janson + Wolfrum, Architecture and Urban Planning. In 2015, after eight years in employment at Meili Peter Architekten, Yamaguchi became the office’s managing director. This Munich-based office researches and realizes projects at all possible scales with various programs. The office is specialized in: urban development; dealing with historical, listed building stock; and subsequent urban densification.

Housing and more

Design Laboratory in Benningen: Learning and Research in a Physical Context in Corona Times.

INFORMATION:

Bachelor's and Master's Project,
summer semester 2020

Chair of Sustainable Urbanism
Prof. Mark Michaeli

Supervisor:
Stefanie Seeholzer

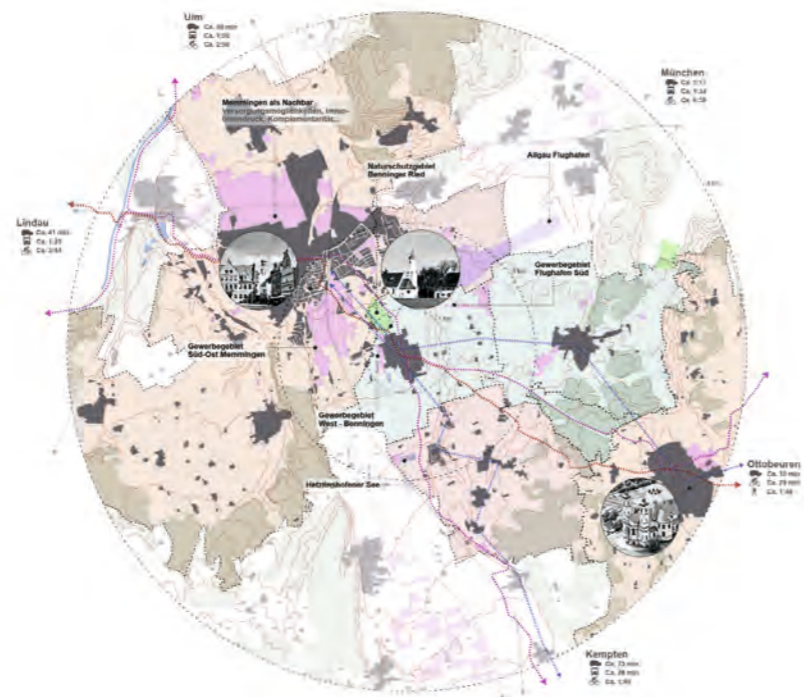
Students:
Timothée Adjedj, Laure Aussy,
Michael Backes, Timo Bechert,
Matthias Delueg, Julita Duda,
Lisa Hempfer, Laura Hoffmann,
Alexander Mayer, Théo Moireau,
Juan Diego Pena Murcia,
Charlotte Petereit, Jessica
Pörsch, Hannes Fabian
Schewe, Annkathrin Schumpe,
Otto Schwarz, Verena Sepp,
Andrés Sierra Sierra Gamboa,
Lara Tutsch, Dagmar Aline Üwe
Garriga, Qianzi Yang

Coming soon: Exhibition and
catalog of the project!

This page: Map of the
analysis of the region.
Next page, top: Sketch of
the existing situation.
Bottom: Visualization of
the new town center.

A core element of transformation processes within cities and rural communities is the participation of citizens, experts, and decision-makers. Typical formulas for such gatherings include round tables, simulation games, co-creation workshops, site inspections, and action days carried out with schools or associations. When carefully embedded, planning process building blocks help develop tailor-made ideas on site, secure them during the long-lasting rebuilding process, and bind stakeholders.

In the Urban Design course at the Technical University of Munich, students are therefore made aware of these formulas. Since 2010, case study-related learning alliances—so-called “design laboratories”—have been organized together with cities and smaller municipalities. Students and young researchers—who are mostly connected to actual urban development projects—think about unusual solutions for the future of the municipalities involved and exchange ideas with residents and interested parties during local discussions. Open communication is essential for this, and relies on in-person presence and on-site visibility to succeed.



In 2020, the corona pandemic has fundamentally called into question these established coproduction techniques. How can collaborative design, the discarding of ideas, and further development succeed without any direct, physical encounter between the actors in the room and locally? How and with whom can a shared future be negotiated against the background of social distancing?

In the summer of 2020, the design laboratory conducted in Benningen (Allgäu region), which was initially focused on issues relating to the revitalization of the town center, the future of the local building stock, and internal development, unexpectedly had to face these questions as well. Given that it was due to take place during the Bavaria-wide lockdown, the first on-site recording—planned as an excursion and workshop—had to be cancelled; typical group work arrangements had to be relocated to virtual space; and technologies enabling interaction beyond simple digital pin boards or electronic data exchange had to be provided. And—this, perhaps, constituted the greatest challenge of all—the specific connection to the local space and people must not be lost.

The Chair's team developed new digital arrangements for this situation, combining submitted documents, uncut filmed sequences capturing the streets and spaces of Benningen, and interviews with local people. Thus, students were able to go on a discovery tour across the location “at a distance” that was appositely supplemented during the semester. As part of a second “work phase on site,” the Chair's team, as scouts invested with specific questions and “search queries” by the students, set out to obtain additional information and, in some cases, transmit it to home offices during interactive live events. In early summer, thanks to the relaxation of the pandemic situation, decentralized site inspections and queries to citizens and the local administration became possible. Owing to the shift in timeline and the variety of perspectives gathered during the collection and mutual provision of material,

this turned out to be sometimes more informative than core appointments for field studies.

Initially, there was great doubt that working things out in small groups, which is typical for urban planning projects, could be successful in digital space. Retrospectively, however, we can see that the need for coordinated collaboration and clear communication while enduring significant restrictions resulted in an astonishing rigor of the lines of argument and ways of working as regards analysis and design.

Since a final handover to the local community, including discussion, is planned, the Chair has also investigated various modes of presentation. These range from “purely” digital—in which the mayor was connected live from his vacation on the Baltic Sea to local home workspaces of the students—to events designed to be hybrid, which can better integrate important planner working tools such as the miniature site model. These modes of presentation were experimented with and improved with regard to their suitability for project discussions among experts and with interested laypeople.

Thus, joint design and negotiation of transformation processes can be enriched and strengthened thanks to the creative use of digital building blocks. Notwithstanding all that we learned about ways of working, it should not be forgotten that the design laboratory provided decisive expert impulses to answer the initial questions concerning the sustainable development of Benningen. It also developed ideas and exemplary demonstrations of solutions for the future of the local building stock, common spaces, and infrastructures, or to deal with vacant properties or with careful densification within historically evolved building stocks and urban tissue in a way that can minimize existing risks and deficits thanks to a demand-oriented (housing) offer.

We would like to thank the community of Benningen and their mayor for the opportunity to conduct this tangible “learning alliance” despite all the imponderables of the crisis situation.

Stefanie Seeholzer





In the summer of 2020, something astonishing happened in Munich as a result of the Covid-19 pandemic: Temporary outdoor dining places following the Viennese model—so-called Schanis—sprang up on public parking spaces across the city. Improvisation became a legitimate tool and architecture without architects was back in the city. The architect Alexander Fthenakis (a visiting professor at the TUM Department of Architecture in the summer and winter semesters of 2020) documented and classified the small hedonistic Schanis with a wink. The resulting publication—Schanitown, A snapshot—is accompanied by an essay on the phenomenon and its temporalities by urban planner Jonas König (TU Berlin).

Schanitown. Eine Momentaufnahme.
Alexander Fthenakis (Ed.)
Sorry Press publisher
ISBN: 978-3-982044-026



All photographs © Alexander Fthenakis

FOAM

We are FOAM, a group of people with different academic and professional backgrounds, working on a new, interdisciplinary, independent platform publishing and discussing ideas about architecture. Earlier this year, we held several live discussions and released our first series of podcasts, which could be commented online in order to start off a (virtual) discussion.

FOAM is a platform working across universities

The initiative was launched in January 2020 by two architecture students of the TUM, Pia Nürnberger and Jakob Bahret. It is the result of a research project conducted at the Chair of History of Architecture and Curatorial Practice with Professor Andres Lepik. We examined architecture and design magazines, journals, and newspapers to find an ideal format for a text-based platform that would discuss topics related to architecture. The TUM does not publish its own magazine. While analyzing architecture-related university print media, we noticed the lack of exchange between different institutions and the potential that exchange could have.

FOAM is an interdisciplinary platform

Architecture is subjected to many constraints that often dominate everyday office life in economic, technical, and legal terms. This is often a distraction from the wider picture and the role that architecture plays in it. Architecture has to respond to issues related to society, history, the future, sustainability, and ethics. Exchange with other disciplines is of great importance for the reflection on, and construction of architectural discourse. The relevant topics should thus be discussed in an interdisciplinary manner. Approaching fields such as art and photography, philosophy, sociology, ethnology, economics, and politics could lead to a more inspiring, reflective, creative, and lively process in order to do justice to the real interdependencies between disciplines.

FOAM includes all

Everyone's life is influenced by architecture. However, the architectural discourse and decision making in architecture seem to be dominated by a few. We wish to open up current topics to the people affected by it.

picture credits: Tobias Priermeier



FOAM is open

FOAM's first call for ideas concerned the subject of: *From Underdogs to Schickeria: The Right to the City* and was published in March. FOAM received diverse contributions by an interdisciplinary field of professionals.

The Covid-19 pandemic, which hit Germany in March, interfered with planned physical public events so we had to rearrange and shuffle our program to find ways to engage with our authors and audience. Since we originally planned to produce podcasts out of the physical events anyway, we used podcasts as the main instrument to reach our audience. FOAM publishes discussions with authors, talks with collectives or interviews with urban activists. Content is available on Spotify, Apple Podcasts and on our FOAM network platform. Essays are published on our website. To generate interaction with the audience and receive its feedback, the concept has been extended to online live events via our FOAM YouTube channel:

Maximilian Steverding's Essay *Imagined Cities* + Podcast

YouTube Live Event: with Maximilian Steverding (Essay *Imagined Cities*) and Eva Heidke (FOAM team) + Podcast

Moritz Neumann's Essay *Activism and Architecture* + Podcast

Benedikt Schatz's Poem *Eine Stadt voller Träume* + Podcast

YouTube Live Special Event: a talk with the urban activist groups of collective 'BushBash' and 'dieStädtischen' held by Kassandra Koutsoftas and Cathrine Steiner (FOAM team) about urban interventions through activism + Podcast

Matthias Faul's Poem *Schaufensterschein* + Podcast

Felix Gaillinger's Extensive Paper *That can all be compensated for the question of the premises—contradictions, growing pains and inequalities between (supposedly) subcultural (institutionalized) cultural service providers in Munich* + Podcast

Kassandra Koutsoftas and Pia Nürnberger's *Social Machinery: What Is the New Ritual Space for the 21st Century in Havana?* + Podcast

NEW CALL FOR CONTENT:
Burn Out—Crises as Opportunity?

Deadline: 02/28/2021

Get involved and stay connected:
www.foam-network.com

Instagram: foam.network
Spotify and Apple Podcasts: FOAM

YouTube: FOAM-network

The FOAM Manifesto

Status on 10/23/2020

There is ...

...an unsatisfactory way of producing, communicating and teaching architecture. Historically, the profession of architect has been associated with an individual genius who masters architecture through his own talent. This picture is highly problematic and has associations with class, gender, and race; it continuously reproduces the system in which “successful” architecture is developed. The architectural profession needs to be amended in the eyes of the public, and acknowledged as a multi-faceted and interdisciplinary process. We think that it is too important a topic to be left to a small elitist group. Many opinions about architecture are often considered to lack validity or be unprofessional.

...a narrow, pre-established set of ideals that prevents us from opening a wider horizon. Architecture is produced and taught through a directive, one-sided process. Architecture is undemocratic since a whole spectrum of underrated views, approaches and practices are excluded. Architecture often ignores social, political, historical and artistic dimensions. Architecture is primarily communicated and recorded through visual methods.

...a tendency to treat architecture as a product. Architecture is becoming a pretext, a profit-generating instrument, it is not interested in the effects it causes. Thus it has become a mere tool of speculation. Instead of creating living space, as it claims to be doing, architecture increases the shortage of built space.

We demand...

...that other approaches to architecture be acknowledged. They must all be regarded as valid, valuable and visible. Every opinion about architecture, be it by professionals or laypersons, students or teachers, is equally worthy of consideration. They all have different conceptions and ways to engage with architecture. The architectural work/product must be released from the sole authority of architects and planners. Architecture and its discourse must be understood as created through the actions of the public. We must acknowledge these actions. Equally, we must admit that what has been called “architecture” so far plays a key role in processes of climate change, but also of spatial and social exclusion. In this way, architecture itself will no longer be a product to be sold, but can become a means to fight for climate and spatial justice.

...a shaking up of the current architectural discourse to make alternative views, ideas and works tangible. Architecture needs to expand its methods of production and representation to include the factors out of which it has been generated or which it is generating. The architectural discourse must consider these socio-political, historical, artistic or ideological factors. Equally, the methods they use, such as text, spoken word, sound, visual and performative arts, etc. should be considered as crucial as predominant visual instruments. By communicating in different ways, architecture can be understood by all, and can become a common good.

FOAM ...

...and its demands can only be seen and heard through the totality of its network and everybody connected to it. Passive observers and listeners turn into an audience. Active contributors provide stimulus and the starting point for a discussion. By getting everybody involved into the conversation, it can develop further and its quality improves. Only as a whole can we reach the capacity needed to bring about change. FOAM equals ‘the size that something needs to reach before a particular change, event, or development can happen’—the definition of critical mass.¹

...is friction between different voices. New discourses emerge. FOAM criticizes the current architectural discourse, not only demanding but also providing a framework for new discussions. The voices and happenings on this discursive stage are not meant to solely produce content for others to consume but also to create a stimulus for (ex)change. Like the molecular properties of foam, FOAM at the same time expands spatially and becomes denser. Unexpected voices are coming together and claiming space.

...is flexible and in constant movement. FOAM is never static and constantly takes on new forms. FOAM’s aim is not to institute a fixed new discourse. It is to open up discussion, learn from each other, and acknowledge different ways of thinking, doing and producing architecture.

Pia Nürnberger, Jakob Bahret, and Jonas Langbein

¹ Cambridge Dictionary, no date, <https://dictionary.cambridge.org/dictionary/english/critical-mass>.

Model photo competition “homemade” Recognition: Luis Steffens, Jonas Wald, Juan Sebastian Vintimilla, and Nora Schmidt

“We confronted the challenge of the digital coronavirus semester together with four Bachelor’s and Master’s degree architecture students. Study area models, interior models, and design models were produced at a wide variety of scales. The working and environment models were mainly built from pasta and cardboard boxes from the paper waste container. For the submission models, a small circular saw with a vacuum cleaner became the most popular tool. Even if living in the midst of the workshop left little opportunity to switch off, design work in your own four walls was intensive and instructive. Dialogue with each other was absolutely enriching and working with recycled materials showed that model-making can also be made more sustainable.”



Model photo competition “homemade” Recognition: Sophia Brauner, Elena Kögel, and Constantin Schindler

“For our Bachelor thesis with Prof. Nagler, we made two material studies. Nothing can prevent us from building photographic models!”



Brain Train? High-speed railway stations as focal points of the knowledge economy

How does increased accessibility through high-speed rail influence the spatial structure, in particular the location of knowledge economy firms?

INFORMATION:

Involved researchers:
Chair of Urban Development
Prof. Alain Thierstein, Fabian Wenner,
Johannes Moser

Principal:
Deutsche Forschungsgemeinschaft (DFG)

Cooperation partner:
ILS-Institut für Landes- und
Stadtentwicklungsforschung, Dortmund

Time frame:
May 2020–October 2022

Transportation infrastructure determines accessibility and, thus, the spatially unequally distributed potential for interaction. Accessibility is an important prerequisite for knowledge exchange and production which, against the background of the economy's transformation into a knowledge economy, has an increasing influence on urban and regional development.

Because of the expansion of high-speed rail (HSR) in many countries—including Germany—in recent decades, HSR stations are now among the central access points for national passenger transportation. Through their accessibility effects, they not only influence the probability of interaction between locally-established companies and households, but also have the potential to catalyze locational decisions and thus affect the spatial structure itself in the medium to long term. These catalytic effects make HSR a potential instrument of regional planning and policy. This is of high societal and political relevance, particularly against a backdrop of past and future large public investments into HSR infrastructure.

In scientific terms, the most interesting question is whether medium and long-term effects of HSR stations, which depend on further influencing factors, can be observed. The recent academic discussion on the assessment of these effects is far from unequivocal and emphasizes the need for further research. Moreover, it focuses on the fast-growing transportation systems in China, Spain, and France; these, however, are only to a limited extent comparable with the German system. In addition, most studies consider the effects of accessibility improvement through aggregated inputs and outputs, while lacking spatially differentiated analyses and local drivers as well as qualitative bottom-up methods.

From a spatial perspective, we are interested in discontinuous and contrastive effects produced by HSR. The specific characteristics of HSR mean that, unlike in the case of road infrastructure, positive effects are mainly to be expected on the centrally-located “nodes” of the network. At the same time, HSR may have the potential to alter the spatial distribution of “peripheral” and “central” spaces itself with regard to accessibility. This affects both actual and perceived accessibility because HSR stations can also project an image that affects the use of space.

The aim of this project is to estimate systematically the functional and spatial effects of HSR stations in Germany at scale levels relevant for decision-making. A particular emphasis is placed on the connection between increased accessibility in the local and regional environment of HSR stations and the location decisions of knowledge economy firms. Our approach is based on a contrasting comparison of case studies and the principle of

methodical triangulation: Quantitative and qualitative approaches complement each other both in terms of the fine-grained nature of the data used and the combination of scientific spatial analysis methods. In this way, we contribute to understanding the mutually reinforcing, catalytic effects of HSR infrastructure in Germany.

The project draws on longstanding research expertise on the knowledge economy and transportation networks at the Chair of Urban Development, as well as on the doctoral thesis of a team member, which can now be continued thanks to a 2.5-year research grant by the Deutsche Forschungsgemeinschaft (DFG).

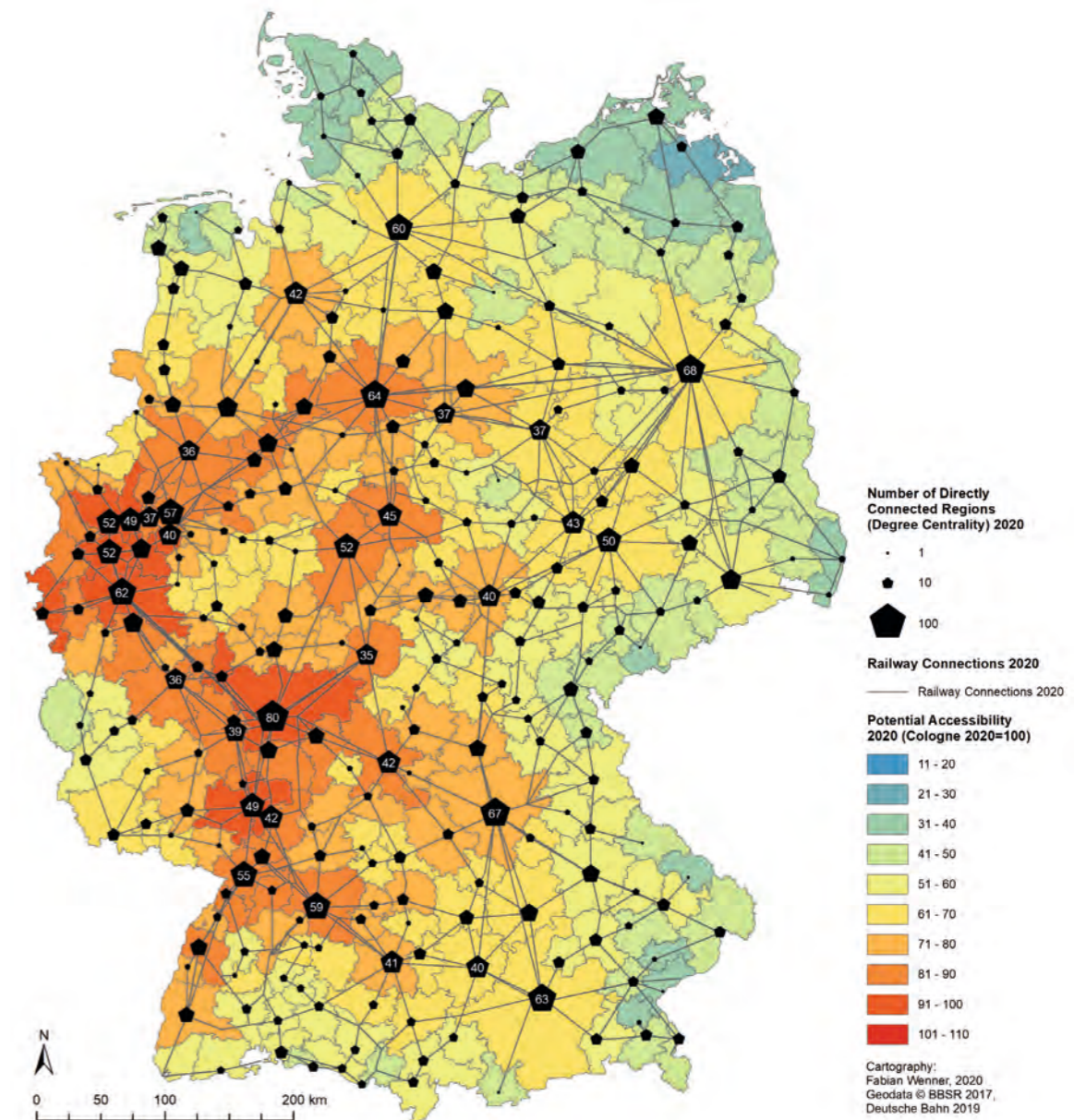
Fabian Wenner

Recent publications on the topic:

Wenner, Fabian; Alain Thierstein (2020): Which Regions Benefit from New Rail Accessibility? Germany in 2030. *disP - The Planning Review*, 56 (3), 59-76.

Wenner, Fabian; Johannes Moser (2020): Which Regions Benefit from Rail Accessibility? Germany 1990-2030. Working Paper. Chair of Urban Development, Technical University of Munich, <http://mediatum.ub.tum.de/doc/1577443/1577443.pdf>

Wenner, Fabian (2020): Euro-Star Architecture: Comparing High-Speed Rail Stations in Europe. In: Nadia Alaily-Mattar, Davide Ponzini, Alain Thierstein (Hrsg.): *About Star Architecture: Reflecting on Cities in Europe*. Springer International Publishing, 227-244.

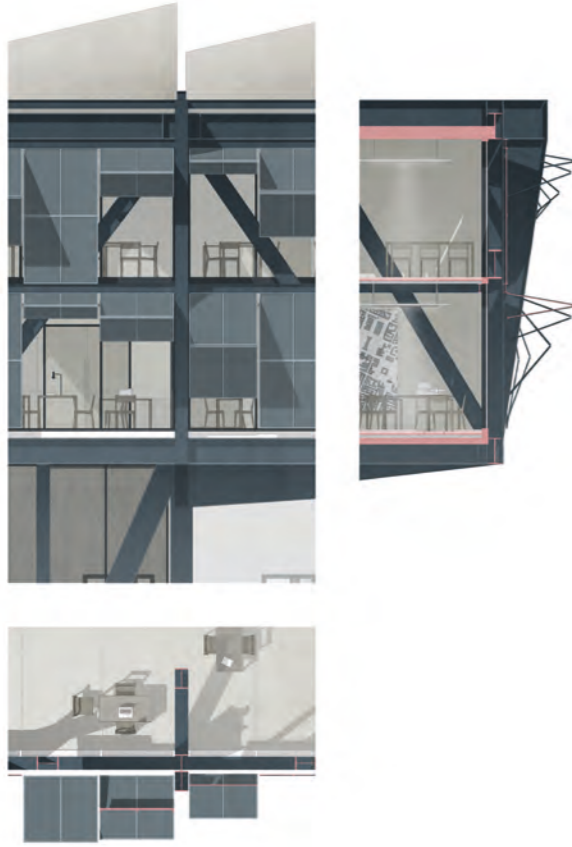


Regional accessibility by rail in Germany, 2020

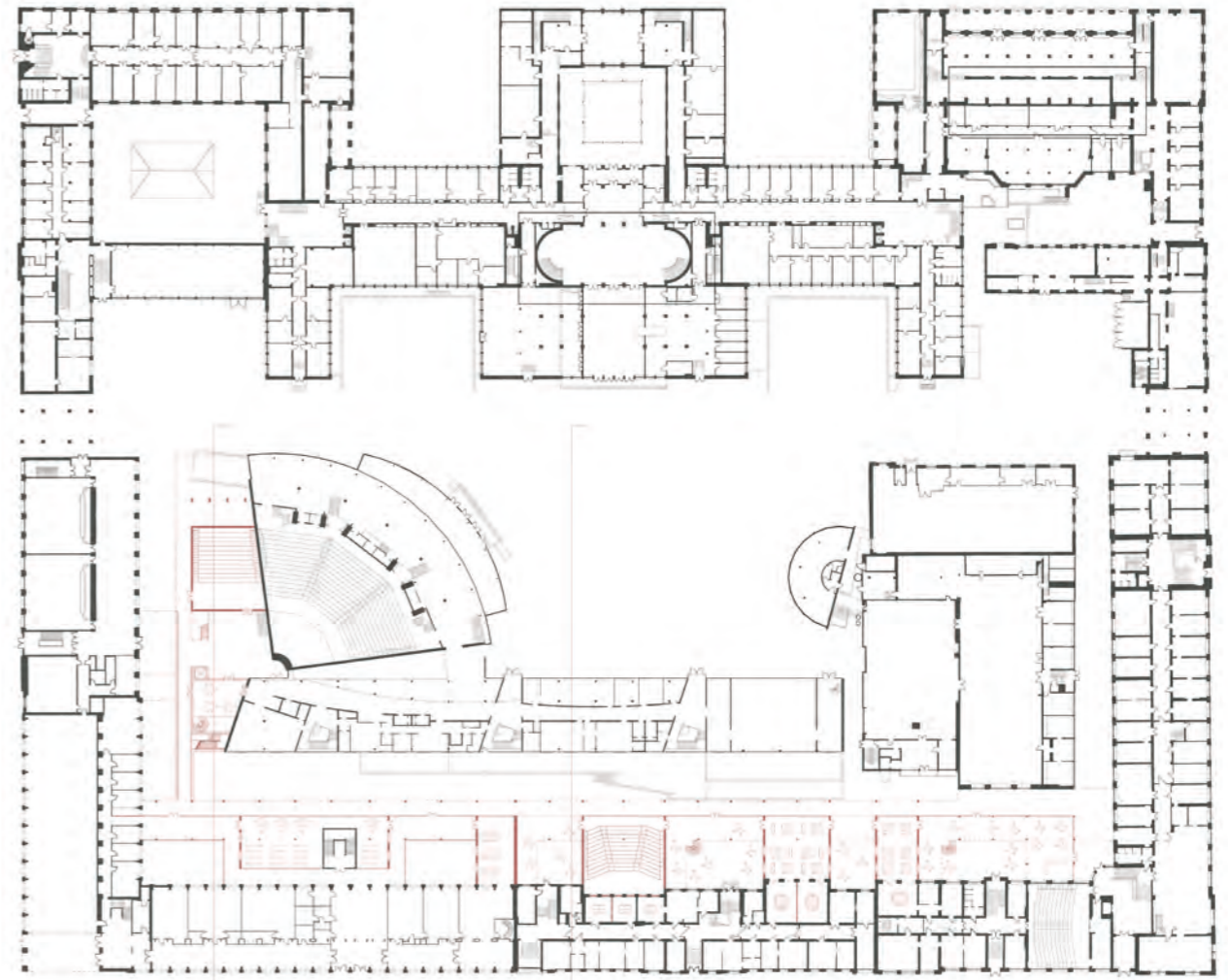
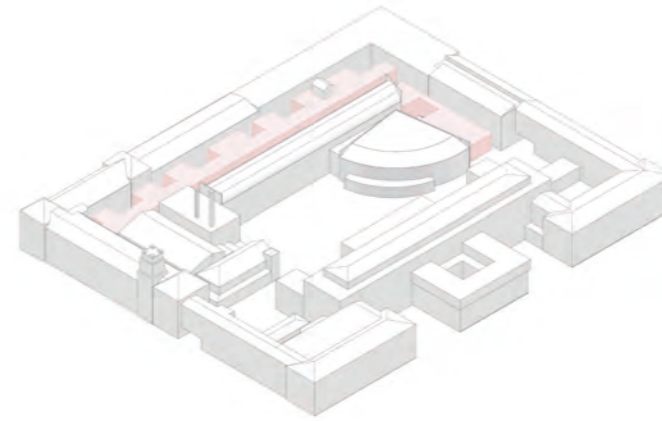
Architecture Institute Bachelor's and Master's Project

Professorship of Architectural Design, Rebuilding and Conservation
Prof. Andreas Hild
Summer Semester 2020

As part of the reorganization of TUM into schools, last summer our students planned building extensions on the main site. This year, we thought, we will have projects on site—and then everything turned out differently. Only a quarter of our students were in Munich, but they were not allowed on campus. Hence, the basic material for the work consisted of existing TUM plans and two gigabytes of photos that we took during the lockdown and sent all around the world. The bachelor's project was called Architecture Institute. For the Department of Architecture at the School of Engineering and Design, the height of administrative building 0510 was to be raised. The design results showed that the increased teaching load due to digital support paid off — the results were compelling. The depicted example (by Anastasiia Kutsak) constitutes a massive intervention into the existing structure, which is nevertheless treated with respect, and comes across as light and easy-going. For the School of Engineering and Design of our master's project, cross-departmental space was to be created by densifying the inner courtyard. Here, students largely built over the alleys across the courtyard, but there were also demolitions, high-rise buildings, and a design that took on the dead space between buildings 0505 and 0509. The work of our students Yi Yang and Qing Zhang is presented here.



Rendering and elevations by Anastasiia Kutsak



Plan and axonometry by Yang Yi and Zhang Qing

InnoSpacing

An integrated research sketch on the critical relationships between physical space and innovation before, during and after the COVID-19 pandemic.

Christos Chantzaras is architect, research associate and doctoral candidate at the Chair of Architectural Informatics at TUM. His focus areas are the spatial dimensions of innovation processes and the future of work.

Chris Ford is a PhD candidate in Mechanical Engineering (Design Group) and the 2016-2019 Hamamoto Interdisciplinary Graduate Fellow at Stanford University. He is a design professional, educator, and researcher in the fields of both Architecture and Infrastructure design.

Acknowledgments

The authors thank Jan Auernhammer, Michael Shanks, Martha Russell and Larry Leifer (Stanford University), Andreas Hild, Frank Petzold and Yonne-Luca Hack (TUM), Dominik Beisser (TUM Global & Alumni Office), and Dolores Volkert for their support.

The disruption caused by the COVID-19 pandemic since March 2020 has revealed a contradiction between the redundancy of physical space for working and the requirement of workspace for innovation. Under emergency conditions and in an impressively short time, work historically performed within commercial office buildings could be conducted remotely in a provisional way. The sharing economy, with its models of space and mobility, decreased in use. Even prior to COVID-19, in certain sectors, the office had been called obsolete in some digital circles and networked societies. But physical spaces serve purposes beyond the execution of tasks. They promote interaction, collaboration, knowledge exchange, and the formation of communities. They are 'object institutions' shaping the behavior of the people within. They provide the frame for critical reasoning and discourse.

Hence, the analysis and design of physical spaces, ranging in scale from single rooms to metropolitan regions, will be essential to foster an innovative and responsible society. This research effort will feature a transdisciplinary approach drawn from both design and non-design disciplines, and will consider a range of spatial scales across time. In collaboration, the Stanford Center for Design Research and the TUM Architecture Research Incubator developed a research sketch titled InnoSpacing, to investigate the different spatial scales at which innovation happens through the disciplinary lenses of engineering, architecture, design, management, and sociology. Its primary goal is to formulate design-actionable outcomes for urban innovation ecosystems. The research cooperation and sketch are funded by the TUM Global Incentive Fund.

1. Yesterday, 2019.

Complexities arising from the confluence of increasing globalization, digitalization of information and knowledge, and product/service integration are prompting new ways of working and innovating [1]. In knowledge-intensive industries, networked, distributed, and self-organizing structures have evolved, enabling companies to adapt, respond, and act in dynamically changing environments [2,3]. The relevance and multiplication of these new structures are contingent on physical working spaces at concentric scales, from a single room to an urban district [4,5]. Starting as a mere tool to organize and manage work in the second half of the 20th century, in the following decades physical space evolved into a medium, enabling knowledge and innovation processes. Space facilitates business models and, in some cases, embodies and empowers innovation processes. Space can promote

inspiration, knowledge exchange, network structures, and self-organization, as confirmed by several studies in innovation research [1,6]. The importance of face-to-face interaction, chance encounters, and spillover effects remains strong; its importance even increases when it comes to generating radical, revolutionary or disruptive innovations at the levels of an organization, an economic cluster or the regional ecosystem. Despite the effectiveness of distance-shrinking technologies for interpersonal interaction, the dynamics of physical proximity, the exchange of creative classes, the energy of research institutions, and the serendipity of urban dwelling remain instrumental in developing interpersonal relationships and building innovative capabilities in firms [7,8]. The need to resemble an urban environment or a campus structure, which foster a seamless transition between life and work, and blur their boundaries, becomes a leading theme in innovation centers, headquarters, and corporate offices [1,9].

On the other hand, workspaces have been additionally shaped by the emergence of the sharing economy. Transportation means (such as bicycles and cars), apartments, and office space and desks have become available upon request, making co-working and collaboration viable for future work [9,10]. Office space has been redefined as a performative activity, doable and executable in different areas and at various intensities. Makerspaces and hardware labs re-link this trend as spaces generously outfitted with next-generation tools elevating the probability of innovation-based production. Consequently, building typologies have evolved, while sizes of apartments and workspaces have shrunk.

2. Today, 2020.

The COVID-19 pandemic brings economic life and knowledge work within office spaces to a disruptive standstill, challenging predictions about how organizations will collaborate and innovate in future. The need for social distancing reduces face-to-face interaction; corporate and co-working spaces are temporarily locked down, and then slowly re-open with revised work protocols [11]. In the past months, work from home has become the "new normal"; it will remain a necessary option for the months required until a vaccine brings an end to the current global health pandemic. The urban experience – as a source of inspiration, creativity and innovation – is currently not available. What we used to think and know about office space—namely, that it promotes communication, exchange, interaction, and is vital for shared understanding, visions, culture and community – is being challenged. What we used to promote – institutions and facilities should be geographically clustered and provide a higher probability of knowledge spillover and network collaboration – is transitioning into the virtual realm. We now Zoom, while others Facetime or Skype. News and comments call office space obsolete, which encourages organizations either to abandon it entirely

or re-configure it into something new. Into what exactly is still unclear, but software technology companies have already positioned themselves to be the last to return to any familiar model of work-life [12].

Within weeks, the control paradigm that had ruled yesterday's workplace since Taylorism dissolved. Remote work became possible literally overnight even in industries that were still questioning its applicability to their processes. Work performance coaches, human resource experts, journalists, and workspace consultants offer recommendations and guidelines to remain efficient at home or become even more productive without the distractions of the physical workplace. Schools and institutions of higher education transfer, wherever possible, their teaching and learning to online channels.

At the same time, architectural practices develop design strategies to return to previous physical workspaces, e.g., with adjusted layouts, usage protocols, or improved building technologies. In highly-developed and industrialized countries, the countryside is becoming a realistic alternative to urbanization and expensive city areas.

Against this background, the interdependency of physical space, work performance, and innovation is becoming an increasingly important interdisciplinary research field. It investigates inequities in space allocation and the shortcomings of the sharing economy. It discusses implications across different scales – from individuals, companies, and institutions to industries – that will affect urban environments, economic clusters and, eventually, the innovation ecosystems of tomorrow. We can see today that our buildings forgot to learn, that our urban structures are reaching the limits of expansion and exaptation (for creative alternative uses), that informal experiences with colleagues, clients, or competitors are vital to receive impulses of the new and develop critical or alternative thinking [11,13,14].

Using exclusively video conferences for knowledge exchange instead of business travels would result in a global decrease of value creation and productivity. (Frankfurter Allgemeine Sonntagszeitung, 23.08.2020, Nr. 34, p. 18, based on a study by the Center for International Development, Harvard University)



InnoSpacing addresses these aspects, and discusses how building space and digital tools together shape the way thinking, collaborating and innovating can be best induced. If “[w]e shape our tools and thereafter they shape us,” the effects are to question if unintended confrontation and criticism from the urban experience are absent from the digital realm [15].

3. Tomorrow. 2021.

Physical space is a fundamental prerequisite for achieving innovation and building innovation ecosystems. Historically, markets have driven the development of office space while simultaneously undervaluing the importance of space as a resource for innovation. When combining knowledge and skills from spatial intelligence, design thinking, entrepreneurship, social responsibility, and physical prototyping, interesting catalysts emerge for shaping tomorrow’s spaces for innovation. Through our inter-university engagement, emphasis is placed on the combination of active processes responsible for yielding innovation across multiple scale-based contexts. We are motivated to act as both researchers and designers to suitably frame questions propelling the work. Against the background of the pandemic, urgent research questions address the space-innovation relationship at different scales, for example: Will private space become the larger space for experiments, and enhance user-driven innovations? Will disruptive, radical and revolutionary innovations decrease in the absence of physical proximity and face-to-face interaction? Will social inequality increase through the limited provision of, and access to away-from-home and third spaces to learn and work? How will corporate organizations and institutions reshape their interactions in the physical and virtual realms to exchange valuable tacit knowledge and cultivate new insights? This investigation is organized according to particular spatial scales and aligned with the question of where innovation occurs: in the room, building, neighborhood, city or metropolitan region.

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These identified scales are perceived as concentric subsets of one another, and reveal systemic interdependencies in innovation processes:

- **Room.** What are the attributes of single rooms that have been credited with promoting creative work and breakthrough innovation? What are the larger contexts that explain how the design of a specific singular space is developed and optimized to support specific moments of the innovation process?
- **Building.** Do buildings credited with assisting innovation share characteristics? Are these characteristics the direct result of a manifest architectural intention, or are they features collateral to other architectural intentions?
- **Neighborhood.** What are the dynamics within integrated campuses or districts facilitating innovation and entrepreneurial activities? To what degree is neighborhood exclusivity advantageous for innovation purposes, and in what ways is it detrimental?
- **City.** How can cities secure and promote diversity, creativity, and knowledge flows at scale? In what ways are livability, smartness, and mobility interrelated?
- **Metropolitan region.** What will new mobility and commuting patterns look like in urban, liminal, and rural spaces? What spatial demands will decentralized areas make in a networked economy? Or will decentralized networks evolve?

These questions are best addressed with an interdisciplinary approach. Economic, social, spatial, architectural and design perspectives will be simultaneously considered. InnoSpacing holds promise for synthesizing design-actionable outcomes for the day after tomorrow.

Christos Chantzaras and Chris Ford

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Model photo competition “homemade” Recognition: Alexander Throm

“Even during the year abroad, challenges for a new type of model-building arose. Complicated access to materials and new workspace conditions required purely manual and precisely planned model-building within the 17 square meters apartment abroad in order to be able to work efficiently with available materials. Moreover, the actual model photograph presented a final challenge, since it now also had to be shot at the home office. So, without further ado, the clothes horse, bedside lamp, and removal boxes were turned into an auxiliary studio that helped to capture the remaining hours of the Danish evening atmosphere.”



Urban Ropeways

Design and detailing of a station in Munich

Chair of Structural Design | Prof. Dr.-Ing. Rainer Barthel
 Supervisor: Frauke Wilken
 Bachelor's Project
 Summer Semester 2020

In Bavaria, cable cars are currently only used in the Alps, but in urban areas could be a valuable addition to local public transport. As a pilot project of the state capital Munich and the Free State of Bavaria, a feasibility study is investigating an approximately 4.5 kilometer long tangential link in the north of Munich. The route of the planned tricable gondola lift will run above the Frankfurter Ring at a height of up to 60 meters, from the Oberwiesenfeld underground station to the Studentenstadt underground station.

Six designs were created for a station at the Frankfurter Ring – Knorrstrasse intersection in the 2020 summer semester as part of the bachelor's project at the Chair of Structural Design. The building site is characterized by the contrast between industry in the north and residential de-velopment in the south. In addition to integrating the new structure into the urban fabric and ensuring short interchanges to the existing public transport network, a particular challenge was the transfer of the large vertical and horizontal loads.

The resulting designs display the diversity of options for ropeway stations and emphasize the special features of the new transport mode.



Left page: Rendering and model photo by Maria Rau and Samuel Frank
 Top, right: Rendering by Sarah Sendzek and Sebastian Hoyer
 Center, right: Rendering by Svenja Siever and Lars Kumpfert
 Bottom, left: Model photo by Charlotte Dahmen, Clara Grothkopp, and Marie Stockmaier
 Bottom, right: Rendering by Philipp Konrad and Alexander Schwanner

Selection of Publications & Articles

Alaily-Mattar, Nadia; Ponzini, Davide; Thierstein, Alain (Ed.) (2020): About Star Architecture: Reflecting on Cities in Europe. Basel: Springer International Publishing.

Abualdenien, J.; Schneider-Marin, P.; Zahedi, A.; Harter, H.; Exner, H.; Steiner, D.; Mahan Singh, M.; Borrmann, A.; Lang, W.; Petzold, F.; König, M.; Geyer, P.; Schnellenbach-Held, M. (2020): Consistent management and evaluation of building models in the early design stages. *Journal of Information Technology in Construction* 25, doi:10.36680/j.itcon.2020.013.

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Auer, Thomas; Lauss, Lukas; Heissler, Karl Martin; Maderspacher, Johannes; Reiß, Dirk; Mehnert, Jan; Rumpe, Bernhard; Stüber, Sebastian; Hannen, Matthias; Plessner, Stefan; Pinkernell, Claas; Kröker, Alex; Gentemann, Roland (2020): Big Data in der Gebäudeautomation – Schlussbericht - FKZ: 03ET1426. Bundesministerium für Wirtschaft und Energie (Ed.), Munich: TUM Department of Architecture, doi:10.14459/2020md1546757.

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Battisti, Alessandra; Santucci, Daniele (Ed.) (2020): Activating Public Space – An Approach for Climate Change Mitigation. Munich: TUM Department of Architecture.

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Dreher, Johannes ; Alaily-Mattar, Nadia; Thierstein, Alain (2020): The multifarious effects of star architecture: The case of the Kunsthaus Graz. In: Alaily-Mattar, Nadia; Ponzini, Davide; Thierstein, Alain (Ed.): About Star Architecture: Reflecting on Cities in Europe. Basel: Springer International Publishing, p. 153-168.

Dreher, Johannes; Alaily-Mattar, Nadia; Thierstein, Alain (2020): The Power of Star Architecture and Iconic Design: Kunsthaus Graz, Austria. In: Lindsay, Georgia (Ed.): Contemporary Museum Architecture and Design Theory and Practice of Place. New York: Routledge, p. 23-42.

Black Rooms (Schwarze Räume)

The publication “Black Rooms” deals with the phenomenon of lightless rooms. How can such a seemingly limitless space be apprehended? How can space be conceived of, and designed when the parameters actually contradict spatiality? A project group at the Chair of Architectural Design and Conception has examined the topic from different perspectives. On the basis of specific design tasks—such as a cinema, a refuge, and a columbarium—“black spaces” were analyzed and developed step by step. Talks with the architects Donatella Fioretti, Astrid Staufer and Francesca Torzo discuss this architectural phenomenon.

Other shorter aperçus and quotations come from architects, artists, and filmmakers, who cast very different lights on the subject.

Editors: Uta Graff, Katleen Nagel, and Felix Zeitler
Authors: Donatella Fioretti, Astrid Staufer, and Francesca Torzo
2020

Munich: Detail Publisher
Language: German
ISBN: 978-3-95553-512-4



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M. Pan, T. Linner, Wei Pan, H. Cheng, T. Bock (2020): Influencing factors of the future utilisation of construction robots for buildings: A Hong Kong perspective. In: Journal of Building Engineering 1/2020. doi:10.1016/j.job.2020.101220.

Reinforced Concrete in Building Construction before 1918 (Eisenbeton im Hochbau bis 1918)

Reinforced concrete became one of the most important materials in the construction industry during the early 20th century. It has a great variety of uses and a high load-bearing capacity. The architect Jörg Rehm deals with the early years of this revolutionary construction method in his book “Eisenbeton im Hochbau bis 1918”. With a focus on the Munich area, he illuminates the role of planners, architects and authorities and their influence on the development and building history of reinforced concrete. The author documented numerous Munich buildings, which were created in the early 20th century with reinforced concrete and which remained prominent in the urban landscape until today. With his work, he provides planners and owners, who are currently involved with such buildings, with tools they need to ensure their long-term preservation. The publication closes the gap between art-historical and engineering considerations and thus represents an important compendium for historical building research.

Jörg Rehm
2019
Munich: TUM University Press
Language: German
ISBN: 9783958840263
doi:10.14459/2019md1468996

Michaeli, Mark; Ehrhardt, Denise (2020): Wohnbiographien im ländlichen Raum: Warum denkt bei generationengerechtem Wohnen keiner an Jugendliche? In: Ländlicher Raum: Schwerpunkttheft Gleichwertige Lebensverhältnisse. Göttingen: Agrarsoziale Gesellschaft e.V., p. 48-51.

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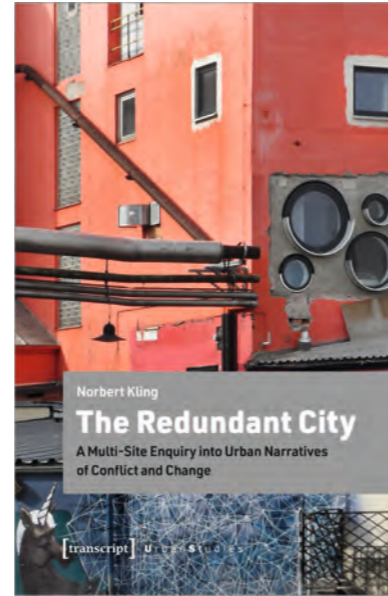
Pan, Mi; Linner, Thomas; Pan, Wei; Cheng, Huimin; Bock, Thomas (2020): Structuring the context for construction robot development through integrated scenario approach. In: Automation in Construction 114. Amsterdam: Elsevier BV, doi:10.1016/j.autcon.2020.103174.

The Redundant City
A Multi-Site Enquiry into Urban Narratives of Conflict and Change

Dynamic processes and conflicts are at the core of the urban condition. Against the background of continuous change in cities, concepts and assumptions about spatial transformations have to be constantly re-examined and revised. Norbert Kling explores the rich body of narrative knowledge in architecture and urbanism and confronts this knowledge with an empirically grounded situational analysis of a large housing estate. The outcome of this twofold research approach is the sensitising concept of the Redundant City. It describes a specific form of collectively negotiated urban change.

Norbert Kling
2020
Bielefeld: Transcript Verlag

Language: English
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Women in Architecture—Pre-study for the development of a third-party funded research project on culturally relevant gender-equitable changes in architecture

In German architecture schools, gender parity has been achieved since the 1990s. Today there are more women graduating in architecture than men. But this equal distribution is neither reflected in leading positions at architecture firms nor within university faculty, where women are still underrepresented. Asking why this is so led to the “Women in Architecture” study, which combined several research methods to create an overview of the current situation of female architects. Among other things, the authors focused on the question whether there were any subject-specific exclusion mechanisms that might lead to discrimination against women and a higher drop-out rate of female architecture graduates. The study clearly states that there are extensive deficits regarding the topic. The authors now plan to draft a research proposal on the basis of this study; it will suggest researching the whereabouts of architecture graduates, the compatibility of care work with employment in the architecture sector, and discrimination mechanisms in the architectural field.

Sandra Schuster, Anne Niemann, and Mirjam Elsner (TUM)
Paula-Irene Villa Braslavsky and Marlene Müller-Brandeck (LMU)
2020
Munich: TUM Department of Architecture
Language: English

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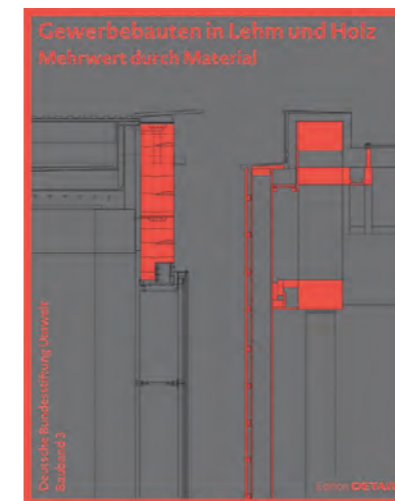
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DBU Building Volume 3: Loam and timber commercial buildings
(Gewerbebauten in Lehm und Holz)

Loam and timber are the exception today in the commercial building sector. But why is this? It is precisely in this sector that such ecological building materials offer numerous advantages. The examples presented in this publication all have one thing in common: The material used generates enormous added value. Sometimes flexibility and prefabrication are the priority aspect, other times it is the indoor climate or comfort factors, sometimes durability, user satisfaction, the CO2 footprint, or recyclability—and sometimes all of these together. The Chair of Building Technology and Climate Responsive Design (Prof. Thomas Auer) and the Professorship of Architectural Design and Timber Construction (Prof. Hermann Kaufmann) have jointly examined various project examples and explored the use of “unusual” choices of materials for commercial buildings.

Djahanschah, S. (Ed.); Auer, T.; Kaufmann, H.; Sauer, M.; and König, H.
2020
Munich: Detail publisher
Language: German
ISBN: 978-3-95553-506-3

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Model photo competition "homemade"
3rd place: Sebastian Haberl

"The photos show my environment model of Schröcken, built to 1:500 scale, which was made as part of the timber construction project under Visiting Professor Sven Matt. The timber I used comes from our own forest (only 500m away)—the main advantages being the short distance, reuse, and the sustainability of the raw material itself."



Master Thesis: Images of the City An Experiment in Urban Renewal

Chair of Urban Design and Housing | Prof. Bates, Prof. Krucker
Student: Matthias Jakob Ackstaller

Streets are public spaces.

Currently, traffic, rush and infrastructure road traffic, a sense of rush, and urban infrastructure? characterize their appearance. "Images of the city" pictures a city for the pedestrian and visualizes future space from a human perspective.

"Images of the city" is based on the planning status of the Landshuter Allee Tunnel in 2018. Despite my personal rejection of additional tunnel projects in Munich, I see its possible realization as a call to examine the urban potential of the proposal under discussion. The suggested green strip along the corridor cannot keep its promise of connecting Neuhausen. Rather, this will require a spatial investigation and more profound interventions into the city's structure. Urban repair supportive of human perception must be conceived from a pedestrian perspective.

"Images of the city" thus challenges conventional urban redensification methods. It establishes the human perspective as primary requirement for assessing urban spaces and emphasizes the importance of the ordinary. Movement through urban space is regarded as a sequence of single moments. The potential of a subjective viewpoint for urban design was tested in the Landshuter Allee case. A spatial analysis was followed by a fictional vision of the future. Thus, the role of public space as social and cultural ground has been placed at the heart of the design, whereas architecture plays a secondary role as a space-creating vessel.



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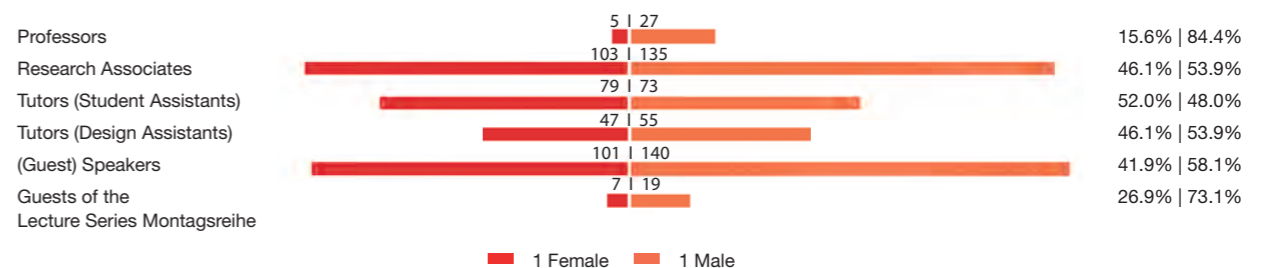
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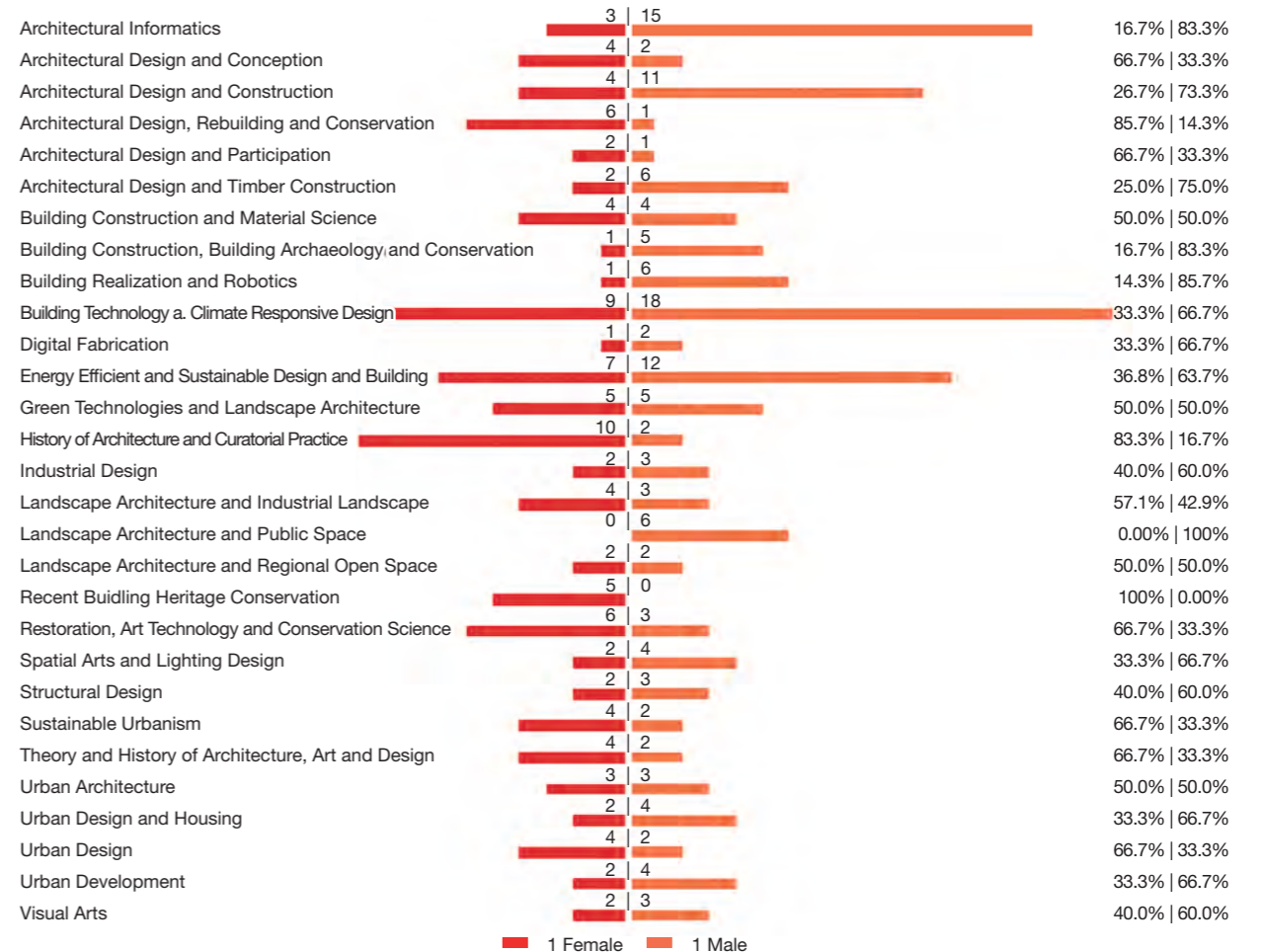
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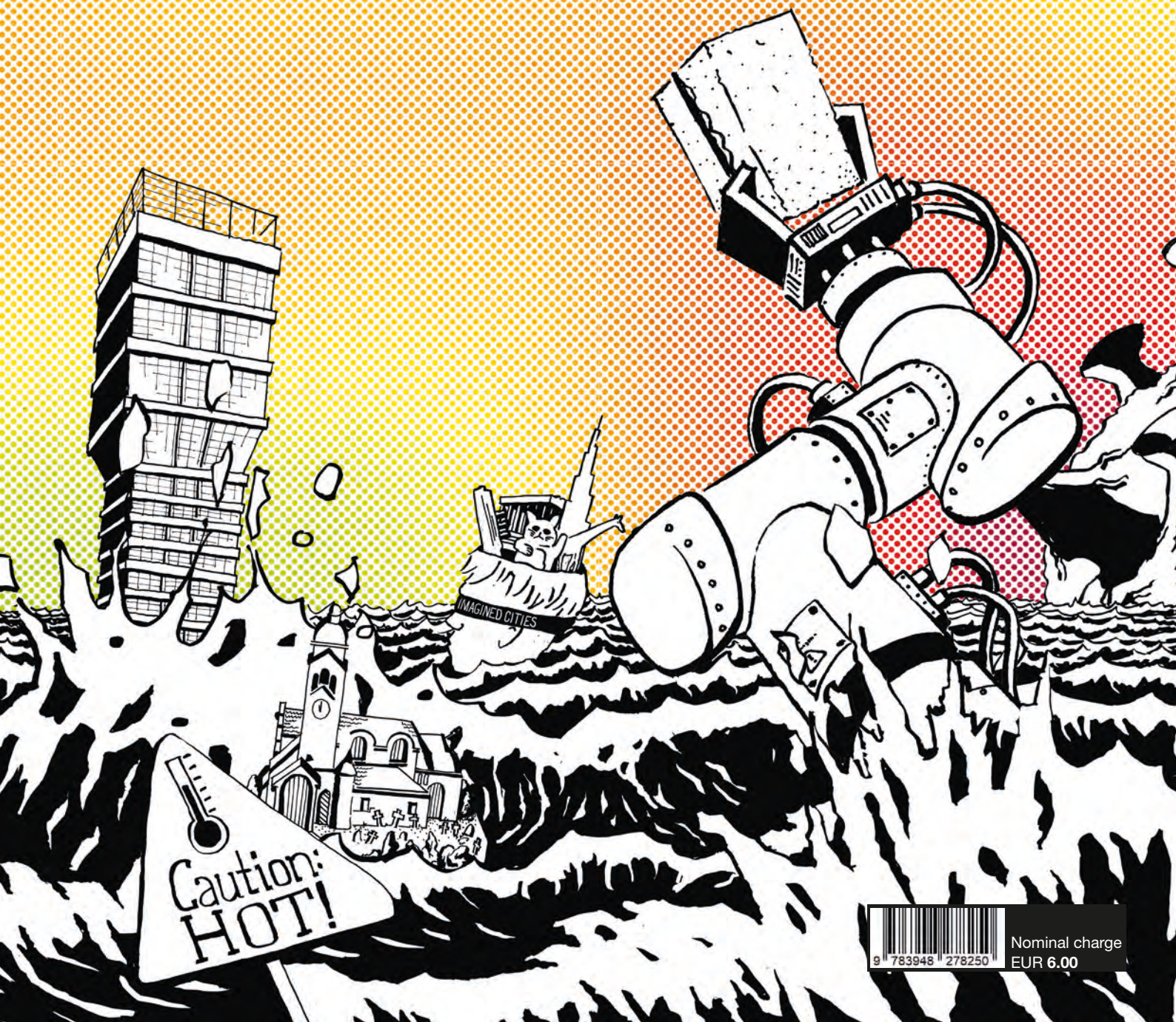
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