

CRAFTSMANSHIP IN THE DIGITAL AGE

Architecture, Values and Digital Fabrication

#data-driven planning #digital tools #prototypes #design
process #materials #natural resources & energy

A series of discussions and workshops on the potential of
digital technologies to trigger innovative responses in the
design and making of architecture

2017

with ANCB Research Partners

**The Netherlands Embassy in Berlin, NOWlab@BigRep and
Forschungsinitiative Zukunft Bau (BBSR)**

INTRODUCTION AND AIMS

Craftsmanship in the Digital Age invited established manufacturers, proponents of newer digital production tools, architects, and building industry representatives, to co-articulate a craftsmanship approach to incorporating digital fabrication into architecture.

Rather than seeing digital tools as incongruous with craftsmanship, **Craftsmanship in the Digital Age** proposed that they could in fact strengthen certain skills and principles characteristic of craftsmanship with benefits for architecture and manufacturing, including; more effective building materials and spatial typologies, a closer working relationship between architects and manufacturers, and an assertion of critical values for the building industry at this point in history.

Delivered as series of five discussions and workshops, **Craftsmanship in the Digital Age** showcases from the present-day studio, factory, laboratory and building site, while simultaneously exploring a future blurring of these work spaces and their products.

EVENTS

Craft in Code 18 December 2017

With reflections from Richard Sennett, author of 'The Craftsman' and its provocation that "we are obliged to change both the things we make and how we use them...to become good craftsmen of the environment"; and with focused discussion on three core themes of the emerging 'digital building culture', the alternative building process and practice it demands, and the prospects offered for socio-politically and environmentally responsible architecture.

on Alternative Sketch to Site Processes 10-11 November 2017

the digital era is enabling the emergence of new structures for managing the communication chain in the building process, -e.g.- BIM. Which frameworks include the manufacturers of building components and allow for closer communication with the architect - between the sketch and the finished component?

on Values for Architecture and the Building Industry 15 September 2017

identifying the societal responsibilities which digital fabrication could assist the building industry in addressing: e.g. commitment to efficient use of depleting natural resources, and public finances; halting the seemingly unstoppable march of mass production and mass importation of products; protection of knowledge and welfare of manufacturing work force to keep pace with technological automation.

on Innovative Building Components 21-22 April 2017

exploring the merits and challenges of the spectrum of additional functionality digital fabrication can add to building components, beyond the aesthetic and structural; e.g. biodegradability, embedded energy, data-driven responsiveness

on Architecture, Materiality and Technology 3-4 February 2017

tracing over time the relationship between design and making, and the evolution of the architecture process, up to the present day moment when the scope of materials can be considered in combination with the potential of digital technology.

FORMAT

Friday Evening **Public Debate 5:30 pm - 8:30 pm**

at **ANCB The Aedes Metropolitan Laboratory**, Christinenstr 18/19, 10119 Berlin

with 2 Keynote Talks: *Perspectives from Research and Practice*, 2 Impulse Talks: *Perspectives from Manufacturing and the Building Industry*, followed by Panel Discussion

Saturday **Workshop 10am - 5pm**

at **NOWlab@BigRep**, Gneisenaustr 66, 10961 Berlin

aimed at identifying ways around the critical obstacles raised in the Public Debate; involving Keynote and Impulse Speakers, architecture practices, and representatives of building industry regularity bodies

BACKGROUND

A Craftsmanship Approach to Integrating Digital Fabrication Into Architecture

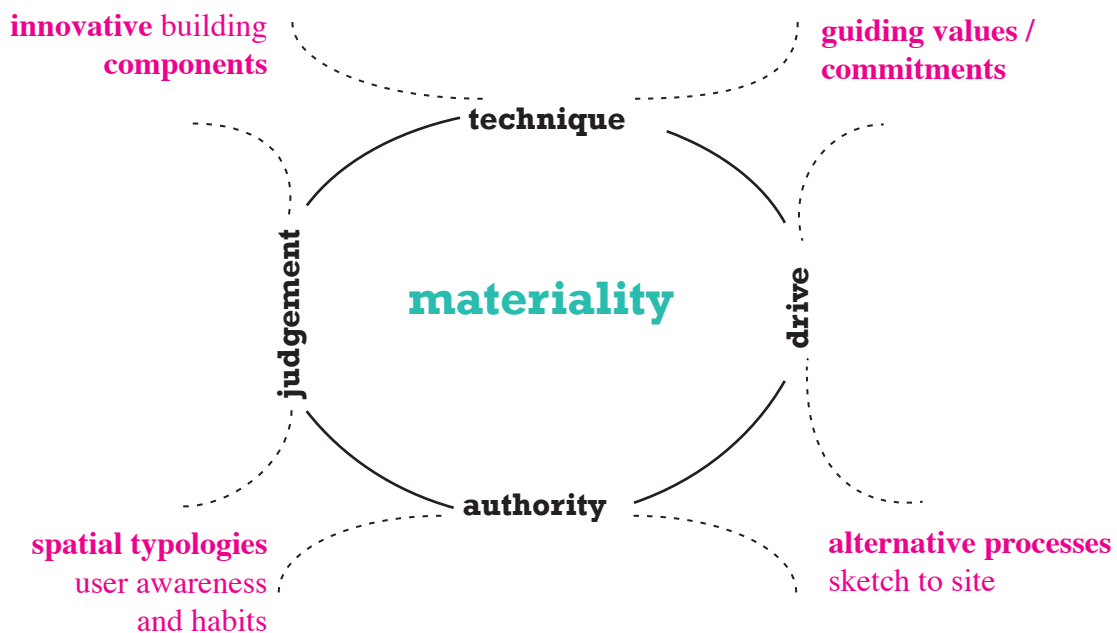
The core premise of this proposed approach is that digital fabrication can reinstate materiality at the centre of architectural design thinking. At the computer-aided-design end of the design-tools spectrum, it enables information about how a spatial form will be constructed to be fed into computational design tools, thus counter-balancing an emphasis on formal expression. At the opposite end of the spectrum, digital fabrication can support the return of techniques (e.g. casting) and aesthetic articulation (e.g. ornamentation) that are usually too expensive.

Materiality is central to craftsmanship. Described simply, it is the bridge between the hand and the head which both demands and hones skills of craftsmanship; namely technique, judgement, authority and commitment/drive. What sets architecture apart from most other design fields is the complex, indirect and drawn-out journey between the idea in the studio and its realisation on site. Despite the head-to-hand relationship being mediated by algorithms and by the limitations of the fabrication machine, working with digital tools and techniques theoretically offers potential to shorten and simplify the studio to site process, and perhaps to think of site in term of workshop. This materiality depends too on masterful technique, judgement, authority and commitment/drive.

Learning these skills, like with any skill, is influenced by the defining particularities of the practice realm - guiding positions and emphases, ways of working, and product range/type. Certain such cornerstones are required to anchor digital fabrication in architecture practice, and the effort and practice of putting these in place will simultaneously develop and reinforce the aforementioned core craftsmanship skills:

- New/ alternative design to construction processes, with 'data' underpinning the communication chain. This supports commitment/ drive towards sustainability and curatorial authority
- Commitment to efficient use of material. This encourages drive towards sustainability in construction, and advances technique by exploring formal expressions/prototypes for efficient structural dynamics.
- Development of innovative/inventive building components/products, with expanded functionality beyond the aesthetic and structural. Dependent on technique and experienced judgement.
- Design of spatial typologies and elements that cue change of use habits and ways of living. Requires and further refines the authority/expertise and judgement of the architect.

Perhaps the expertise described here fits less to the architect we know today, than to a new type of craftsman for buildings and spaces, committed to the collective societal goal of the sustainable use of the earth's resources.



PARTICIPANTS

December 2017 Craft in Code Urs Füssler, Association of German Architects, Berlin; **Erhard An-He Kinzelbach**, Professor of Architectural Design and Building Construction, Bochum, University of Applied Sciences / Founder KNOWSPACE, Berlin; **Jan Krause**, Head of Master Architecture Media Management, Bochum University of Applied Sciences / Head of Strategic Marketing, Sto SE & Co. KGaA, Stühlingen; **Kristjan Nielsen**, Engineer, Arup, Berlin; **Norbert Palz**, Professor Digital and Experimental Design / Vice Dean Design Faculty, Universität der Künste Berlin; **Jürgen Paul**, Managing Director, BauNetz Media, Berlin; **Sven Pfeiffer**, Researcher, Digital Architecture Production, Technische Universität Berlin; **Andrea Pfeil**, Architect, German Federal Ministry for the Environment, Nature, Conservation and Nuclear Safety (BMUB), Berlin; **Richard Sennet**, Centennial Professor of Sociology, London School of Economics; **Léon Spikker**, Founding Partner, Studio RAP, Robotics Architecture Production, Rotterdam; **Frans Vogelaar**, Hybrid Space Lab, Berlin, Academy of Media Arts/Kunsthochschule für Medien, Cologne; **Monika Thomas**, Architect and Director of Building, German Federal Ministry for the Environment, Nature, Conservation and Nuclear Safety (BMUB), Berlin

November 2017 on Alternative Sketch to Site Processes Urs Füssler, Association of German Architects, Berlin; **Harald Kloft**, Director, Institute for Structural Design, Technische Universität Braunschweig / Office for Structural Design, Frankfurt am Main; **Jan Krause**, Head of Master Architecture Media Management, Bochum University of Applied Sciences / Head of Strategic Marketing, Sto SE & Co. KGaA, Stühlingen; **Martin Pauli**, Senior Architect, Arup-Foresight, Research & Innovation, Berlin; **Sven Pfeiffer**, Professor, Digital Architecture Production, Technische Universität Berlin; **Florian Scheible**, Berlin Chamber of Architects / Director, Knippers Helbig Advanced Engineering, Berlin; **Kjetil Trædal Thorsen**, Founding Partner, Snøhetta Architects, Oslo; **Raghunath Vasudevan**, Head of Parametrics, Schneider & Schumacher Architects, Frankfurt am Main

September 2017 Resetting Values for Architecture and the Building Industry Frank Heinlein, Werner Sobek Group, Stuttgart; **Francine Houben**, Founding Partner and Creative Director, Mecanoo Architects, Delft; **Monique Ruhe**, Counsellor and Head of Department for Culture and Communication, The Netherlands Embassy in Berlin; **Martin Tamke**, InnoChain ETN Network / Centre for Information Technology and Architecture (CITA), Royal Danish Academy of Fine Arts, Copenhagen; **Monika Thomas**, Architect and Director of Building, German Federal Ministry for the Environment, Nature, Conservation and Nuclear Safety (BMUB), Berlin; **Sebastian von Oppen**, Berlin Chamber of Architects

April 2017 on Innovative Building Components Lothar Fehn Krestas, Director for Building Construction and Industry, German Federal Ministry for the Environment, Nature, Conservation and Nuclear Safety (BMUB), Berlin; **Fabio Gramazio**, Founding Partner, Gramazio Kohler Architects and Chair of Architecture and Digital Fabrication, ETH, Zurich; **Carsten Hein**, Associate Director Structural Engineering, Arup Berlin; **Manuel Kretzer**, Visiting Professor in Digital Crafting, Braunschweig University of Art and Founding Partner Responsive Design Studio, Cologne; **Gesine Last**, Design Team, Fraunhofer Center for Responsible Research and Innovation, CeRRI, Berlin; **Kas Oosterhuis**, Professor of Digital Design Methods, Director of Hyperbody Research Group, TU Delft and Founding Partner, studio ONL, s-Gravenzande; **Andrea Pfeil**, Architect, German Federal Ministry for the Environment, Nature, Conservation and Nuclear Safety (BMUB), Berlin; **Wolfgang Rieder**, CEO and Founder, Rieder Group, Maishofen; **Christiane Sauer**, Founding Partner Raum und Material – Lüling Sauer Architekten, Berlin and Professor of Material-Design in Spatial Context, Weissensee Art Academy Berlin; **Florian Scheible**, Berlin Chamber of Architects, Working Group on Digital Planning and Building, and Director Knippers Helbig Advanced Engineering, Berlin

February 2017 on Architecture, Materiality and Technology Guido Biessen, Head of Economic Department, The Netherlands Embassy in Berlin; **Mario Carpo**, Reyner Banham Professor of Architectural History and Theory, the Bartlett, University College, London; **Norbert Palz**, Professor Digital and Experimental Design / Vice Dean Design Faculty, Universität der Künste Berlin; **Carin Schirmacher**, PhD candidate Architecture Culture (History and Theory of Architecture), State Academy of Fine Arts in Stuttgart; **Léon Spikker**, Founding Partner, Studio RAP, Robotics Architecture Production, Rotterdam; **Nathalie Swords**, Product Developer at Arup, Berlin; **Ben van Berkel**, Founder and Principal Architect, UNStudio, Amsterdam; **Hilco Vos**, International Business Developer Architectural Ceramics, Koninklijke Tichelaar Makkum; **Tobias Wallisser**, Co-founder, LAVA (Laboratory for Visionary Architecture), Berlin / Professor of Innovative Construction and Spatial Concepts and Vice-President at the State Academy of Fine Arts in Stuttgart

COLLABORATORS

BBSR Helga Kühnhenrich, Head of Division, Research in Building and Construction, Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR), Bonn; **Arnd Rose**, Researcher, Division for Research in Building and Construction, German Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR), Bonn; **Netherlands Embassy in Berlin Tom Maasen**, Cultural Attaché, The Netherlands Embassy in Berlin, **NOWLab@BigRep Jörg Petri & Daniel Büning** Founding Partners, **ANCB Áine Ryan** Project Curator, **Hans-Jürgen Commerell** Director

Project Curator: Áine Ryan, **Project Curator**, ANCB The Aedes Metropolitan Laboratory, Berlin

Moderators: Daniel Büning and Jörg Petri, Co-founders, NOWlab@BigRep, Berlin

Part of the ANCB Theme

RESPONSIVE CITY: Combining Local Knowledge with Digital Systems

Municipal decision-making and user experiences of cities are steadily relying more and more on digital computing of geodata; information linked to latitudinal and longitudinal coordinates. The advancement in digital technology that makes capturing and real-time analysis of this and other 'big data' possible is also enabling the production of entirely new types of basic and so-called 'smart' or responsive materials. Both promise revolutionary and innovative impacts on the functioning and on the form of cities, often in the name of greater resilience or sustainability.

So far, in practice, efforts have mostly produced apps and systems for monitoring, measuring and analysing quantifiable data. Comparatively little has been achieved to harness the more qualitative, analog information that is so fundamental to cities, and equally critical in achieving resilience and sustainability.

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