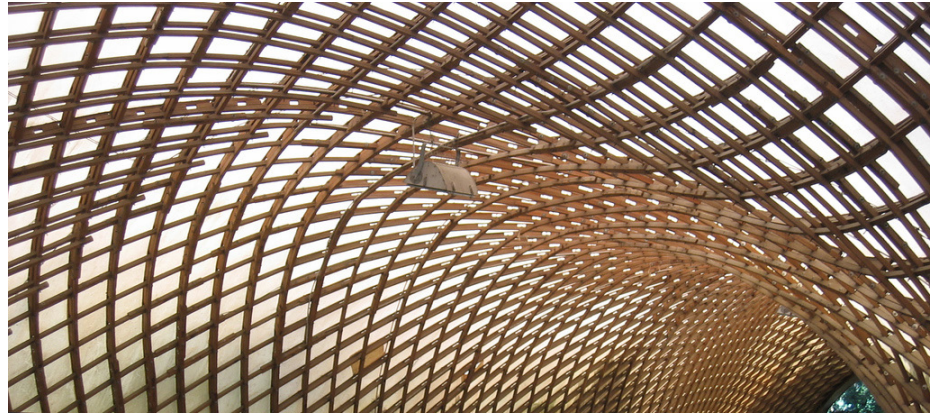


*Multihalle Mannheim by Frei
Otto utilizing the flex of wood*



Workshop – Encoded Behavior

*December / January 2009
Royal Academy of Fine Arts,
School of Architecture, The
Red House*

Workshop with
Paul Nicolas, Martin Tamke,
Jacob Riiber
and Department 8

The ubiquitous use of computation in design, construction and fabrication of architectures forces the profession to rethink its approaches. When previously the drawing of architects remained abstract and needed reinterpretation through the subsequent (and thus often understood as subordinate) engineers and craftsman for making a building, today's technology allows a direct instruction of the build. Yet these attempts are often rendered unsuccessful as the design system itself doesn't know anything about the consequences of the instruction it gives. The digital stays disconnected to the knowledge and experience of the processes participant. This is especially true on the nature of material, which is not the least introduced as homogenous matter with linear behaviour ready for use in industrialized context.

The workshop asks how material behaviour can be introduced into architectural design and which consequences this has on design. The workshop focuses on the behaviour of material in larger arrays and how one can design and steer these.

Workshop approach

Knowing about the complexity of materials and the limitations in simulating their behaviour, we will start our investigation with processes of physical modelling. These 'Material Probes' will be a key means for directly identifying and gaining knowledge of material properties and behaviours. We will then investigate how parametric tools can support the encoding and activation these performances to inform and even drive geometric design models. Throughout our investigation we will be comparing physical and digital outcomes, and through several iterations will develop systems that facilitate a direct interaction with design intent.

Design Task

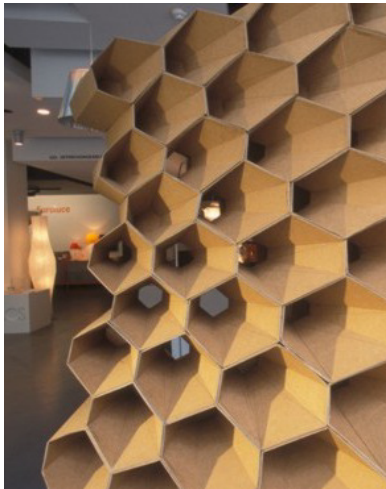
The workshop focuses on the exploration of structures which utilise material behaviour to mediate light and view in innovative ways. Shading, direct, indirect light as well as the visual impact of open or inhibited lines of view are considered. The programmatic setting will develop from within the investigations, by which a wide range of applications beyond shading devices, screens, canopies or building facades can be addressed. Priority will be given to the fast implementation and evaluation of material feedback loops, with the aim of gaining a deep working knowledge of material capacities

and tendencies, and of their potential to mediate relationships between design intent, context and performance.

Performative Extensions: Light and Structure.

To explore the means by which material behaviour might inform and extend processes of design exploration, we will lastly look to link flexible digital models to the concepts of performance analysis, evaluation and adaptation. By re-purposing optimisation techniques as generative design instruments, students will examine how material properties and solar exposure analysis might in combination actively guide design generation through the concept of performance. Our aim will be to take parametrically defined material systems, to some extent cognisant of their own material tendencies and capacities, and to then seek good solutions to the problem of shading from within this range.

In keeping with the broader architectural nature of this investigation, this part of workshop will focus upon generative and integrative potentials, and upon ‘aptimised’ design rather than strictly ‘optimised’ solutions. A means for utilising an algorithm for simulated annealing within Grasshopper will be provided.



Screen by Paul Nicholas in mesne.
www.mesne.net

Techniques and Materials

The necessary tools and techniques will be introduced within the workshop in December. They are developed before by the team. Further developments, adaption to the student’s projects and refinement will happen within the workshop.

The parametric environment Grasshopper for Rhino will be within the focus of the workshop is already introduced within the student body. The workshop will capitalize on this knowledge and further this by introducing tools for calibrating and monitoring, bend, curvature and other component and array properties.

Groups will investigate and develop individual systems consisting of mono or composite materials. The aim is to investigating and build self supporting components, being able to modulate light. These are tested and encoded. Their assembly is developed and an underlying pattern structure encoded. This code can be a direct link to fabrication or a generated notation informing the manual crafting of the pieces.



Paul Cambon – flexed veneer

Schedule

The design task might be answered within the December workshop or being continued to the end of the semester. A special workshop for individual inquiries and in-depth counselling can happen in the beginning of January. Design chits in persona or via video-conference are as well considered. A final review will be conducted together with Paul Nicholas and Mark Bury on Video conference.

2.-9. December	Workshop with Paul Nicolas
December	Crits and individual development of the projects
24. December	Christmas
31. December	New Year
13.-15. January	Workshop with Paul Nicolas
End of January	Handing in of Projects and Final Crit with Mark Burry