Future of Multimedia and the Arts

UK Multimedia Knowledge Management Network, Workshop, KMi/OU, Milton Keynes, Feb. 14, 2008

Goldsmiths College,
University of London

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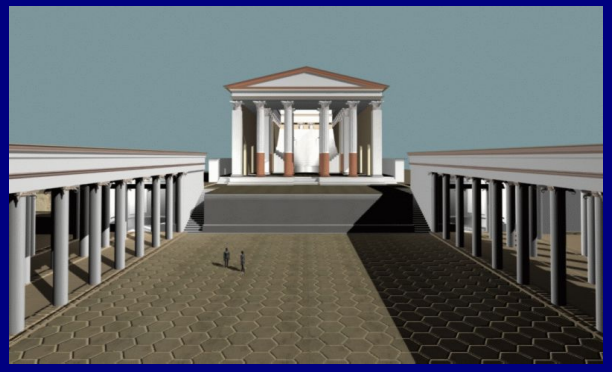
A few years ago...



In 1999: the SHAPE Lab. is created at Brown University.

www.lems.brown.edu/shape

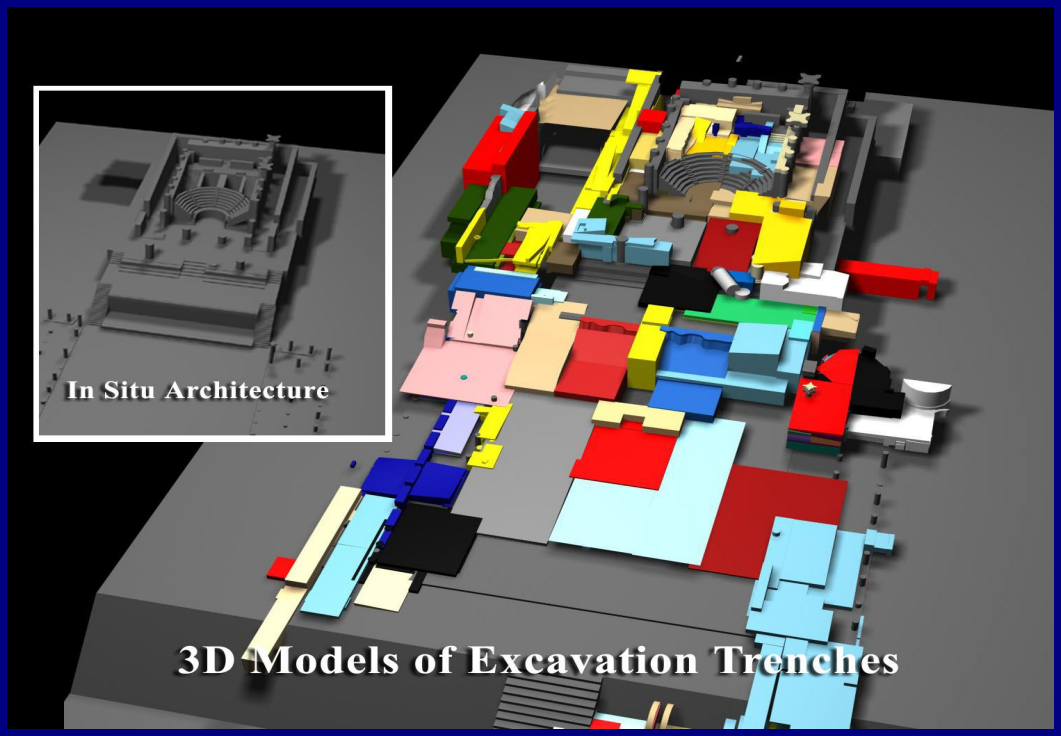
The digitisation bottleneck

What can we really do with the technology?

We may drown under too much data !!

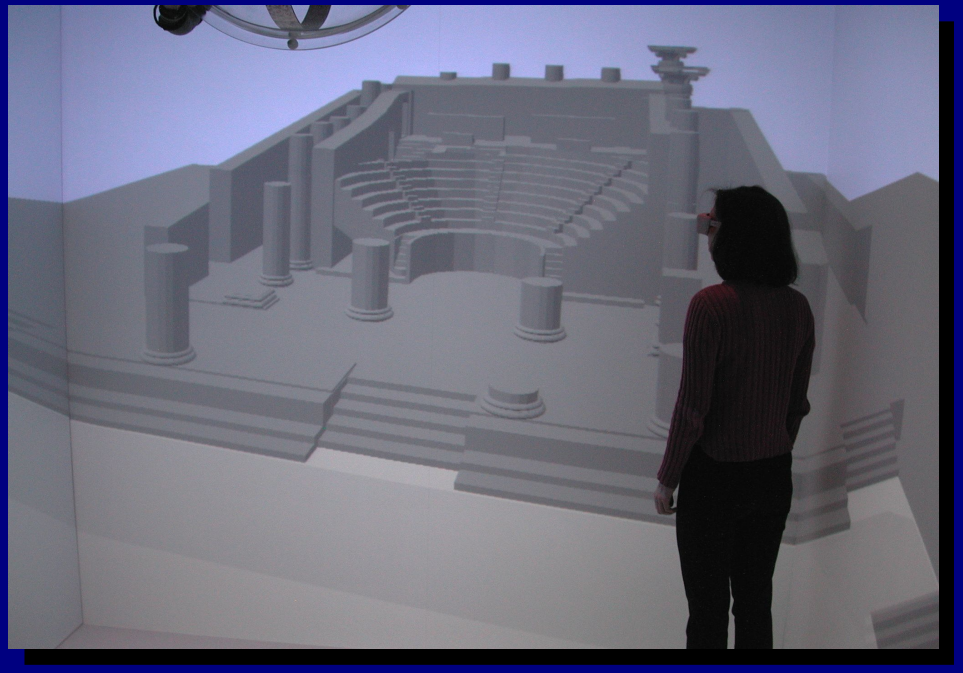
One site can (easily) produce hundreds of thousands of registered artifacts.

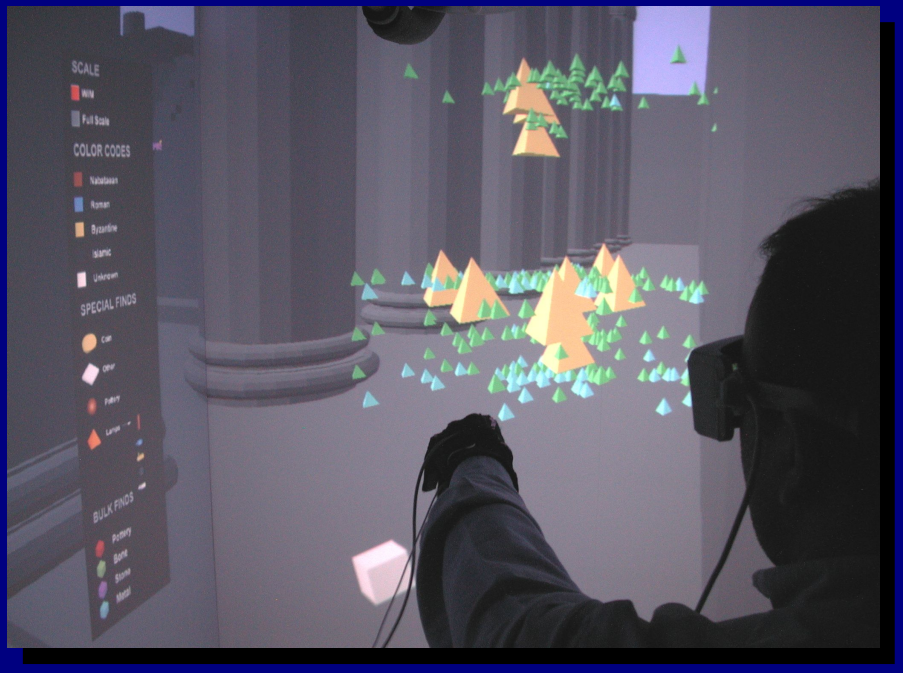
Since 1993, the Great Temple of Petra, project of Brown Univ., M. Joukowski.



VR & large DB access @ Brown: the ARCHAVE system for the Great Temple at Petra, Jordan (E. Vote, D. Acevedo, D. Laidlaw).

Challenge: multi scale, multi user interplay with large multimedia DB via VR systems.





Art and Perception

Consider Art as a window on the human mind.

Art as “a way of seeing,” apprehending,
giving thoughts substance,
acting as reflections on our thought processes,
providing “memory stores.” [Leyton]*

Theories of perception
try to pinpoint such thought processes.

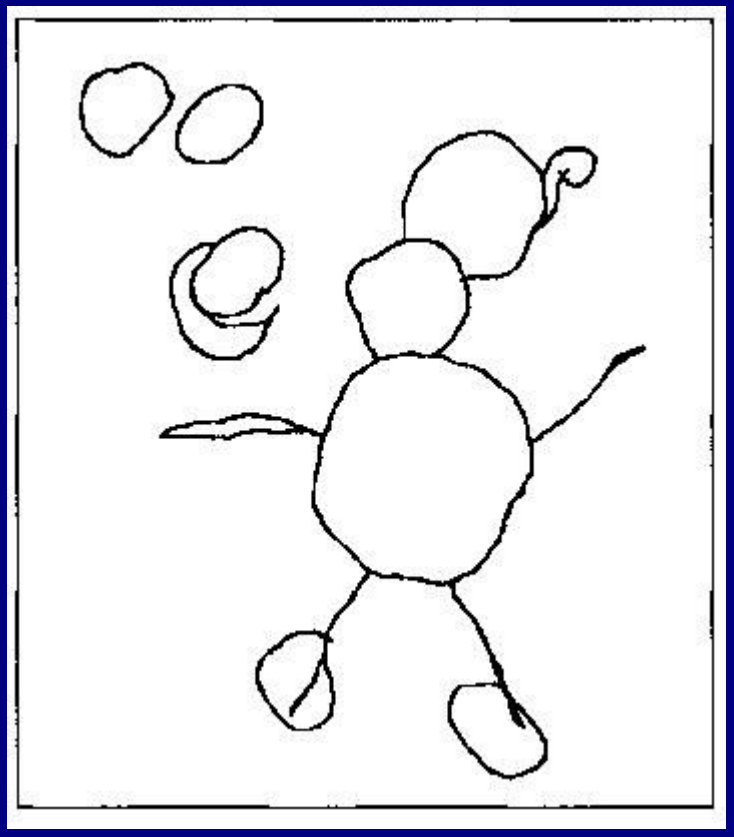
Arts Computing attempts at marrying
the two views.

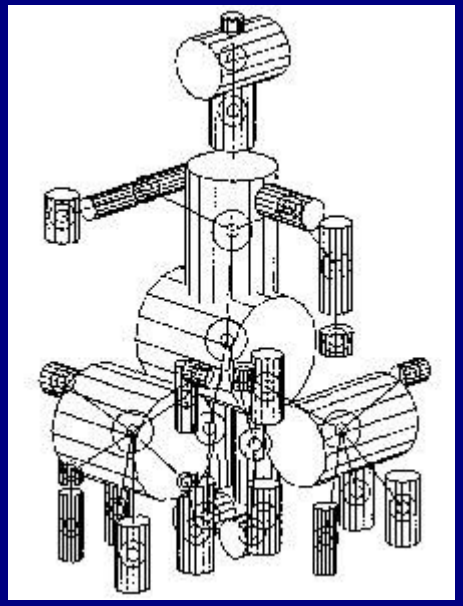
*Michael Leyton: *The Structure of Paintings*, Springer, 2006.

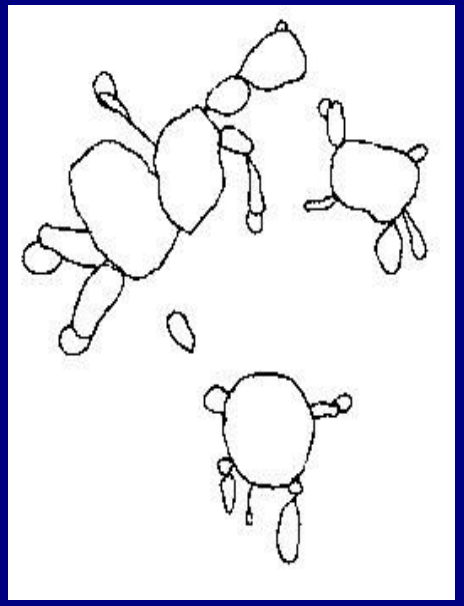
Drawing

Lascaux paintings

Drawing







ROSE: Representation Of Spatial Experience by
Ed Burton, circa 1995.

Drawing

AIKON : the Artistic/Automated IKONograph
www.doc.gold.ac.uk/aikon/

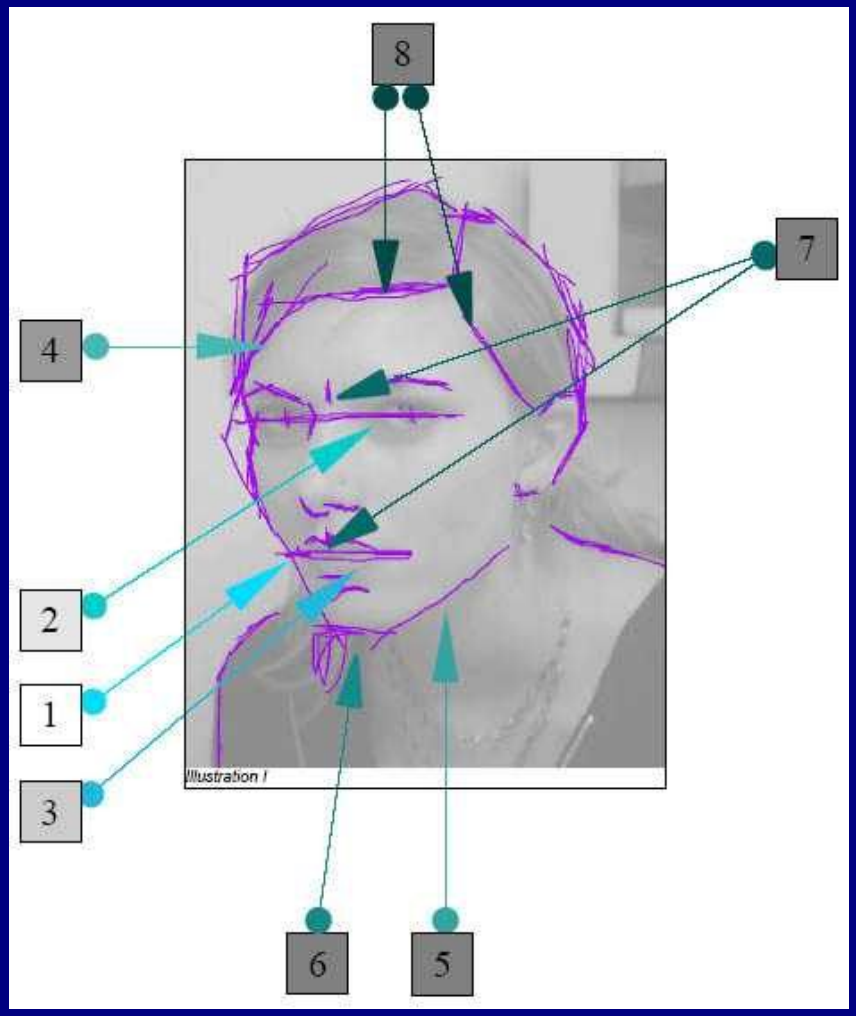
Collaboration with Patrick Tresset, artist, portraitist, since 2005.

Initial goal: Study the creative “grammar” of the artist.

Early result: the artist proceeds by steps, from an image, real or virtual, to a feature space, to a gesture space, and finally to a rendering space.

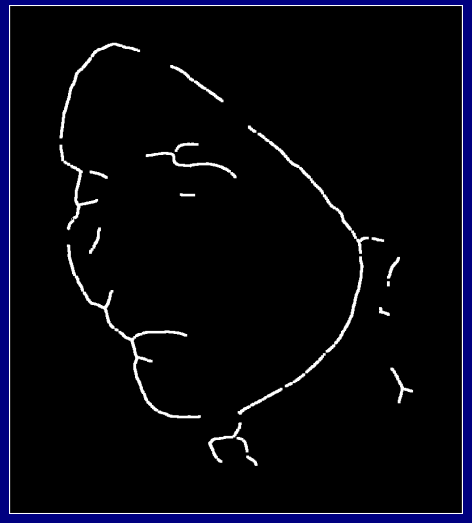
The set of processes is studied individually in a sequential manner in AIKON's first versions.

Drawing



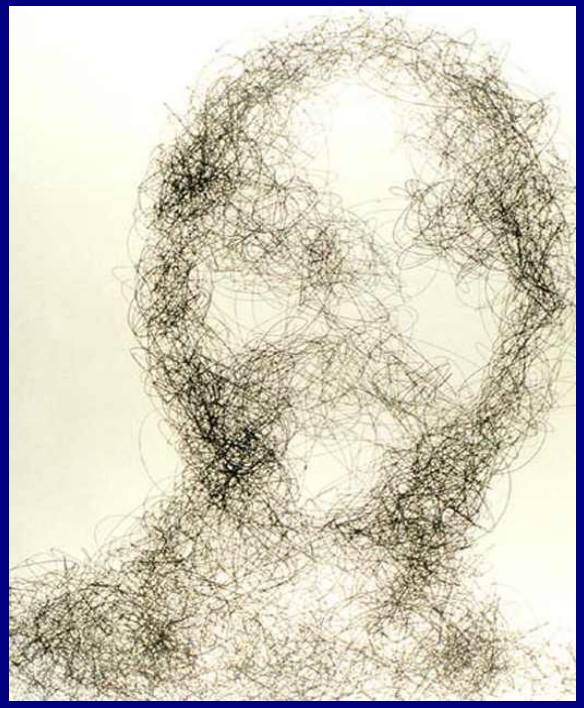
Drawing

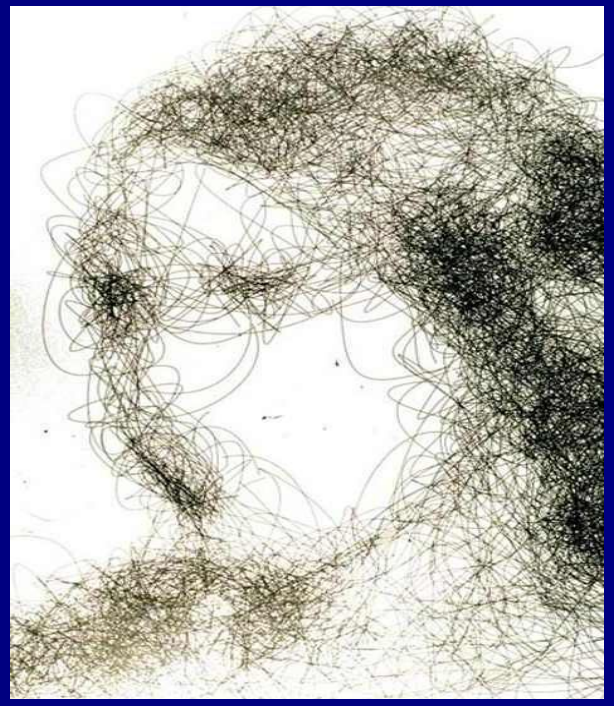


AIKON: Automated/Artistic IKONograph
P. Tresset & F. F. Leymarie @ Goldsmiths

Drawing





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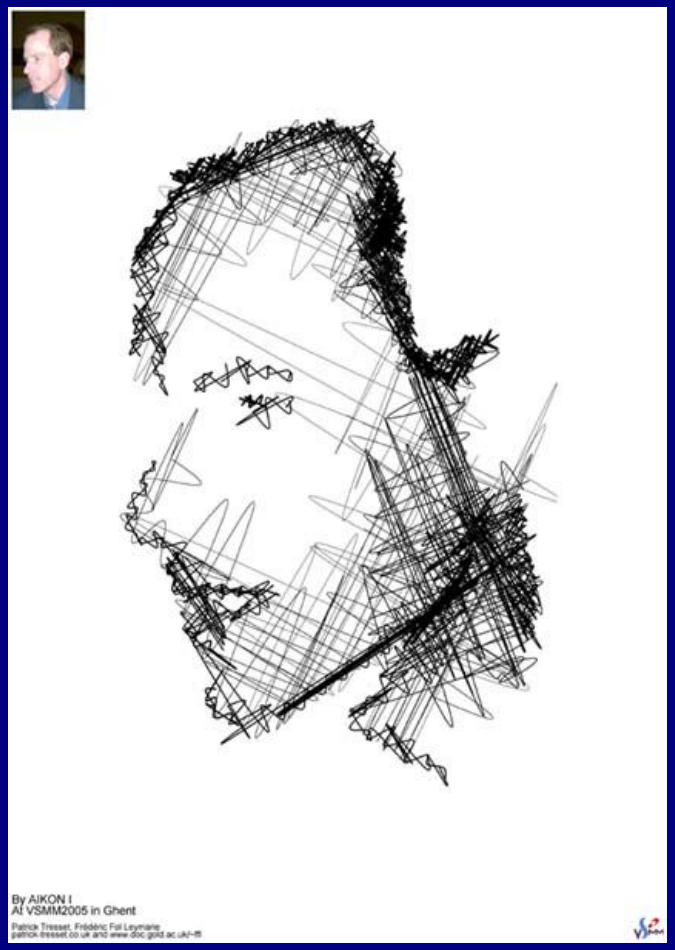
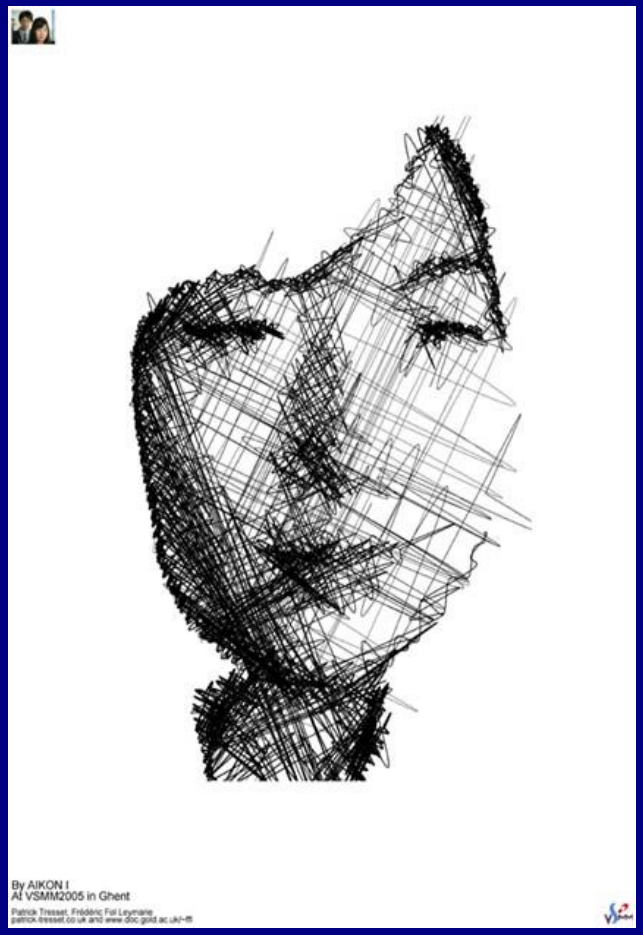
Drawing





AIKON: Automated/Artistic IKONograph

P. Tresset & F. F. Leymarie @ Goldsmiths

www.doc.gold.ac.uk/aikon/

Drawing

What next?

• Introduce feedback mechanisms --- how to undo, how to modify the next drawing gesture as a function of the previous one.

• Study other styles, other artists: make explicit the cognitive and motor processes which lead to an artwork.

Art and Perception

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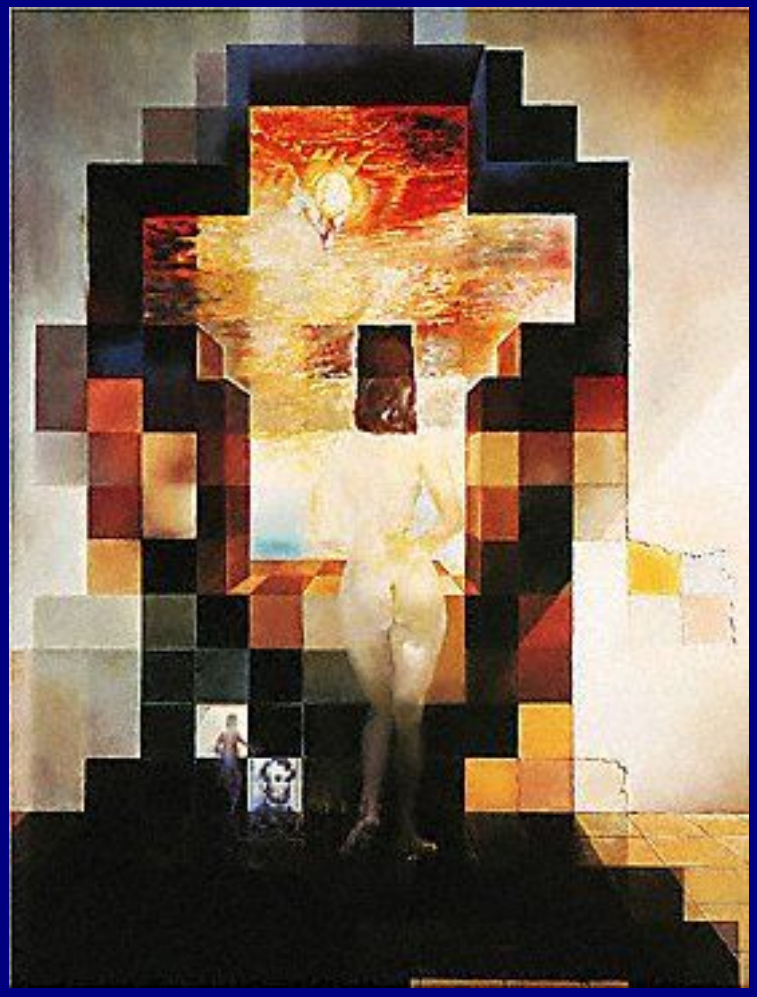


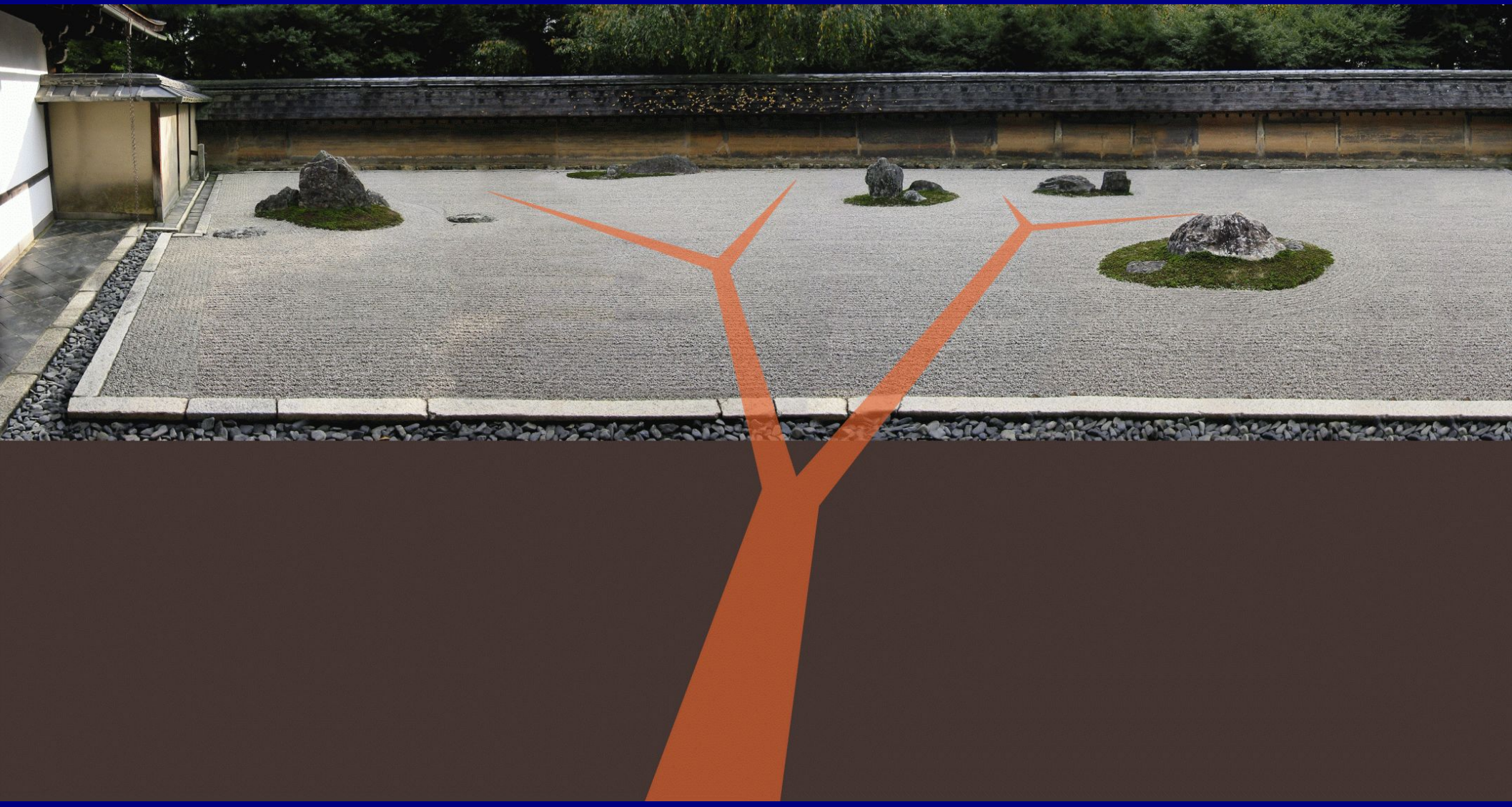
Lincoln / Gala (by Dali, 1976)

"Gala contemplating the Mediterranean sea which at 20 meters becomes a Portrait of Abraham Lincoln --- Hommage to Rothko"

The perception/design of gardens

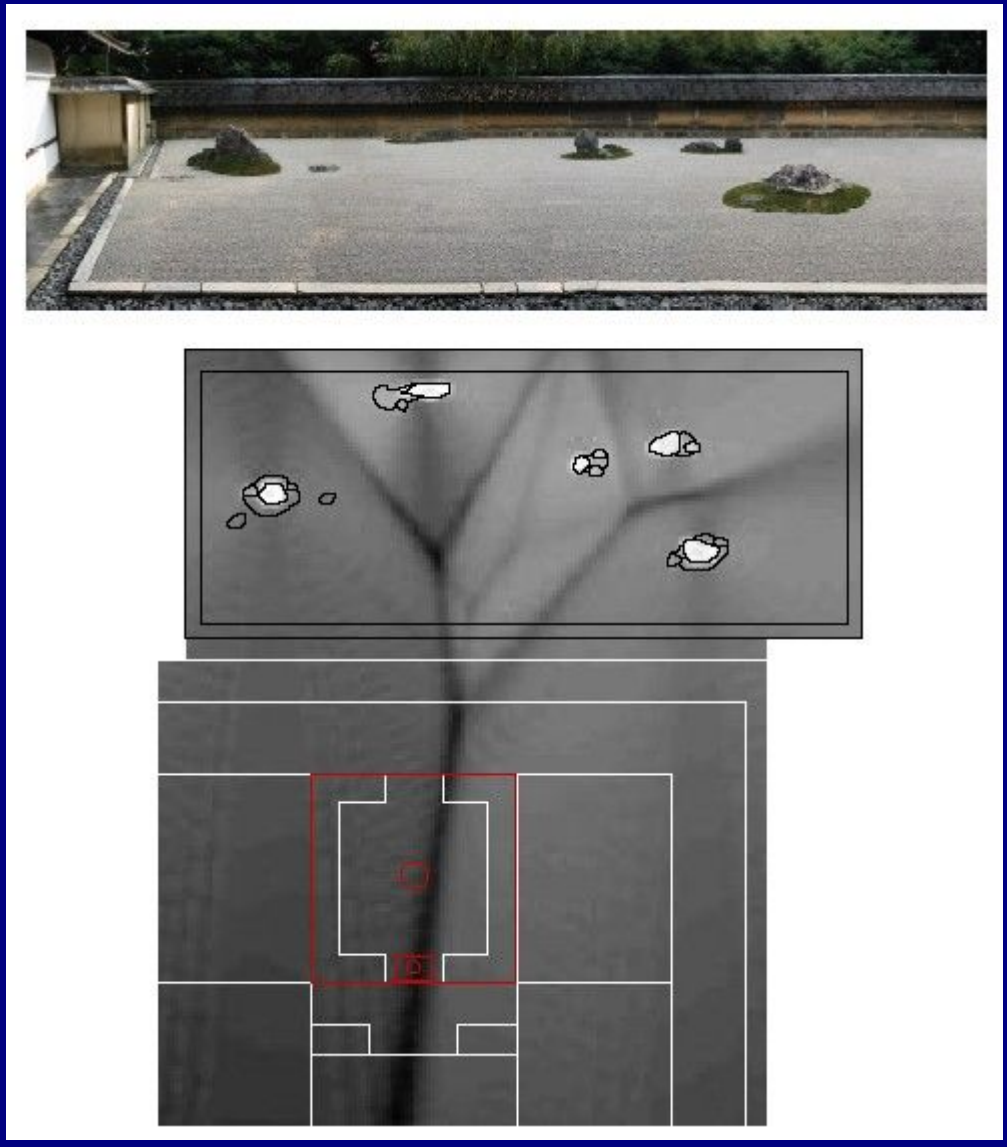
Ryonji garden, Japan, 15th century

The perception/design of gardens



Gert van Tonder *et al.* --- Nature, 2002.

The perception/design of gardens



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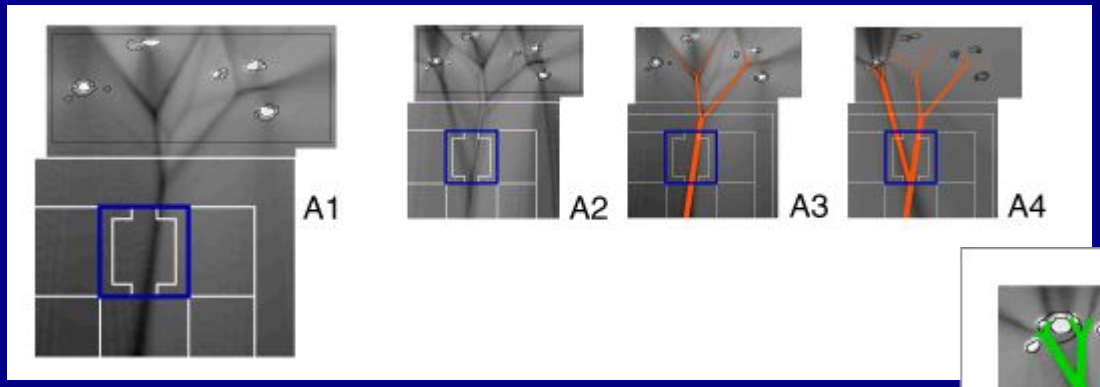
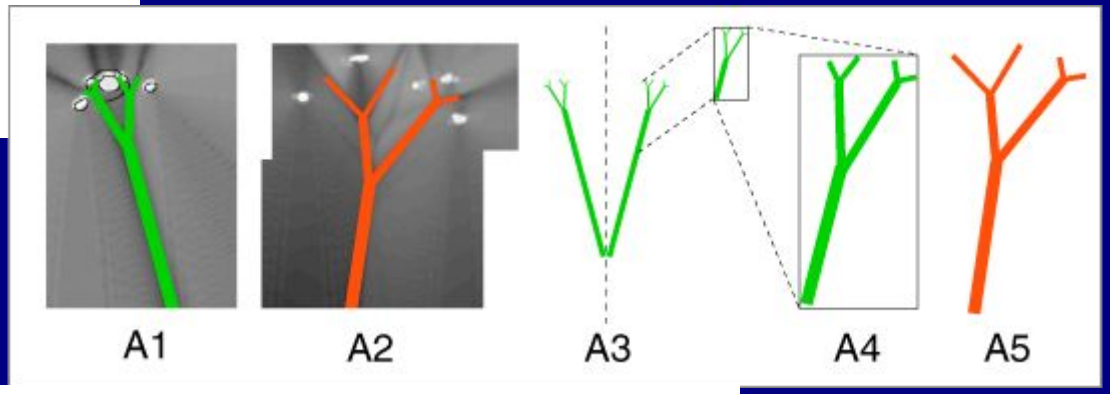
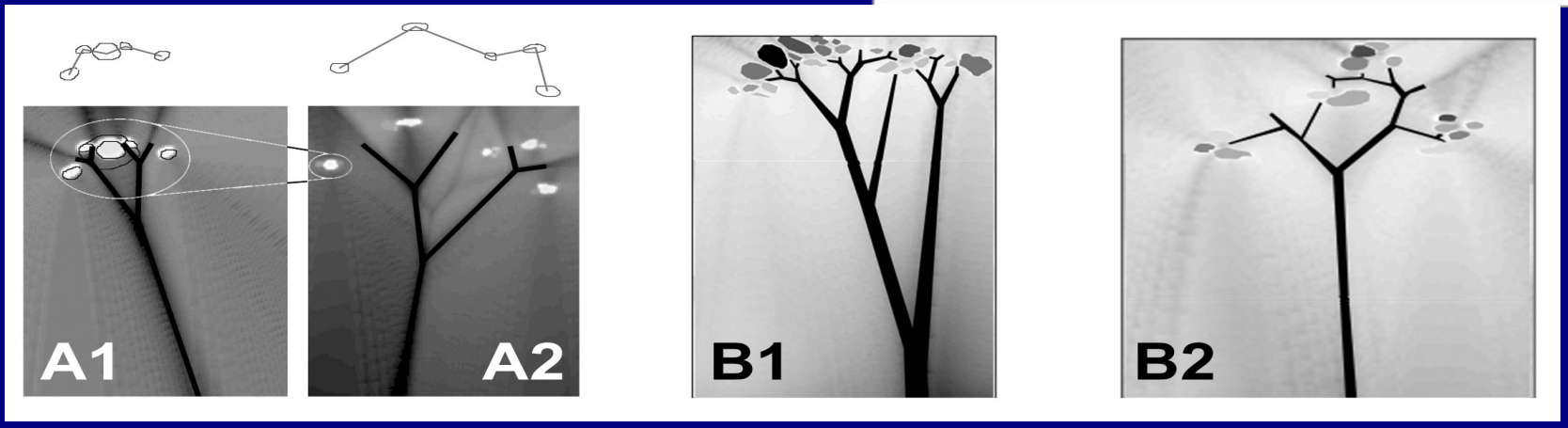
The perception/design of gardens



Gert van Tonder *et al.* --- **Stylistic signature of creators.**



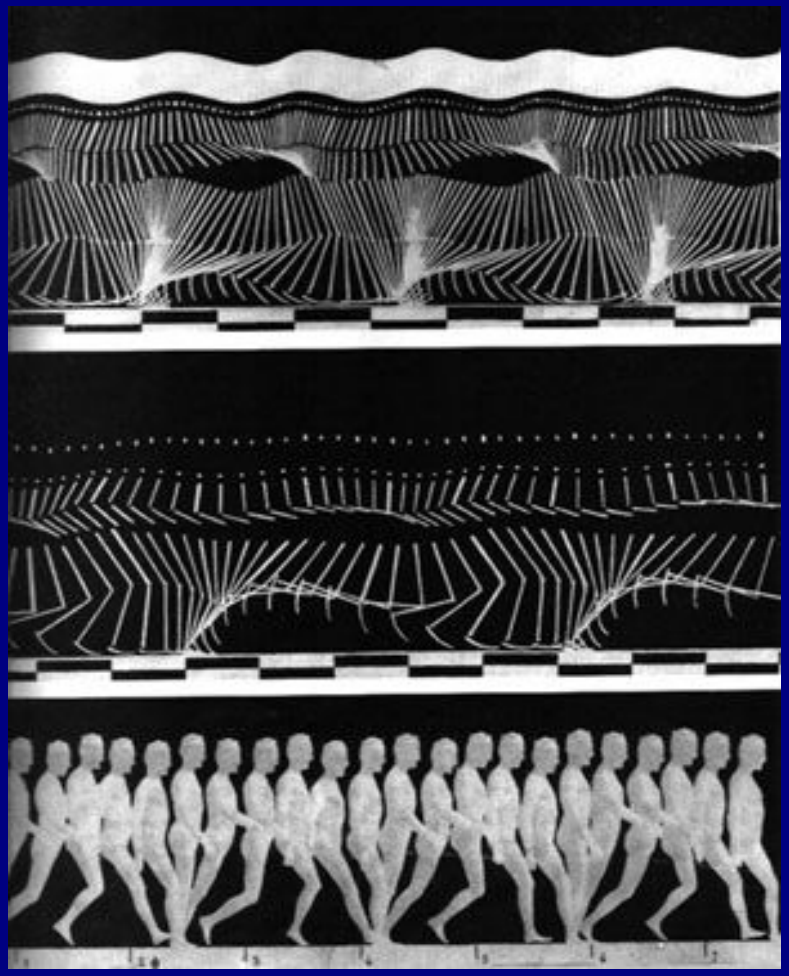
Fractal-like designs



Local (A1) vs. global (A2) MA's in Ryonji

B1: Zakkein (no longer exists) –
B2: Akisato Ritoh (1799)

Perception --- Motion



Etienne-Jules Marey --- Motion studies (1886)

M. Duchamp
Nude descending
a staircase
(1912)

Art and Creativity

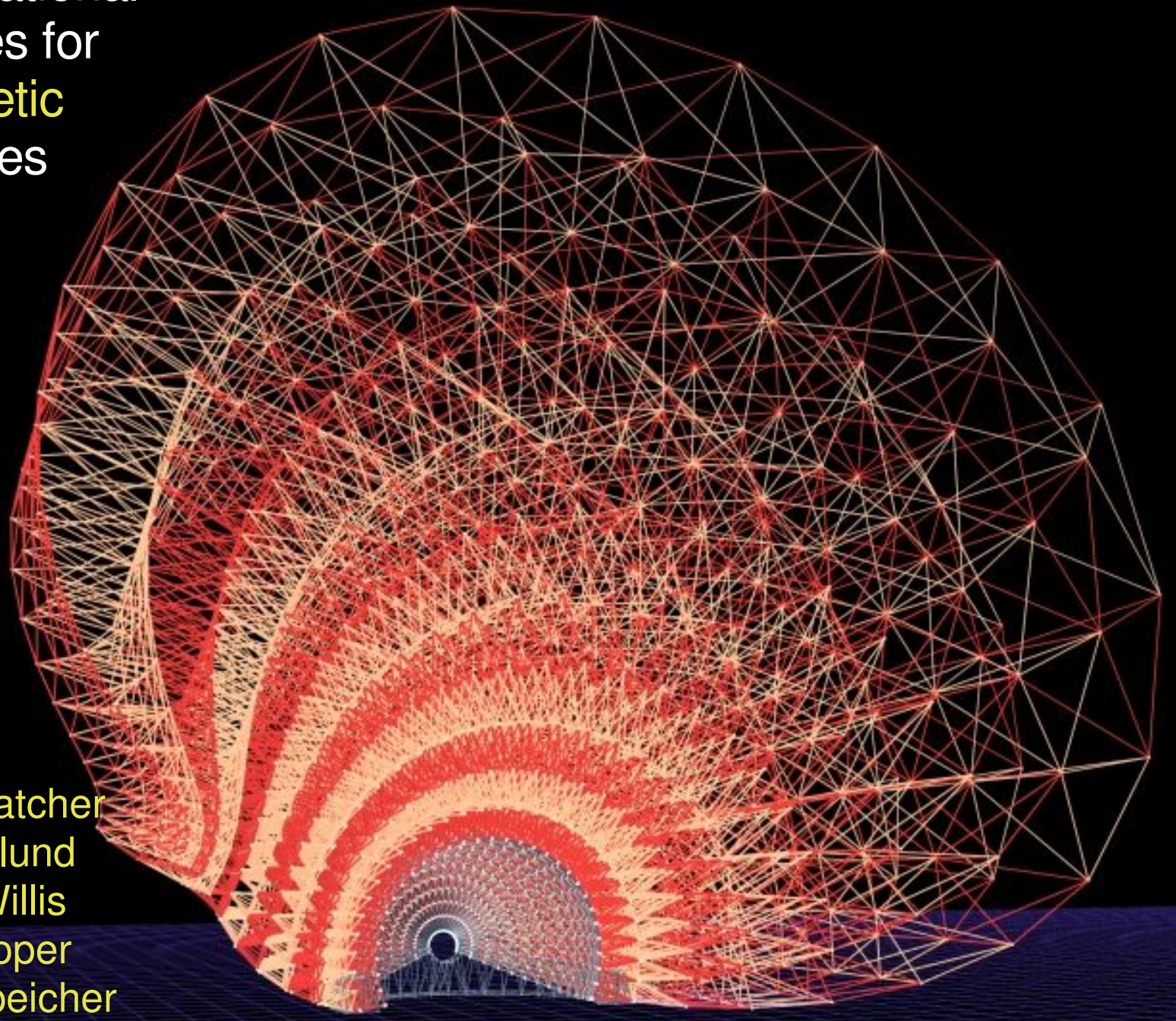
Consider Art as a catalyst of the creative mind.

Art as “a way of exploring,” discovering,
shading new lights on accepted “truths”
re-interpreting our memories.

Constructive paradigms (in painting,
sculpting, architecture, ... , biology) as
a source of formalisms (to be re-interpreted).

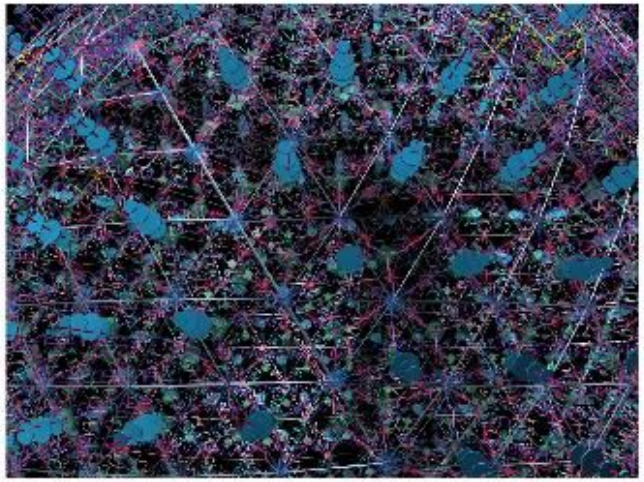
Arts Computing offers the artist new
efficient ways to blend the boundaries.

Computational Schemes for Biomimetic Structures

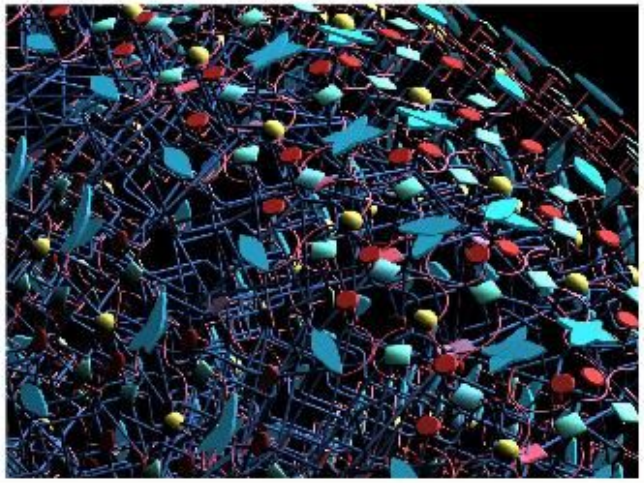


Brower Hatcher
Karl Aspelund
Andrew Willis
David Cooper
Jasper Speicher
Frederic F. Leymarie

(a)



(b)



Biomimetics & Sculpting

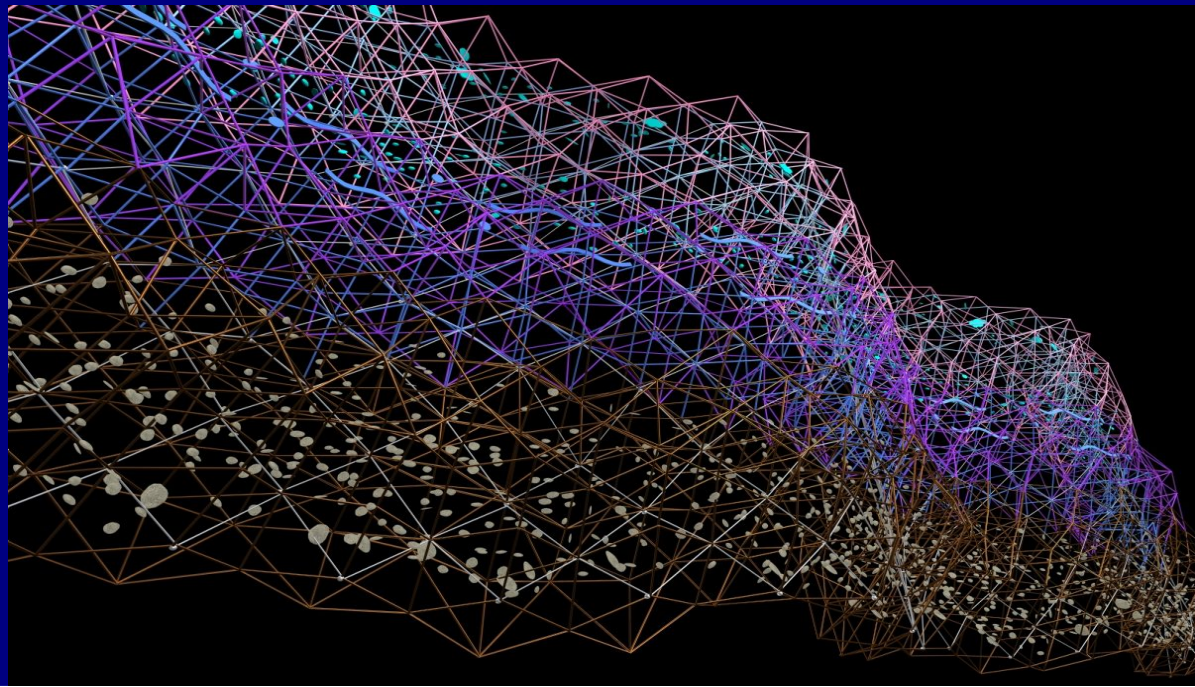
Collaboration with Mid-Ocean Studio

Brower Hatcher's manifesto:

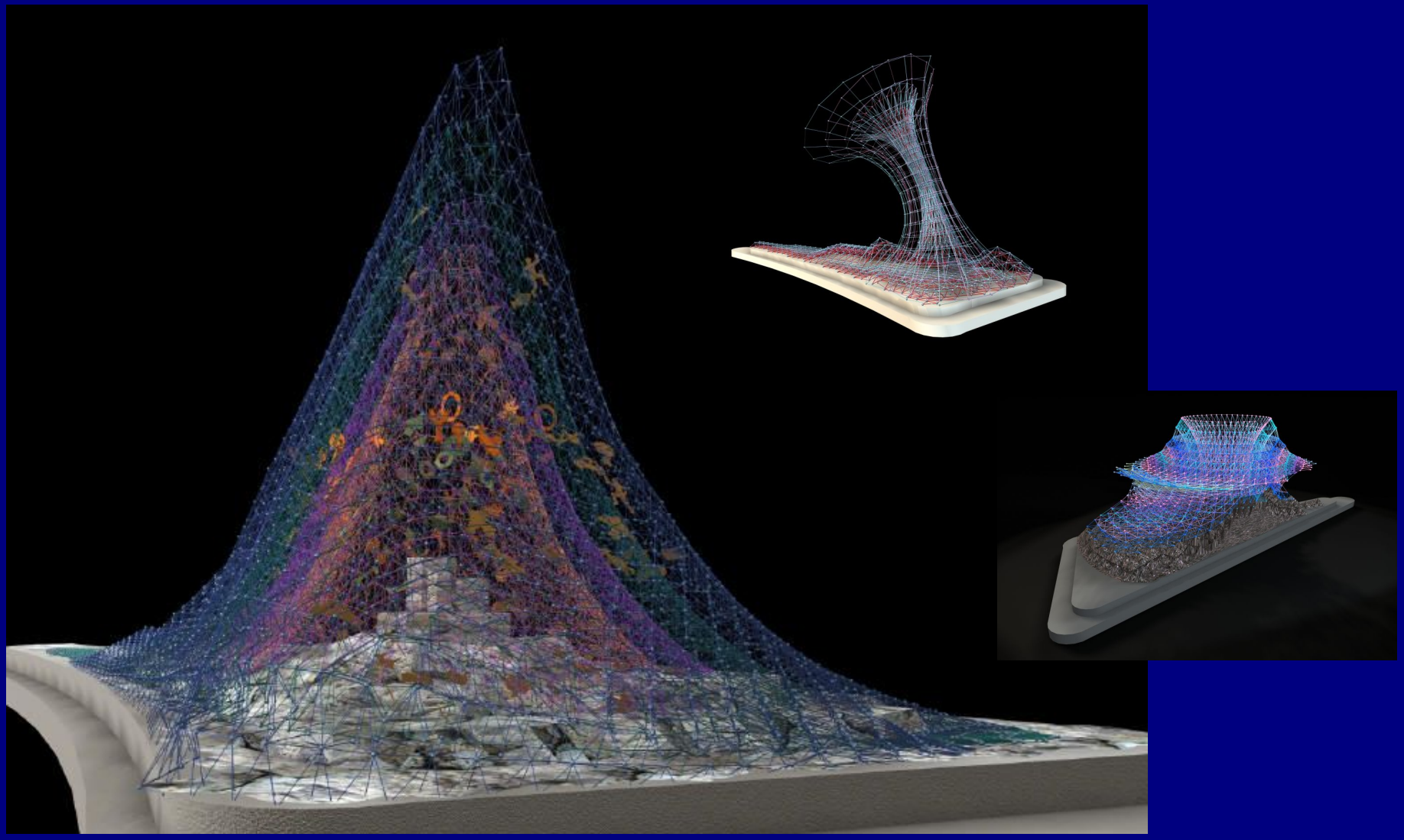
Paradigm for sculpting
where a deformable, layered,
approximately regular
scaffold structure is used as
a framework upon which
other sculptural elements
can be associated.

The Need for Digital Tools

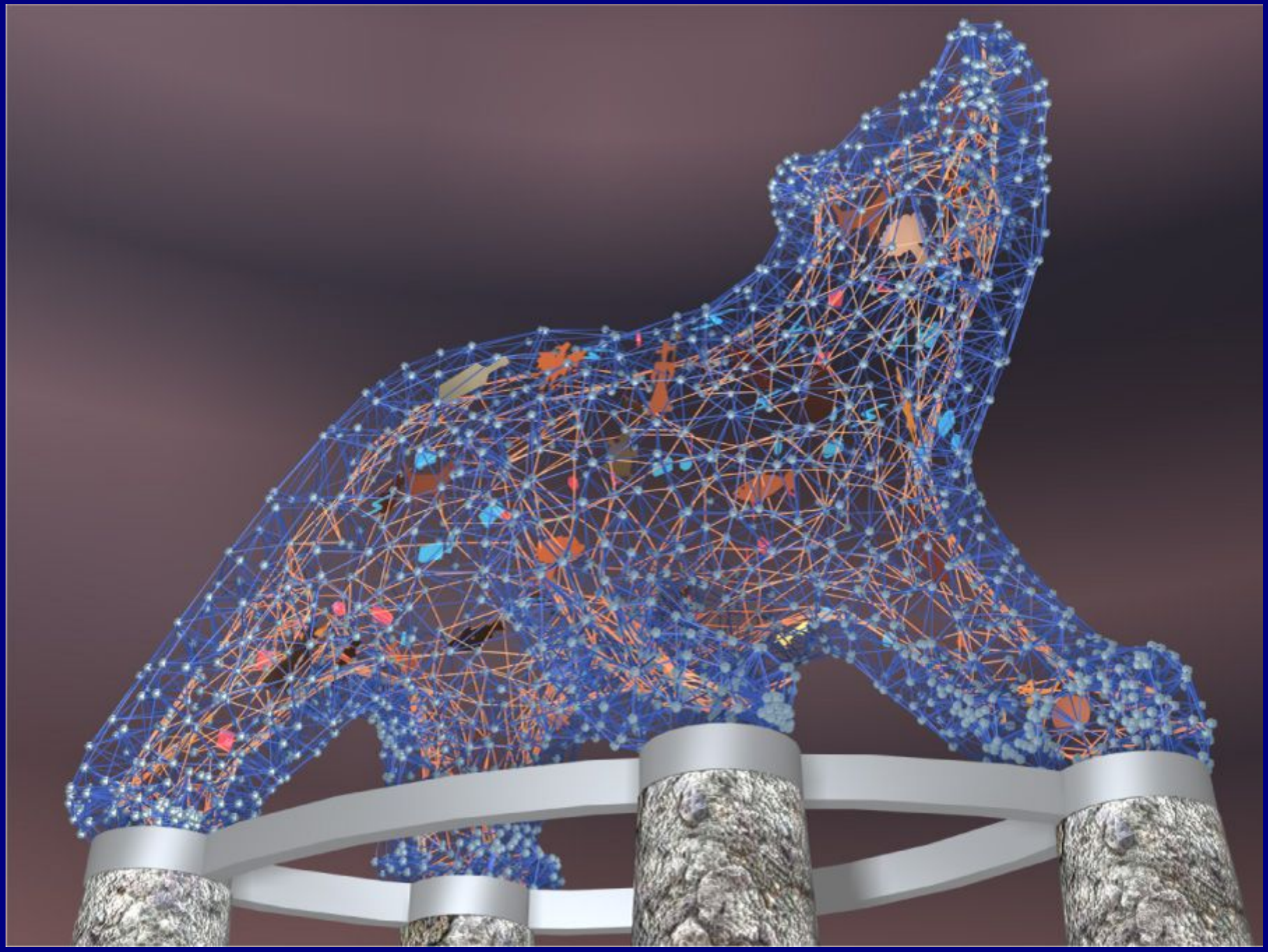
- Explore complex 3D free-form structures
- Permit the inclusion of environmental features and function values.
- Create and flatten-out scaffold layers at large scales.



Biomimetics & Sculpting

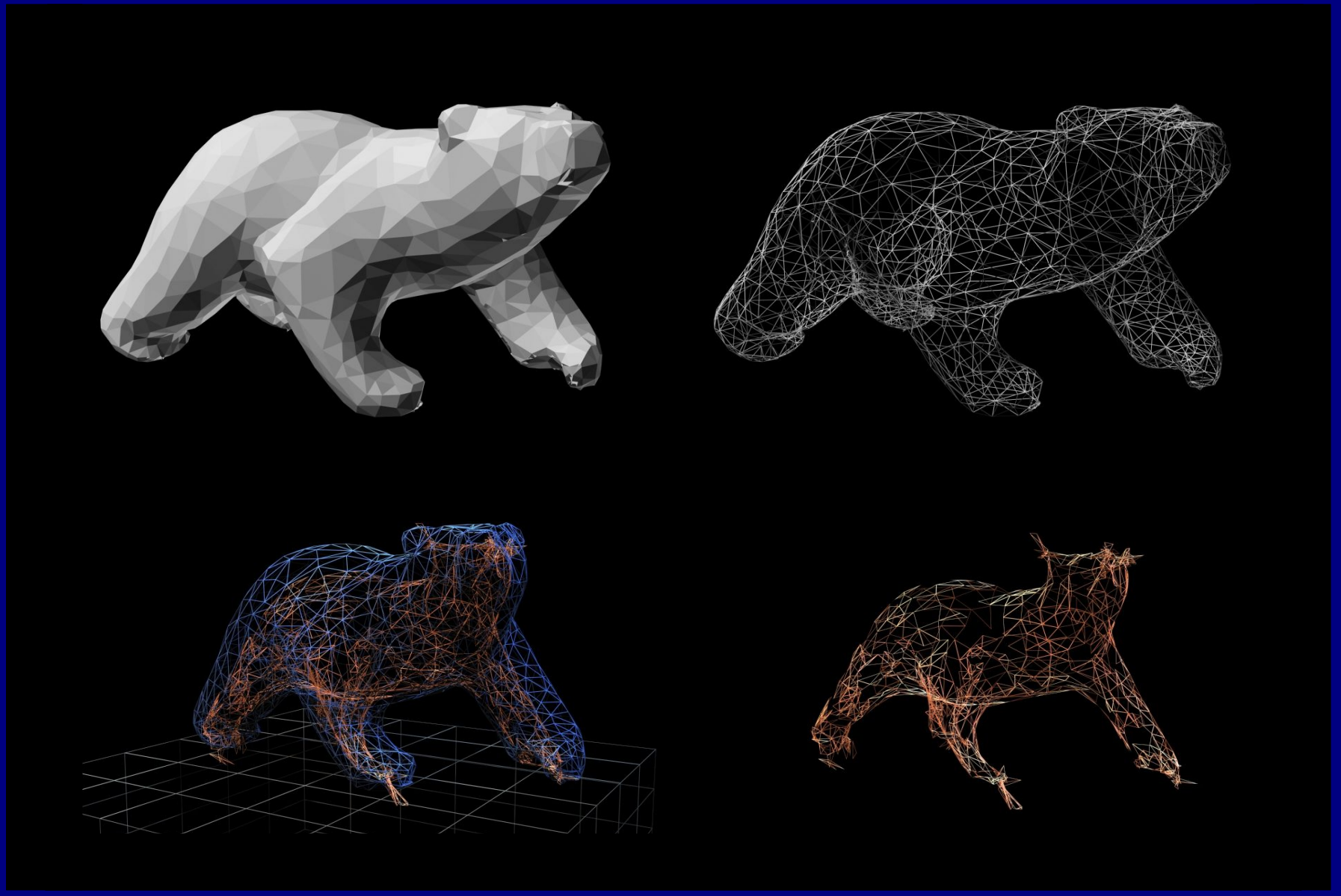


Collaboration between Mid-Ocean Studio,
Brown University & Goldsmiths College



Kelowna, British Columbia, Canada

Towards biomimetism



Laser scanned toy bear --> Surface layer --> Growth

Art and Creativity

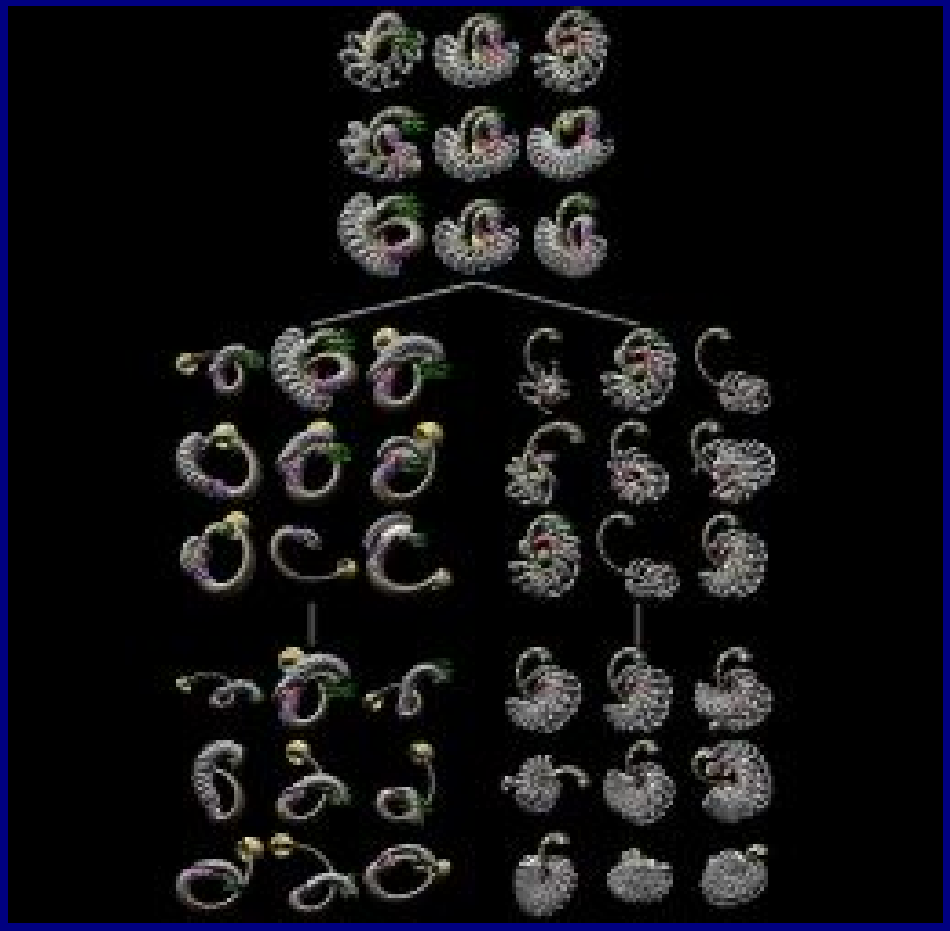
Consider Art as a catalyst of the creative mind.

Art, Aesthetics, Design

The artist seeks new solutions in a space of possible forms.

Aesthetics decisions provide guidelines
to navigate this space and aim at
regions of “interest.”

Project *Mutators*



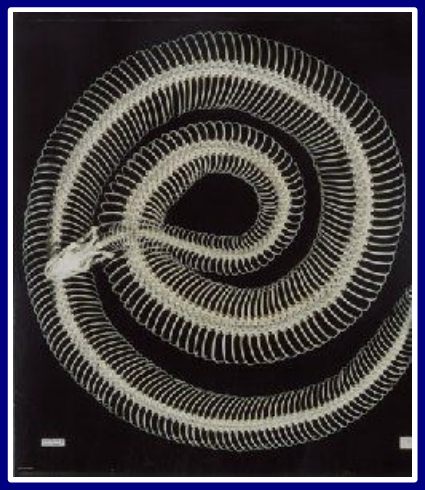
FormGrow: Stephen Todd & William Latham (early 1990's)

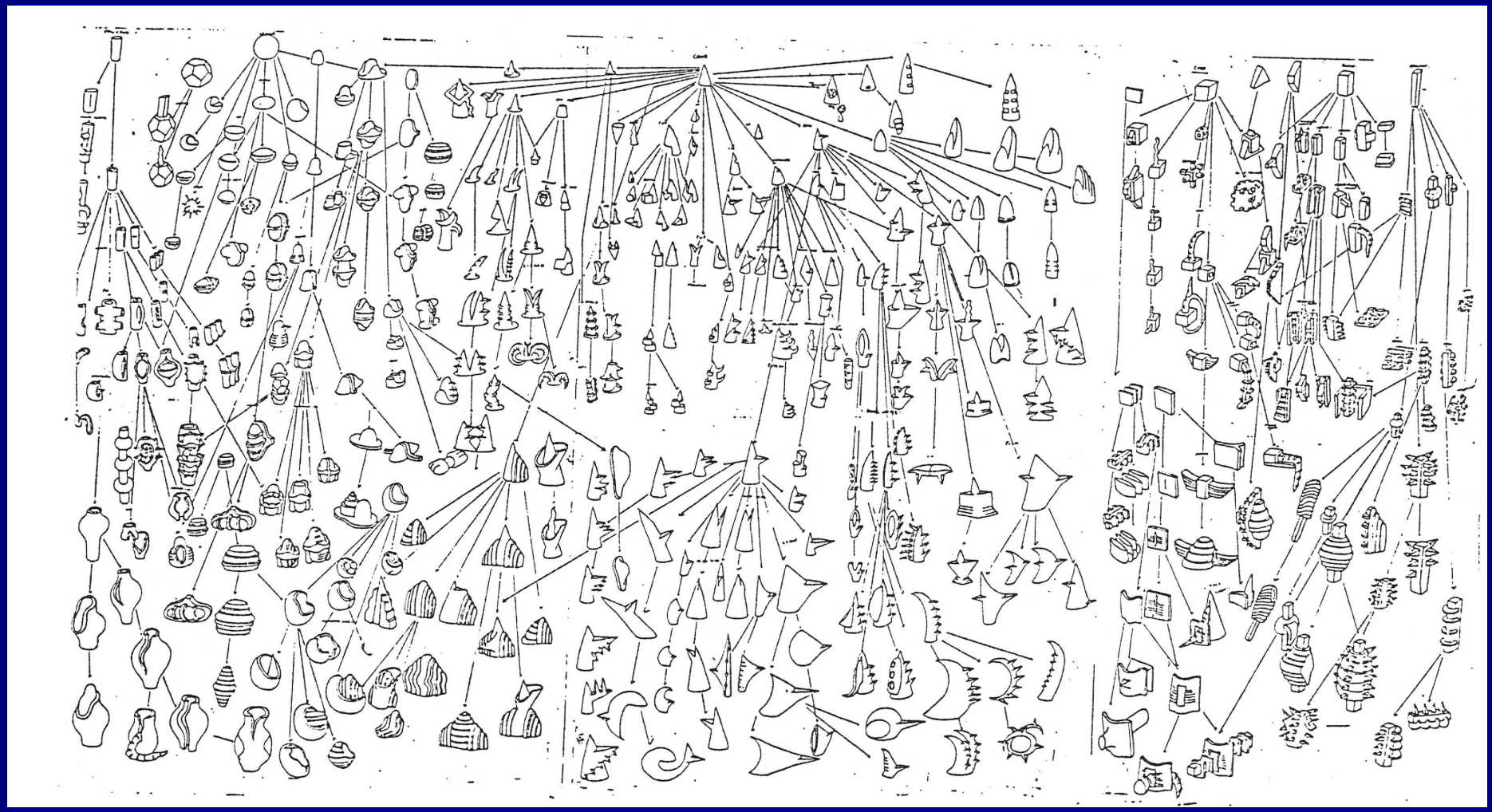
Project *Mutators*

William Latham's organic art

Spending much time at The Natural History Museum. London, producing large scale evolutionary drawings. looking at Form

(W. Latham, mid 1980's).





Latham's *FormSynth* (mid to late 1980's).

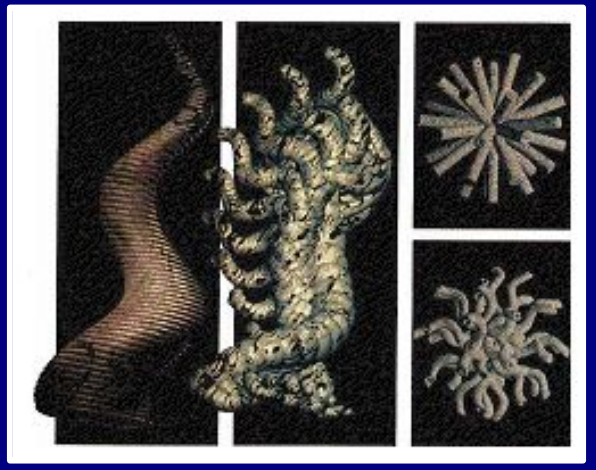
FormGrow

Formal Grammar **Inspired By Nature**

Based on plant forms: Branch, L-Systems, Fractals
Based on animal horns: Horn
Based on webs: Web
Based on worms: Segmentation

But can be combined:

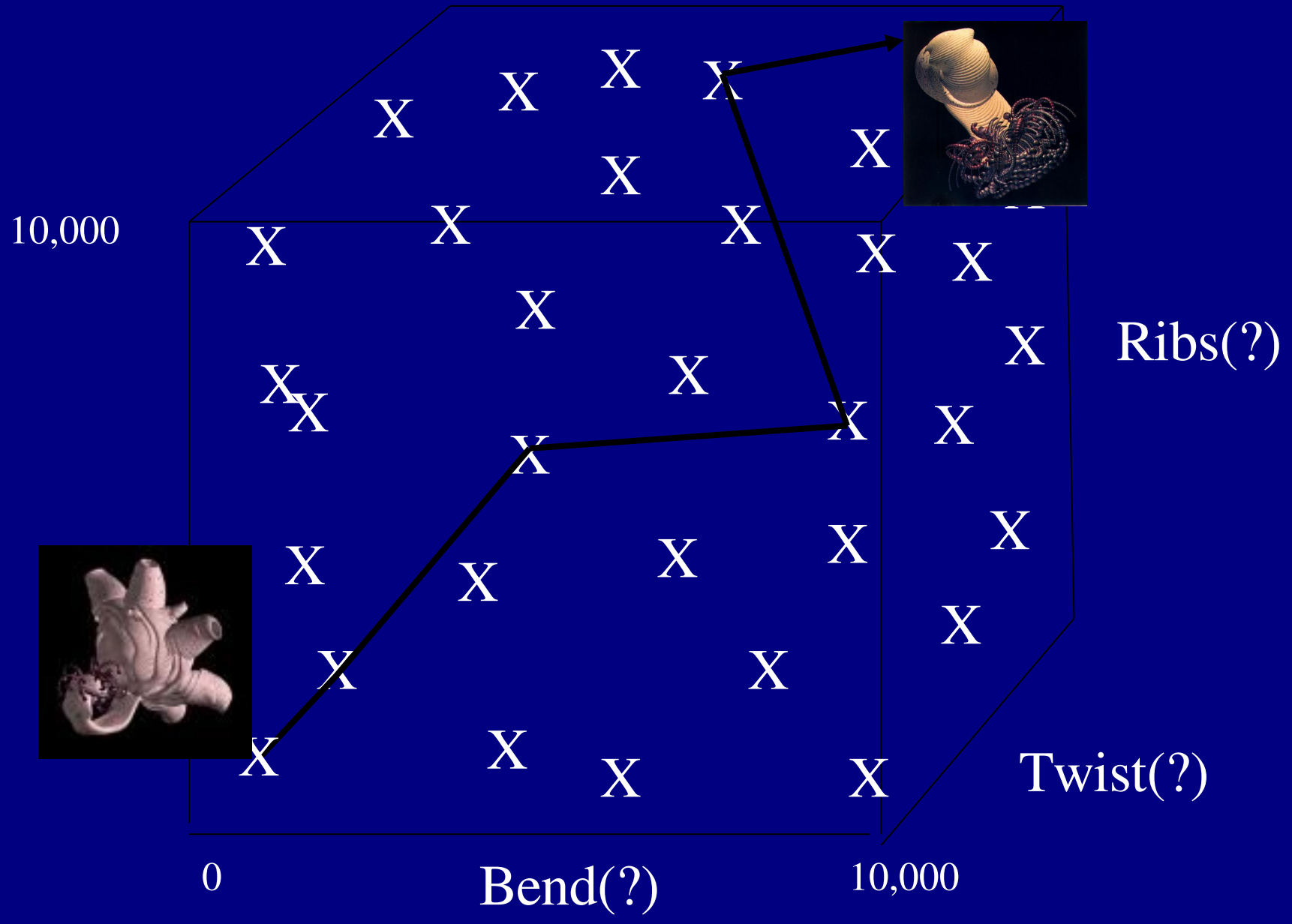
Horn-of-Horns
Horn of Horn Branches
HornWeb of L-Systems of horns
Horn-of-Horns-of-Branch-of Horn-of-Webs



Horn **Horn of Horns.** **Branch of Horns**

Mutator: Navigating Parameter Space

3 Parameters



Since 2006: MUTATOR revisited

Genotype

CGA GTA CGTTA

?

Phenotype

Mammalian Tapeworm.

Genotype

FormA (399, 34, 743, 3455, 332, 455, 345,1, 234,450, 5598, 45)

Form Grow.
Horn-of-Horns
Horn of Horn Branches.
HornWeb of L-Systems of horns of horns.
Horn-of-horns-of-branch-of-horn-of-webs ….

Phenotype

Since 2006: MUTATOR revisited

Genotype

CGA GTA CGTTA

?

COMPUTATIONAL GEOMETRY
Working with Geneticists to try and find common factors.
- Gene waking / freezing.
- Directed cellular goal growth without intersection
- Growth control mechanisms.

Genotype

FormA (399, 34, 743, 3455, 332, 455, 345, 1, 234 ,450, 5598, 45)

Form Grow.
Horn-of-Horns
Horn of Horn Branches.
HornWeb of L-Systems of horns
Horn-of-horns-of-branch-of-horn-of-webs.

Phenotype

Reference Scientific American.

Mammalian Tapeworm.

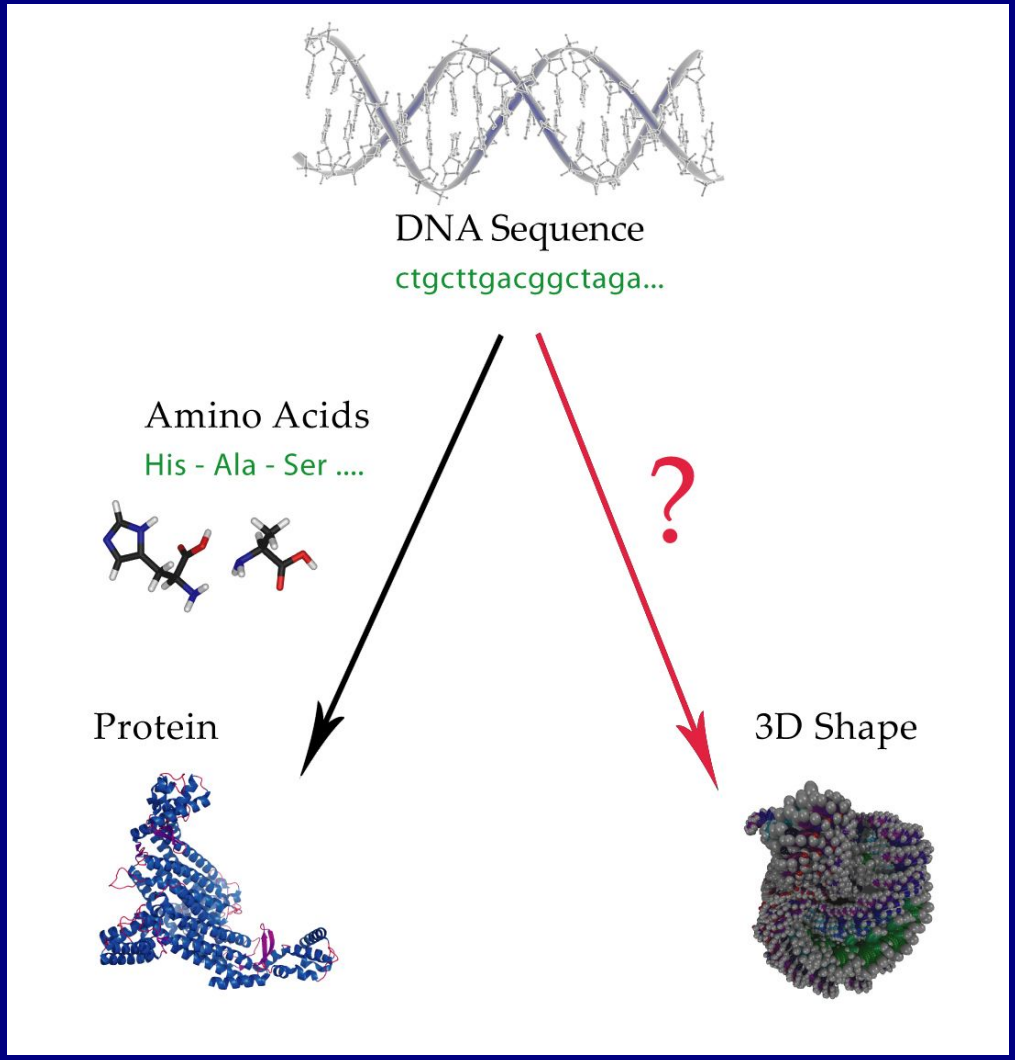
Phenotype

Creative Playground

Geneticists	Artists
Problems with visualisations + Common Language	"Aesthetic Navigators" + Good at working in purely abstract terms + Sensitive to form, colour, shape, balance + Morally adaptive + Good at working with formal problems + Fairly good at lateral thinking
Computer Scientists Mathematicians New challenging problems..	

Using DNA to Create 3D Mutator Forms

Nature's method



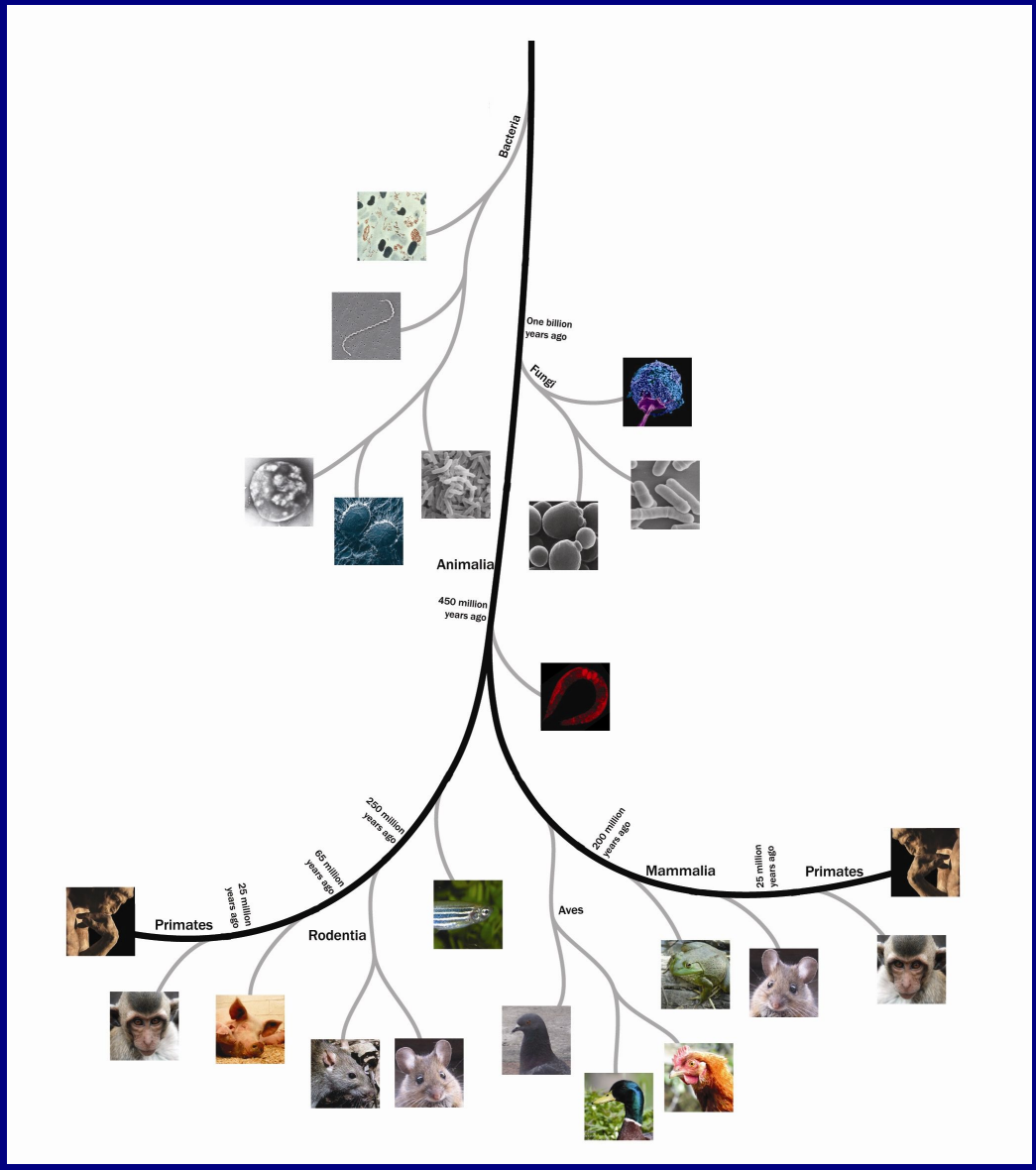
Mutator's method

“The History of the Species”

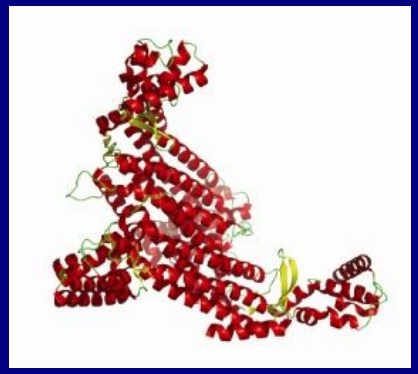
Film of the De/Evolution of Two Proteins.

- Case study: From the Delta crystallin (from the lens of the eye) to Argininosuccinate lyase (from the liver).

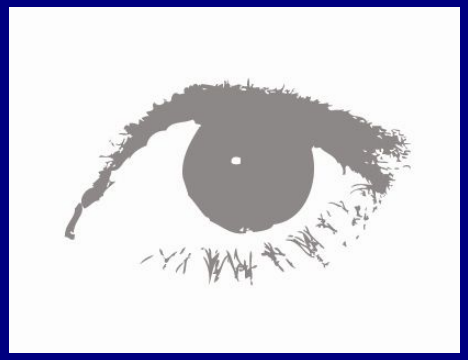
- Sketch at SIGGRAPH 2007
- Paper at EvoMUSART 2008.
- www.mrg-gold.com

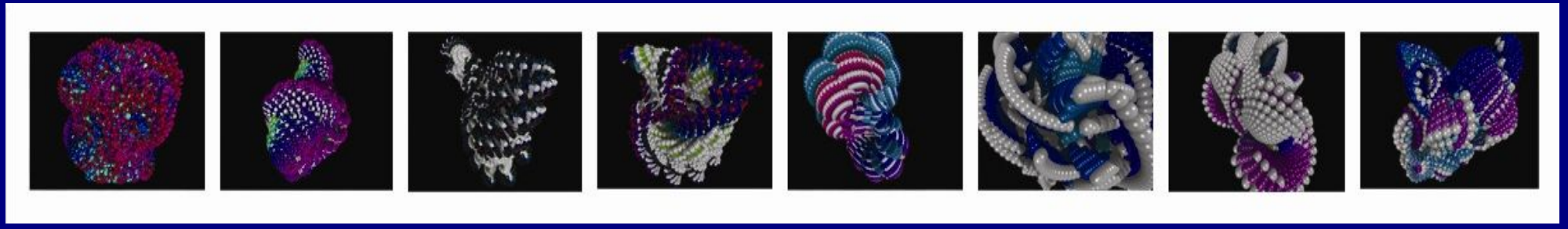


Delta crystallin



Argininosuccinate lyase





http://hos.mrg-gold.com

Arts (Design, Music, Architecture,...) Computing

- to better understand the mind
- to create new forms, possibilities
- to collaborate and design in novel useful ways
- to process multimedia data more efficiently

Special thanks:

Michael Leyton (Rutgers), Ben Kimia & David Cooper (Brown),
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The “England team” : Computing Dept. at Goldsmiths, incl. Miki Shaw, Digital Studios (Janis Jefferies, Mark d'Inverno, Robert Zimmer *et al.*), artists Patrick Tresset and William Latham,
mathematician Peter Giblin (Liverpool) and Stephen Todd (Goldsmiths),
computer scientist Stefan Rueger (KMi),
bio-informaticians Ben Jefferys & Lawrence Kelley (Imperial).

www.folleymarie.com