



responsive architectures

subtle technologies

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Edited by

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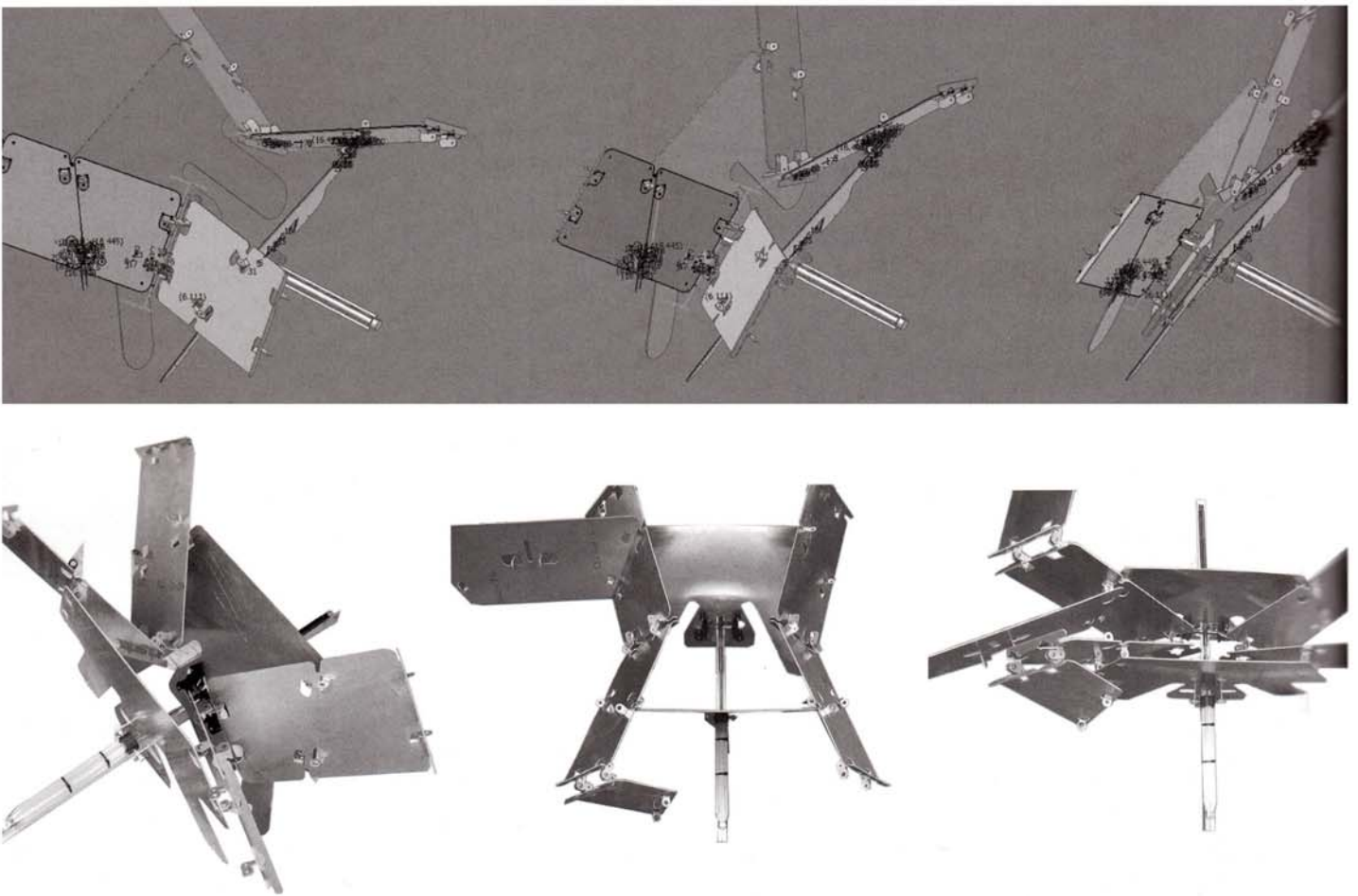
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Riverside Architectural Press



1 Digital representation and analogue realisation of a simple mechanism.

Digital Representations, Analogue Realisations

Phil Ayres

sixteen*(makers)

Architecture School of Århus



2 Digital simulation of a possible artefact comprising tessellated mechanisms responding to environmental change.



3 Spatial conditions in the forest reveal themselves through the actions of forest management. Established microclimates are eradicated, new ones emerge.

New techniques of representation and construction have recently been introduced to architecture. Computer aided design and computer aided manufacture (CAD and CAM) bring the world of manufacturing to the designer. But rather than establishing a form of neo-medievalism, these technologies permit a reappraisal of design as an iterative process with a linear trajectory towards 'the constructed'. The potential exists for design to become a circular iterative process in which 'the construct' can feed local environmental and performance data back to the digital representation, the representation can then be modified, and the construct 'remade'.

An 'architectural residency' in the Kielder Forest, Northumberland, UK, is the site of a case study exploring these issues. The forest territory is a vast landscape undergoing constant flux, governed by a cycling 50 year management strategy that orders the planting, maturation, and harvesting of each forest plot. Highly localised microclimates arise out of the many conditions ranging from complete exposure to dense canopy. (*image 3*) The cognitive psychologist Herbert Simon proposes that 'complexity' emerges from the interaction of a simple mechanism with a complex environment.¹ Because the Kielder Forest is an ever changing environment, it becomes a valuable resource for exploring the notions of novelty, complexity, and adaptation, which are part of a design paradigm that creates a circular relationship between digital representation and analogue realisation.

Simple mechanisms have been manufactured, are ready to be placed in the landscape, and data from their interactions gathered. The data will be fed into a digital model, which is beginning to exhibit complexity from the low level interactions of the mechanisms. We anticipate the results of the first iterative cycle this year. (*image 1, image 2*)

By considering the design process as continually cycling between the analogue and the digital, we might imagine a construct that continually redefines itself in relation to its perpetually changing context, attempting to become increasingly specific to a particular location and given task over time.

References

1. H Simon, *The Sciences of the Artificial*, 3rd ed. (Cambridge, Mass: The MIT Press, 1996)

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subtle technologies 2006

How do responsive systems affect us? Scientific research, art and architecture come together in this multidisciplinary forum documenting the 2006 Subtle Technologies Festival of Art and Science. Subjects include electronic art and performance installations, research in cell structures and natural systems, and design of interactive buildings. Discussions include historical context and contemporary implications.

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