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DIGITAL PHYSICALITY

Edited by Henri Achten, Jiří Pavlíček, Jaroslav Hulín, Dana Matějovská

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Volume 1

Digital Physicality

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Volume 1

Digital Physicality

Proceedings of the 30th International Conference on Education and research in Computer
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Czech Technical University in Prague, Faculty of Architecture

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Edited by
Henri Achten
Jiří Pavlíček
Jaroslav Hulín
Dana Matějovská

Theme

Digital Physicality

Digital Physicality is the first volume of the conference proceedings of the 30th eCAADe conference, held from 12-14 september 2012 in Prague at the Faculty of Architecture of Czech Technical University in Prague. The companion volume is called Physical Digitality. Together, both volumes contain 154 papers that were submitted to this conference.

Physicality means that digital models increasingly incorporate information and knowledge of the world. This extends beyond material and component databases of building materials, but involves time, construction knowledge, material properties, space logic, people behaviour, and so on. Digital models therefore, are as much about our understanding of the world as they are about design support. Physical is no longer the opposite part of digital models. Models and reality are partly digital and partly physical. The implication of this condition is not clear however, and it is necessary to investigate its potential. New strategies are necessary that acknowledge the synergetic qualities of the physical and the digital. This is not limited to our designs but it also influences the process, methods, and what or how we teach.

The subdivision of papers in these volumes follow the distinction made in the conference theme. The papers in Digital Physicality have their orientation mainly in the digital realm, and reach towards the physical part. It has to be granted that this distinction is rather crude, because working from two extremes (digital versus physical) tends to ignore the arguably most interesting middle ground.

Henri Achten, Jiří Pavlíček, Jaroslav Hulín, Dana Matějovská

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Acknowledgements

The 30th eCAADe conference in Prague is the result of a three year journey that started after attending the 2009 Istanbul conference, where we got inspired to also organise a conference. Many people have enabled us to make this aspiration come true. We hope to mention all of them here.

First of all, we would like to thank the dean, Zdeněk Závřel, for his immediate support after we coined the idea in a meeting. Together with faculty secretary Jana Tóthová and her team: Eva Vrátilová, Hana Novotná, and Lucie Skružná, we gained the support that made it possible to produce a successful bid and make the conference reality.

The eCAADe council was supportive throughout the whole process and helped with all aspects of the organisation. Knowing that we could always rely on good advice or help was very reassuring for us as conference organisers. Both acting presidents - Wolfgang Dokonal and José Duarte - and Bob Martens and Johan Verbeke were in particular helpful with many issues in the process. Martin Winchester made sure we could always rely on the OpenConf system to run smoothly and reliably. Nele de Meyere and Maaïke Waterschoot were always ready to advise with administrative questions.

We got a lot of support and advice from the previous conference organisers—Tadeja Zupančič, Anja Jutraž, Špela Verovšek, and Matevž Juvančič—and valuable pointers from Rok Grdiša to get InDesign to do what we needed.

Financial support was generously provided by the sponsors Autodesk and Bentley, and we also secured support from the Rector's office of Czech Technical University in Prague. The Czech Chamber of Architects supported the event as well.

After the Call for Extended Abstracts and closing the OpenConf system we were facing a record amount of 319 submissions. We want to thank all the authors who submitted and presented at the conference, and all the session chairs who lead the presentations. In total 106 reviewers helped us to assess all submissions. The list of reviewers is included after the keynote speakers section.

Our initial team of two was extended by many capable people. Vanda Rihová acted as registration secretary. Jiří Pavlíček and Jaroslav Hulín processed a major part of the proceedings. Lukáš Kuriš helped out with the workshops. Martin Odehnal secured the website and helped with the design of the conference pages. From the faculty we furthermore want to thank the IT-team, Jiří Fůska, Jiří Fůska, and Daniel Zahradka, for their help with IT-matters, and all the students who assisted throughout the conference.

We were very grateful to have as confirmed keynote speakers at the conference one of the foremost Czech architects, Eva Jiřičná, and one of the most prominent Czech AI and design researchers, Jiří Bíla, to provide their views to the conference. John Gero kindly accepted the invitation to be keynote speaker to discuss past and future.

Finally, we want to thank our partners—Gabriela Achtenová and Lukáš Matějovský—and our families for their support and patience while we were spending late hours organising, reviewing, editing, and trouble shooting during the past three years.

eCAADe 2012 Conference chairs
Henri Achten and Dana Matějovská

Keynote speakers

Eva Jiříčná

Eva Jiříčná is the founder of Eva Jiricna Architects. She is a Czech born architect who has been based in London for over 30 years. The London office currently employs twelve architects and designers, with a satellite office operating in Prague. Jiříčná's long experience started with a job at the Greater London Council on her arrival in the UK in 1968 followed by the Louis de Soissons Partnership working on Brighton Marina for 10 years, and the Richard Rogers Partnership, where she was responsible for the interior design packages for the Lloyds Headquarters building. With Jan Kaplicky and his practice Future Systems, she designed the Way In store at Harrods, an award winning scheme that influenced a generation of retail interiors, and which enabled her to start her own practice. Over the last decade, Jiříčná's contribution to architecture and design has been recognised with personal awards, including being made a Royal Designer for Industry (RDI), a CBE (Commander of the British Empire), election as a Royal Academician by the Royal Academy of Arts, and Hon Fellow A.I.A. (American Institute of Architects). She holds honorary doctorates and professorships in several Universities, participates on international juries (e.g Darwin Centre at the Natural History Museum, new Arts wing for Goldsmith's College, London), and lectures internationally on her work.

Jiří Bíla

Jiří Bíla is Full Professor at the Department of Instrumentation and Control Engineering (Head in years 2005-2009), Faculty of Mechanical Engineering, in Czech Technical University in Prague (Vice-rector in years 2006-till now). He was in study and lecture visits in Technological Institute Linköping (Sweden), in L.A.A.S., Toulouse (France), in University La Sapienza, Rome (Italy), in Technical University of Wien and in institute GOPA, Bad Homburg (Germany). The kernel of his scientific activities is in: - artificial intelligence and neural networks in modeling and control, - qualitative modeling of ill defined systems, - modeling of ecosystem functions and - computer support of the synthesis of technical systems (including conceptual design). He is author and co-author of 5 books and over 300 conference and journal papers (1972-2011).

John S. Gero

John Gero is Research Professor at the Krasnow Institute for Advanced Study and was formerly Professor of Design Science and Director, Key Centre of Design Computing and Cognition at the University of Sydney. He is the author/editor of 50 books and over 600 research papers the fields of design science, design computing, artificial intelligence, computer-aided design, design cognition and cognitive science. He has been a Visiting Professor of Architecture, Civil Engineering, Cognitive Science, Computer Science, Design and Computation or Mechanical Engineering at MIT, UC-Berkeley, UCLA, Columbia and CMU in the USA, at Strathclyde and Loughborough in the UK, at INSA-Lyons and Provence in France and at EPFL-Lausanne in Switzerland.

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DIGITAL PHYSICALITY

vol. 1

Digital Physicality is the first volume of the conference proceedings of the 30th eCAADe conference, held from 12-14 September 2012 in Prague at the Faculty of Architecture of Czech Technical University in Prague. Physicality means that digital models increasingly incorporate information and knowledge of the world. This extends beyond material and component databases of building materials, but involves time, construction knowledge, material properties, space logic, people behaviour, and so on. Digital models therefore, are as much about our understanding of the world as they are about design support. Physical is no longer the opposite part of digital models. Models and reality are partly digital and partly physical. The implication of this condition is not clear however, and it is necessary to investigate its potential. New strategies are necessary that acknowledge the synergetic qualities of the physical and the digital. This is not limited to our designs but it also influences the process, methods, and what or how we teach.

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