

Organisation

Beatrix Emo

*1984, is a practising architect, and director of Spatialist Arch. She holds a PhD from the Bartlett School of Architecture, in which she explored how individuals experience urban spaces. Her interests lie in urban design, space syntax and spatial cognition, conducting experiments in real and virtual environments. She is a Digital Initiative Zurich (DIZH) Fellow at the Institute Urban Landscape, ZHAW.

Andri Gerber

*1974 is a historian of architecture and urban design. He studied architecture at the ETH and worked in New York for Peter Eisenman. He holds a PhD on metaphors in urbanism (awarded with ETH medal) and a habilitation on bureaucracy and urbanism, both from ETH. His current interests lie in space from a cognitive perspective and in the use of board and video game as teaching and researching instruments. His most recent video game, Dichtestress, is on the topic of urban space, density and covid-19 and founded by ZHAW digital (<https://www.zhaw.ch/de/archbau/institute/iul/dichtestress/>). He currently leads the SNF-founded project Challenging or Reproducing the Status Quo? The Leftist Architect in Milanese Architecture (2021-2024). He is professor of the history of urban design at the Institute Urban Landscape at ZHAW.

Zürcher Hochschule
für Angewandte Wissenschaften

The poster features a central illustration of a human head profile in silhouette. Inside the head, a staircase leads up to a square window. A small figure of a person is standing in the window. The text "Space, language & cognition" is written in a large, curved font across the top of the head. Below it, "Perspectives on architecture and urban design" is written in a similar curved font. The date "9.11.2021" is in the top right corner. The ZHAW logo is in the top left corner. At the bottom, there is a list of speakers and organizers, and a note about the conference being broadcasted.

zhaw Architektur, Gestaltung und Bauingenieurwesen Institut Urban Landscape

Space, language & cognition
Perspectives on architecture and urban design
9.11.2021

Johannes Binotto (HSLU)
Rosario Caballero Rodríguez (UCLM)
Heiko Hausendorf (University Zürich)
Thora Tenbrink (Bangor University)

Ruth Dalton (Lancaster University)
Sergei Gepshtein (Salk Institute for Biological Studies)
Christoph Hölscher (ETH Zürich)
Daniel Ness (St. John's University)
Tiziana Proietti (University of Oklahoma)
Sofia Psarra (University College London)
Kerstin Sailer (University College)

Organisation/Moderation:
Beatrix Emo, Andri Gerber,
(Institute Urban Landscape, ZHAW)

The conference will be broadcasted per webex. Link and informations:
<https://www.zhaw.ch/de/archbau/institute/iul/space-language-cognition/>

Image: © Matthias Gnehm

**Space, language & cognition:
Perspectives on architecture and urban design
Workshop, 9.11.2021, online**

Organisation: Beatrix Emo, Andri Gerber (ZHAW)

Space has always been an obsession for architecture, not least how to conceptualize and to express it in language to non-architects. While there is no doubt that the discipline of architecture is based on the production of space, discord exists on what architectural/urban space is and what qualities are associated to it; on how it can be designed and how it could/should be perceived. Architects are specialists on space, but their knowledge is more tacit in form and hard to communicate by words. While architects' discourse has been rather circular and self-contained, and the gained knowledge partially obliterated by the many changes of style and interests of architectural discourse, cognitive sciences and in particular cognitive linguistics have brought forward in the last decades a huge number of studies on the spatial nature of our thinking and of language. These findings have only seldomly been discussed by architects and are still encountered with suspicion by the latter, not least because of their tendency to quantify this knowledge and experience. While architects want to speak about quality, the sciences here seem rather to talk about quantitative analyses.

With this conference we aim to discuss with experts from the fields of cognitive sciences how space can be conceptualized and communicated, and how these findings can be integrated into architecture and its teaching. This calls for a bridge between architecture and the cognitive sciences and for the question how this bridge should span between the two shores and on a secular spatial "void".

The morning session will be dedicated to language and to how human beings conceptualize space through their expressions. Based on the relationship of thought and language, space plays the role of a mediator between these two, as both are built upon space and the localization of human beings in space. Particular attention will be dedicated to metaphors as these are mediating elements often used in architecture and urban design, to communicate ideas, intentions but also spatial situation but also important triggers for creativity.

The afternoon session will be dedicated to spatial cognition and architecture. How can spatial cognition be applied in architectural research? What methods exist to tie the disciplines together? The focus will be on interdisciplinary methods related to spatial thinking.

<https://www.zhaw.ch/de/archbau/institute/iul/space-language-cognition/>

Program

9:00–9:15: Welcome and Introduction

[Beatrix Emo and Andri Gerber \(ZHAW\)](#)

9:15–9:45: Transforming spaces to places: Architectural thinking and language

[Thora Tenbrink \(Bangor University\)](#)

9:45–10:15: Sensing and discussing space through metaphor

[Rosario Caballero Rodríguez \(UCLM\)](#)

10:15–10:45: Bespoke Spaces. On Textuality and/as Architecture.

[Johannes Binotto \(HSLU\)](#)

10:45–11:00: Break

11:00–11:30: Architectures for “lecturing”: Notes on space, language and interaction

[Heiko Hausendorf \(UZH\)](#)

11:30 -12:00: Anticipating user behaviour in architectural design - qualitative and quantitative methods

[Christoph Hölscher \(ETH Zurich\)](#)

12:00–12:30: Discussion

12:30–13:30: Lunch

13:30–14:00: The Relational Hospital – A sociospatial perspective on healthcare outcomes

[Kerstin Sailer \(University College London\)](#)

14:00–14:30: Ontogeny of Architectural Thinking

[Daniel Ness \(St. John's University\)](#)

14:30–14:45: Break

14:45–15:15: The Language of Architectural Diagrams

[Ruth Dalton \(Lancaster University\)](#)

³ 15:15–15:45: From the Purely Functional to the Most Symbolic: Why Language Matters in Architecture

[Sofia Psarra \(University College London\)](#)

15:45–16:00: Break

16:00-16:30: Psychophysics of architectural proportion

[Tiziana Proietti \(University of Oklahoma\)](#)

[Sergei Gepshtein \(Salk Institute for Biological Studies\)](#)

16:30-17:00: Final Discussion

Moderation: Beatrix Emo and Andri Gerber (ZHAW)

Transforming spaces to places: Architectural thinking and language

Architects have the extraordinary ability to transform a certain space (a mere location) into a meaningful place: something for humans to relate to, live in, use, and become attached to. Given that meanings are very personal and diverse, this is no small challenge, and it is no wonder that major architectural efforts are not always universally appreciated. To succeed, as part of their professional training and development over time, architects develop specific ways of thinking about space – as discussed throughout this workshop.

Language is a particularly prominent means of expressing and representing architectural thinking, and this has been addressed from a range of perspectives. Cognitive Discourse Analysis (Tenbrink, 2020) is one way of systematically identifying aspects of architectural discourse that reflect thoughts and concepts. For instance, Cialone, Tenbrink & Spiers (2018) showed how the way architects talk about depicted spaces differs systematically from that of other people, including the ways in which these could be transformed. This includes a particular focus on three-dimensional thinking and materials, transcending the two-dimensional abstract space depicted in the images themselves.

This ability to think physically and functionally from limited available input is also reflected in architects' ability to change perspectives flexibly, both in terms of how spaces are transformed to serve specific purposes, and in terms of how users of these spaces would inhabit and navigate these purposes (Tenbrink, Brösamle, & Hölscher, 2012). Such multi-layered thinking is at the heart of architects' ability to transform spaces into meaningful places for human usage and emotional attachment.

Thora Tenbrink

Thora Tenbrink is a Professor of Linguistics at Bangor University (Wales, UK), who uses linguistic analysis to understand how people think. She is author of “Cognitive Discourse Analysis: An Introduction” (Cambridge University Press, 2020) and „Space, Time, and the Use of Language“ (Mouton de Gruyter, 2007), has co-edited various further books on spatial language, representation, and dialogue, and published nearly 40 peer-reviewed journal papers on a wide range of interdisciplinary topics.

Sensing and discussing space through metaphor

Buildings and related spatial entities are 'popular' sources in metaphorical mappings. The potential of spatial artefacts as metaphorical sources lies in the fact that they belong to our physical, everyday experience and, hence, are used for discussing (and, presumably, thinking) about more abstract, less tangible concepts. However, although space is inextricably related to human experience, it remains a difficult entity to define and, more specifically, to describe by using literal, spatial-only language. Rather, buildings are described as breathing, having bowels and skins, as clad with various materials, fitting in tightly-knit urban spaces, or tumbling down, cutting into, or hugging their sites (Caballero 2006, 2014). However, architectural descriptions are not solely concerned with the structural or aesthetic properties of buildings, but also attempt to capture what buildings 'feel' like, as suggested by adjectives qualifying them as craggy, fluid, enveloping, clammy, loud, warm, bland, stuffy or crisp – all of which attempt to 'translate' the sensory properties of buildings.

In this talk I describe the ways architects use language to evoke the visual, olfactory, tactile and interactive experiences afforded by buildings. I am particularly concerned with discussing how architects transfer their perception of space as knowledge, and how this knowledge is communicated through figurative language in one of the most popular genres in architectural discourse, namely the architectural review (hereafter, AR). Indeed, and contrary to folk views of experiencing and assessing architectural space as mainly visual affairs, contemporary architects maintain that their work is much more multimodal, and that vision actually engages the other senses as well. The task of reviewers, then, is to translate their experiences through the medium of written language in a form that the readers can understand and, presumably, also relate to through their senses. This is an extremely complex and sophisticated task which often requires the use of imagery of diverse sorts. In this regard, the ultimate aim of my talk is to explore the ways in which imagery informs and contributes to the shaping of the sensory landscapes of the community of architects as these are staged in the AR genre.

Rosario Caballero

Rosario Caballero has a degree in History and a Ph.D. in English Linguistics and is currently Professor in the Universidad de Castilla-La Mancha. Her research interests include professional genres, the role of metaphor in genre, and sensory language. She is the author of *Re-Viewing Space. Figurative Language in Architects' Assessment of Built Space* (2006, Mouton), and *Representing Wine - Sensory Perceptions, Communication and Cultures* (2019, John Benjamins), the co-editor of *Sensuous Cognition. Explorations into Human Sentience* (2013, Mouton), and journal papers on metaphor in architectural and wine discourse. Address for correspondence: Departamento de Filología Moderna, Facultad de Letras, Universidad de Castilla La Mancha, Avda. Camilo Jose Cela s/n, 13071 Ciudad Real, Spain

Bespoke Spaces. On Textuality and/as Architecture

Far from being only a medium for the representation of architectural spaces texts should be seen as architectural interventions themselves. Instead of describing them, texts cannot help but to constantly rebuild, expand, transform, and warp space as we know it. They do so by performing an intersection of different and conflicting spatial modes: the imaginary architecture as we picture it in our minds when reading a text is related to the text's metonymical architecture of syntax and grammar, and finally to the physical three-dimensionality of the medium itself: the sentences, the printed page and finally the book itself as a physical, three-dimensional object on and through which we travel.

By looking at different examples which most explicitly perform such an exchange between different spaces like Edgar Allan Poe, Karl May, Friederike Mayröcker, or the film maker Heinz Emigholz, I want to outline a theory of how to use textual practices as a new approach in architectural design.

Johannes Binotto

Johannes Binotto is senior researcher in cultural and media studies at the University of Zurich and at the Lucerne University of Applied Sciences and Art, as well as video essayist. He earned his PhD (awarded with the annual prize of Zurich University) with a study on the uncanny as spatial phenomenon in theory, art, literature, and film. His current research focus on the intersections between media theory, history of technology and psychoanalytic theory. He currently leads the SNSF-project „VideoEssay. Futures of Audiovisual Research and Teaching (videoessayresearch.org).

Architectures for “lecturing”: Notes on space, language and interaction

In the last decade or so, linguists interested in face-to-face interaction have started to reflect upon the relevance of space. Having studied the relevance of time in interaction (in terms of sequentiality) for quite a while, linguists have long neglected space as a topic in its own and have only recently started to account for space and spatiality in discourse. Hand in hand with the spread of video recordings as the standard type of data collection, space has been re-discovered both as an essential resource for social interaction (architecture in terms of built and furnished space) and as an interactive achievement (interactional space in terms of the participants’ perceiving, movements and actions). Adopting an interactionist’s point of view I will introduce a conceptual framework to bring together these different meanings of space. In doing so, I will provide some empirical evidence from architectures for lecturing. Drawing on a current research project on university lecturing I will try to demonstrate that and how the characteristics of lecturing as a social practice can be read out from the architectural key features of the lecture hall. Throwing a side glance at data from so-called “ghost lectures” in times of COVID-19 I will briefly discuss the relevance of copresence.

Heiko Hausendorf

Heiko Hausendorf is a linguist with a special interest in spoken and written discourse. He started as a Bielefeld trained scholar in Conversation Analysis and turned out as a specialist in German studies at the Universities of Dortmund, Wien and Bayreuth. Since 2007, he holds a chair in linguistics of German at the German Department of the UZH. Some years ago, he was one of the founders of the UZH University Research Priority Programme Language and Space (UFSP SpuR: <https://www.spuR.uzh.ch/en.html>).

Anticipating user behaviour in architectural design - qualitative and quantitative methods

A key aim of our research group is to understand how the structure of the built environment shapes user behaviours like wayfinding, movement and occupancy patterns in complex built environments. Designing such spaces to be well-suited for the needs of users, visitors and inhabitants requires that the architectural designer successfully anticipates how her design decisions will shape the user response. The user, the designer and the built environment form a set of complex relationships (use, design, anticipate) that can only partially be captured by directly observing overt behavior. It is necessary to understand the rationale of the stakeholders' decision making, e.g., by collecting concurrent verbal reports when users or designers perform a dedicated task. Neither the verbal track alone nor the non-verbal behavior suffice to reveal the underlying structure. And since much of the decision making is inherently spatially embedded, it becomes necessary to understand the spatial mapping between verbal comments, design moves and user behavior. In this presentation I will highlight how we approach this challenge both for user experience and design cognition studies.

Christoph Hölscher

Christoph Hölscher is professor of Cognitive Science at ETH Zurich since 2013. At the Singapore-ETH Centre, he is Programme Director of Future Resilient Systems. He was previously assistant and extra-curricular professor at the Center for Cognitive Science in the University of Freiburg, Germany. He received his Doctorate (2000) and Habilitation (2009) in Psychology at the University of Freiburg. He was project manager in IT industry during 2000-2003, specialising in user-adaptive systems and usability.

The Relational Hospital – A sociospatial perspective on healthcare outcomes

Bringing together architectural knowledge and behaviour, we can look back at decades of research aiming to understand the role of the built environment in shaping human perception and actions. Various strands of research under the lead of environmental psychology have explored how certain environmental characteristics can be associated with perception, cognition, comfort, satisfaction, wellbeing and health.

In this talk I will argue that despite considerable progress in our understanding of situated actions, a sociological perspective taking into account the presence of others is less well explored. We are hardly alone in buildings and the actions of others can be argued to play an important role in guiding someone's behavioural responses, yet, all too often a focus on individual outcomes has been pursued to date.

Using healthcare settings as an example, arguably one of the most complex building types, and drawing on a series of research projects conducted over the last years, I will highlight how a relational perspective provides a useful lens to investigate situated action as well as healthcare outcomes. I will show how spatial design choices can mitigate the spread of disease by orchestrating togetherness and separation; how spatial configuration can explain the complex interplay of healthcare worker movement; how healthcare teams rely on visibility to provide good care; and how diagnostic processes in outpatient clinics can be optimised. In doing so, I propose that hospitals are best understood as relational systems composed of interrelated spatial and social networks.

Kerstin Sailer

Kerstin Sailer is a Professor in the Sociology of Architecture at the Bartlett School of Architecture, University College London. An architect by training, her research interests combine processes and practices of work with the architectural layout of buildings such as offices, hospitals and schools. As an expert in both space syntax and social network analysis, her work builds bridges between architecture, sociology and strategic management. Her publication record includes 60+ papers and book chapters.

Ontogeny of Architectural Thinking

When considering the role that cognition in the form of spatial thinking plays in architecture, it would be fruitful to study how architectural thinking develops ontogenetically. In this regard, ideal environments for this kind of exploration would include spaces for one to observe individuals engaged in constructive free play. However, to date, few, if any, studies have approached architectural thinking in the form of ontogenetic investigation. More specifically, research on the emergence and development of architectural thinking is sparse, if nonexistent. A paucity of inquiry on the cognitive development of architectural thinking has demonstrated a clear need for examination if one is to tap the ineffable, tacit knowledge of architects and resurrect that knowledge in a way that makes it more conscious, deliberate, and explicable.

The purpose of this paper, then, was to explore and identify everyday emergent architectural thinking constructs during constructive free play. These spatially-laden constructs have served as media for developing codes as a means of revealing ways to enfranchise expression and communicability of architectural discourse. To this end, the Space-Architecture Coding System (SPARC), which includes four overarching codes—symmetric relations, geometric relations, direction/location, and architecture/engineering—was created and has served as a tool for identifying ontogenetic characteristics of architectural cognition. For the purposes of this investigation, greater focus has been placed on architecture/engineering codes (in chronological order: stacking, enclosure, proto-cantilevered construction, foundation, posting, trabeated construction, truss construction, curvature construction, and complex cantilevered construction).

Daniel Ness

Daniel Ness is Professor of STEAM Education in the Department of Curriculum and Instruction at St. John's University in New York. He has authored numerous articles on the development of mathematical and scientific thinking, which focus on spatial cognition from birth through adolescence. Professor Ness is the author of *Block Parties: Identifying Emergent STEAM Thinking through Play* (Routledge). As Director and Principal Investigator of the National Science Foundation funded Robert Noyce Academy for Spatial thinking in STEM, he specializes in spatial cognition and its influence in STEM disciplines. He has coauthored *Spatial Intelligence: Why It Matters from Birth through the Lifespan* (Routledge) and is co-editor of *Alternatives to Privatizing Public Education and Curriculum*, which was awarded the Society of Professors of Education Outstanding Book Award in 2018. Professor Ness developed the SPARC coding system, which identifies emergent spatially related behaviors during young children's free play.

The Language of Architectural Diagrams

Complex buildings frequently present a challenge to users' understanding, which may affect wayfinding as well as appreciation of the building's structure. In this paper we focus on the building's diagram, a representation by the building's architect that captures its main 'idea'. Motivated by the intuition that a building may be easier to understand if its conceptual diagram can be clearly and easily described, we explored perceivers' descriptions of such diagrams' features. We asked students of Language and students of Architecture to write about the buildings represented in a variety of diagrams, and then repeated the task for photographs of the actual buildings. Using Cognitive Discourse Analysis, we aimed to create a first qualitative exploration of the linguistic and conceptual patterns that are associated with the perception of diagrams and images of complex buildings. Among other factors, results show how perception of the diagram's meaning is fundamentally affected by subject expertise. Linguistic patterns demonstrate the ways in which written descriptions reflect observers' understanding and concepts of building representations, providing a starting point for future studies which may address the possible relationship between verbalisability of a diagram and the legibility of a building.

Ruth Conroy Dalton

Ruth Conroy Dalton is the Founding Professor of Architecture at the University of Lancaster's new Lancaster School of Architecture and Head of the Lancaster School of Architecture. She has taught previously at the Architectural Association, London, the Georgia Institute of Technology, Atlanta, USA, the Bartlett School of Architecture, London and Northumbria University at Newcastle. Ruth Conroy Dalton's research interests are centred around the relationship between the spatial design of buildings and environments and their effect on how people understand and interact in those spaces. She is a leading expert in space syntax analysis, architectural and spatial cognition and pedestrian movement/wayfinding. She is passionately interested in placing the user at the centre of architectural design.

From the Purely Functional to the Most Symbolic: Why Language Matters in Architecture

In this presentation I look at the role of language in how we understand and design buildings. The presentation is organised in three parts. The first part discusses three key approaches to this subject: Bill Hillier's approach to language as offering a weak analogy for architecture through the syntactic rules we think with; Adrian Forty's assertion that if architecture is not language, this does not lessen the value of language in understanding architecture; and finally, Thomas Markus' and Deborah Cameron's approach to language as pragmatics and socio-linguistics, relating linguistic phenomena in architecture to communication and the social context in which they arise. The second part of the presentation delves into space syntax theory and method, arguing that language in space syntax is symbolically expunged from its theoretical and analytical framework, as the main purpose is to make architecture 'speak' through spatial relationships. However, linguistic and semantic structures are inherent in space syntax, but present in disguise through a series of notions the most important of which is the 'interface', operating as a structural coupling between a plane of spatial form and a plane of social content. The third part of the presentation examines the idea of the parti and composition as an interaction between these two planes, spatial form and content. The presentation concludes that we need to approach the understanding of architecture, not as an experimental science in search of a law, but as an interpretive one in search of meaning. In order to do this we need to study the analogical and interactive relationship of architecture with language in the realm of social actions and the social construction of reality.

Sophia Psarra

Sophia Psarra is Professor of Architecture and Spatial Design at The Bartlett School of Architecture, UCL. Her research focuses on spatial and urban morphology in relation to the histories of building and cities that have influenced their development alongside the social patterns of human activity. She is the author of *The Venice Variations* (UCL Press, 2018) exploring cities and buildings as multi-authored processes of formation alongside authored projects of individual design intention. Her book *Architecture and Narrative* (Routledge, 2009) explores the relationship between design conceptualization, narrative and human cognition. Her edited book *The Production Sites of Architecture* (Routledge, 2019) addresses the production of knowledge in architecture. Sophia is the Director of History and Theory PhD programme at The Bartlett School of Architecture and has taught undergraduate/graduate studios and seminars at The Bartlett, University of Michigan (2005-2011), Cardiff University (1997-2004) and the University of Greenwich (1992-1997). Sophia was the editor of the *Journal of Space Syntax* (2011-2015). Her research has been funded by the NSF (USA), Leverhulme Trust, UCL Grand Challenges, the University of Michigan and the Onassis Foundation. She has collaborated with leading cultural institutions on layout design, exhibition narratives and visitors' experience. As a practicing architect, Dr. Psarra was part of a team that won first prizes in European international architectural competitions. Her work has been exhibited in Venice Biennale, the George Pompidou Centre, NAI Rotterdam, London, Berlin, Milan and Athens in Europe.

Psychophysics of architectural proportion

Over their long and convoluted history, studies of architectural proportion have meandered between mathematics of proportional systems, their aesthetic manifestations, and their consequences for human perception and behavior. These efforts have yielded three distinct frameworks for understanding effects of proportional systems: symbolic, aesthetic, and cognitive. In the symbolic framework, designer's choice of the proportional system is viewed as an outcome of the larger cultural context. In the aesthetic framework, the choice is linked to the sense of pleasure or concepts of beauty. And in the cognitive framework, the choice is couched in terms of sensation, perception, memory, and active behavior. The last two frameworks have often been conflated in trying, for example, to explain aesthetic effects of proportion by appealing to properties of human perception.

Here we concentrate on the cognitive framework and ask how our understanding of the role of architectural proportion can be improved using methods of sensory psychophysics and neuroscience. We have developed a program of formal studies of perception of proportion, in which we emphasize that such studies must be conducted in three-dimensional environments where objects are generally viewed under perspectival distortion. Using methods of sensory psychophysics, we present observers with pairs of proportioned objects, viewed monocularly (through a pinhole) or binocularly (free viewing). The task is to discriminate aspect ratios of certain facets of these objects selected by the experimenter, following a two-alternative forced-choice protocol. The experiments are conducted in two formats: "external observation" and "immersive observation."

These studies reveal how architectural space is organized by its proportional structure, including division of space into regions defined by whether observers occupying those regions can or cannot experience proportional properties of the environment.

Tiziana Proietti

Tiziana Proietti, Ph.D., is an architect and educator. She is Professor at the C. Gibbs College of Architecture of the University of Oklahoma and director of the Sense-Base Laboratory. She earned her doctorate from the Department of Architecture of the Sapienza University of Rome in collaboration with the Delft University of Technology. Her doctoral dissertation concentrated on the theory of proportion in architecture. Together with the scientist Dr. Sergei Gepshtein, she is developing an interdisciplinary program of research to bridge neuroscience and architectural design and to test long-standing hypotheses about the human response to architectural proportion.

Sergei Gepshtein

Sergei Gepshtein, Ph.D., is a scientist working in the areas of perceptual psychology and systems neuroscience. He is a member of the Center for the Neurobiology of Vision at the Salk Institute for Biological Studies in San Diego, California, where he studies perception and active behavior from the mechanistic point of view of neuroscience and from a point of view that respects perceptual experience as a research focus in its own right. He also directs the Center for Spatial Perception and Concrete Experience at the University of Southern California in Los Angeles.

Notes

/ Participation is open to everyone

/ Join via webex

/ <https://zhaw.webex.com/zhaw/j.php?MTID=m0d65ab3cdff6afe75c2b8a156d5ff8e5>

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Beatrix Emo, Andri Gerber

Zürcher Hochschule
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**Architektur, Gestaltung
und Bauingenieurwesen**

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