

Designing Physical Artefacts from Computational Simulations & Building Computational Simulations of Physical Systems

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**Can we exploit simulation techniques in designing
physical artefacts?**

**How do we design simulations and visualisations to
model the natural world?**

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- The Cell Project
- Inter-disciplinary Investigation into stem cells
- Almost no conceptual modelling
- Confusion between labs
- Reluctance of experimentalists to work with modellers
- Need more than maths for conceptual models
 - Simulation and visualisation
 - stem cells form complex adaptive system
- Visualisation as trojan horse for formal modelling
 - How do we design the visualisation?
- How to design our models.
 - CA vs Agents
- World, model, computational model, simulation, visualisation, physicalisation and perception

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- Explore new modes of design thinking arising from inter-disciplinary teams in art, design, science and engineering
- How do we perceive and relate the computational in the physical world.
- Understand what it is to *simulate the real world* in a computational environment in an inter-disciplinary team? How does affect the design of a simulation.
- How might we exploit natural world simulations in design of physical artefacts?
- Natural vs Experimental vs Model vs Computational Model vs Simulation vs Visualisation vs Physicalisation.
- How can we harness emergent properties of distributed systems in design?
- What models can we use to enable interdisciplinary teams to work together more productively?

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- Symposium in June
- Workshop in September
 - Jon McCormack
- Through the cluster we will identify a number of case studies which involve embodiment of simulation
 - Live algorithmic musician
 - Stem cell simulation and its Physicalisation in Art
 - Using CA to design physical artefacts (Eden)
- We will design in workshop and build in last few months
- Please join our cluster interdisciplinary.co.uk

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- Complexity in working in an inter-disciplinary team
- Exploiting Emergence
 - need models and strategies for recognising and harnessing the emergence
 - especially in inter-disciplinary process-based collaboration