Systemic Knowledge Ecologies

Data and Landscape

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All design disciplines are facing new challenges that require novel solutions in the face of changing climate conditions. The future of cities may not be determined by conventional technocratic, analogue, but rather organic, bio-digital inspired, interdisciplinary approaches that are able to continuously adapt to changing conditions.

Against this background, this work will primarily explore how current bio-inspired mechanisms can help us, on the one hand, to eliminate harmful man-made influences on an urban-landscape scale and, on the other hand, to learn to cope and live with change, which is also to be seen as a natural process. Research, Knowledge and the distribution of knowledge play a major role herein. In this work, data and its evaluation are seen as an integral part of our environments and, in terms of digital transformation, also as a design tool. The perception and transformation of data as well as our environment in real time literally changes the learned notion of urban landscape. Linked to this is the transformation and development of aesthetic paradigms.

The density of digital data generated from the analysis of environmental properties, our movements, our encounters and our behaviour, as well as human and non-human networks, is increasing as the capacity of computers, sensors and algorithms that can intelligently link this data grows. To an unprecedented extent, self-learning machines can be used to map and explore static properties as well as dynamic processes, forming the basis for progressive designs to shape the spheres of human and non-human species as well as autonomous machines. In relation to landscape, this could also mean that with the increasing density and resolution of the collected data, landscape itself will increasingly become the source as well as the carrier, indeed the very image, of digitised and humanly intellectually or even exclusively machine-transformed and shaped information. Ultimately, one could imagine that future computers will be materially composed of distributed units that smartly link biological and technical intelligences by cross-fertilising each other, having a self-sufficient energy supply or metabolism and are updating themselves according to profound analysis processes and feedback loops.

The central research question is therefore to what extent such systems, which do not operate on separate levels (hardware - software - built environment), are disruptive compared to conventional design strategies. Instead of space-consuming server farms - operated by remote energy sources - that are responsible for the storage and distribution of data, integrated, energy-autonomous data processing and storage ecologies could possibly emerge. This raises fundamental questions about the aesthetic appeal of such systemic worlds. The aesthetic logic of networks across different scales will also be examined in this context.

Based on the core topic of this "Transformed Campus" and the core area of investigation of science environments, in the field of tension between digitisation and the rapid further development of biotechnological means, also in the area of data processing and storage, for example DNA data storage in molecules, which, linked with bio-inspired computing machines, could advance to become biocomputers, as well as the future demands on physical outdoor and indoor spaces in education, science and also numerous other possible working environments, it will be examined in depth whether and how these very environments can develop into systemic, networked organisms, both materially, functionally and virtually. Last but not least, knowledge biotopes themselves, as driving institutions for the exploration and adaptation of intelligent linkages of non-human domains such as the intelligence of organisms, human models of logic and thought, and artificial forms of intelligence, are the subject of substantial change.

The intelligent linkage of biological intelligence and machine modelability may have the potential to lead environments and spheres out of anthropocentric use and at the same time make them more compatible for human and non-human species.

Against this background, how can material, spatial education and learning infrastructures be conceived and designed as a system, as an interconnected ecosystem, to bring to bear all the digital conveniences and benefits, but also to offer resilience to possible disruptions and negative developments. How can these systems live, prosper and develop in a dynamic spatial structural but also virtual way? Who are these systems meant to serve, who has control over them. We are collectors, operators and producers of data and at the same time the target of the resulting conclusions and changes. These systems ultimately form public space and its design and development is a matter of systemic, urban landscape architecture.

Research objective

All these processes form complex systems, landscapes and require aesthetic and functional design. A future, progressive design of our living environments, if they were systemically networked on as many levels as possible, be it spatial, ecological or virtual, could also deal much better with the complex future requirements. Virtual levels of reality, spaces with multisensory properties could create intuitive access as an extension of physical space to meet basic (education) but also broader needs (research, economy). It is one of the aims of this work to explore technical, aesthetic and philosophical possibilities of how and with what means to respond to all these needs in design.

> “The future cannot be predicted, but futures can be invented.” (Gabor 1964, 207)

As a goal, I see the development of aesthetic-technical tools, scenarios, strategies and perhaps material prototypes under a systemic paradigm and on a very concrete empirical basis.

Methods

The questions require an intensive examination of contemporary approaches and developments in the areas mentioned as well as an evaluation of the relevant literature and familiarisation with relevant participants and concepts. Related disciplines should not be ignored. Exploring inconspicuous areas between disciplines could also be a promising approach - those areas where, for example, geography or ecology has already ended and landscape architecture has not yet begun.

In the context of this work, new tools will be consolidated and further developed that allow us to work with complex data sets (GIS, Lidar, satellite data, Big Data, AI, robotics) in an evidence-based manner and to develop sets of aesthetic and operational strategies from them, among other things.

"Data" is at once the central element of this work and, on another level, also the basis for the material design in my project. The aim would be to develop and explore strategies for urban landscape architecture in relation to knowledge ecologies based on empirical data (and its analysis). It is a goal to develop a stringent narrative in both philosophical and aesthetic terms that does justice to the complex developments.

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