

# Foreword

When Anhalt University organized the first international conference on information technologies in Landscape Architecture eleven years ago, computers had just started to replace drawing boards in landscape architecture practice. Today, landscape architecture is digital, with landscape architects working digitally in all project phases, often in international and interdisciplinary working groups around the globe. Besides replacing the analogue utilities, digital work allows us to meet many more challenges in complexity of planning and design. The world of the new media offers a powerful field of creativity.

Responding to today's international landscape architecture practice, as well as to the international cooperation in software development for landscape architecture, the tenth annual Digital Landscape Architecture DLA Conference in 2009 was held for the first time outside the Anhalt campus. The local chair was taken on by the Faculty of the Built Environment at the University of Malta.

Relevant research in IT-development in Landscape Architecture is only possible when research units at universities of different disciplines cooperate with each other and with the software industry as well. The DLA conferences are providing an international platform for this exchange of research and teaching labs, for the specific CAD- and GIS- industry and for the practicing landscape architect and urban planner who are all seeking to meet the new challenges of virtual landscape architecture.

We are honored that the entire spectrum of our profession has spent so many hours of effort to document today's state of the art in the digital workflow, to share their own experiences and to point out further needs for research and improvement.

Of course, there is and will likely always be the need to sketch the main ideas for clients or staff on a sheet of paper. And it is likely that there will always be a need for thorough corrections of design and planning issues on a printed map or plan.

However, today's landscape architect needs to be able to analyze, design, review, construct and submit on screen. A growing number of professionals are close to a paperless digital workflow. Individual landscape architects working around the world connected via wireless internet access as virtual design teams is today's daily routine. A laptop, CAD, GIS and imaging software, extra-large disc space and a fast internet connection are standard tools. It is remarkable how fast we can submit large graphic files worldwide and how small, in terms of physical size, large data storage has become.

Professionals and students can take advantage of a huge amount of opportunities offered by information technologies. One of the objectives of this conference series is to present these opportunities for our special field and to try to give a forecast for upcoming opportunities. As these proceedings document, the digital landscape architecture work we can do today is outstanding. Experimenting with digital virtual worlds with algorithms can be called virtual creativity. Knowledge-based planning and design is close to being at our fingertips, even though we have speaking about it for 20 years. And combining old and new techniques is bringing out the best of both worlds.

However, there is an urgent need for more standardization for an acceptable dataflow between the different project phases and different software product needs. The landscape architecture standards have to be defined as objects in the software industry. There is the need for a single coherent database “Landscape Information Model (LIM)” standard parallel to the “Building Information Models (BIM)” that can also handle complex 3D landscape models.

So not only laptop screens being impractical on sunny days outside (at the beach or on terraces), or architects from other offices not using sufficient layer standards, but also the partially non-existing possibility of data exchange between applications and the lack of knowledge of data management for an entire project workflow need to be addressed.

This proceeding combines the blind peer-reviewed papers of the DLA 2009 and the 2010 conferences. The forty-six contributions from seventeen countries which successfully passed the full paper review document a wide range of research and education in the field of “Landschaftsinformatik”, the German term for Computer Science in Landscape Architecture. The contributions are coming from the areas of “Research and Software Development”, “Prototype Applications” and “IT in Landscape Architecture Education”.

### **Introduction**

For increased clarity, we have further arranged them into ten more defined chapters. We are very happy to start with an introduction by Prof. Carl Steinitz who, as a teacher of many educators and of some of today’s CEOs in the GIS industry, continues to influence many of us.

### **GeoDesign**

We start with some of the first articles on GeoDesign. Prof. Dr. Michael Flaxman from MIT in Boston, USA explains the long process of developing an idea for a needed software function from its inception until its final product phase. He uses his idea of a “GIS Sketching Tool“ which he developed for ESRI in Redlands, USA, as an example. Cristina de Oliveira Mattos of ESRI Germany presents very elaborate large scale GIS scenarios for the region of Munich. These had been applied by the landscape architecture office of Prof. Dr. Jörg Schaller in Kranzberg, Bavaria. Further contributions to this important dynamic two-way process between design and planning are expected in the coming years.

### **Landscape Information Models LIMs**

More research work is also needed in the area of standardization and defining Landscape Information Models LIMs. Matthias Pietsch presents the results of the project “OKSTRA Standards for Landscape Planning” by Anhalt University for the German Federal Highway Research Institute (BAST). The team of Prof. Buhmann has defined objects for landscape planning within the lifecycle of a road project. The stages from early environmental assessment to landscape construction and landscape management are defined. The industry partner for this research project was the Austrian/German company SYNERGIS. One of the findings is that only if the profession contributes to the definition of objects in the software development will landscape architecture content be part of CAD and GIS software products.

### **Knowledge-Based Landscape Architecture**

The spectrum of this research field is linking knowledge and spatial information with tools for design assisting tools. In addition to the contribution from Iran, the case studies are from all over Europe.

### **New Media Applications in Landscape Design**

With the minimizing of our computers to small interactive tablet PC's and powerful PDA, we are moving more and more into spatial data processing with mobile devices. At the same time, we can use 3D printing for our digital design and planning and we are moving towards 3D-perceptions. These new media applications offer a wide experimental field.

### **Landscape Visualization and Communication of Planning**

A wide range of excellent research papers are documented in this chapter on landscape visualisation and communication of planning. Examples of research findings with a potential for landscape architecture practice are given by keynote speaker Prof. Dr. Döllner. He is founder and Scientific Director of the initial development of the software LandExplorer, which is now being developed as a product by Autodesk. Prof. Döllner presented some current findings of his research lab focusing on 3D visualisation at the Hasso Plattner Institute, HPI of University Potsdam, Germany.

The presentations on visualisation had been complemented in 2009 with a very well-received workshop given on “Real-Time Open Source Landscape Visualization” with the new open source-based product Biosphere3D, a further contribution of the start-up company Lenné3D GmbH, Berlin and the German Konrad Zuse Institute in Berlin. We are looking forward to receiving papers on this development in the future.

### **Visual Landscape Analysis**

Among the numerous prototype applications, contributions from East European PhD candidates and young research faculty were very convincing and promising, as well as contributions from newly revised academic programs. Contributions from Corvinus University in Budapest, from the University von Ljubljana and from the University of Technology in Krakow present applications with high complexity and new developments of planning methods using modern IT techniques.

### **Sustainable Landscape Modeling and Design**

The intention for the DLA 2010 conference is to offer a platform for exchanging IT driven methods for sustainable landscape modeling. The contributions in this chapter offer an introduction to this important research field.

### **Digital Landscape Design for the Mediterranean**

The 2009 conference was held for the first time outside our own campus facilities. After 10 years we felt the need to expose our expertise to a Mediterranean country where the profession of Landscape Architecture is not yet established. With Malta we found a historically rich and ecologically fragile environment where the professionals are very eager to use new technologies to best exploit the limited resources of a small and beautiful island.



**Fig. 1:** Participants of the DLA conference, May 2009, Malta

During his welcome address, the Hon. Dr. Chris Said, Parliamentary Secretary for Public Dialogue and Information in Malta, introduced the Maltese Government's strategy for sustainable development in Malta. Describing the approach on introducing sustainable principles to the mostly rural localities gave a good introduction to the multidisciplinary task this small group of islands has to master in order to survive socially and economically, as well as ecologically. The many faces of Malta – breathtaking beauty, a grand cultural heritage, and limited and endangered landscape resources, all in a tiny area – became obvious to the participants of the conference during the evening harbour cruise and the day excursion led by Dean of the Faculty of the Built Environment, Prof. Alex Torpiano. The object of an ongoing conversion of a huge industrial port to being tourist-oriented, the Grand Harbour of Valletta is a success story, being partly driven by different models of private/public partnerships. The seven landing docks for cruise ships already allow up to ten thousand passengers a day to visit the baroque city of Valletta. The waiting list for the yacht harbours is pushing for even more place. Prof. Alex Torpiano could point out that the conversion of the enormous building substance at the waterfront is taking more time because of responding to the direct conversion to the use for yachts.

The Maltese interest in landscape architecture was documented by a number of members of the local architecture board Kamra Tal-Periti KTP, which especially came to the public lecture held within the DLA 2009 conference, on current international landscape architecture projects of Prof. Rainer Schmidt, Beuth University in Berlin.

It remains to be seen how the smallest member of the EU will keep the balance between preservation of its tremendous cultural heritage sites and the principal need for sustainable development of the islands. However, the Maltese showed landscape architects from around the world that despite its small population, Malta has valuable Human Resources. The Maltese have proven over the centuries that they adapt well to new challenges. As Malta won the hearts of all the conference participants, they will hopefully come back and see further implementation of the government's sustainable strategies.

We would like to thank all of the authors, reviewers, moderators and keynote speakers for their great efforts and contributions. A special thank you has to be given to our local conference partners, to Prof. Alex Torpiano, Dean of the Faculty of the Built Environment at Malta University; to the Kamera Tal-Perit (KTP) and their President Vincent Cassar; to the Mapping Unit of Malta Environment & Planning Authority (MEPA); and the Malta Association for Geographical Information (MAGI). We also thank the Parliamentary Secretary Hon. Dr. Chris Said from the office of the Prime Minister and the Grand Harbour Regeneration Corporation Plc (GHRC) for their valuable assistance.

### **Teaching Digital Landscape Architecture**

Robert Watson, University of Greenwich, was one of the excellent speakers lecturing on IT teaching in landscape architecture. He presented a summary of how education in computer application has evolved over the last 15 years. Considering the fact that, today, IT tools are an integral part of all landscape architecture work, specific IT-techniques should be taught in all lectures and in all studios. Had been there one subject necessary 15 years ago, such as “CAD in Landscape Architecture”, then today there is a need for an IT-introduction in all Landscape Architecture courses throughout the entire curriculum. The DLA 2011 emphasis on “**Teaching & Learning with Digital Methods & Tools**” will give a chance to define and exchange best practice models.

### **DLA AWARDS and Poster Submission**

We are gladly publishing the names of the awarded colleagues with outstanding contributions during the 2009 conference. The awards which we present during the 2010 conference will be published in the next proceedings.

We are also very happy to present authors and titles of some 50 poster contributions, both from the professional side and from students from following countries, in order of number of contributions: Turkey, Germany, United States, Canada, Switzerland, Costa Rica, Latvia, and United Kingdom.

This poster will be posted together and the images of the conferences at [www.digital-la.de](http://www.digital-la.de). There you are also able to find the DLA conference archive of the last ten years. You can also find contributions in the 2009 preliminary proceedings, which due to the time-consuming process of peer review, could not be included in this publication.

Furthermore, it is our intention to also publish there the contributions of German speaking authors in German as well.

### **Board of Committee Contributing to the DLA Conference**

This conference is the eleventh in a series of conferences headed by Scientific Director Prof. Erich Buhmann and his research group “Landschaftsinformatik” at Anhalt University of Applied Sciences. These conferences were organized first in cooperation with the keynote speakers and the LE:NOTRE working group Information Technology. As documented in the closing chapters, a formal DLA Program Committee has been established for the further scientific development of this international conference series. Members of the DLA Program Committee will also serve as local chairs for further DLA Conferences. More than fifty experts are working at the moment on the DLA Review Board. At the General Assembly Meeting of the 2009 ECLAS Conference, the LE:NOTRE working group Information Technology was additionally established as ECLAS Committee

Digital Technology. Therefore, The DLA conference will always focus on the ECLAS needs for improvement of teaching digital methods.

We would like to thank all of the authors, reviewers, moderators and keynote speakers for their great efforts and contributions.

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To all of them thank you for work, once again, above and beyond the call of duty!  
And a big thank you to all our families for their patience and support.

Aschersleben, as host of the Saxony-Anhalt State Garden Show 2010: "Natur findet Stadt" and as important partner of the International Building Exhibition IBA 2010 "Stadtumbau", the Bestehornhaus and its team, are wonderful hosts for this eleventh international conference!

**The next conference will be held 26 – 28 May, 2011 in Dessau** and at the Bernburg Campus, Germany parallel to the ECLAS/LE:NOTRE Summer School 2011. As the Summer School will focus on Teaching, the DLA 2011 will have "**Teaching & Learning with Digital Methods & Tools**" as the main theme.

The call for papers is available on the last page of these proceedings and at [www.digital-la.de](http://www.digital-la.de) and DLA conference 2011.

Abstracts for 2011 need to be submitted by December 1, 2010.

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