

Conference Review

New Trajectories in Computational Urban Landscapes & Ecology

The 2024 Digital Landscape Architecture Conference

June 5 – 7, 2024

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Introduction

At its 25th anniversary, the annual International Conference on Information Technology in Landscape Architecture “Digital Landscape Architecture DLA 2024” was held from June 5 – 7, 2024, at TU Wien (Vienna University of Technology), Austria. Founded and continuously directed by Prof. Erich Buhmann of Anhalt University of Applied Sciences (Dessau and Bernburg, Germany) since 1999, the conference alternates between Anhalt University and other international venues. The DLA 2024 was organised in close collaboration between the two research departments of Digital Architecture and Planning (Prof. Dr. Michael Hensel, Stefanie Tischberger) and Landscape Architecture and Landscape Planning (Prof. Dr. Susann Ahn, Prof. Dr. Thomas Hauck, Dr. Boris Salak), with sponsorship from Vectorworks, Inc.. Since the Covid-19 pandemic, when the DLA 2020 was held entirely online, a hybrid format has become established. Over 140 researchers, lecturers and practitioners from the fields of landscape architecture, landscape and environmental planning, architecture and urban design, representing about 27 countries attended in person or participated online via Zoom (22 participants) for an inspiring exchange. The conference theme “New Trajectories in Computational Urban Landscapes and Ecology”, facilitated discussions on advancements in computational techniques, data-driven co-design, and novel technological thinking. These insights prompted critical reflections on their implications for research, practice and education in a time marked by intensifying climate impacts.

Conference highlights

Overall, the conference featured two keynotes, four visionary perspectives, and 70 presentations of current research. The double-blind, peer-reviewed papers of the research contributions are published in the open access Journal of Digital Landscape Architecture 9-2024 (<https://gispoint.de/jodla.html>). Three major points stand out from the diverse contributions and discussions made over the three days: “Beyond Traditional Approaches,” “The Role of Artificial Intelligence (AI),” and “Educational Transformation.”

Beyond Traditional Approaches

The term “beyond” was a recurring theme among several speakers, pointing to an ongoing shift in thinking and consequently in approaches. Prof. em. Dr. Gerhard Schmitt, ETH Zurich, emphasised the need to move beyond “sustainable” and “regenerative” to create generative future cities capable of addressing multiple climate change challenges, such as urban heat islands. He advocated for a “citizen design science” that combines citizen design with scientific methodologies, integrating local knowledge with digital tools for design, analysis, and evaluation. Viktoria Sandor of the AIT Austrian Institute of Technology called for “going beyond the digital”, and she demonstrated how analogue co-creation of urban designs can be combined with the computer-aided toolbox for rapid evaluation in the early stages of a planning process. This reflects a broader shift in considering who we design for and with.

The conference underscored the importance of integrative modelling approaches with computational feedback to support designers in iteratively enhancing solutions and making informed decisions. While these models offer significant potential, their complexity and the necessity for accessible, user-friendly technology were also emphasised. Additionally, the notion that not everything can be controlled and managed was highlighted, reflecting the recognition of the complex and unpredictable nature of developments, especially in relation to climate change. Simple visualisation tools were identified as essential. These tools should be technically easy to implement, clear, and consistent instruments, providing relevant information in an understandable, trustworthy way for non-professionals (Bittner et al. 2024; Dhaini and Dreksler 2024; Schünemann and Taeger 2024). The visualisation tools are intended to foster co-creation in landscape design by promoting an integrated understanding of the dynamic changes across all aspects of the environmental system. Prototypes of such tools are evolving, such as online mapping and analysis tools for the spatial integration of energy and environmental policies in England (Lovett et al. 2024). Moreover, using point cloud technology can extend experiences far beyond data representation. It provides insights into the physical interaction of abstract datasets, thereby enhancing the understanding of complex systems and facilitating a shift from information to intuition. By leveraging point clouds in this way, we can add additional layers of information on the complex interactions between urban green spaces and CO₂ levels. This approach, as highlighted in the keynote by Prof. Pia Fricker of Aalto University, Finland, moves beyond mere simulation to create a deeper understanding and immersive interaction with of the underlying principles and relationships.

An important but often neglected topic was brought to attention by Fabian Pitscheider from OPTIMUSE and TU Vienna: the consideration of costs. Operational systems for implementation in practice need to go beyond mere designing and need to demonstrate how, e.g., decarbonization of buildings can be achieved. This includes cost estimations for different design solutions and indicating their respective impact, such as CO₂ reduction. Jakub Tyc suggested a shift from local to remote computing in the design process, leveraging experts to assist designers.

There were also critical viewpoints articulated about the overabundance of technical tools and their application without a critical understanding of the underlying logic. Both keynote speakers, Prof. Bradley Cantrell from University of Virginia School of Architecture, USA, and Prof. Dr. Pia Fricker from Aalto University, Finland, emphasised the necessity of moving beyond linear technocratic approaches to address urgent environmental and societal issues. They argued for transcending the traditional human-nature dichotomy. For instance, the parameters influencing local microclimates should be regarded as significant design drivers alongside broader environmental frameworks. Prof. Cantrell outlined a framework for co-evolving and co-existing species based on an understanding of the landscape not as a static object but as a dynamic, multi-agent system requiring synchronised adaptation. He advocates for a design approach characterised by experimental yet critical prototyping, learning from the results, and continuously adjusting the design based on feedback loops. Understanding planetary boundaries is essential to shift from merely solving isolated problems to designing within the context of the entire system (Fricker and Kotnik 2023). This holistic understanding is crucial not only for practice but also for the education and training of future practitioners, as emphasized in several presentations highlighting the need for educational transformation.

The Role of Artificial Intelligence

The term “Artificial Intelligence” was heavily emphasized throughout the conference. The exploration of novel application fields of AI in landscape architecture and planning is gaining momentum, as evidenced by the increasing amount of contributions focused on this topic, a notable change from previous DLA conferences. The majority of the shared AI applications were still exploring available tools for image creation. However, there was also a recognizable shift towards a more critical evaluation of these tools and their black-box nature. Zwangleitner and colleagues (2024) introduced a design process, where generative AI tools such as Midjourney were interwoven with classic design tools such as hand sketching and 3D visualisation. Their presentation outlined how this collaborative design process with AI facilitated the exploration of creative solutions that might not have been achieved otherwise. George and colleagues (2024) demonstrated the use of AI for compiling plant lists, showing how it can automate or enhance existing processes and thereby introduce significant efficiencies. However, it was also highlighted that current generative AI tools might lead to a lack of diversity due to biases in the training data used for plant selection, underscoring the necessity of expert plant knowledge to use AI effectively.

Educational Transformation

The aforementioned issues have also led to a reconsideration of Digital Landscape Architecture Education. Specific suggestions for curriculum changes included teaching cash flows and finance to promote an interdisciplinary understanding, and equipping students with the new skill of "critical prompt crafting" for AI. However, the rethinking of design education must extend beyond these points. The need for a forward-thinking transformation was emphasised, drawing from a series of discussions that began at the DLA 2022 at the Harvard Graduate School of Design, Boston, USA, continued with a panel discussion at the DLA 2023 at the Anhalt

University, Dessau, Germany, and was further deepened in a workshop at the ETH Zurich,, Switzerland (Fricker et al. 2024). It was argued that while the digital remains an important part in education, it has to be integrated into the forward-thinking transformation as the complexity of the problems requires imbuing the digital. A framework was presented, outlining key areas for improvement and innovation within the curriculum. Additionally, the audience was encouraged to contribute examples in pedagogy regarding tools, methods and tangible references to collaboratively develop possible future trajectories.

Conclusion

In summary, the DLA 2024 highlighted the urgent need to re-evaluate the approaches and tools we use and teach in landscape design and planning to address the pressing and complex challenges posed by climate change. The conference underscored the importance of moving beyond traditional dichotomies, advocating for the integration of both analogue and digital methods to incorporate socio-economic and ecological aspects into comprehensive solutions.

A notable trend observed was the expansion of system boundaries and the emphasis on co-design, fostering new collaborations and redefining who we design with. This collaborative approach is essential for developing models that connect local and global scales. It was called for landscape architects to embrace the responsibility of defining the relevance of their field in an era marked by complex climate dynamics, urging them not to shy away from this critical task. Furthermore, this transition towards expanding system boundaries and fostering co-design prepares the ground for next year's conference theme: "Collaboration." The DLA 2025 will be hosted by Anhalt University of Applied Sciences (Prof. Dr. Matthias Pietsch, Prof. Dr. Nicole Uhrig, Prof. Trevor Sears) from June 4-6, 2025, at the Bauhaus campus in Dessau, Germany. Abstract submissions for the DLA 2025 conference are open until November 1, 2024, via the submission portal at www.dla-conference.com. We look forward to the continued advancement of research, practice, and education through the inspiring discussions and collaborations fostered at future DLA conferences.

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