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richard horden

micro architecture

ltdedition

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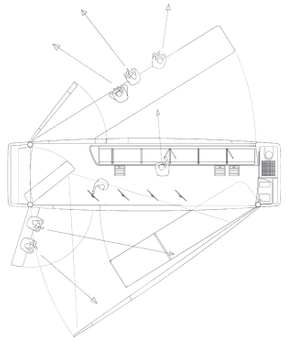
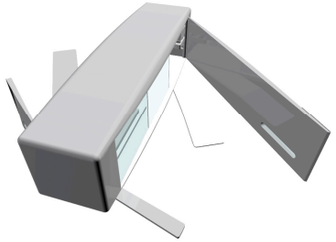
micro architecture I studio + projects

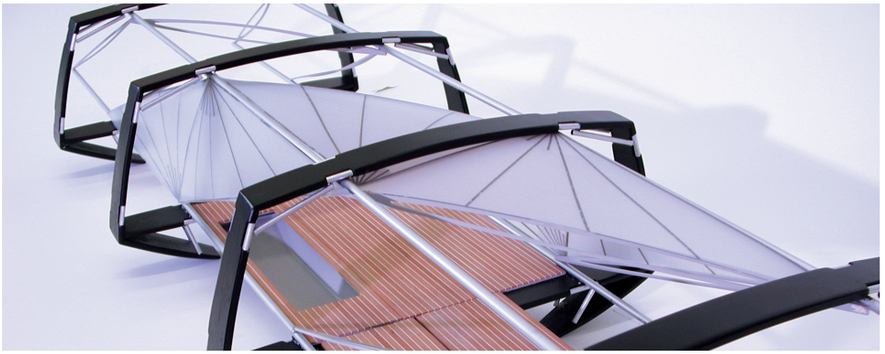


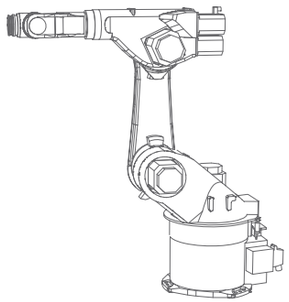


knowledge transfer

As a teacher at a university architecture department I am often dealing with questions like, ‘what is complex 3D conceptual design?’, and ‘how do we communicate it?’. The study of these questions is producing a huge variety of complex spatial ideas. In developing designs many different aspects have to be considered such as functional, constructive and creative parameters. These different requirements for the design cannot be executed step by step; they involve overlap and interlock. The method of resolution for such tasks requires a certain integral ‘concurrency’. Naturally young students cannot immediately cope with this complexity, so many aspects have to be factored out in the initial stages. Still, the consequences of basic decisions in the conceptual design are not always obvious, for instance those concerning human factors. The flaws in the original concept may only show up much later in the design and production process. Richard Horden approaches the teaching of architecture in another way. He prefers to offer small and unconventional tasks that cross the border between product design and architecture to lead to sustainable and adaptable architectural concepts. Students learn to create a conceptual design continuously from detail through to the completion of the entire form. Understanding architecture as a product helps them to loosen former cultural fixes and established ideas of architecture. Classically, architecture is primarily concerned with creating a unique, one-off prototype, while product design is intended for mass production and duplication from the beginning, and is therefore more concerned with issues of weight, transport and methods of production. Traditionally built architecture has a predetermined function at a certain place; it is fixed and relates to a defined environment. Products are developed for different situations at different places. The design process for the students is thereby defined by iterative development as it is within product design. Using an analytical approach to find new, effective concepts has become the architectural challenge of our time.

this page:
student project 2001
‘Carbon-fibre House’,
M. Pektor, C.
Roettinger
opposite page:
student project 2004
art lab (above),
P. Sturmhofer
J. Pietraszewski;
student project 2000
living scape, H. Friese,
D. Payer





Tasks related to the field of product design are also a very important topic at Lehrstuhl für dreidimensionales Gestalten (Three Dimensional Design), at TU Vienna. However, the focus is slightly different, and our main concern is to deal with complex geometries which are a matter of course in product design for ergonomic and stylistic reasons. New analysis and computer programmes have also inspired more complex forms in architecture, so that soon rectangular geometric restrictions will no longer be the accepted norm in the built environment. Product designers create their own illustrative techniques and proceedings for complex geometries and even their own linguistic and semantic repertoire. This know-how can also be used by architects to produce more open forms and to control them. Computer software simplifies the production of such new forms at first but their quality can only be proved and evaluated in physical reality. Computer-controlled manufacturing methods such as milling and cutting techniques, and stereoscopic prints offer the ability to create physical samples out of virtual, computer-generated samples. For this purpose we are establishing with the appropriate equipment, the 'v2r-lab' (virtuality to reality laboratory). The sample object produced in this workshop should not only represent a fixed form at its final stage, it should also function as a working model still open for changes. Therefore we are designing a computer-controlled foam-laying machine at present. This will give the students the opportunity to produce quick models to be worked over manually and to explore different shapes during the design process. To integrate manual and CNC manufacturing techniques we use 3D laser scanners to feed manually worked-over models back into the digital design. The students will then be confronted with the file-to-factory process in which their own drawings will be used directly to produce units. These techniques will be increasingly important for creative control and for the realization of complex geometries both in academic situations and in architectural practice.

this page:
digitizer, micro scribe gx2 (above); student project 2008, 'secret form', B. steiner, R. steffek

opposite page:
7 axis milling robot kuka kr 60 ha (above); student project 2008, 'secret form', E. Hofstetter, S. schopf