Introduction

The cover of the third issue of the Journal of Digital Landscape Architecture 3-2018 indicates the status of image resolution in landscape architecture that is currently at our fingertips. The photogrammetric point cloud was taken in 10 cm resolution with a camera mounted on an Aibotix UAV and processed with Photoscan software. The derived 3D model shows the historic area of the University of Weihenstephan-Triesdorf, and surrounding green spaces with the landscape architecture greenhouse. The survey was conducted in autumn 2017, by HSWT students under the supervision of Matthias Thoma and Prof. Dr. Silke Rossipal-Seifert.

For this edition, we have focused on the main theme **Expanding the Boundaries: Landscape Architecture in a Big Data World,** while still inviting contributions on other current issues that apply digital tools in landscape architecture and neighbouring disciplines.

This third issue contains fully peer-reviewed articles drawn from the 19th annual Digital Landscape Architecture Conference DLA 2018 held at Hochschule Weihenstephan-Triesdorf/University of Applied Sciences in Freising, Germany. It covers eleven chapters with following broad topics:

- Geodesign for Climate Change
- Mobile Devices for Geodesign
- Algorithmic Landscapes
- Augmented and Virtual Reality and Immersive Displays in Landscape Architecture
- Big Data and Landscape Architecture
- Building Information Modeling (BIM) for Landscape Architecture
- Drone & UAV Based Sensors and Near-range Photogrammetry in Landscape Architecture
- Sharing Designs through Cloud Computing and the Internet-of-Things in the Landscape
- Point Cloud Applications in Landscape Architecture and Digital 3D Scanning and Fabrication in Landscape Architecture
- Social Media in Landscape Architecture
- Teaching Digital Landscape Architecture

We hope that you will appreciate the third edition. It is first to be distributed at the DLA 2018 held from May 30 to June 2 at the University of Weihenstephan-Triesdorf in Freising. You will find all the contributions online as open access publication at the GIS.POINT and GIS.OPEN platforms of Wichmann http://gispoint.de/jodla.html

We would also like to invite you to the next DLA conference:

The 20th annual international conference on information technology in landscape architecture, Digital Landscape Architecture DLA 2019, will be held at the Dessau Campus of Anhalt University, Germany from May 23 to 25, 2019. We are especially pleased to hold the conference in Dessau in the year 2019 which marks the 100th anniversary of the founding of the Bauhaus. We do hope you will join us for this doubly significant occasion.

The Journal of Digital Landscape Architecture invites you to submit ideas for special issues and topics.

Please follow our continuing announcements and call for papers and posters at www.digital-la.de. Here you will also find the complete documentation of the DLA beginning from the year 2000.

Erich Buhmann, Stephen Ervin, Sigrid Hehl-Lange, James Palmer, Ulrich Kias, and Olaf Schroth

Editorial: Digital Landscape Architecture – 2018

Just two short decades ago – in 1998 – Google was just freshly incorporated; Apple was just on the verge of introducing the iMac, and would not introduce the iPhone until nearly another decade later; most mobile phones were Nokias, and none had cameras, or could surf the web, or send email; augmented- and virtual- reality were still science-fiction or exotic research technology; consumers did not have drones, wearable computers, or electric cars; no school of landscape architecture had a laser cutter, 3D printer, or CNC router; the term "big data" was just beginning to be used in select high-tech circles; "climate change" was not at the top of many agendas; the term "geodesign" would not be coined for another decade either; and there had not yet been a single Digital Landscape Architecture (DLA) conference!

This year, on the occasion of the 19th annual International Conference on Information Technology in Landscape Architecture (DLA), held at the Hochschule Weihenstephan-Triesdorf/ University of Applied Sciences in Freising near Munich, the conference theme is "Landscape Architecture in a Big Data world". The collected papers from the conference, from 44 authors from 17 countries, cover topics including "geodesign for climate change", "mobile devices", "algorithmic landscapes", "augmented and virtual reality", "building information modelling", "drone-based sensors", "cloud computing", "the internet-of-things", "point clouds", "digital 3d scanning and fabrication", "social media", and "teaching digital landscape architecture". Arguably, none except the last of these would have made much sense a mere twenty years ago; today, some are commonplace, and some are pressing. And all are impacting conception, design, and construction of landscapes, at many scales.

It is a truism that the pace of technological, environmental, and social change is accelerating in a logarithmic fashion – these times have been called the "exponential Anthropocene". For students, practitioners, academics, historians and researchers within and around the disciplines of landscape architecture this is no less true. These changes are harder to detect through the lens of many other establishment and industry publications – where the preoccupation, perhaps quite rightly, is with the timeless qualities of landscape, urbanism, qualities of life, environmental and visual impacts, and the primary palette of vegetation, landform, and paving and building materials; and technology is seen primarily as an enabling tool rather than a driving force, or a subject worthy of study in itself. For the many authors in this volume, and attendees at the DLA conference, the timeless qualities of good landscape design are not dismissed or ignored; but our focus is squarely on the unique power and potentials, and occasional pitfalls, of digital, algorithmic, and computational approaches, data of all sizes, big and small, and data science, along with other related and emergent sciences, media, materials, and processes. The papers in this volume range from detailed field reports and comparative studies to theoretical speculation and critical commentary, in which the multi-faceted impacts of the exponential explosion of technologies on the discipline of landscape architecture are chronicled, illuminated, and analysed.

The emphasis in this issue on "Big Data" is a sure sign of the times. Any digital approach naturally depends upon, and inevitably also generates, data in many forms. Data science is said to be currently among the fastest growing field of study in universities world-wide; due in part to the overwhelming amounts of data from the explosion of smart-phone technology, as well as from such data streams as earth-sensing satellites, telemetry from self-driving cars, sensor arrays embedded in various 'building automation' and 'smart-city' systems, and the

proliferation of measuring devices occasioned by the global blossoming of the 'Internet of Things'. Together with the demand for 'data-driven', or 'evidence-based', design and decision-making in all fields from commercial marketing to agricultural-engineering, climate-monitoring, and public health policy research, and new advances in 'machine-learning' and artificial intelligence (AI), this constellation of issues is rich with promise for landscape architects concerned with environmental impacts, social behaviours, and interconnected urban- and environmental-systems, and for a future of 'smart landscapes' no less informed than the 'smart buildings' and 'smart cities' already dotting the landscape. Perhaps we are on the way to transforming these 'big data' into 'big knowledge', for humankind's benefit …

These topics necessarily extend beyond traditional boundaries of landscape architecture (such as they may be!) and require interdisciplinary work and cooperation, as well as new vocabularies, and new techniques, and new understandings of "landscape" as well as of "architecture", "environment", etc. These new understandings and processes, including mechanical, cognitive, computational, social, and theoretical, among others, are both grounded in familiar experiences and values, and motivated by new, emergent, and tantalizing prospects. The promise of an expanded view of the domain of landscape architecture – in which, for example, machine learning fuelled by big data and multi-scalar sensing of the dynamic global environment, in harmony with AI and human designers, and involved and informed citizens, using the best available technological media, techniques, and equipment, is used to devise ways to tackle the grand challenges of planetary survival, while also celebrating the greatest of human achievements and reinforcing human values including the spiritual and the aesthetic – is explored in many (albeit often embryonic) forms, here in these pages.

Stephen M. Ervin