HyperSpace: A Bio-inspired information design framework for real-time adaptive spatial components

Keywords: Evo-Devo (Evolutionary Development Biology), Cellular differentiation, Self-Organization, Evolutionary Computation, Adaptive & interactive architecture

Architectural Engineering + Technology Department (/HyperBody Research Group)

Area of Research: Computation & Performance

Research Summary: In the past few years, interactive architecture has paid attentions on developing interactive buildings’ skins and facades through experimenting fields of materials and mechanisms. After a pioneering interactive architectural insight, HyperBody, proposed by Kas Oosterhuis, interactive architecture eventually started to shift its focus from surface/skin towards intra-body. Based on this architectural body idea, the research assumed interactive architecture is not only an opportunity to fully combine individual digital architectural techniques together, but also create true organic architecture which can grow as a whole, like an organism to have developments of forms, systems and functions simultaneously. The "HyperCell" notion proposed here is based on swarm behavior logic, and each individual HyperCell component is considered as an intelligent entity. Going through cell-differentiation, self-organized, and other growing process, Hypercell components build up a mature HyperBody which can still interactive and respond to the dynamic environment or users’ requirements afterwards.

Research Methodology: The research starts with knowing the basic principles of Evolutionary Development Biology and intends to extract the most inspiring, feasible and valuable logics applied as fundamental design concepts of Adaptive Architectures. By using parametric, computational interactive technology nowadays, the research aims not only to establish a design methodology for Adaptive Architecture, but also to experiment and realize a design project from digital to physical as a prototyping process.

Key Publications:

Main Question: Is it possible to develop structurally economical, energy efficient, multiple-performative, user oriented, and context aware architectural spaces via learning from real-time adaptive evolution principles in nature?

Deliverables: To establish an adaptive and interactive design methodology and create both virtual and physical prototype based on inspired principles of Evolutionary Development Biology.

Link(s)
http://pandalabccc.blogspot.com/

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