

# Research Methods I: On (Big) Data

Seminar for PhD Students, FS 2023  
Prof. Dr. Sascha Roesler, Dr. Mosè Cometta

The Research Methods Seminar is one of the pivots of the Accademia's PhD School. Here, doctoral students address fundamental questions in contemporary architectural research. The two institutes, ISA and ISUP, are two complementary centers of excellence of the Accademia, representing historical and empirical research and a wide range of architecture-related methods. The focus of the seminar and its main topics change from semester to semester.

In the Fall 2023 semester seminar, we will focus on empirical research methods that draw on the inherent skills of the architect: Expertise, Imagination, and Skill. Empirical research is not a clearly defined method in architecture, but points to fundamental uncertainties in architectural design practice. Global challenges such as planetary urbanization, climate change, or the energy transition require the ability to create scientific evidence and traceability in design processes that engage both the architect's sensory apparatus and representational technologies. The pressing questions raised by the new "hyperobjects" are increasingly leading to a trans- and interdisciplinary nature of research topics at the intersection of "data and things" (Timothy Morton). Evidence-based design requires the ability to collect data in the field and to critically evaluate them.

The fall semester seminar consists of three workshops on the notion of "data". We will focus on "ways of knowing cities" (Laura Kurgan) highlighting all kinds of data and associated narratives. Each workshop forms an autonomous unit that integrates lectures and discussions. The workshops will cover topics such as Big Data, Data-driven Narratives, Virtual and Augmented Reality, and Climate Data. Methodologically, the seminar focuses on thick ethnographic descriptions and mapping techniques that offer an humanities approach to architecture and urbanization processes.

Active participation during the semester is the basis for student evaluation. The seminar is primarily intended for PhD students, but a limited number of master's students will also be admitted. Students applying for the seminar must submit a 150-word letter of motivation explaining the relevance of the seminar to their past or future research interests.

Oct. 4, 2023

## **What means "Data" in architecture and urban design related research?**

Prof. Dr. Sascha Roesler, Dr. Mosè Cometta

The first session of the seminar will focus on the notion of data. This term, so central to scientific production, is in fact the basis of every research project. What are data? How to understand them, define them, produce them, and use them critically and functionally? These questions will be addressed in a twofold way -both through a discussion of data in different doctoral students' theses, their validity and limitations, and, more generally, by making a connection to the topic of big data. Indeed, big data - large masses of data that are impossible to collect and decipher without the aid of digital tools- represent a great opportunity for scientific and architectural research. However, they also propose a number of challenges to the research process: how to be sure to produce and interrogate your data correctly? With this very interactive introduction, the first session provides insight into a key issue for every PhD student in architecture. The discussion on data, their production and visualization will then continue in the following sessions with prominent guests.

Oct. 25, 2023

## **How will Big Data change urban design practices?**

Prof. Dr. Nikos Katsikis, TU Delft

In the early twenty-first century, urbanization is being generalized across places, landscapes, territories and scales. As newly emergent geographies of urbanization are superseding inherited patterns of cityness and exploding the traditional boundary between the city and the non-city, they are becoming

extremely difficult to grasp, much less to visualize. At the same time, the proliferation of geospatial technologies, from remotely sensed databases, to pattern recognition AI algorithms and powerful modeling tools, softwares and methodologies, offer a renewed promise that the unprecedented socio-ecological challenges of planetary urbanization can be effectively managed and configured. Can this promise be fulfilled? What would this mean for theorists, designers, planners, cartographers and others who aspire to reshape the rapidly urbanizing landscapes of our planet? This presentation attempts a critical interrogation of these recent developments. It aims to reveal how the complex sociotechnical processes behind the construction of geospatial data on urbanization are invariably mediated through a combination of: theoretical and epistemological assumptions manifested in spatial taxonomies and techniques of data construction and processing; technological potentials, limitations and even “accidents;” and conceptual biases reflecting sociopolitical tensions around goals and aspirations.

Nov. 22, 2023

**How will hybrid reality research impact the representation of urban data?**

Adam Kiryk, Nico Stutz, Assistants at the Chair for Digital Building Technologies, ETH Zurich

Fusions of digital-analog relationships have accompanied us since the very beginning of the digitalization era. The rapidly growing impact of digital technologies on our life necessitates constant adaptation. The lecture and workshop "Hybrid Reality Workflows" harnesses the experiences from the courses conducted at ETH Zürich over recent years organized by Hybrid Reality Research of the former Chair for Architecture and Art at the department of architecture. The lecture gives an introduction to the synergy of virtual reality design methods and 3d scanning technologies, intending to redefine architectural education and practice. The seminar session consists of two parts: After a general introduction to hybrid reality research (making the invisible visible), a VR demo with examples on VR headsets and smartphones (AR with QR code) will be shown. The session will provide an opportunity to delve deeper into the latest digital tools such as VR Headsets and their use in architectural research.