

On Simulation

A Cultural Technique for Uncertain Urban Futures



UC Berkley Environmental Simulation Laboratory

The Institute of Urban and Landscape Studies (ISUP), and Institute for the History and Theory of Art and Architecture (ISA), Accademia di Architettura, Mendrisio, Università della svizzera italiana in collaboration with ZAZ Bellerive - Zentrum Architektur Zürich

Location: ZAZ Bellerive - Zentrum Architektur Zürich, Höschgasse 3, 8008 Zürich

08:30-09:00	Welcome and registration	
09:00-09:30	Organisers' Introduction	
09:30-10:30	Panel 1: Games and Experiments	Prof. Andri Gerber (ZHAW School of Architecture, Design and Civil Engineering Winterthur)
10:30-10:45	Coffee	PD Dr. Anne Dippel (Department of Cultural Anthropology, University of Jena)
10:45-11:45	Panel 2: Simulation as Cultural Technique	Prof. Peter Krapp (Film & Media Studies, University of California, Irvine)
11:45-12:30	Q&A	Prof. Marco Caracciolo (Department of Literary Studies, Ghent University)
12:30-13:30	Lunch	
13:30-14:30	Panel 3: Simulating Architecture Futures	Prof. Angela Rout (Faculty of Architecture and the Built Environment, TU Delft)
14:30-14:45	Coffee	Joshua Silver (School of Environment, Education and Development, The University of Manchester)
14:45-15:45	Panel 4: Simulating Urban Futures	Dr. Darío Negueruela del Castillo (Center for Digital Visual Studies, Max-Planck Society/ University of Zurich)
15:45-16:15	Q&A	Prof. Orit Halpern (Chair of Digital Cultures at Technische Universität Dresden)
16:15-17:15	Roundtable with all speakers	
17:15-17:30	Conclusion	
17:30-18:30	Apéro	

Organizers:

Prof. Sascha Roesler is an urban scholar and architectural theorist, working at the intersection of architecture, ethnography, and science and technology studies. He is the Associate Professor for Theory of Urbanization and Urban Environments at the Academy of Architecture in Mendrisio, Switzerland.

Dr. Noa Levin is a philosopher and cultural theorist working at the intersection between political philosophy and theory, visual cultures and philosophy of space and environment. Her postdoctoral project at the Academy of Architecture in Mendrisio, Switzerland, focuses on the politics of climate change.

How to play CO2: Environmental games as ultimate simulations?

„C'est un principe de simulation qui nous régit désormais en place de l'ancien principe de réalité. Les finalités ont disparu. Ce sont les modèles qui nous génèrent. Il n'y a plus d'idéologie, il n'y a plus que des simulacres.“ Jean Baudrillard 1976: 8-9

There is no doubt, that games can be considered simulations, as they build a relationship to reality or the actual, which is translated in the mechanics and/or the theme of a game. Architecture and urban environment are favorite references for games, be it in construction toys or in city building games. On the other hand, the influence of games on architecture and urban design has been rather modest up to now. With the raising awareness about the climate crisis also in the field of architecture, environmental games open new possibilities for this relationship, but also challenges, due to the nature of games. For players, games are vessels of engagement and of social action, they are the basis of cultural orientation and powerful pedagogical tools. Yet games are only simplified “copies” of reality and often subjected to a specific (environmental) ideology, and they are “given” in their technology and cannot be modified.

Discussing games in relation to architecture as cultural practices might be useful to understand their potential but also shortcomings. Taking reference to Jean Baudrillard and his differentiation between simulation and simulacra, games clearly open the possibility to overcome simulacra, as they have a clear goal (win the game, overcome the environmental crisis), at the same time their specific form, reduces the possibility for the player to really use games as techniques.

To discuss this relation, I will introduce an historical perspective and discuss the multiple genealogy of environmental games, not least in term of the growing complexity of the simulation models that lie at the heart of the games.

Andri Gerber is co-head of the institute constructive design at the Zürich university of Applied Sciences (ZHAW). He studied architecture at ETHZ and worked for Peter Eisenman. He holds a PhD (awarded with an ETH medal) and a habilitation from ETHZ. His recent interest revolves around the potential of games in architecture. Together with Ulrich Götz he is the editor of the book *Architectonics of Game Spaces* (2019). He consequently started to develop his own games, such as a game about Corona and Density (<https://www.zhaw.ch/de/archbau/institute/iul/dichtestress/>) and a game for the integration of Ukrainian refugees in Zürich (<https://www.zhaw.ch/en/archbau/institute/ike/where-am-i/>). Currently he is working on a simulation game about sustainable construction (<https://www.zhaw.ch/en/research/research-database/project-detailview/projektid/6844/>).

The Depths of Illusion. Knowing Reality Through Computer Simulations

This talk examines the erosion of concept-based truth in the digital age and explores pathways of knowledge in physics through computer simulation. I will be presenting outcomes of a media ethnography of the famous quantum physics double-slit experiment and its simulation. Recognizing simulations as central to shaping reality and multiplying illusions I will propose “operational realism” as epistemic composure in the digital era through a crisp book presentation of the freshly published English version of a study I conducted together with Martin Warnke.

The epistemic challenges of the simulation of quantum mechanical experiments serve as a looking-glass to discuss ethical questions of algorithmic world design, offering humor, revelations, and insights into new ontologies of knowledge. I will be discussing various positions, attitudes and composites one currently can observe when it comes to media-based knowledge production. In that way, the talk allows to dive into currents of epistemic perspectives from the fields of new materialism, media theory and queer-feminist STS by reflecting a very specific and peculiar case study, navigating the borderlands of theory and practice.

Anne Dippel is Substituting „Professor of Knowledge Cultures in the Digital Era“ „Wissenskulturen im digitalen Zeitalter“, HBK Braunschweig; Co-PI EthnOA – Open Access Transformation of ethnographic Journals Friedrich-Schiller-Universität Jena. Magistra Artium in Early Modern and Modern History, Cultural Studies and Cultural Anthropology (HU Berlin, Brunel University West London). PhD at the intersection of Cultural Anthropology and Media Theory (HU Berlin) : *Dichten und Denken in Österreich – Eine literarische Ethnografie*. Wien 2015. Habilitation in Cultural Anthropology (University Jena): *Research on digital cultures of physics. Habilitation on Games and Play in the digital era: Habilitationsschrift: Ludutopia. Elemente einer kulturwissenschaftlichen Spieltheorie*. Universität Jena 2022. Another monography, together mit Martin Warnke will be published in English Decem ber 2024: *The Depths of Illusion, Knowing Reality Through Computer Simulation*.

Weirded Urban Spaces in Contemporary Fiction and Video Games

Recent scholarship in environmental literary criticism has highlighted how the literary mode of the weird is well positioned to imagine and negotiate the uncertainty that underlies the climate crisis. A genre originating in H. P. Lovecraft's work in the early 20th century, the weird has been profoundly reimagined by contemporary writers such as Jeff VanderMeer and China Miéville. It involves a combination of science fiction and horror elements, along with a focus on bodily atmospheres. In this talk, I will discuss how the imaginative "weirding" of urban spaces in fictional narrative can open up spaces for the simulation of the empirical and affective instabilities brought into view by climate change. I find inspiration in two examples of weird fiction, from literature and video games respectively: China Miéville's *The City & the City* (2009) and *Alan Wake 2* (Remedy Entertainment 2023). I argue that these fictional narratives offer concrete--and affectively resonant--templates for the simulation of climate uncertainty.

Marco Caracciolo is an Associate Professor of English and Literary Theory at Ghent University in Belgium. Drawing inspiration from cognitive science, the philosophy of mind, and the environmental humanities, his work explores the forms of experience afforded by narrative in literary fiction and other media (especially video games). Between 2017 and 2022 he led the ERC-funded NARMESH project at Ghent University, which focused on negotiations of the nonhuman in contemporary narrative. He is the author of several books, including most recently *Contemporary Narrative and the Spectrum of Materiality* (De Gruyter, 2023).

Simulation as a cultural technique

Simulation is as a cultural technique that enables symbolic work and foregrounds hypothetical competence, but it also holds significant potential for the preservation of cultural memory, where modeling, imitation, and serious play are constitutive of how we relate to our inherited history. Moreover, the discourse on simulation can also serve as a critique of the computer age. A media history of simulation promises to excavate hypothetical literacy from ancient thought experiments to computing, to help debunk common sense realism as anti-speculative, and to recognize it as cultural critique, despite totalizations suggesting that we already live in a simulation. Simulation is a set of practices by which modeling, emulation, and serious play are constitutive in how we comprehend and relate to our mediated situation. It is an axiom of computing that a universal Turing machine ought to be able to run any program for any other computer that is likewise a universal Turing machine; in other words, computers can impersonate each other. This idea not only lays certain theoretical foundations for computing, it also holds a promise for digital heritage, as new machines can emulate older ones. Thus, simulation has important implications for archives, museums, and the preservation of digital culture.

Peter Krapp is Professor of Film & Media Studies at the University of California, Irvine, and affiliated with the Departments of Music (Claire Trevor School of the Arts) and of Informatics (Donald Bren School of Information and Computer Science). He held visiting positions in Taiwan, South Africa, Germany, Brazil, and South Korea. Among his books are *Deja Vu: Aberrations of Cultural Memory* (2004), and *Noise Channels: Glitch and Error in Digital Culture* (2011), both with the University of Minnesota Press, and most recently *Computing Legacies: Digital Cultures of Simulation* (MIT Press 2024).

Reimagining Data: New Approaches to Climate-Responsive

This presentation explores how data visualization and computational methods can be reimagined for architecture, enabling practitioners to interpret and apply complex information in ways that are spatially and visually intuitive. Architecture is a practice rooted in the observation of the world, transforming complex information into meaningful spaces for people, communities, and the environment. With the advent of digital technologies and ubiquitous sensors like smartphones, architects now have access to vast new data sources that offer deeper insights into how buildings are inhabited and how architecture interacts with ecological systems. Architecture data includes observations, visual records, and project requirements that are curated, categorized, and rearticulated into building strategies, concepts, and schematics. It is often inherently dynamic and multi-dimensional.

While scientific methods for data analysis are useful for identifying patterns and relationships, these approaches must be revised to fit the creative and context-driven nature of architectural design. This lecture explores the concept of architecture data and how we can reimagine scientific methods to better operationalise it. By reconsidering the nature of data within the design process, architects can develop proactive, climate-responsive solutions that address both environmental challenges and human needs.

Angela Rout is an Assistant Professor within the Design, Data, and Society Group in the Department of Architecture, in the Faculty of Architecture and the Built Environment at TU Delft. She holds a Bachelor of Fine Arts (BFA) from the University of British Columbia and a Master of Architecture (MArch) from the University of Calgary. Her doctoral research (PhD, Computational Media Design) focused on the intersection of data and design, and was followed by a postdoctoral position in Urban Forestry at the University of British Columbia. Angela's current research critically engages with the role of data in architecture. Through her research program: "Living Data Studies," she seeks to conceptualize and operationalize dynamic, multi-dimensional datasets to inform the design of climate-responsive built environments.

Observing the Future: Digital Simulation to Sustain Networks of Design Practice

While architectural design and construction have become increasingly precarious—between uncertain work conditions and the climate crisis—new technologies have been deployed to address risk. Simulations have played a key role in the networked design practice which has ensued. Derived from my doctoral research, this paper will explore the key role of digital simulation practices for sustaining this precariously networked condition. Taking RPBW's Los Angeles Academy Museum of Motion Pictures as a case, I will present two simulation practices which each depict different ways that simulation-supported future observation sustains existing networks of design practice. Transsolar's "thermal comfort" consulting will present simulation's capacities to prevent the radical transformation of design features when threatened by an uncertain future climate. Here a cascade of simulations addresses future climate conditions through building technologies while pre-empting the possible failure of design. Kiran Consulting Group's Discrete Event people flow simulations will present the data collection practices which underpin simulations. Here empirical observations of everyday activities address the future occupants of a building as discrete, solvable spatial problems. By way of a coda, I will gesture toward the failure of simulations, whether the rejection of what they make-observable or the inability to sustain the futures they propose.

Joshua Silver is a Postgraduate Doctoral Researcher at the University of Manchester with the Manchester Architectural Research Group. His research examines digital technological transformations to architectural practice since the 1980s. Moving beyond the formal and representational outcomes of digital technologies, Joshua seeks to address the wider array of participants and practices these technologies sustain. Additionally, Joshua is the Co-Investigator of the Late Antiquity Modelling Project (LAMP) which studies the built landscape of Late Antiquity architecturally through digital methods. Joshua holds an M.Arch degree from the University of Toronto.

Simulating Urban Denkstile: Vision-Language Models as Theoretical Lenses for Uncertain Futures

This presentation explores how data visualization and computational methods can be reimagined for architecture, enabling practitioners to interpret and apply complex information in ways that are spatially and visually intuitive. Architecture is a practice rooted in the observation of the world, transforming complex information into meaningful spaces for people, communities, and the environment. With the advent of digital technologies and ubiquitous sensors like smartphones, architects now have access to vast new data sources that offer deeper insights into how buildings are inhabited and how architecture interacts with ecological systems. Architecture data includes observations, visual records, and project requirements that are curated, categorized, and rearticulated into building strategies, concepts, and schematics. It is often inherently dynamic and multi-dimensional.

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Dario Negueruela del Castillo has been the Scientific Coordinator at the Center for Digital Visual Studies (Max Planck Institute–University of Zurich) since 2020. His research integrates architecture, urbanism, and artificial intelligence, focusing on multimodal deep learning models in urban analysis through projects like “Clip and the City.” Co-founder of DataThink with Shin Koseki, he promotes critical data methodologies. He has organized symposia such as “Digital Double 2024” in Rome, “Deep City 2021” in Lausanne, and co-edited the volume *From Hype to Reality: Artificial Intelligence in the Study of Art and Culture*. He earned his PhD from EPFL in 2017.

Planetary Experiments: Science, Life, and Politics in the Age of the Anthropocene

We live in the age of the planetary experiment. As sociologist of science Bruno Latour noted in the wake of recent crises in ecology and biomedicine, such as oil spills, pandemics, and climate change, the “distinction between the inside and the outside of the laboratory has disappeared,” and the “laboratory has extended its walls to the whole planet” (Latour 2004). The transformation of the entire planet into an experimental space is underscored by recent natural scientific projects such as the Event Horizon Telescope, which employs the earth as a whole as a sensor for observing celestial phenomena, and by projects such as the European Commission’s Destination Earth (DestinE) project, which aims to create a digital “twin” of the earth. The vital importance of planetary experimentation in the present is highlighted by the recent decision to accept formally the term “Anthropocene” as designation of our current geological era. The Anthropocene is inextricably connected to the concept of planetary experimentation both because human-caused global warming has been described by natural scientists as the result of “unintended” global experiments (Revelle & Suess 1957; Steffen, Crutzen & McNeill 2007), and because solutions to problems such as global warming seem necessarily to depend on new modes of intentional planetary experiments.

While such discussion of planetary experimentation often seems metaphorical, this paper will examine contemporary forms of planetary management through digital twinning. Focusing on the NVIDIA Earth 2 project and European Union project Destination Earth, but also more broadly engaging digital twinning in the simulation and management of large scale systems, this talk will investigate the automation of data analysis and collection and the use of generative AI in twinning platforms for planetary climate crisis management. Arguably, these new models are part of a broader epistemic transformation in knowledge and the governance of life.

Orit Halpern is Full Professor and Chair of Digital Cultures at Technische Universität Dresden. Her work bridges the histories of science, computing, and cybernetics with design. She completed her Ph.D. at Harvard University. She has held numerous visiting scholar positions including at the Max Planck Institute for the History of Science in Berlin, IKKM Weimar, and at Duke University. She is currently working on two projects. The first is a history of intelligence and evolution; the second project examines extreme infrastructures and the history of experimentation at planetary scales in design, science, and engineering. She has also published widely in many venues including *Critical Inquiry*, *Grey Room*, *Journal of Visual Culture*, and *E-Flux*. Her first book *Beautiful Data: A History of Vision and Reason* (Duke UP 2015) investigates histories of big data, design, and governmentality. Her current book with Robert Mitchell (MIT Press 2023) is titled *The Smartness Mandate*.