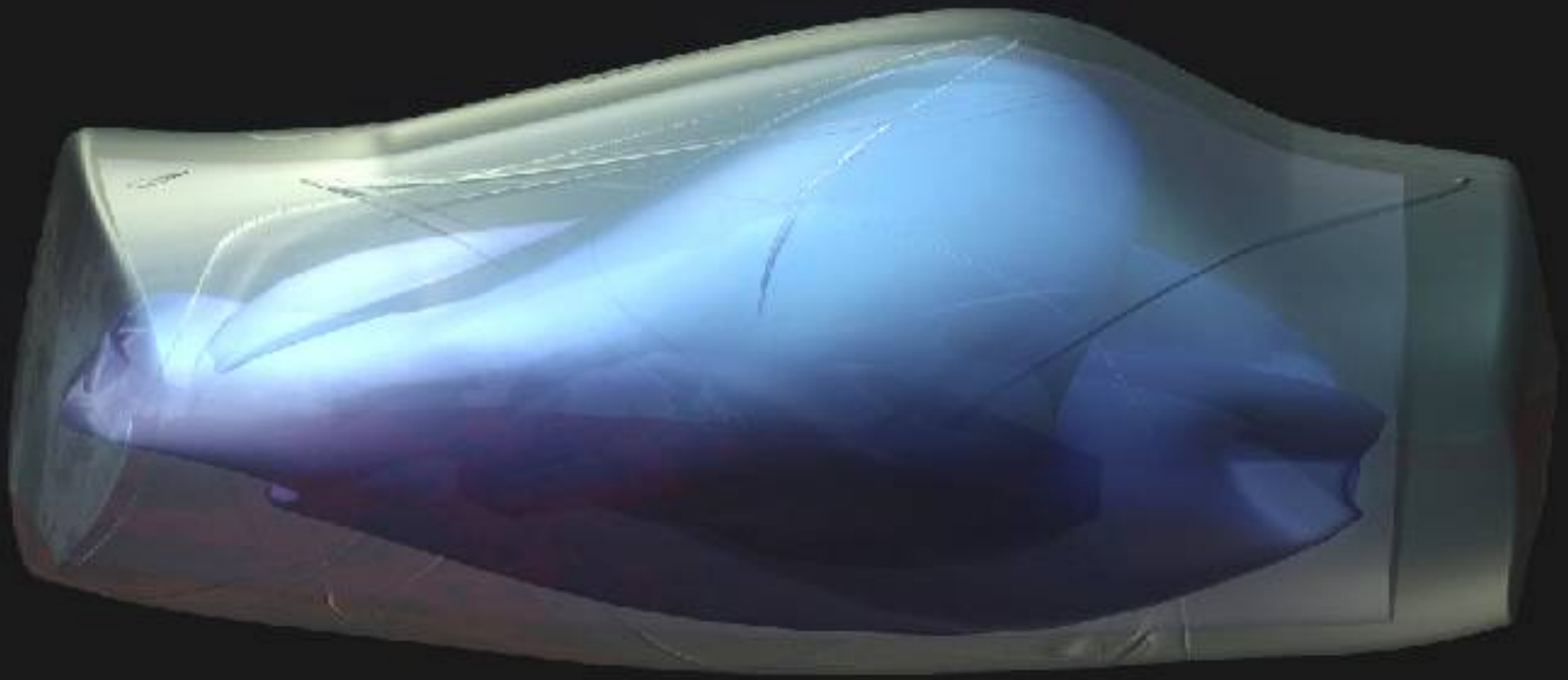
CREATIVITY?
Birger Sevaldson



What is creativity?

- Mihaly Csikszentmihalyi asks: where is creativity

- Is creativity found in the person or ?

The Systems Model of Creativity

- ”…..creativity can be observed only in the interrelations of a system made up of three main parts. ” (Mihaly Csikszentmihalyi: Creativity, Flow and the Psychology of Discovery and Invention, 1996 p:27)

- THE INDIVIDUAL
- THE DOMAIN
- THE FIELD

The domain

- ”The domain consists of a set of symbolic rules and procedures.” (e.g. mathematics)

- Design is a domain though it is not so easy to recognize any well defined set of rules and procedures.

The Field

- ”The field includes all gatekeepers to the domain: In visual arts the field consists of art teachers, curators of museums, collectors of art, critics, and administrators of foundations and government agencies that deal with culture. It is the field that selects what new works deserve to be recognized, preserved, and remembered.” P:28

The individual person

- ”Creativity occurs when a person, using the symbols of a given domain such as music, engineering, business, or mathematics, has a new idea or sees a new pattern, and when this novelty is selected by the appropriate field for inclusion into the relevant domain. The next generation will encounter that novelty as a part of the domain they are exposed to, and if they are creative, they in turn will change it further”

- ”Creativity is any act, idea, or product that changes an existing domain, or that transforms an existing domain into a new one.”

Some consequenses following the systems model to creativity

- ”A creative person is not necessarely different from other persons
- A person cannot be creative in a domain in which he or she is not exposed.
- Creativity can only be manifested in existing domains and fields.
- What is regarded creative fluctuates over time.”

- ”Perhaps the most important implication of the systems model is that the level of creativity in a given place at a given time does not depend only on the amount of individual creativity”

Typical reports from creative people

- FLOW (Csikszentmihalyi)
- Creative people love what they do.
- They all agree that what they enjoy the most is discovering something new.
- Flow comes when knowing your domain, topics, techniques so well that you can forget about them in moments.
- Distractions are excluded
- There is no worry of failures
- Self-consciuosness disappears
- The sense of time becomes distorted

Inspiration and interaction

- Individual creativity is regarded historically as something spiritual, divine. There is a spirit (muse) who inspires the genius.
- A different conseption is that creativity is inspired by the world. The creative person can look at things in the world and reinterpret them and translate them by looking beyond the ”thing”

Incubation

- More about this tomorrow

- Messyness is inspiring
- Why is the ”contaminated” more interesting?
- Richness allows for many readings.
- Many readings are more powerful than one bright idea.

Emergence

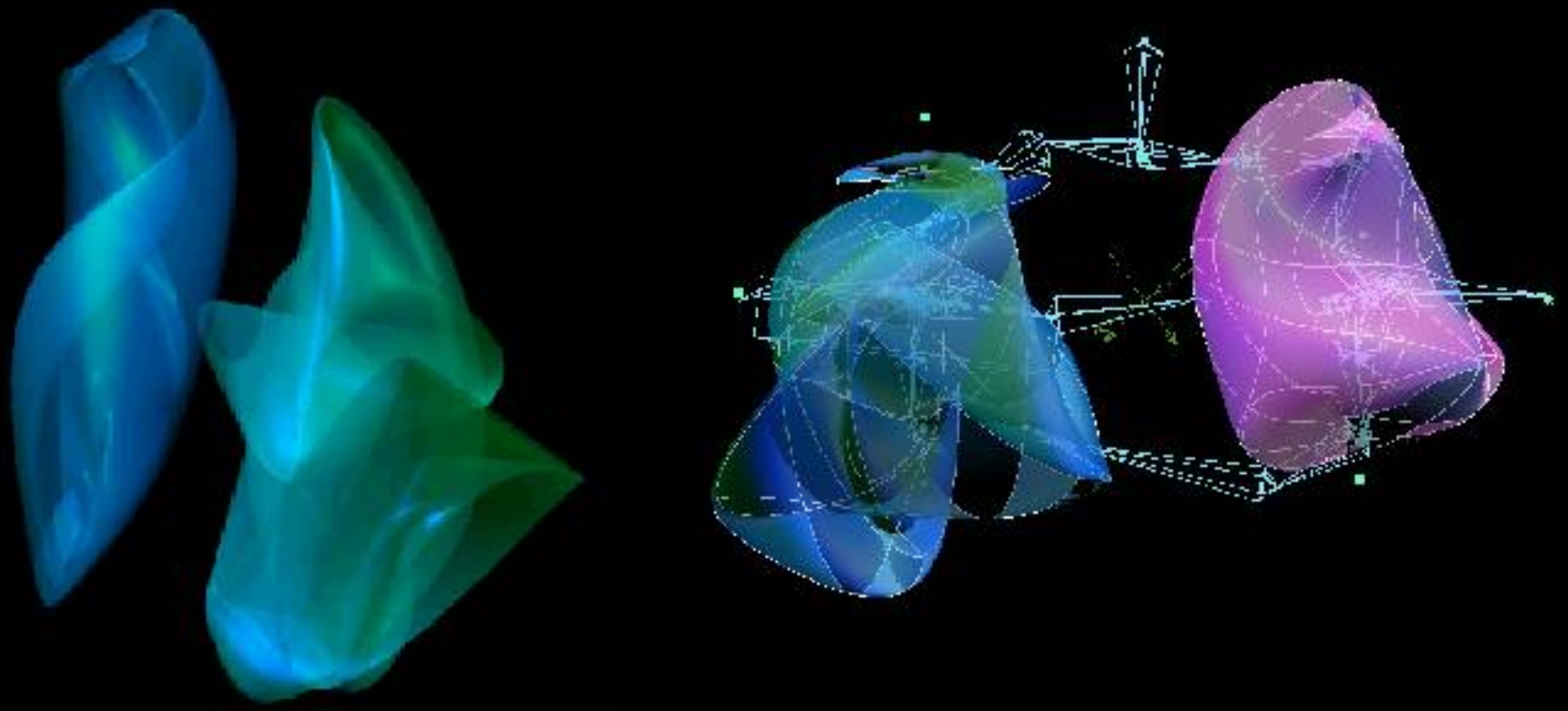
- Emergence is a general phenomena in nature, society, technology, and economy. The resent financial crises is an emerging phenomenon.
- Emergence is a central driving principle in systems.
- New web solutions, fashion and many other design areas are consciously basing them selves on emergence in social and economic interactions.
- Creation, creativity and emergence are interlinked.
- Ask your self: how does emergence play a role in my project?
- How can I use the principle of emergence or design according to or trigger emergent phenomena?

Emergence in design computing

- The cases I will show are based on the use of computers in visual creative processes.
- Emergence is maybe the main driving phenomenon in this type of design.
- The computer can be used to generate forms and structures in a way that is partly out of the designer's control.

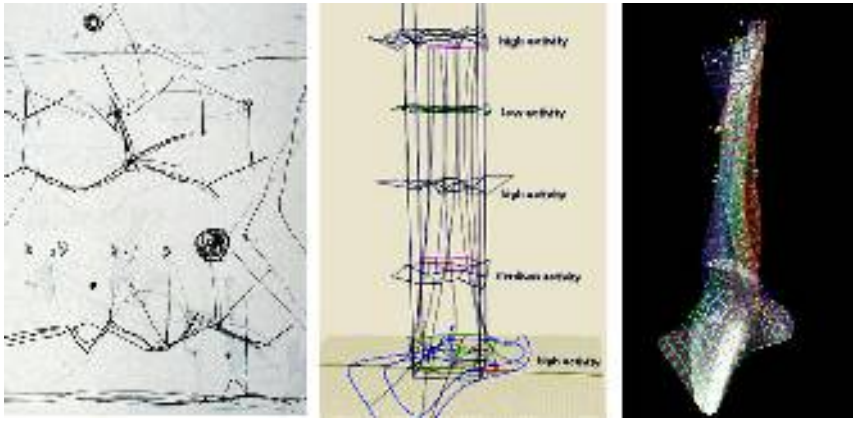
Four types of emergence in design.

- The use of a source material that dictates some of the conditions of the design process which will thereafter follow a path that is less controlled by the designer and from which the end result will eventually materialise and have an element of novelty and surprise.
- The design of conditions for and according to emergence in urban or natural systems.
- The use of emergence in material systems, how materials self-organise into structures.
- Computer simulated emergence, like self-organising architecture or genetic algorithms, cellular automata or self-organising and self-growing architecture.

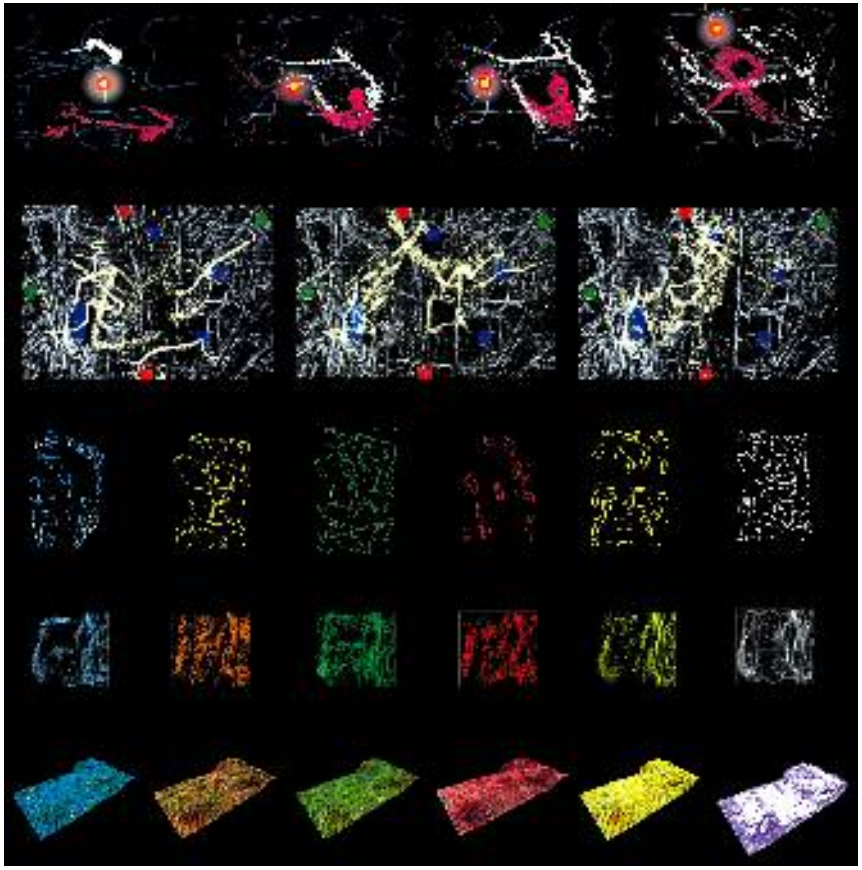


Central concepts of emergence in design.

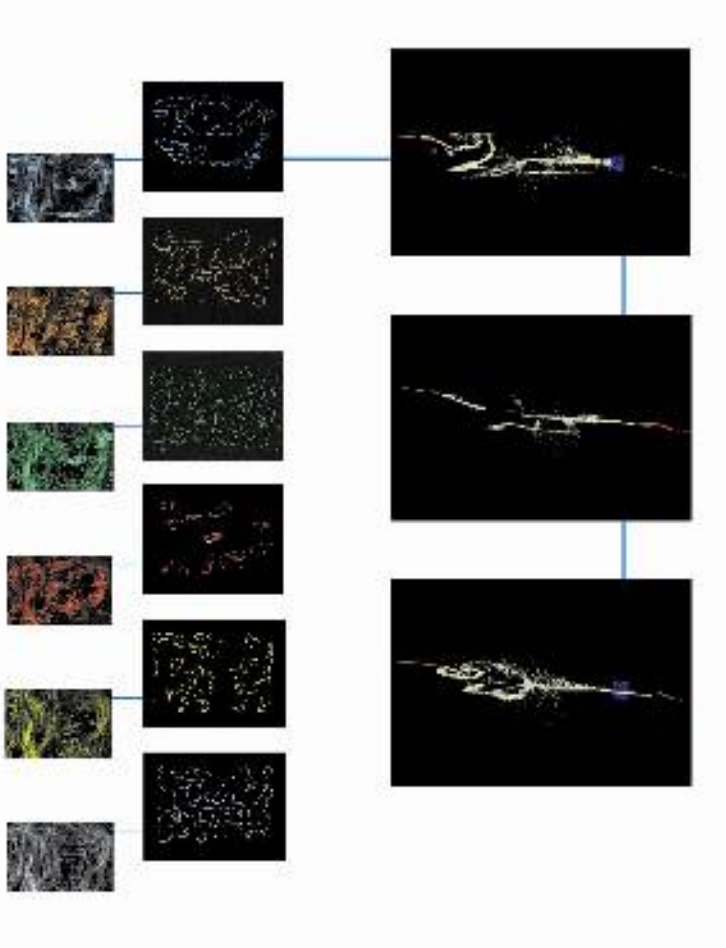
- *Thinking through design practice*:
- *The importance of the source material and finding strategies*:
- *Breaking schemata*:
- *Abstraction and generative diagramming:*
- *Visual thinking*:
- *Virtual phenomena*:
- *Time-based design*:
- *Mis-use strategy*:

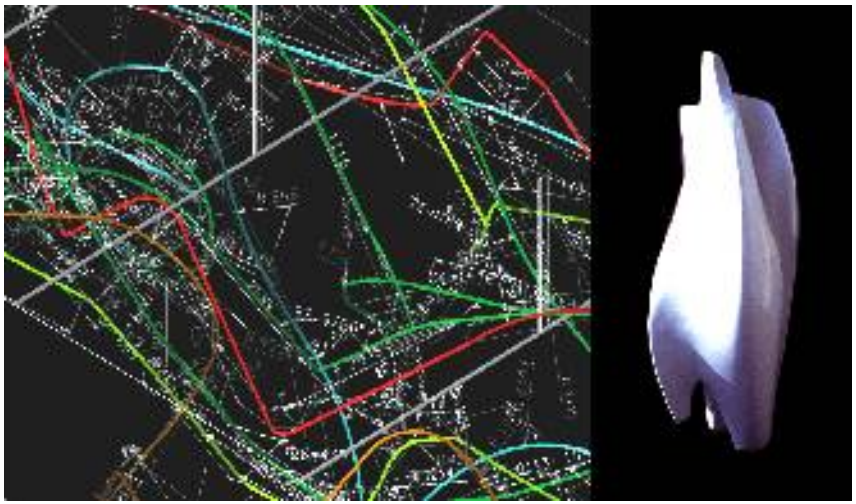


- *Working with and not against the technology*:
- *The role of processing*:
- *Pre and post rationalisation*:
- *Collaboration*:
- *The hybrid process:*

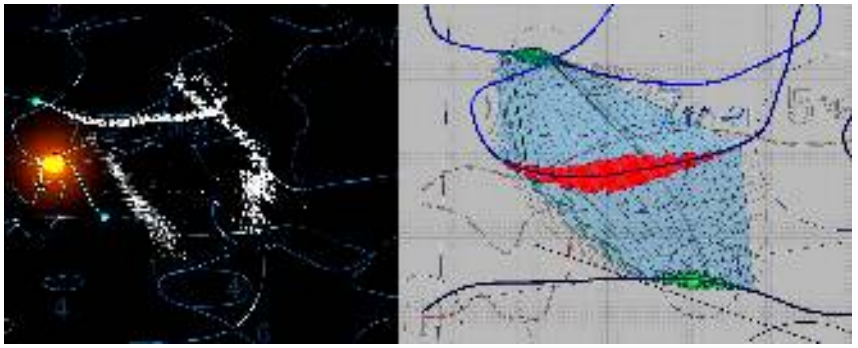


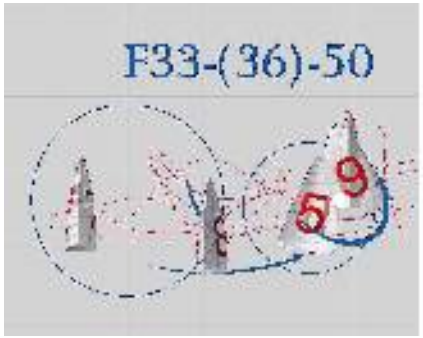
Experimental design

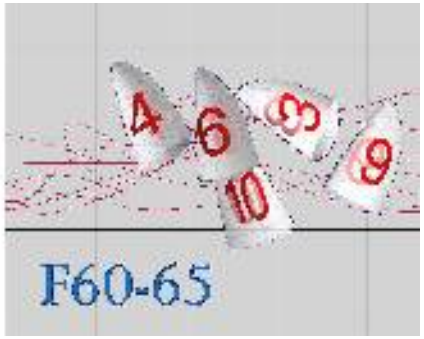


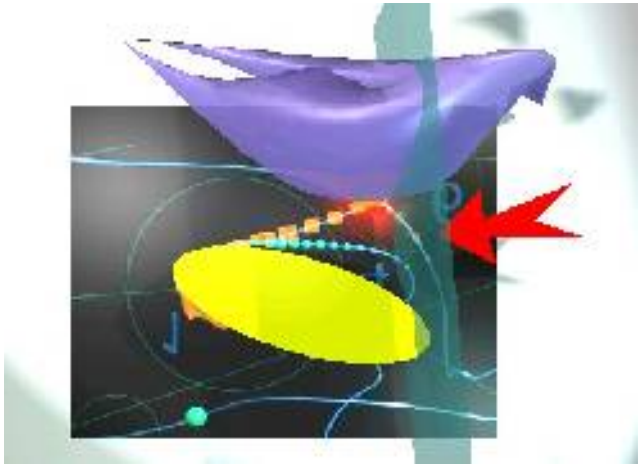


Creative interpretation

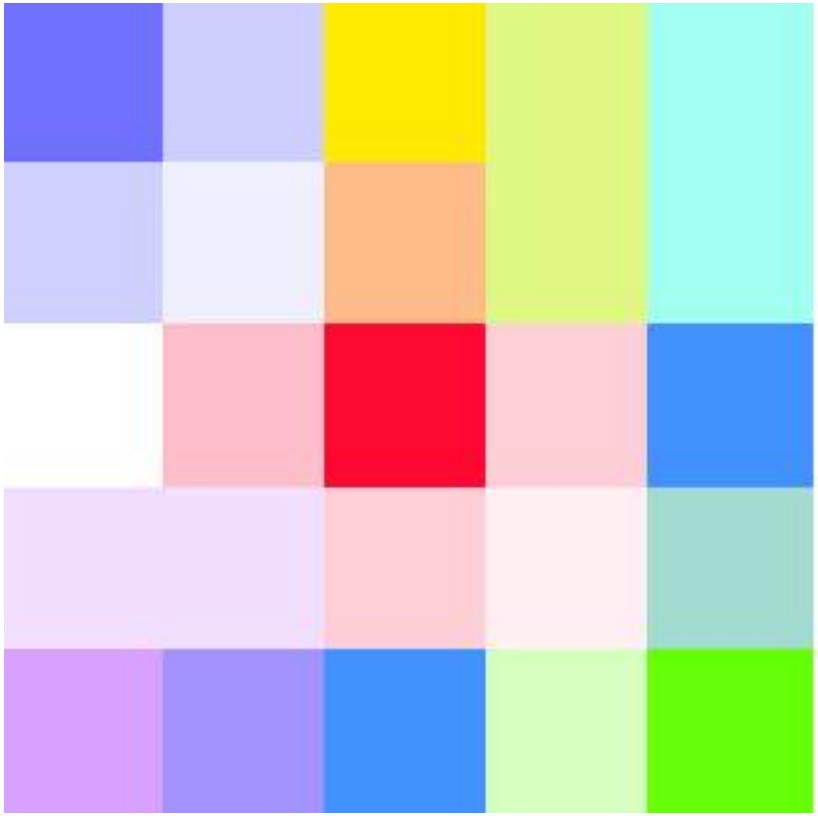








Recoding (interpretation, reading)



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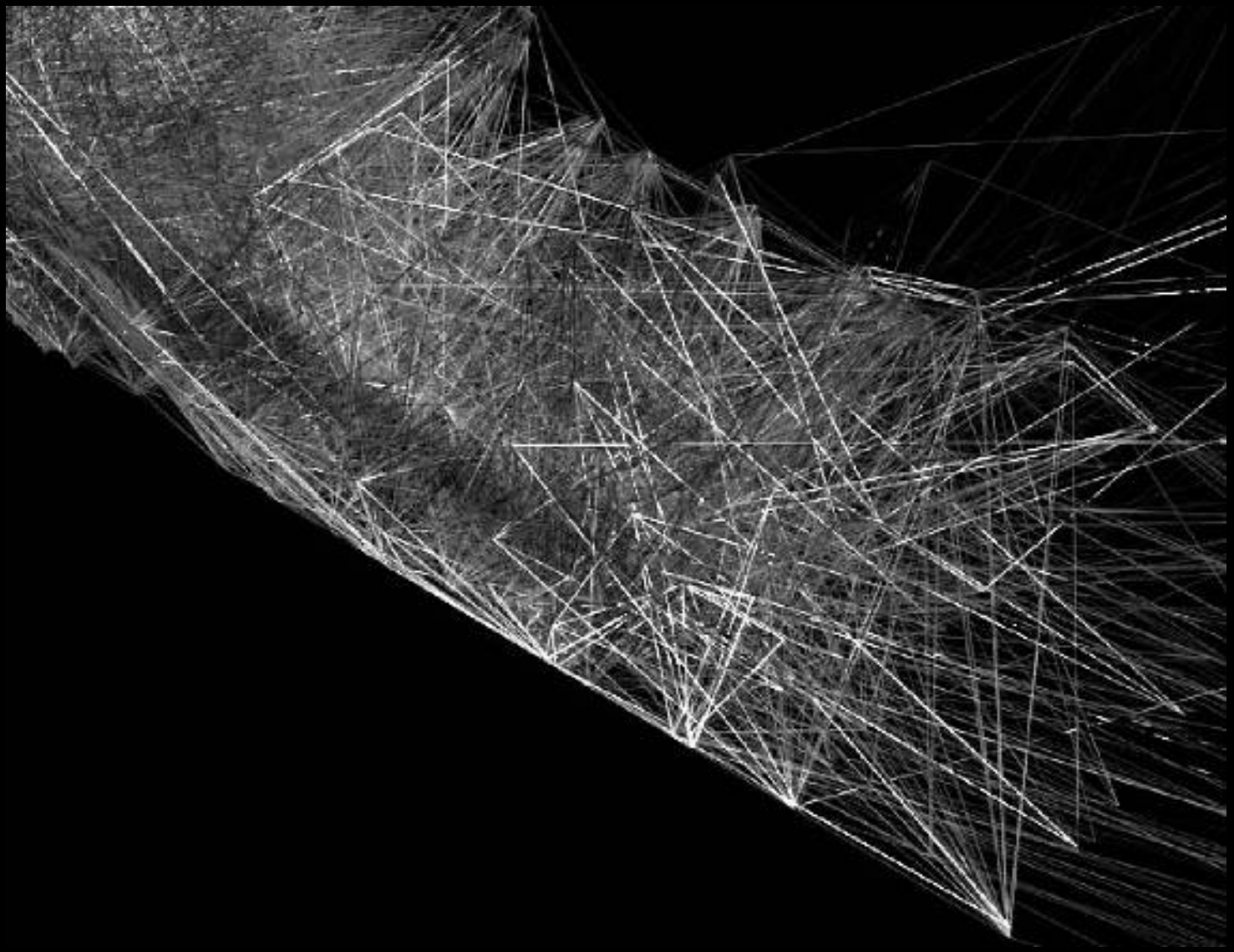


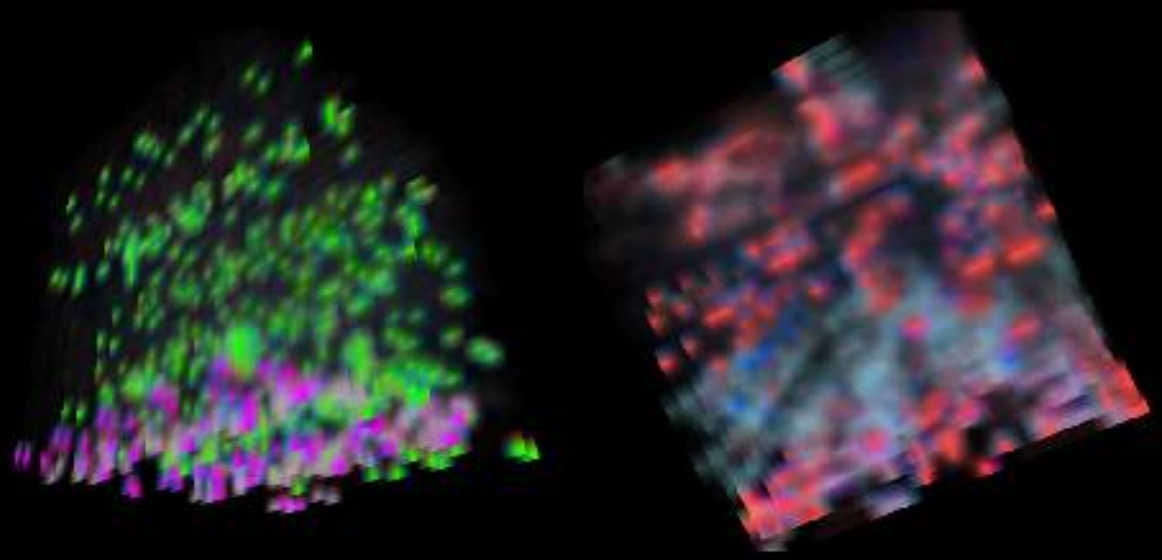
```
// Vertex size
long dx = 32;
double x_0 = 0.0;
int y = 0;
double z = 0.0;

// Calculating Data array
char *data; // use appropriate variable for data
data = new char[dx] * sizeof(data[0]);

char *fill...
data = new char[dx][y][z] * sizeof(*);

char swap[30];
char name2[30];
char *p_1;
char *p = new char[30];
temp_ = new char[30];
t = *p = *p = *p[30] = 0;

// Initialize
call close(fd, (struct sockaddr *)&server, sizeof(server));
int i, j, k, l, m, n, o, p;
call (x, y, z);
i = 1; i < dx; i++) {
```

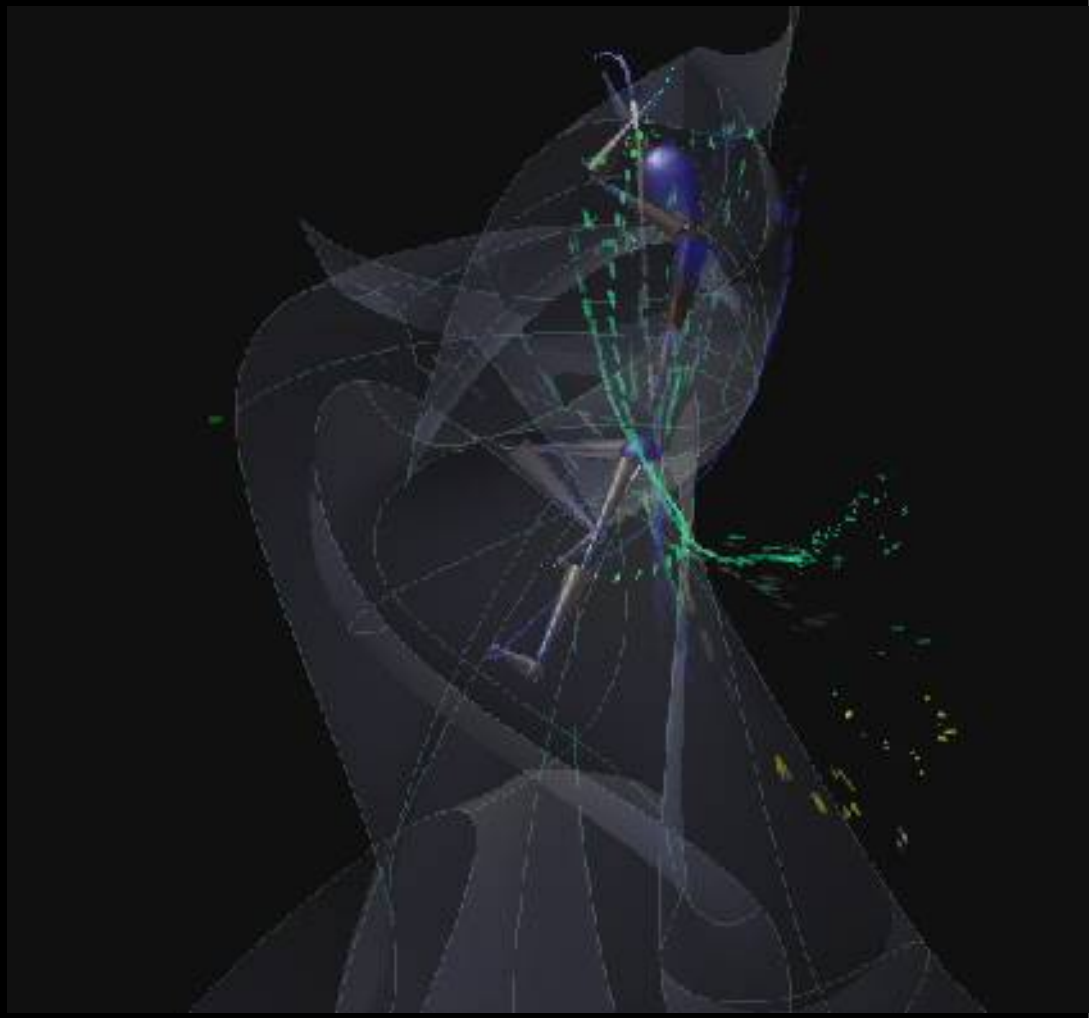


Loss of control and taking control

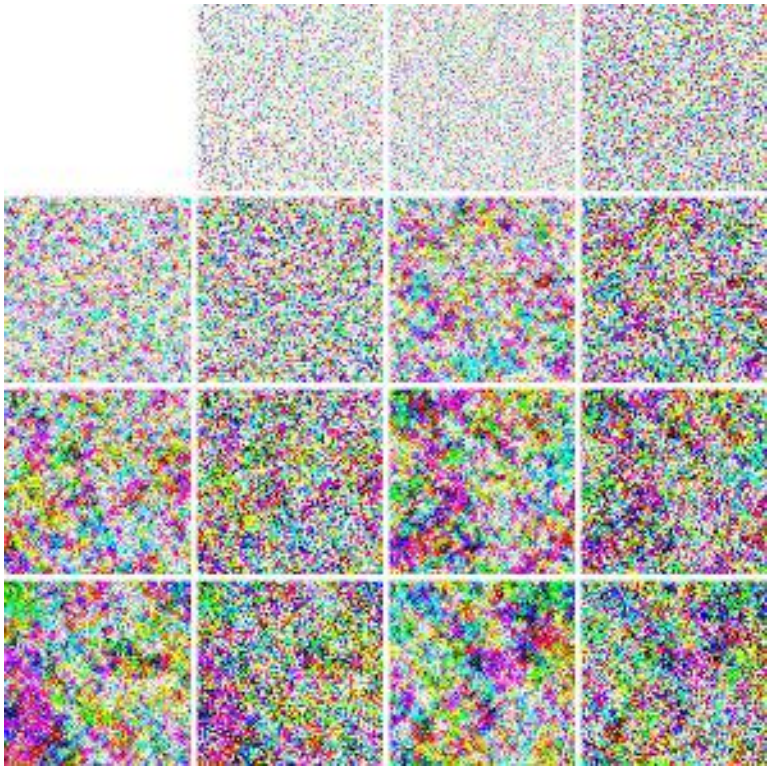
- The idea that ‘the more control the better’ is questioned. The digital design process creates a space for the unanticipated. The central aspect is about loosening control and developing strategies for the negotiation of control throughout the process.
- Control is always relative to a static ideal…….

The control idea

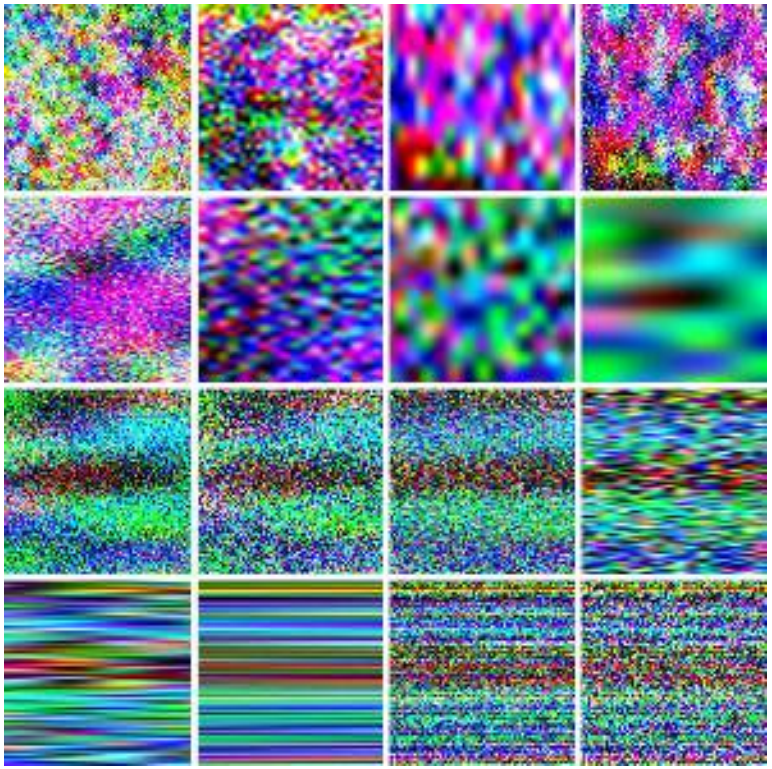
- In system thinking the idea of maintaining full control is long abandoned.
- Instead one planes for open ended situations, and uncontrolled futures.
- So the idea of the totally controlled design product might also be dated.
- This also questiones the idea of the finalised product and the static product.
- The open ended and slightly out of control is not a bad thing regarding creative processes.



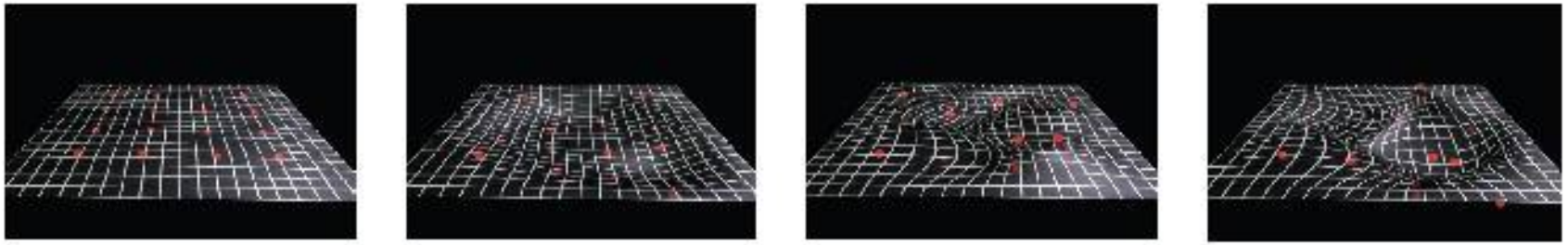
The rigidity of the machine



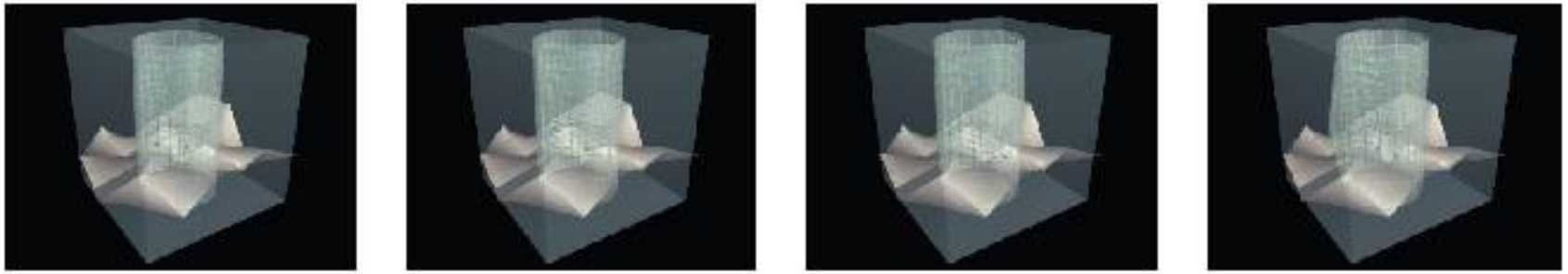
The flexibility and potential found in interaction between man and machine



Generative Design

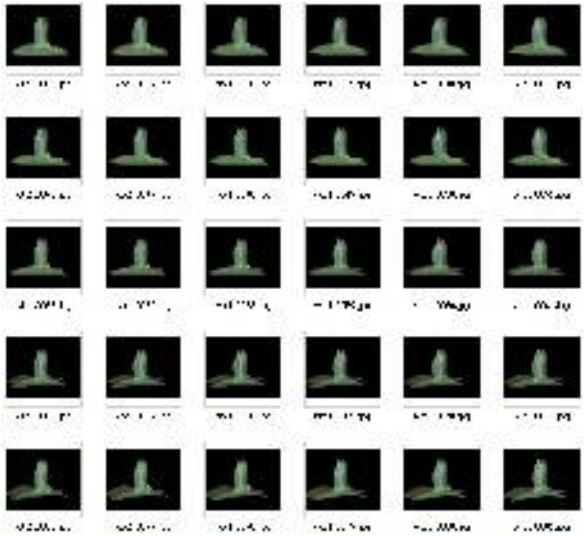


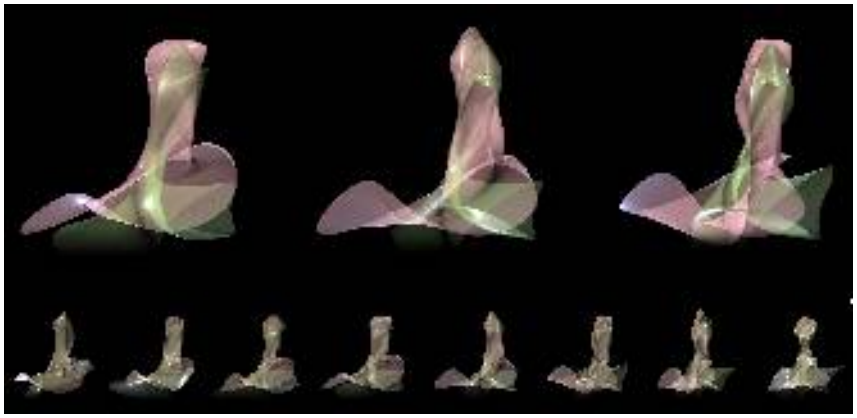
First surface cursor experiment

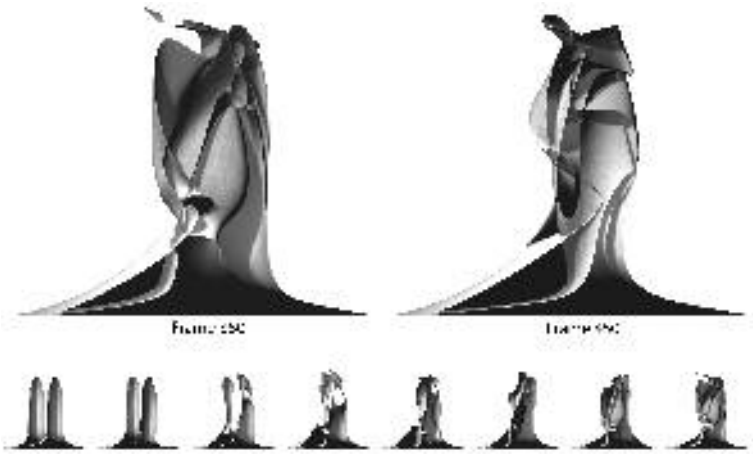


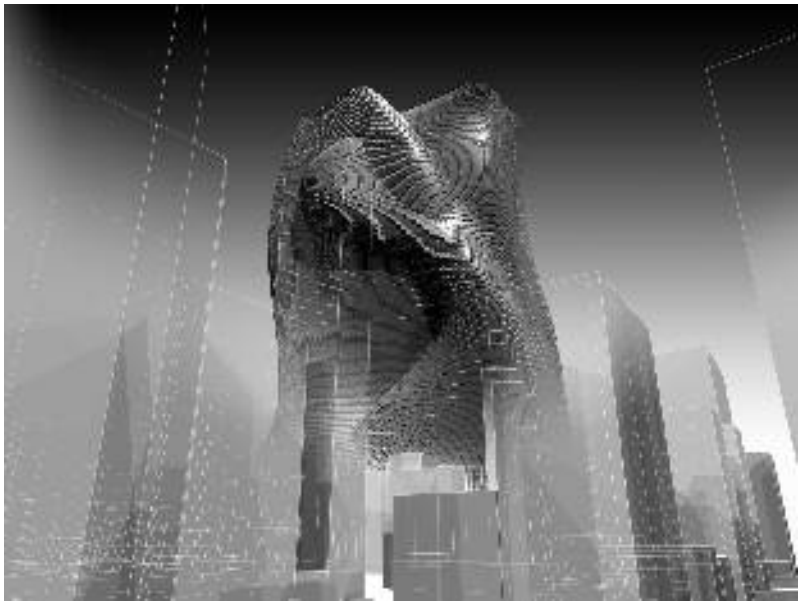
Surface cursor experiment with input surface.

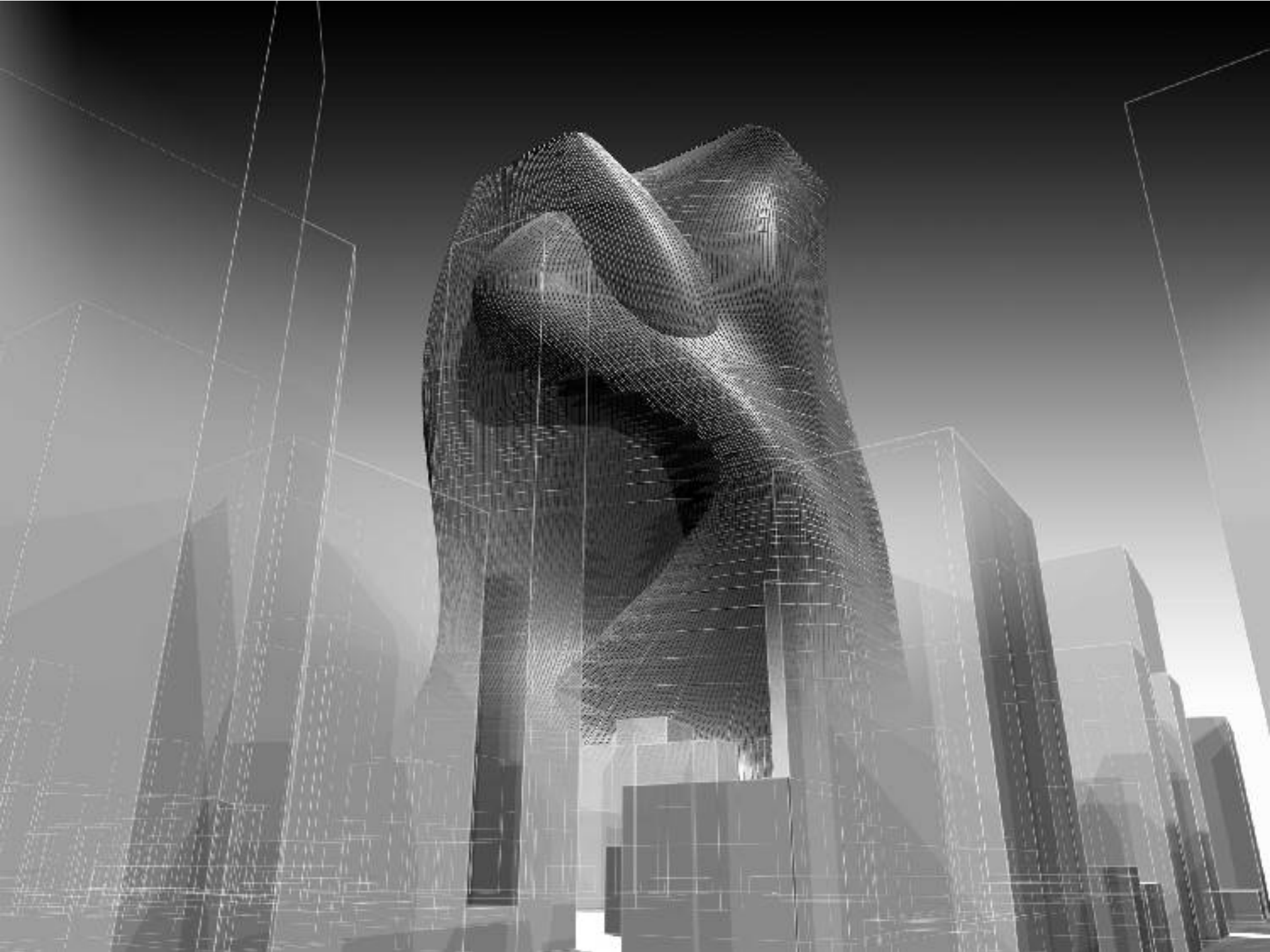
Generative design







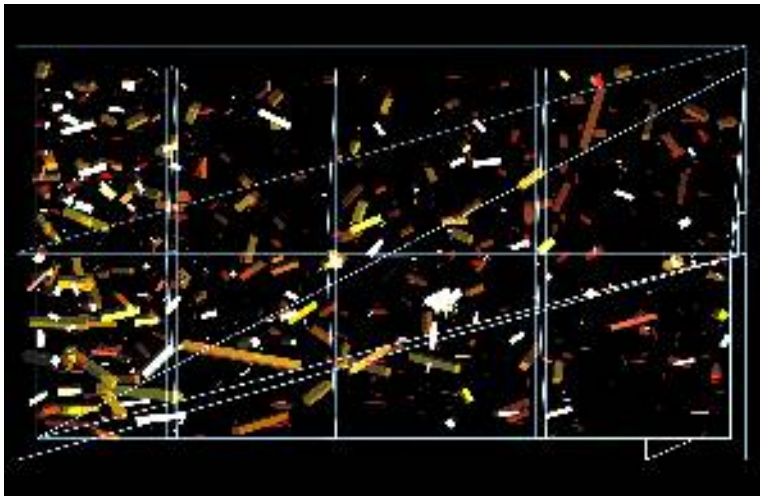


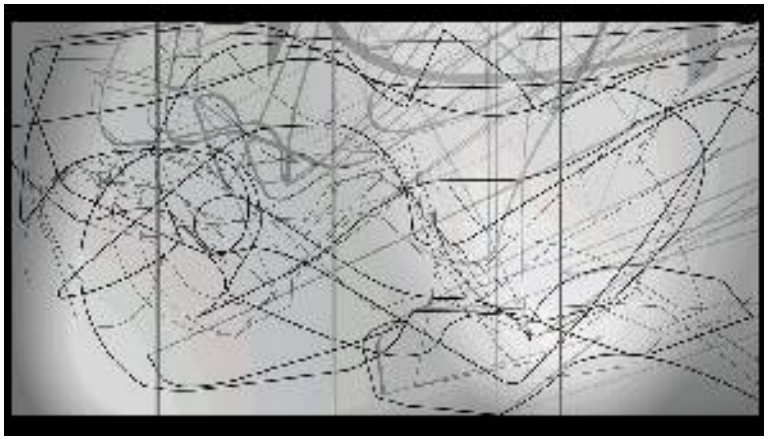


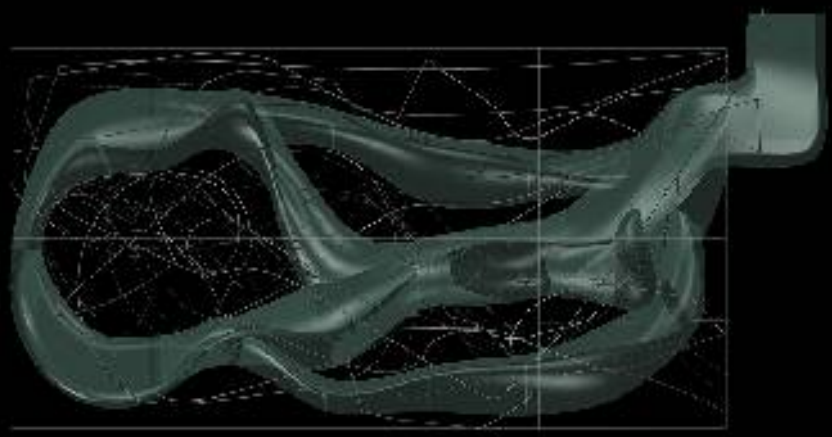
Anti typology and abstraction

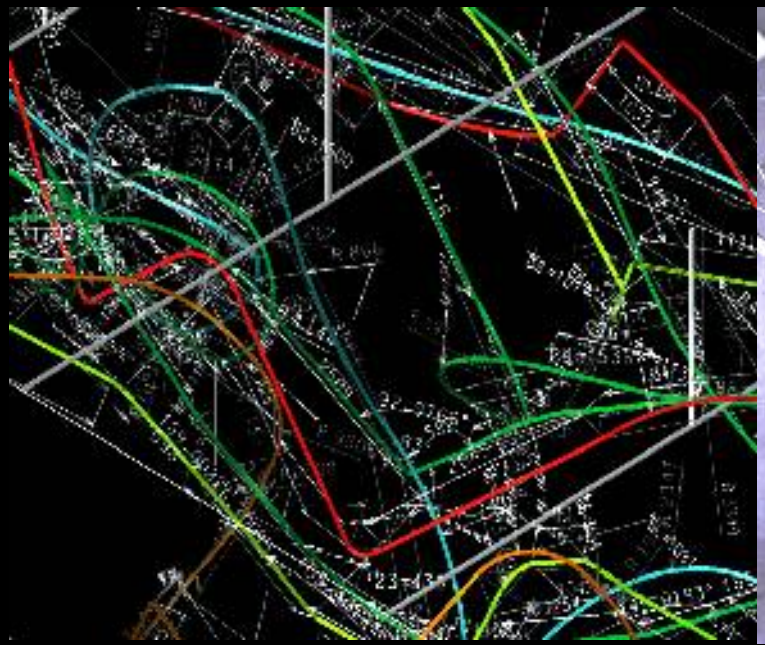
- Abstract and structural
- Abstraction is better suited for the exploitation of digital creativity than types,

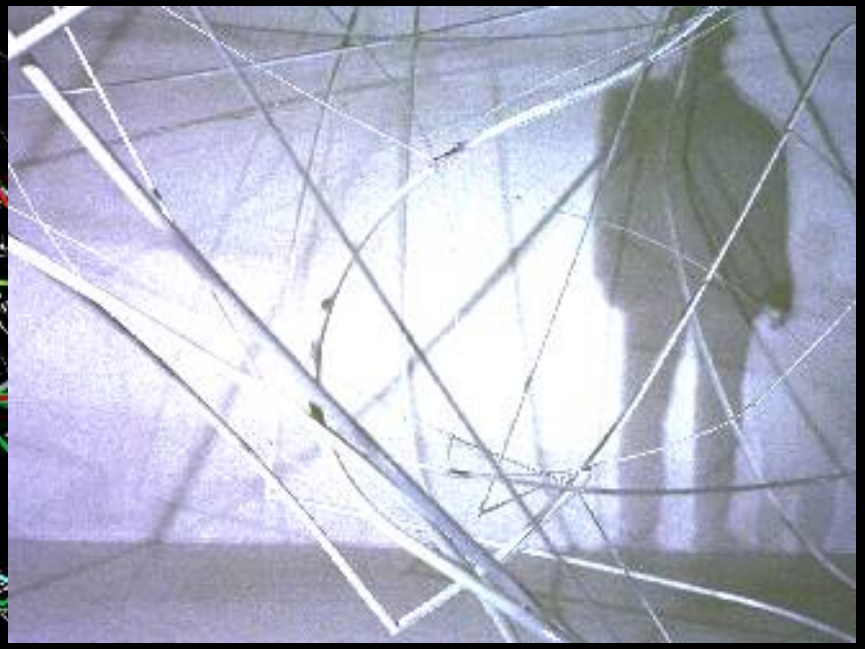
  metaphors and symbols.





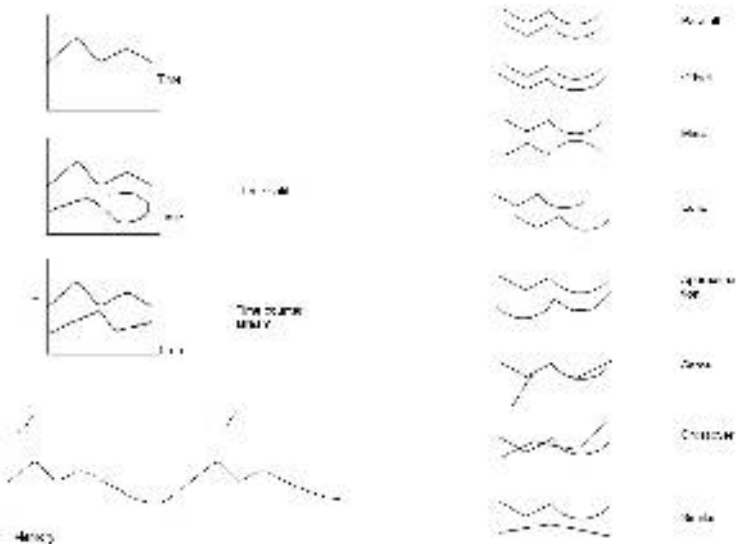


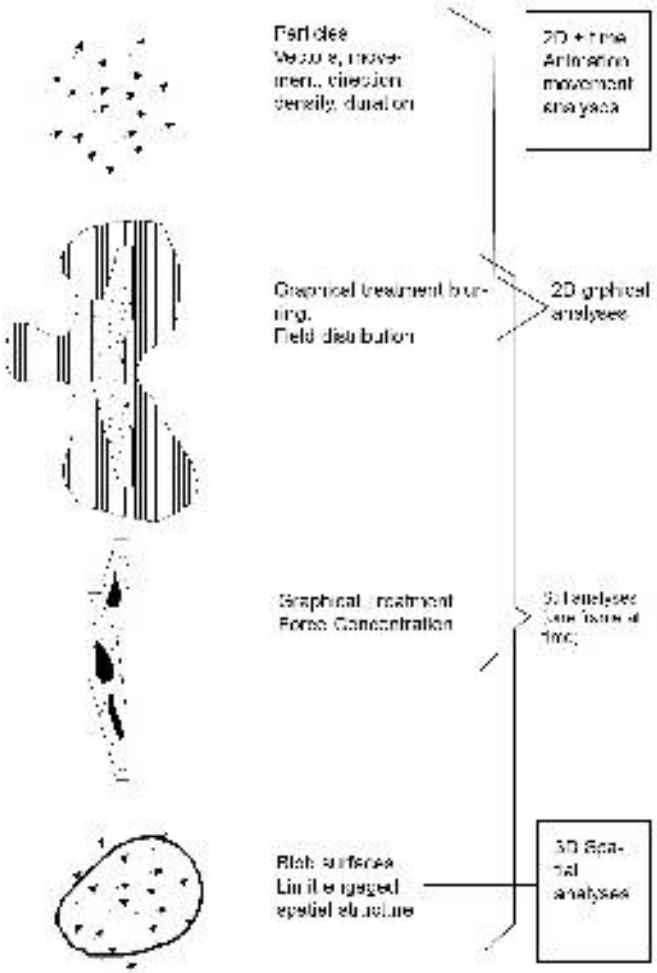




Visual thinking (Rudolf Arnheim)

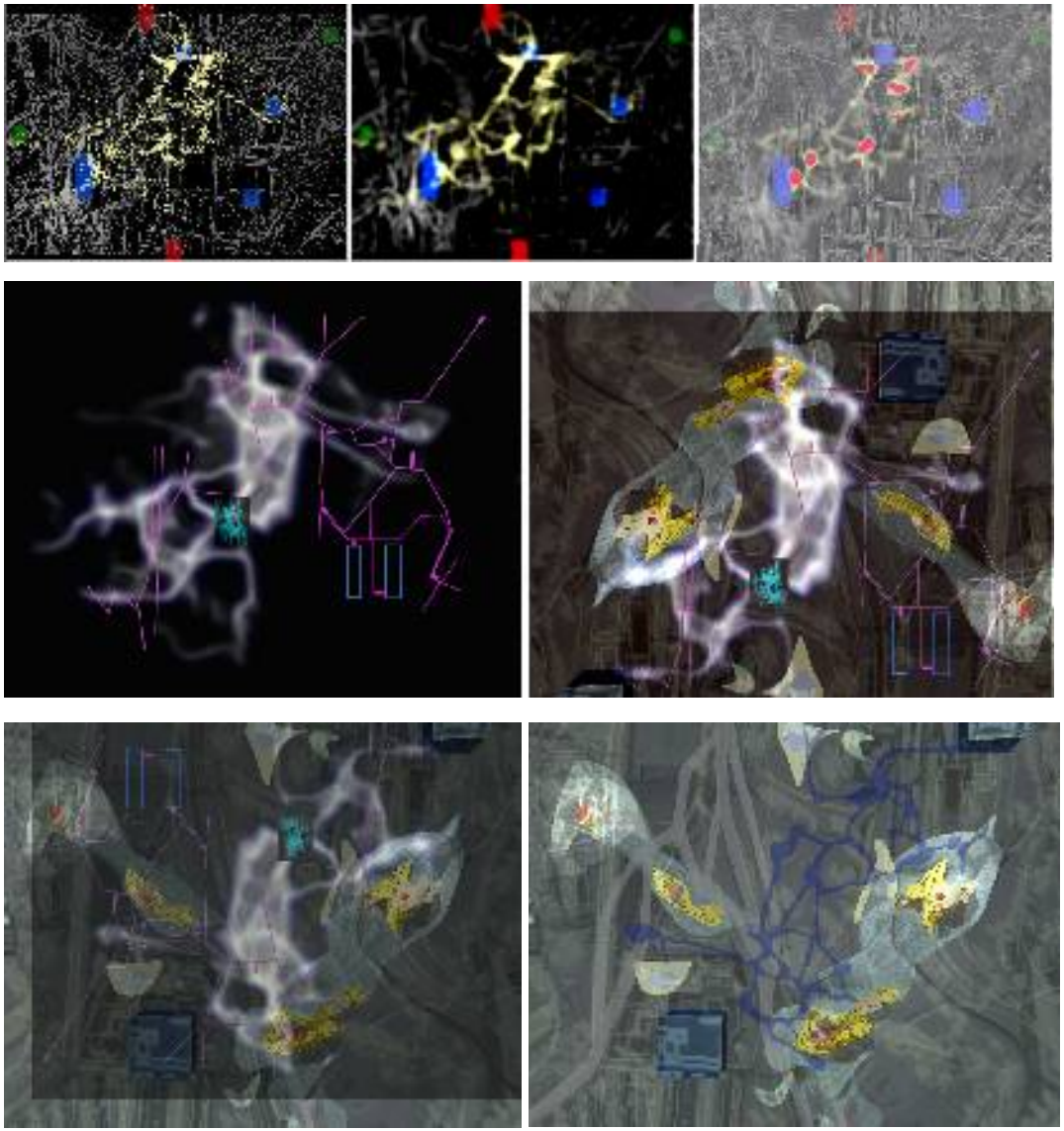
- Visual analyses of the found or generated visual material including recoding are central aspects that enable the exploitation of the generative potential in graphic computing.

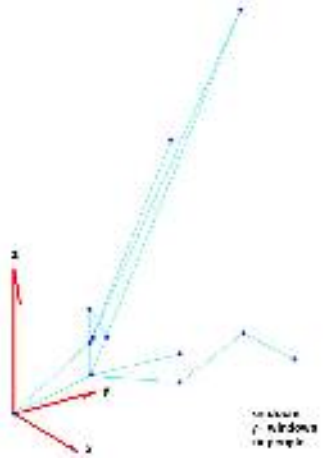


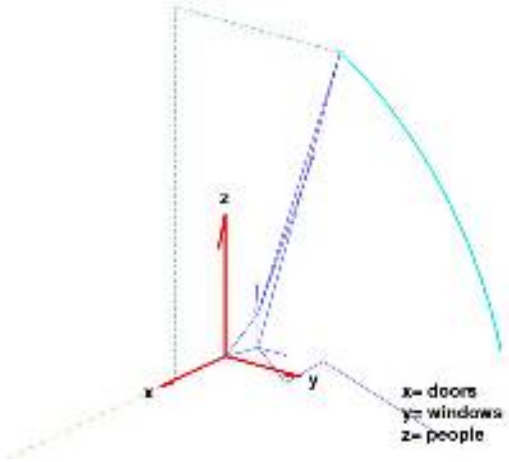


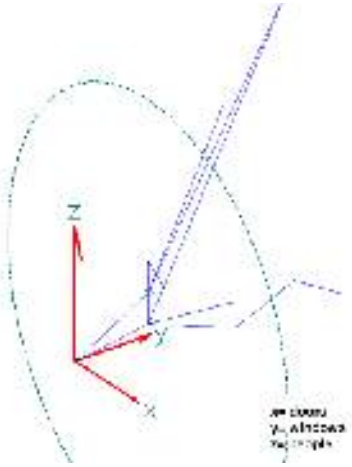
Diagrams

- Descriptive
- Generative






z
x
y
x= doors
y= windows
z= people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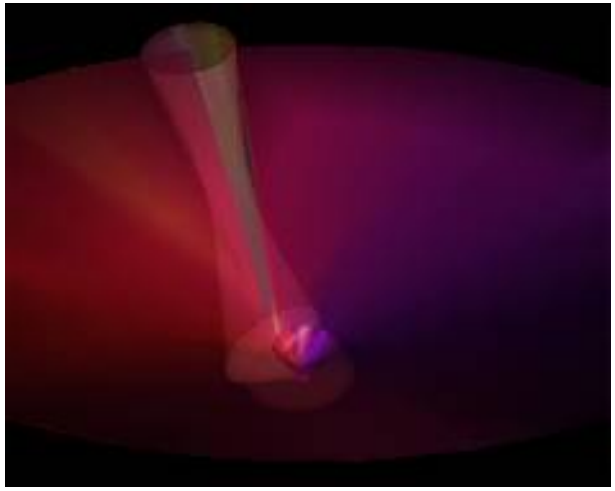
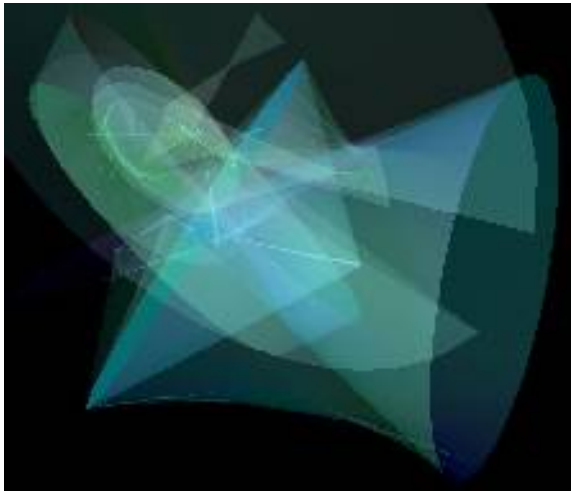
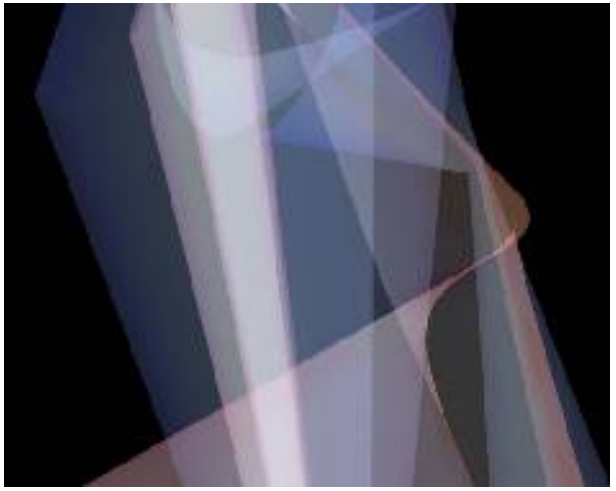
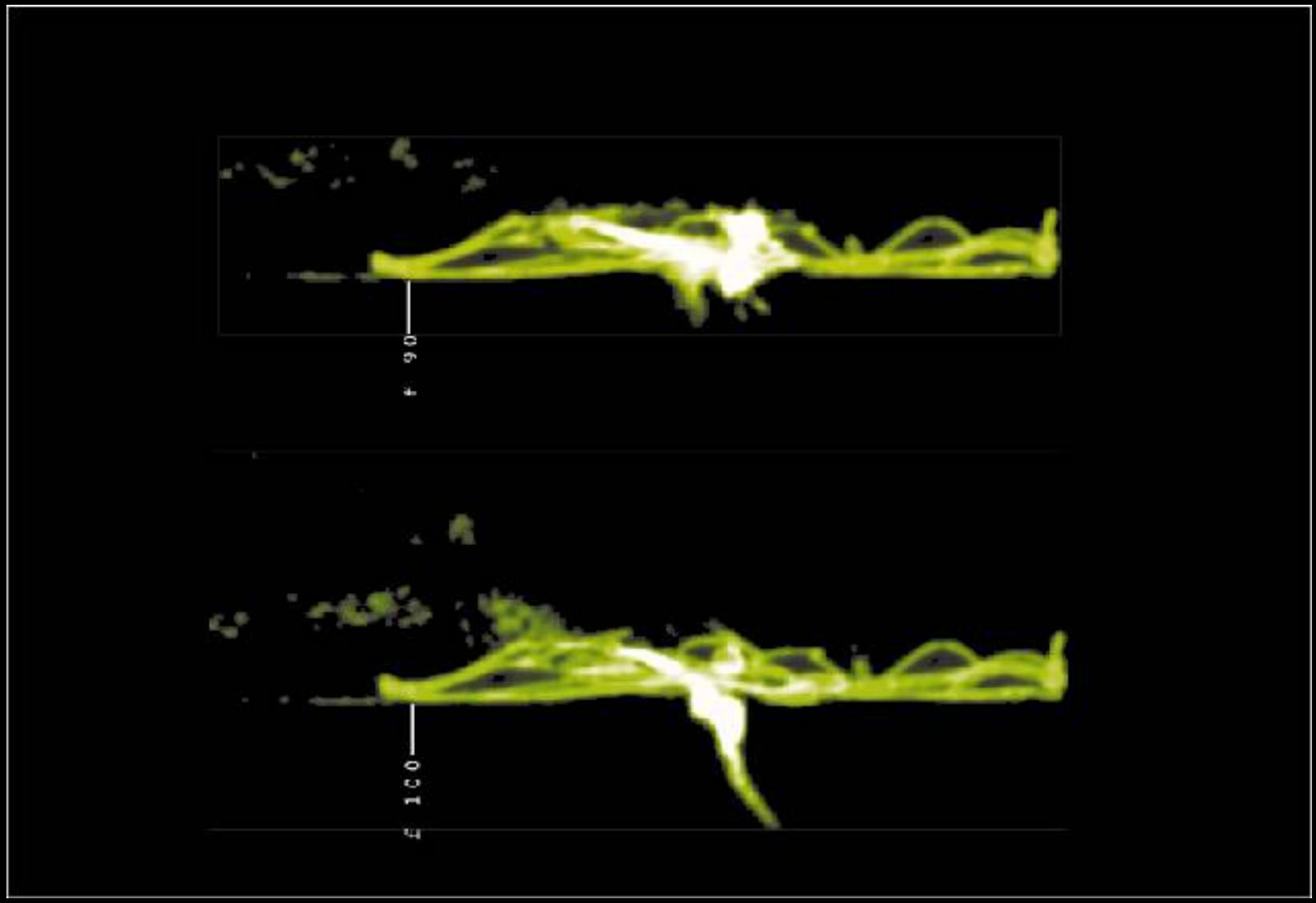


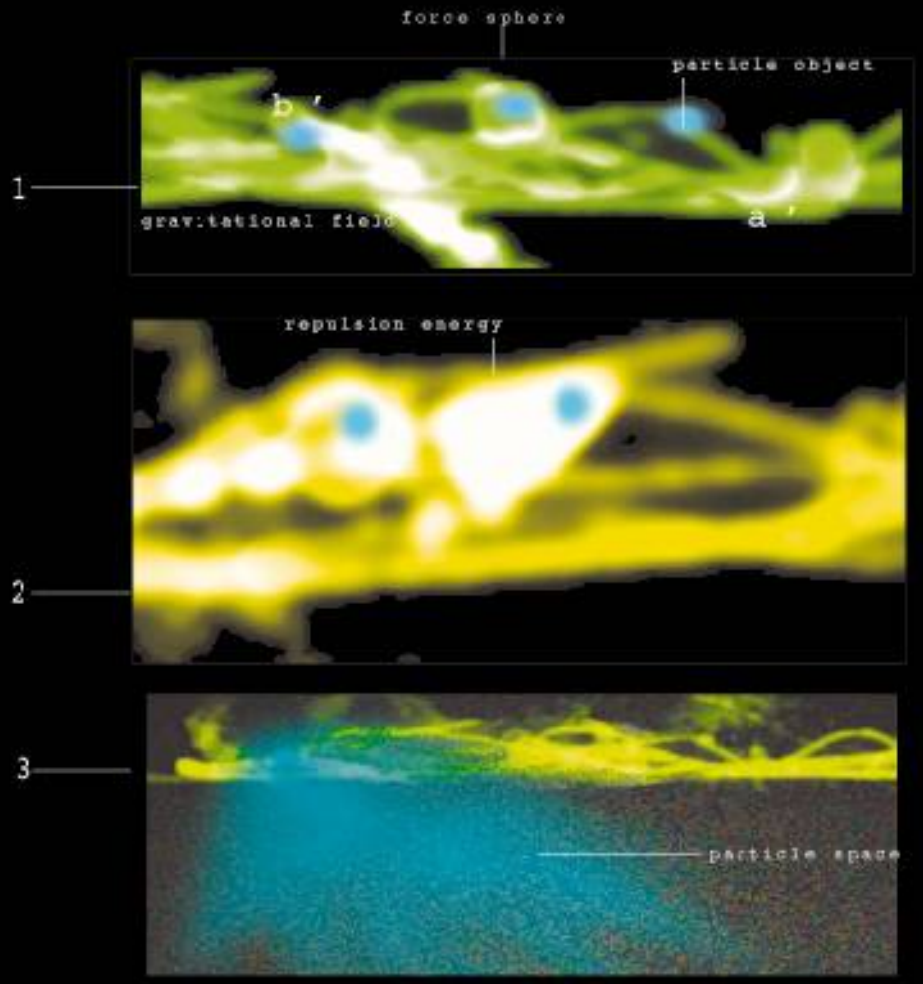




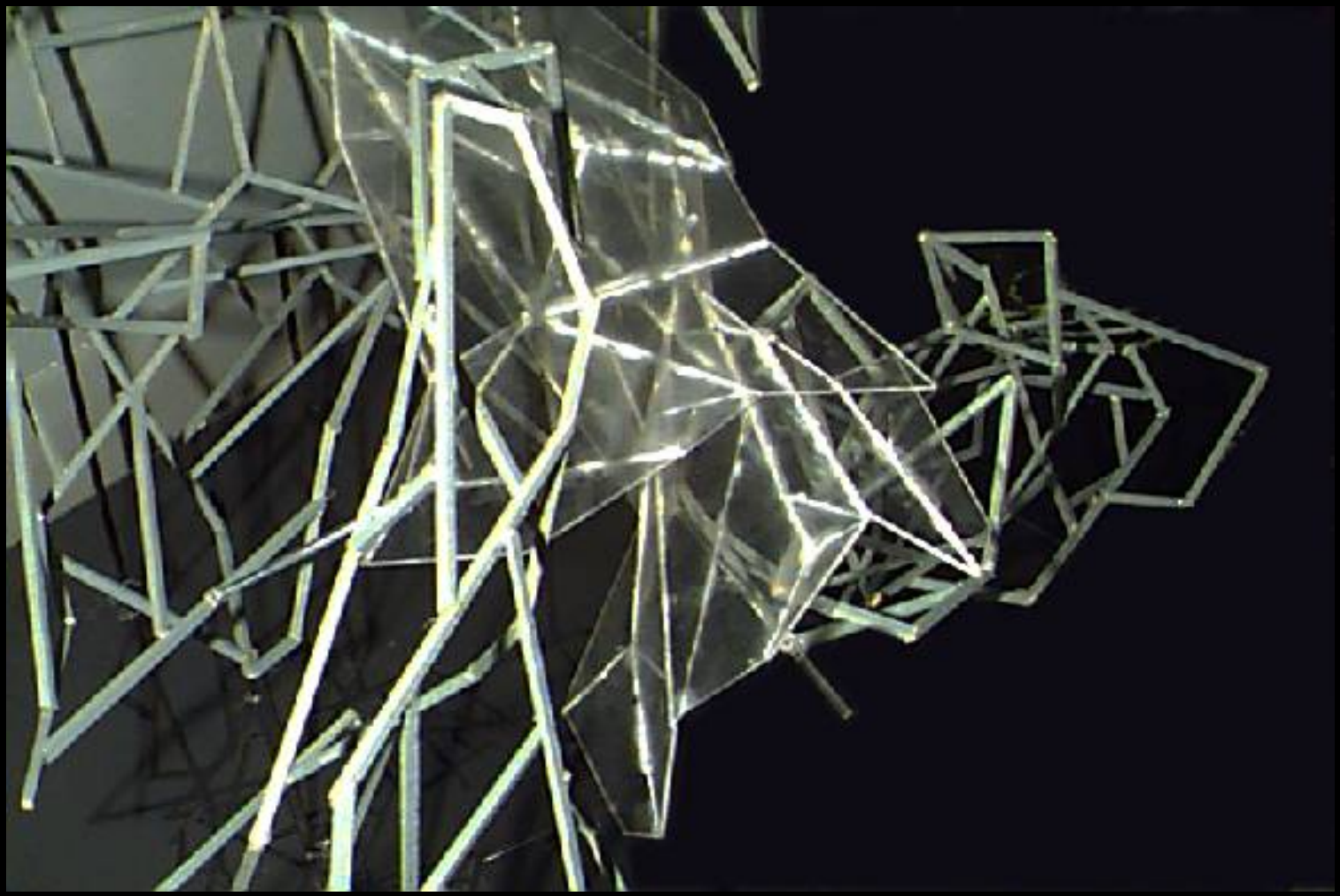
Generative diagramming, transition from diagram to model

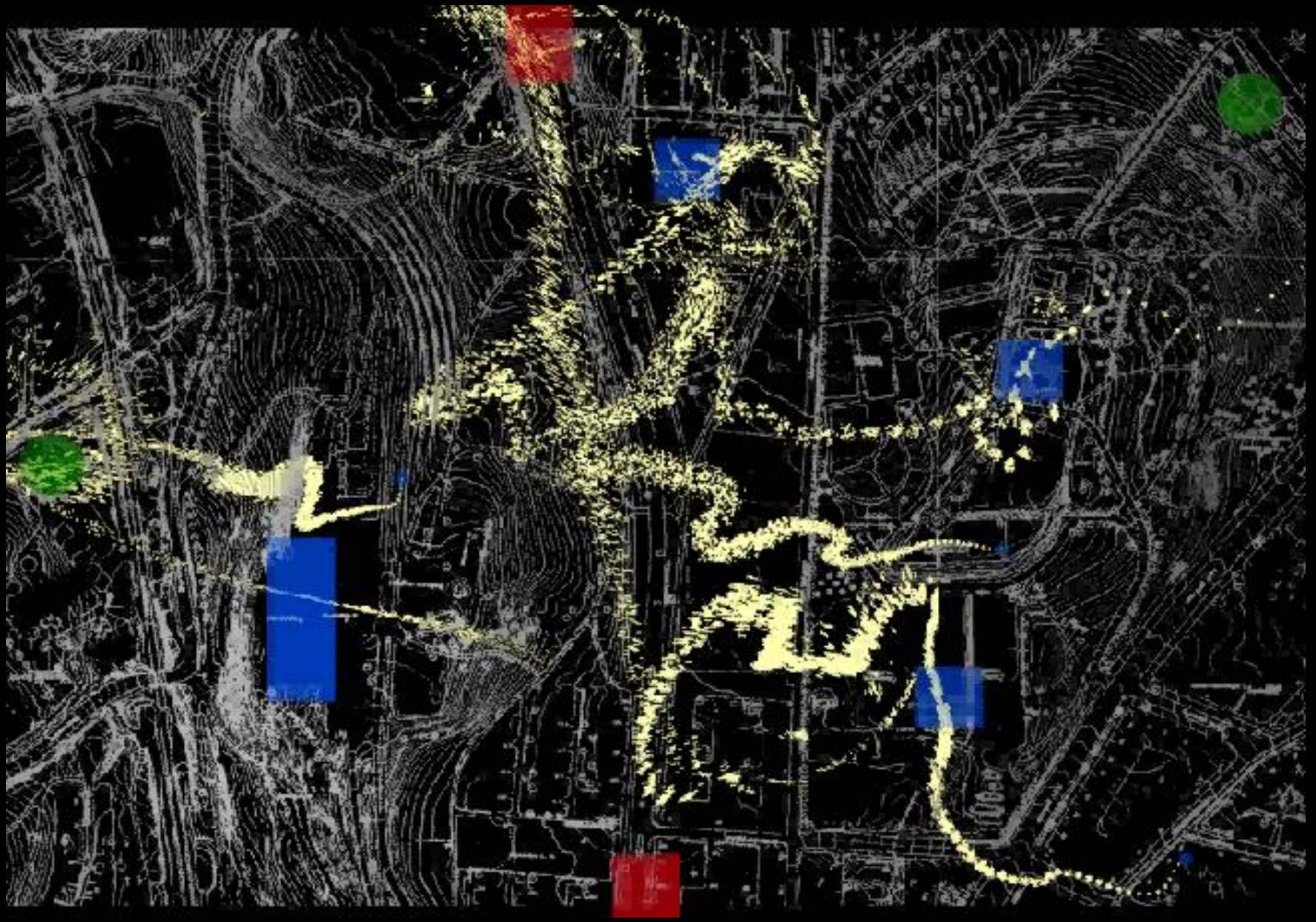


Codification

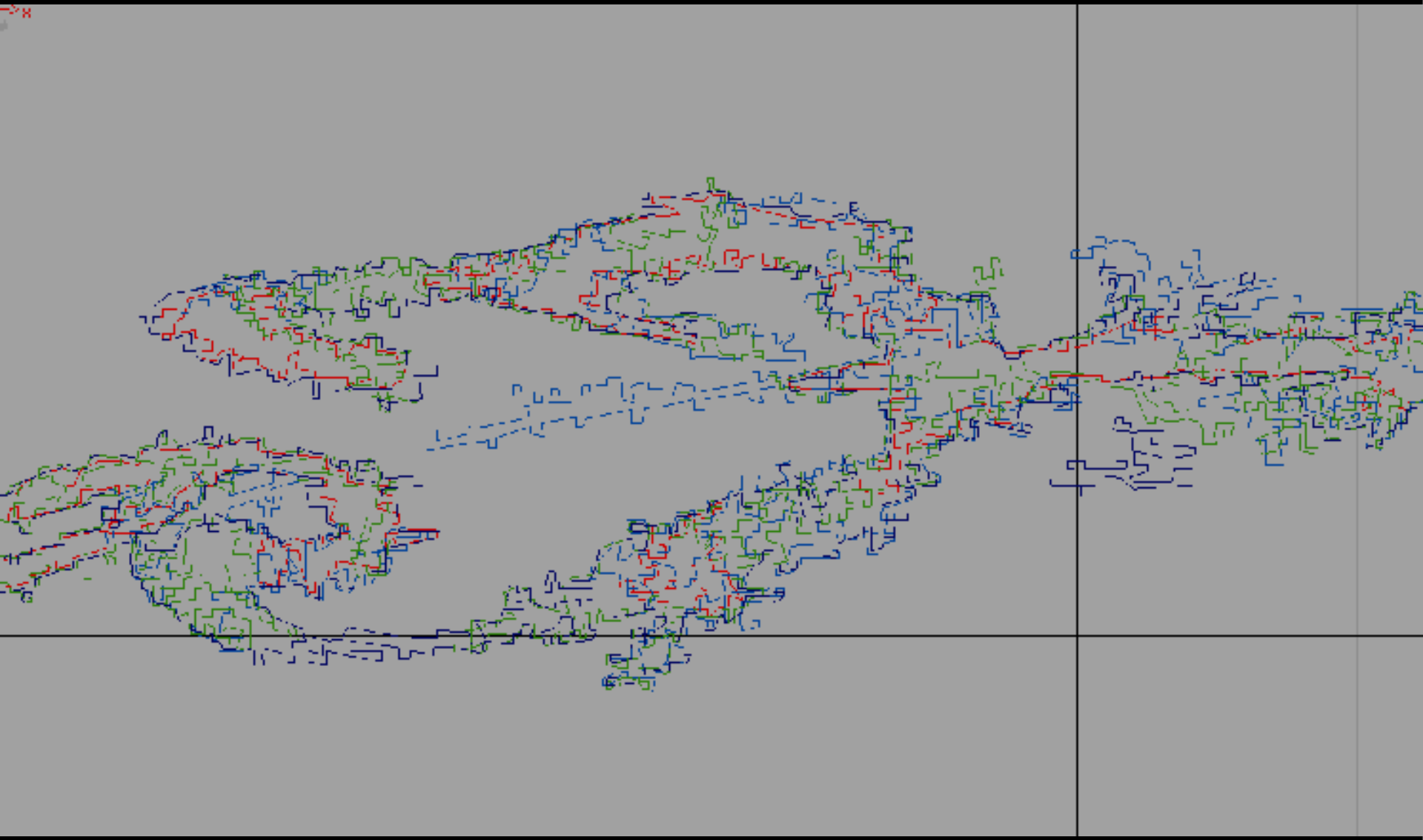


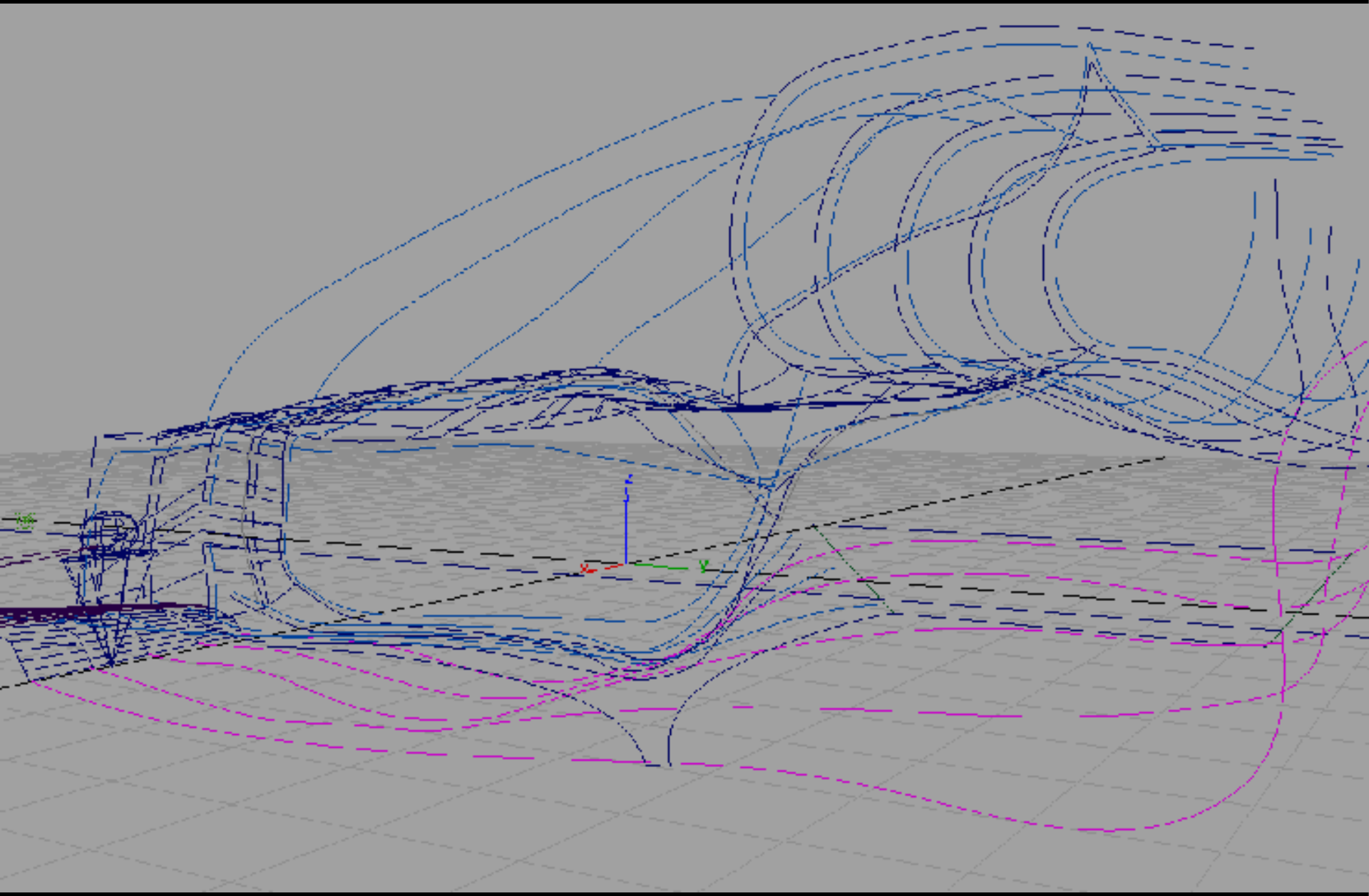
Preliminary study model, between diagram and model

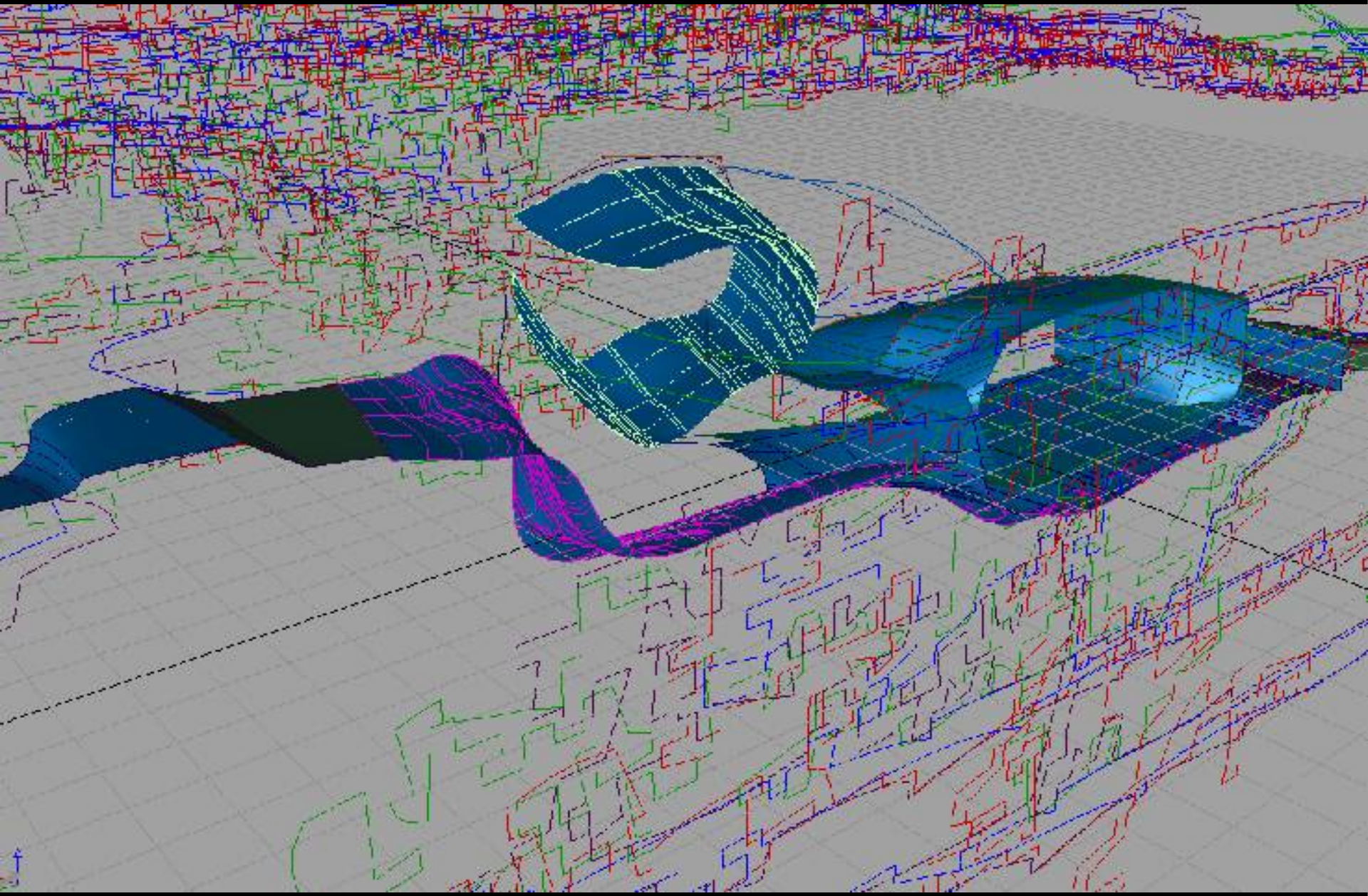




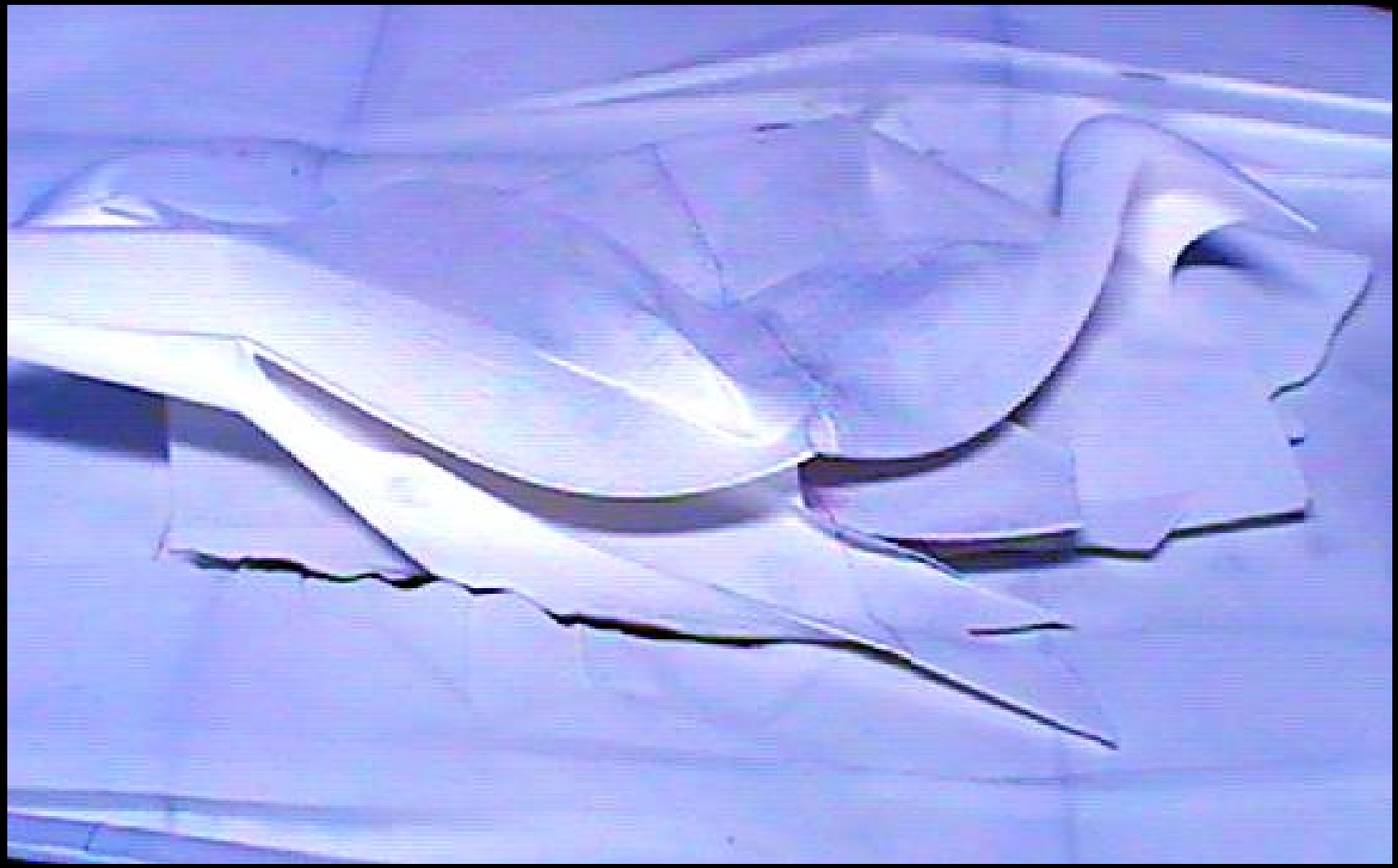
Synthetic pavilion 1998







Rapid Prototyping model.
Modelling complex geometries.



Finding

- ‘Finding’ as a creative strategy: This is an external (inspired impressive) creativity rather than an internal (expressive) creativity.

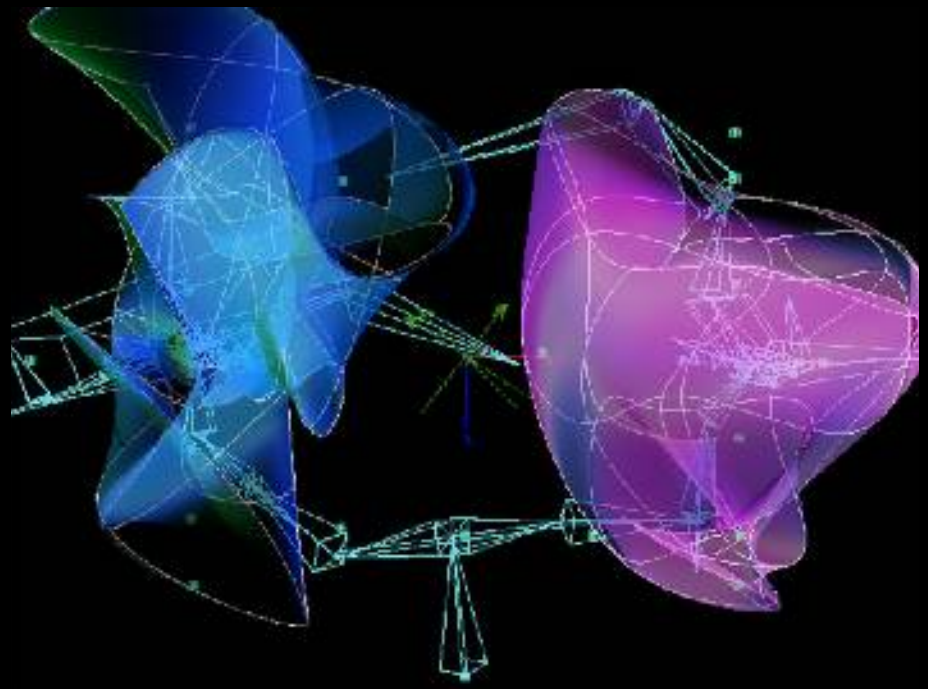
a_drift

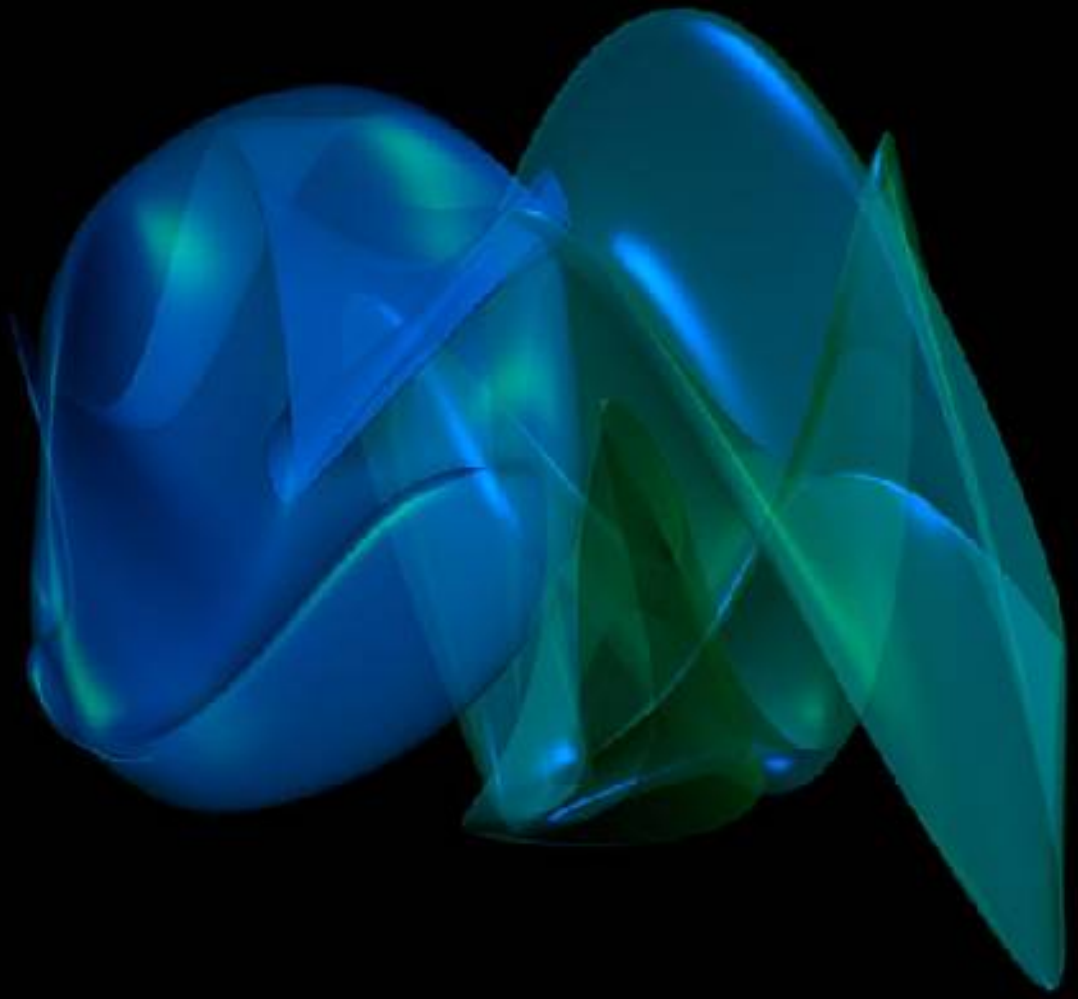
1999 - a_drift Time Capsules

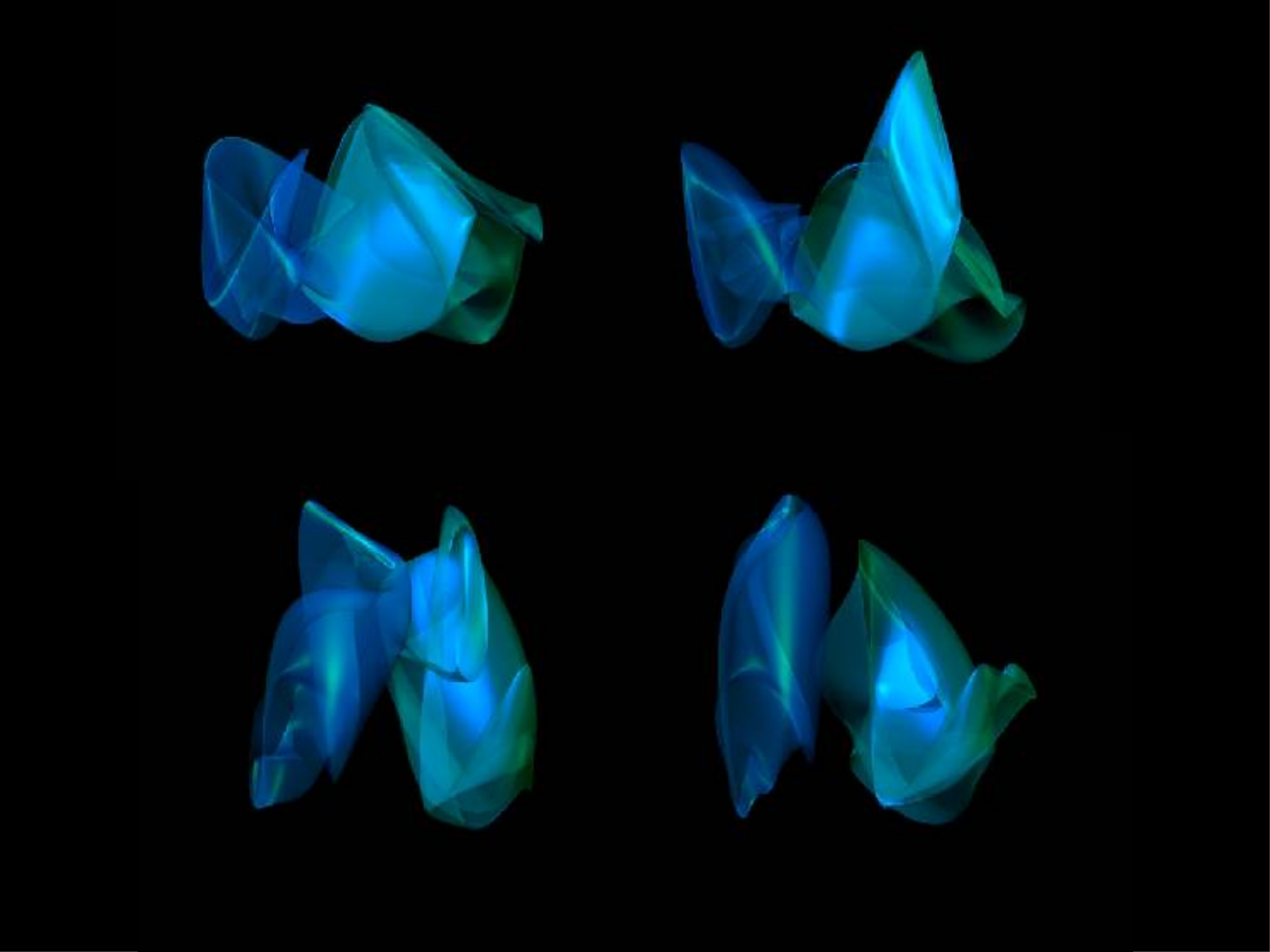
Finalist - Design Competition organised by The New York Times, New York, USA

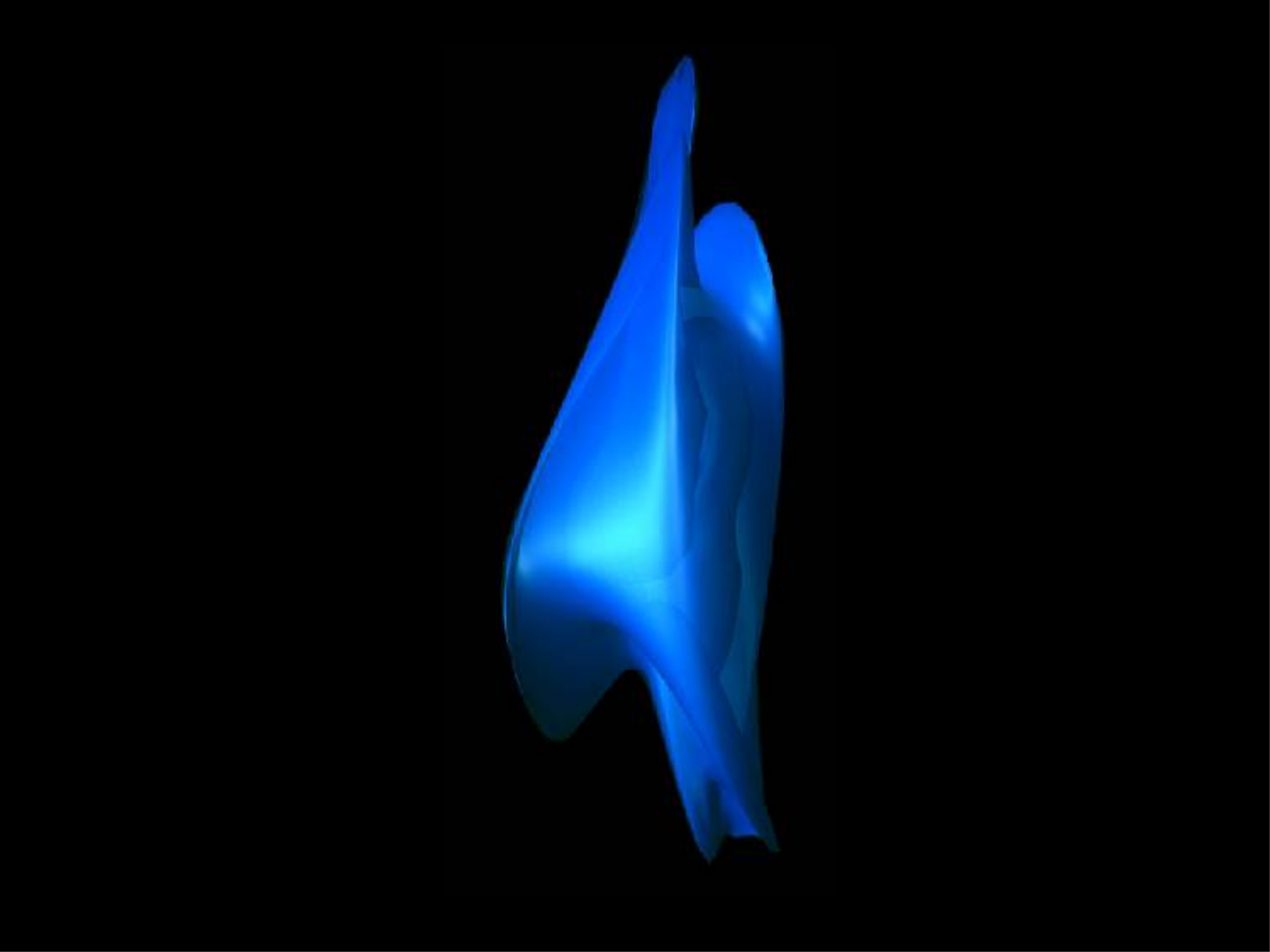
OCEAN NORTH
- Kivi Sotamaa
- Tuuli Sotamaa
- Birger Sevaldson
- Johan Bettum
- Michael Hensel

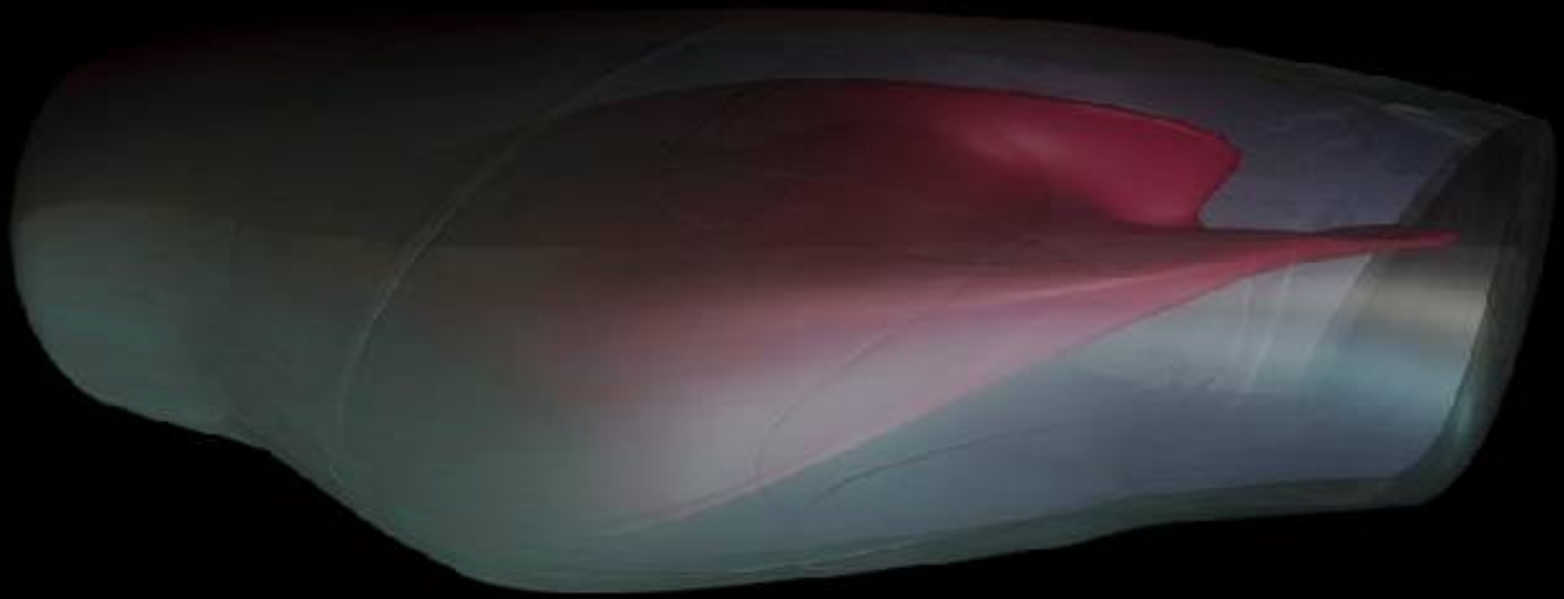
CONSULTANT
- Institute for Metallurgy, Technical University of Helsinki - Tero Kolhinen





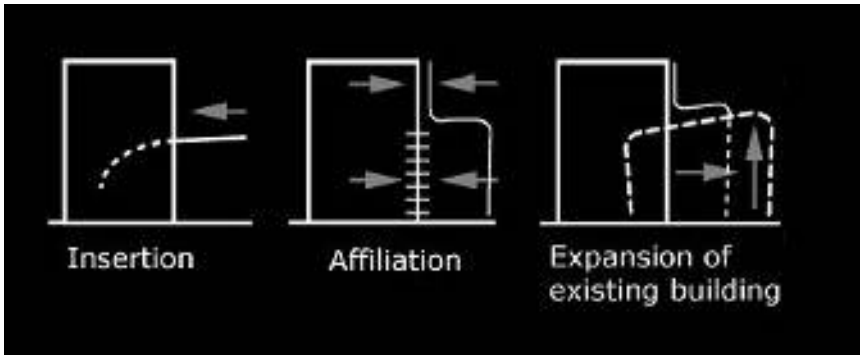






Negotiation

To enable the computer to become a creative design tool we need to implement a less absolute and insistent design process. An important strategy for this is negotiation.



AGORA boundary conditions

AGORA: Boundary Conditions 2002

Concept and Project management : Natasha Barrett and Birger Sevaldson

Composition and programming: Natasha Barrett

Installation: Birger Sevaldson, with OCEAN NORTH: Tuuli Sotamaa, Michael Hensel

Programming and electronics: Øyvind Hammer

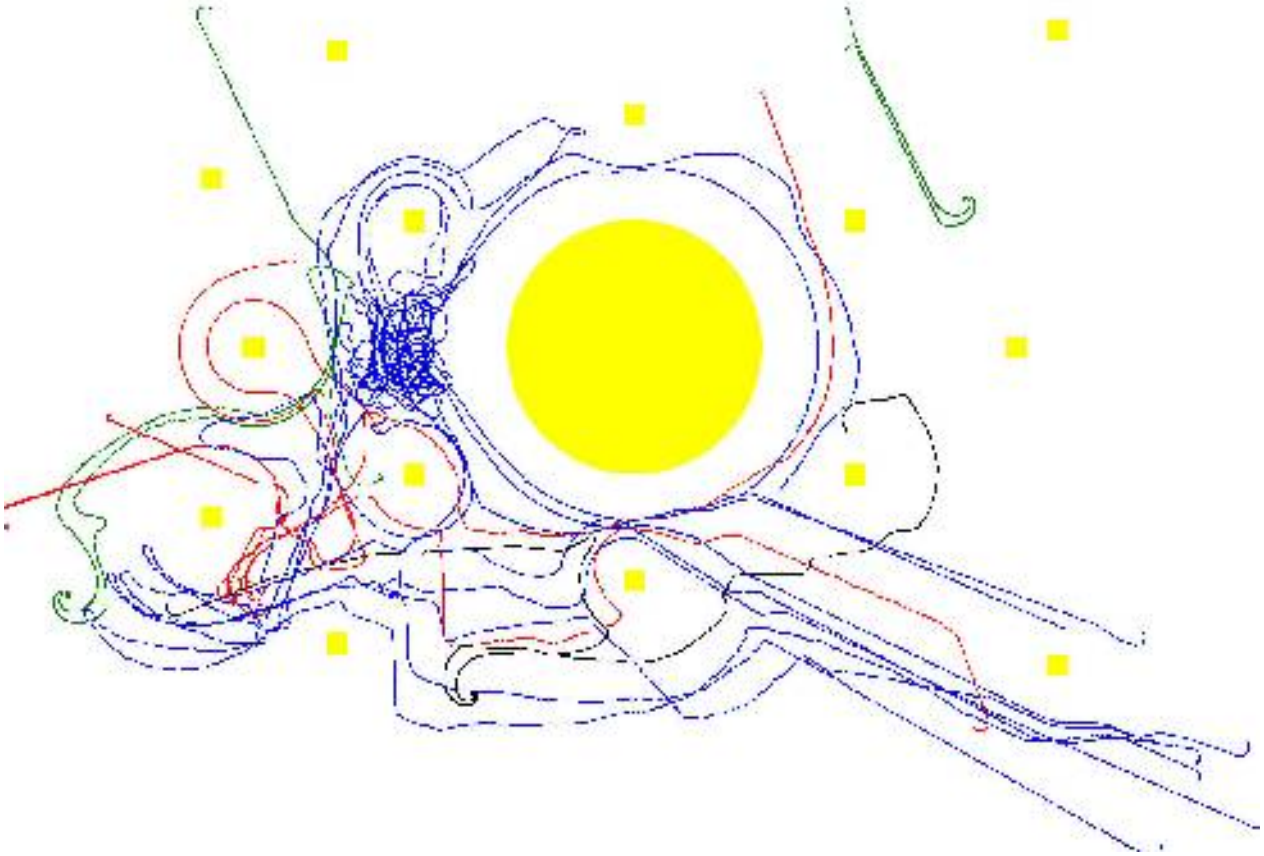
Proiect-team: Are Nielsen, Markus Høy-Pedersen, Hanne Marte Holmøy, Ambjørn Viking, Sylvia LeSoil, Heidi Leren, Dan Sevaldson, Svein Berge.

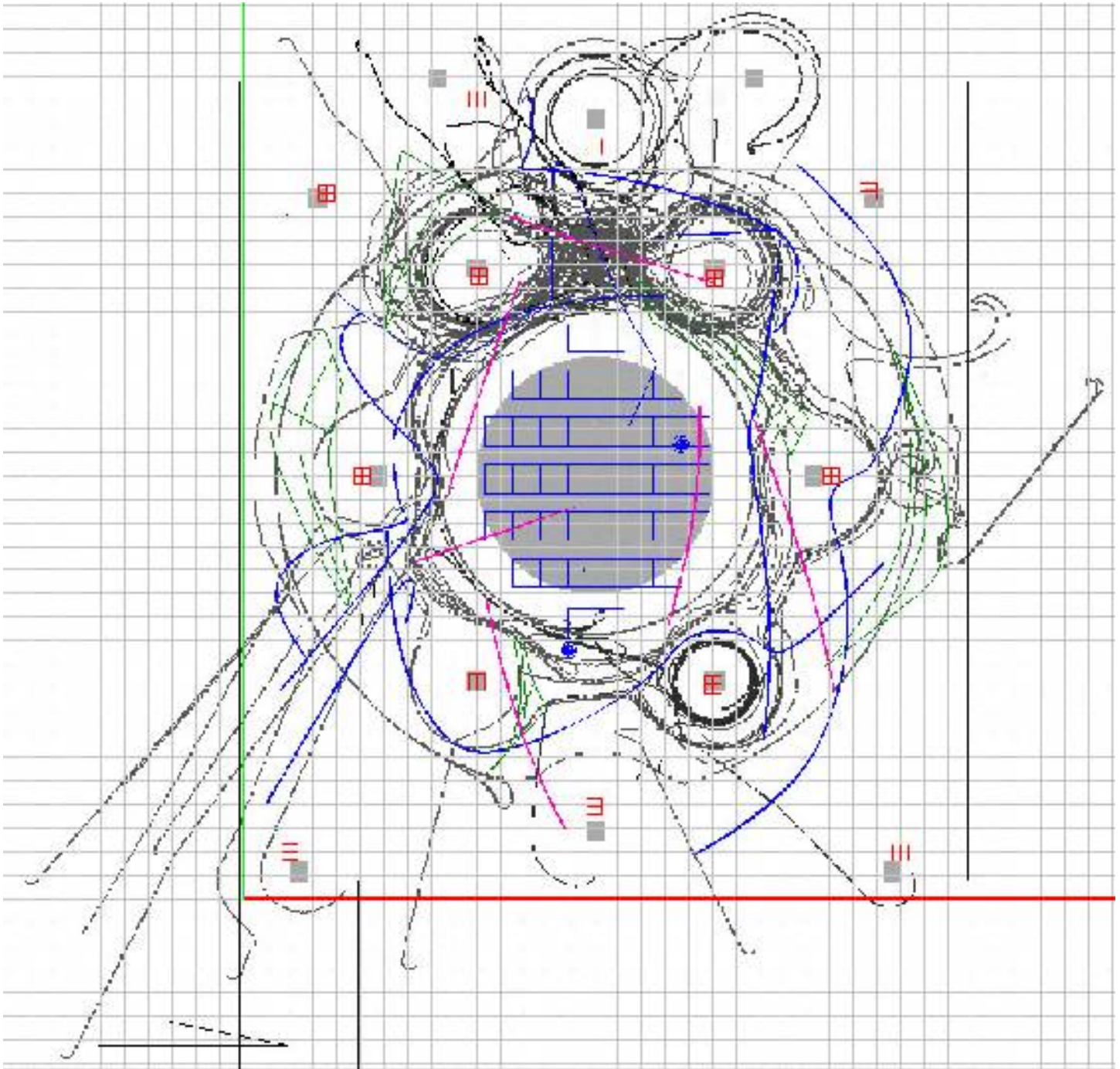
Project management, *Rom for kunst*: Mesén as

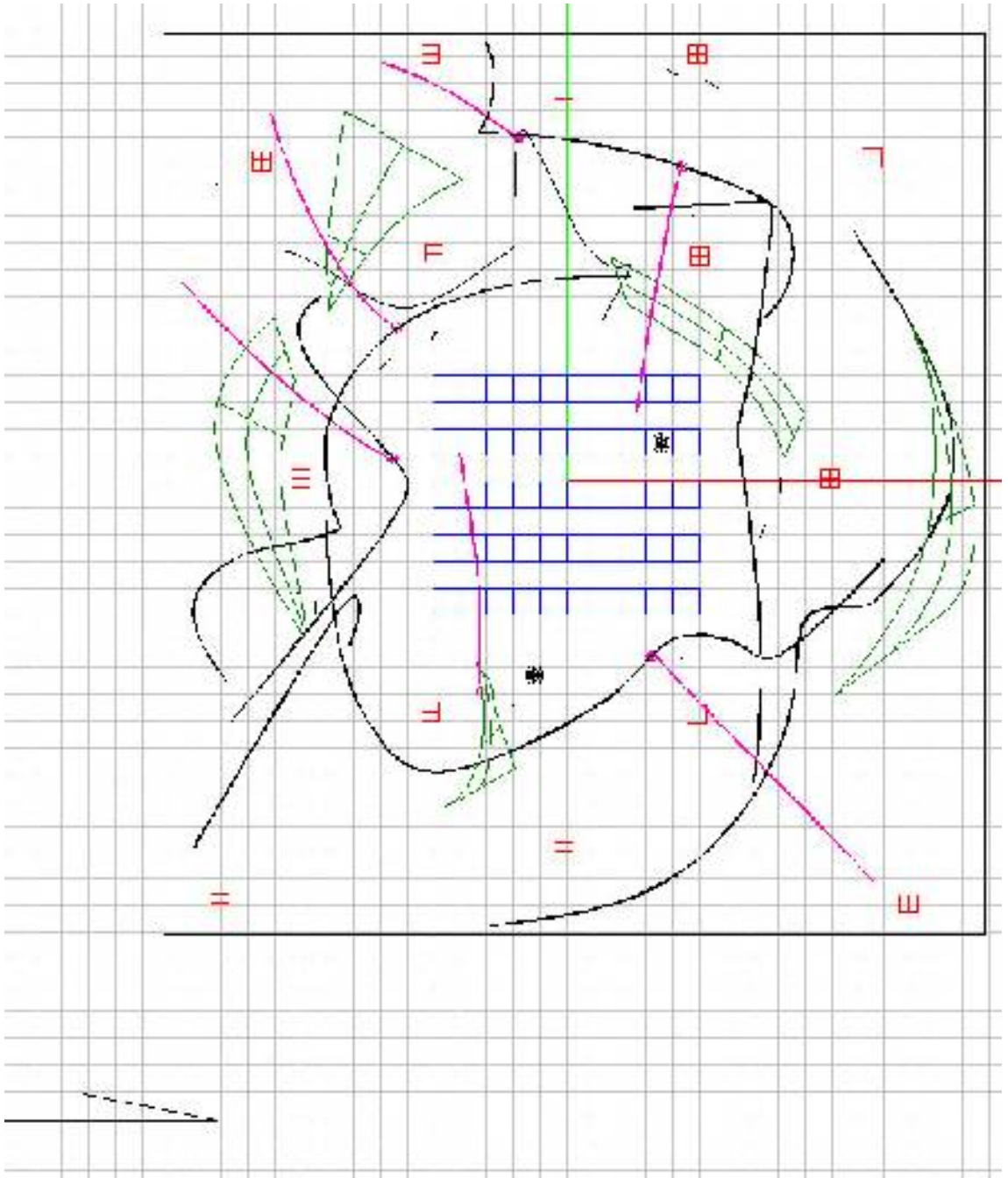
Rigging: All Production, Håkon Klemetsen

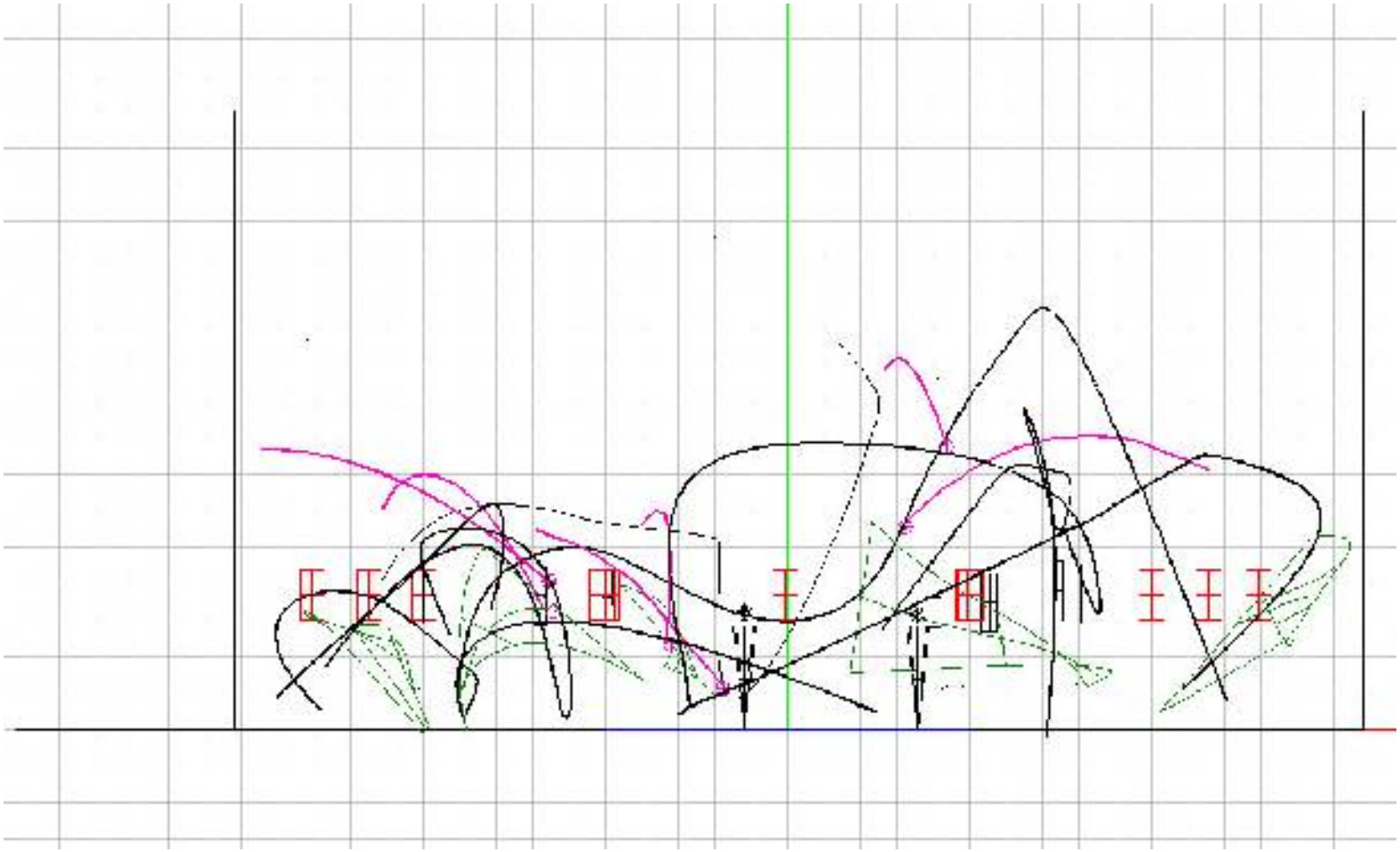
AGORA : *boundary conditions* is supported by:

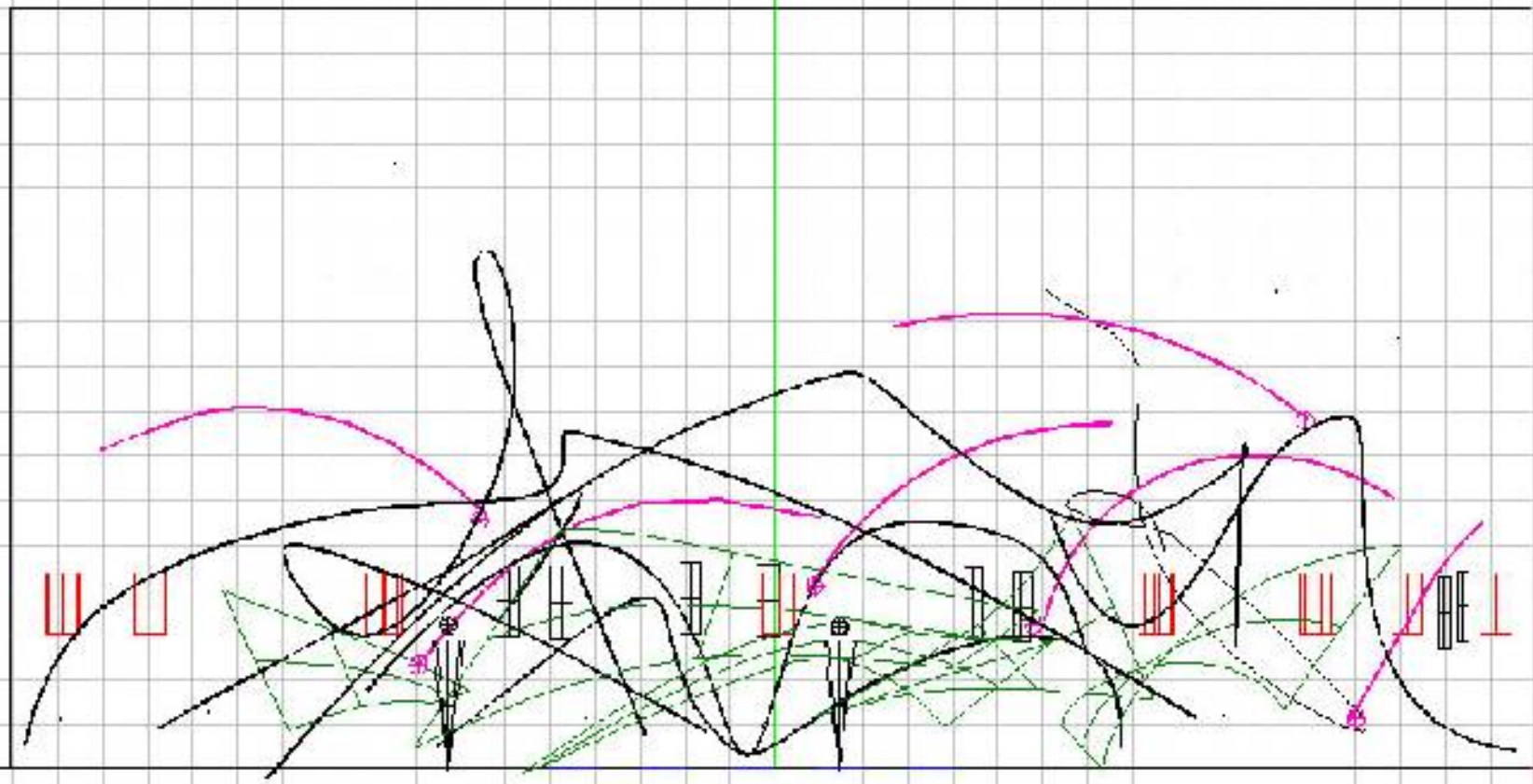
Fond for Lyd og Bilde, Norsk Kulturråd, Celexa, NoTAM and Abry Design

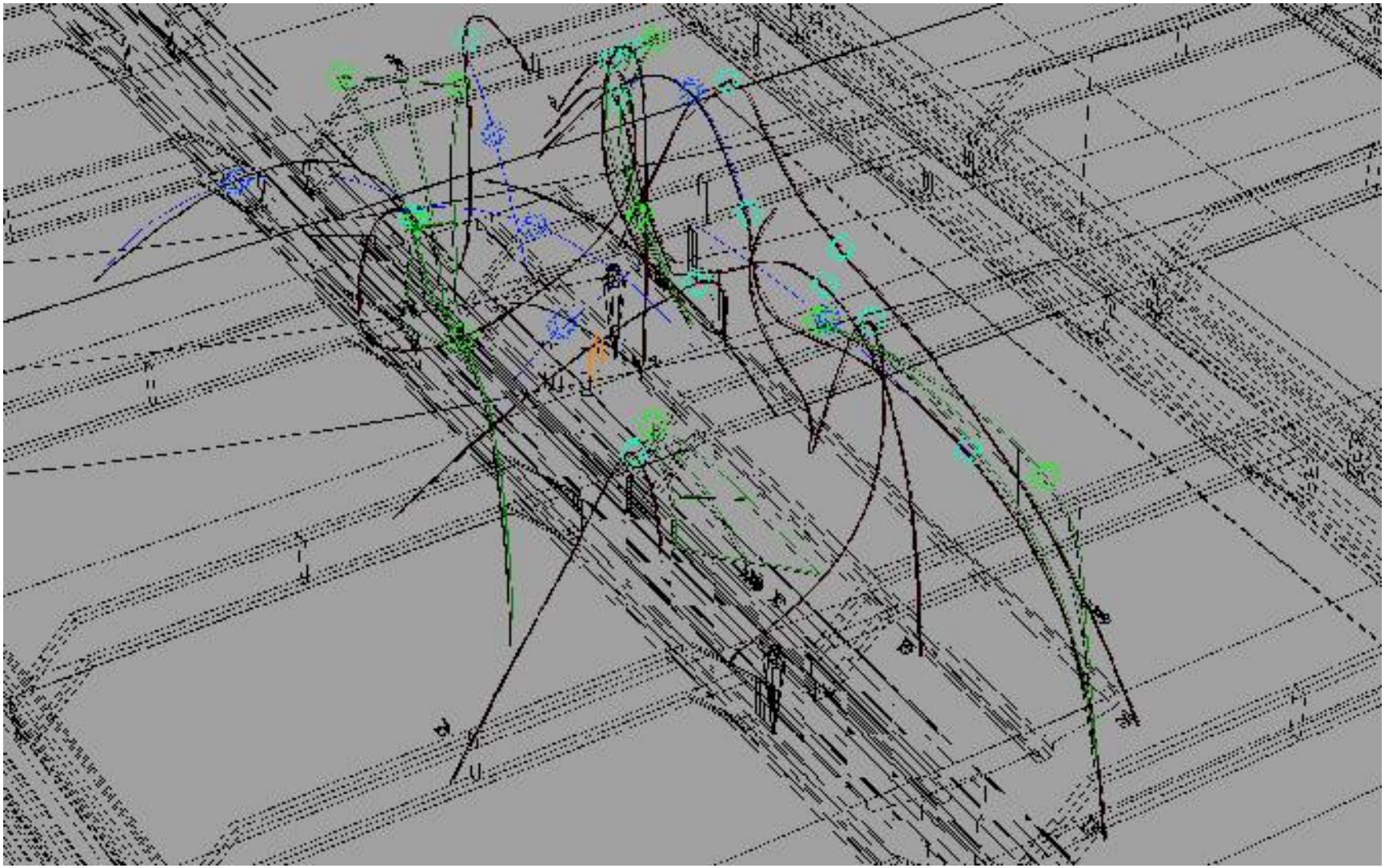


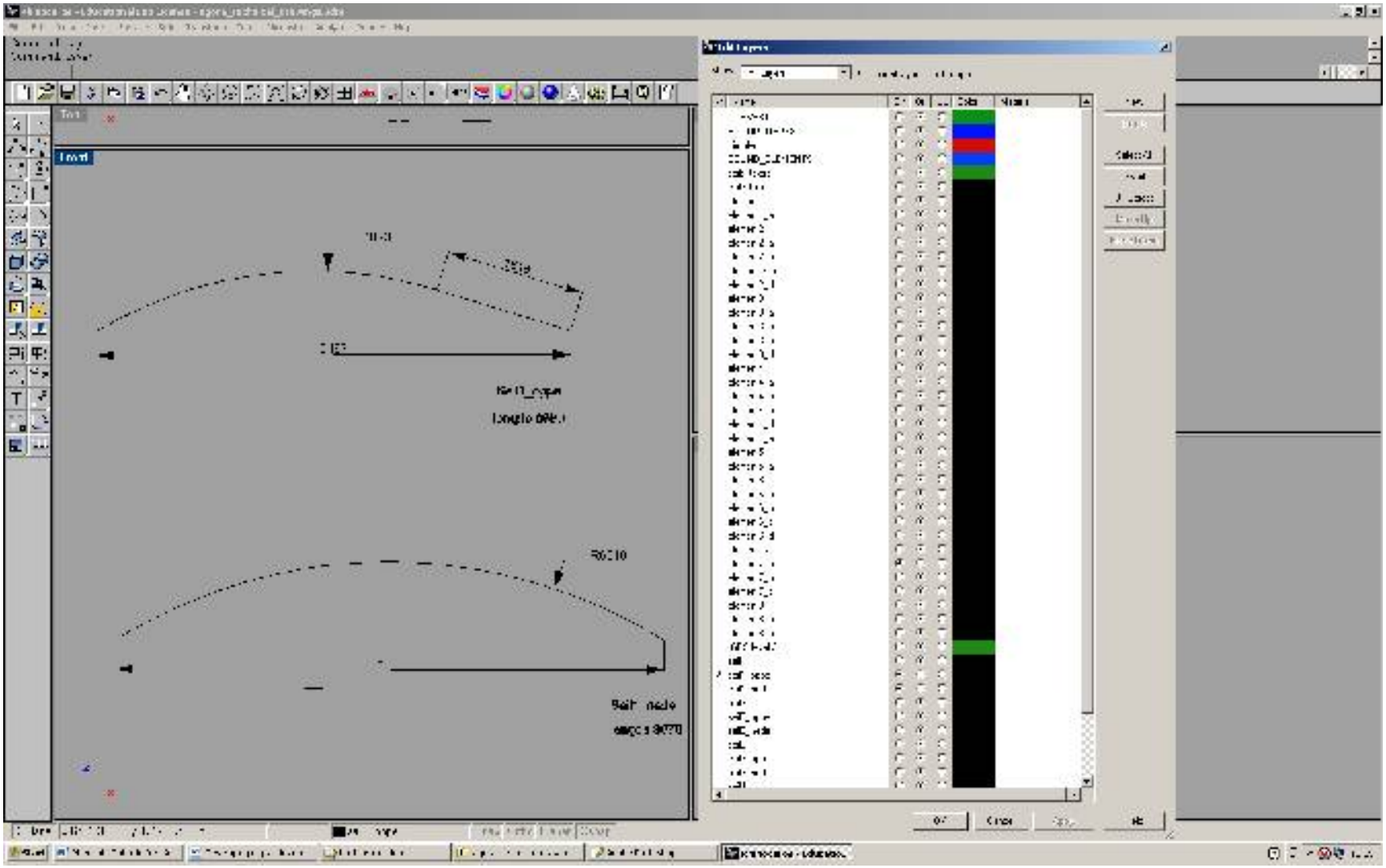


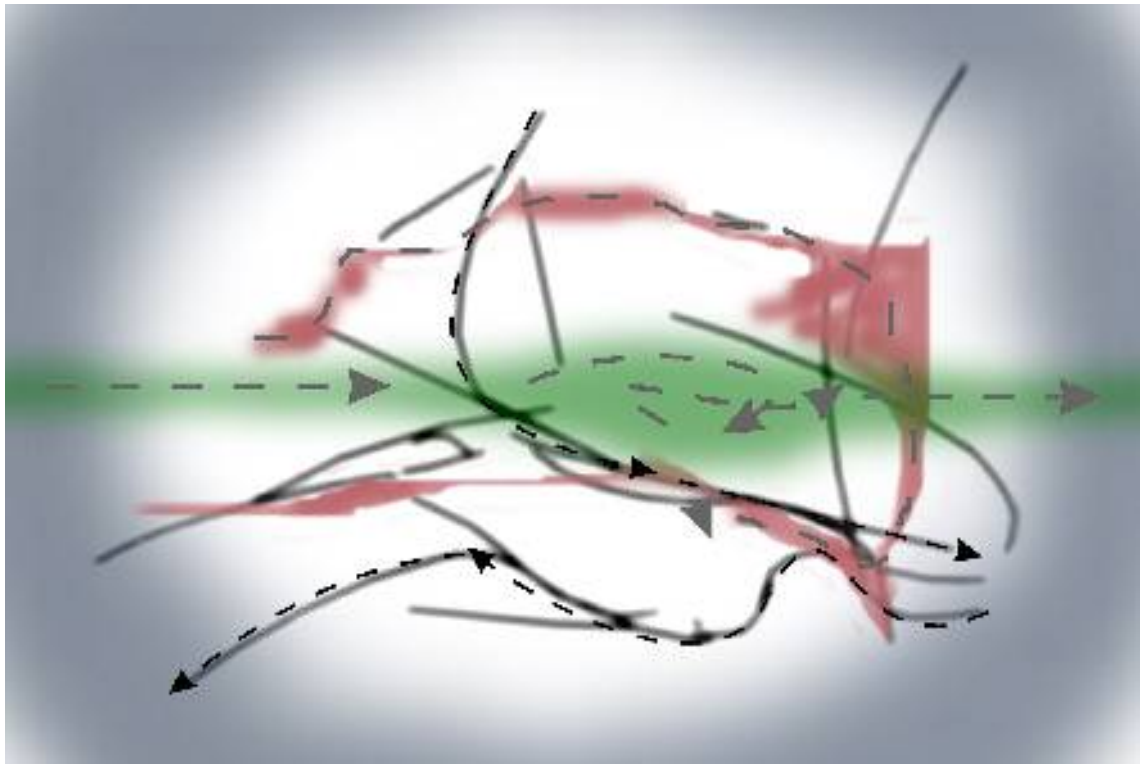


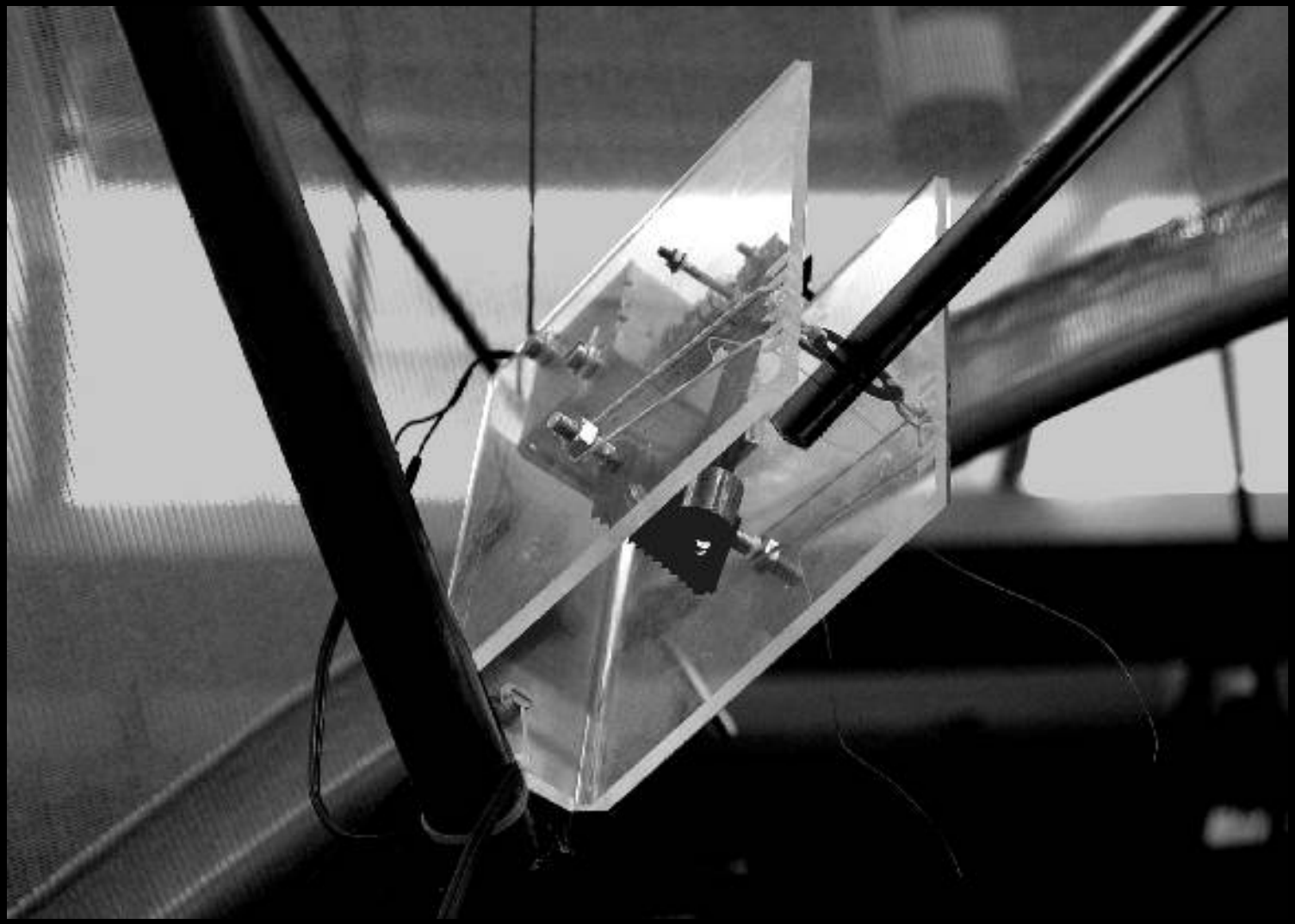


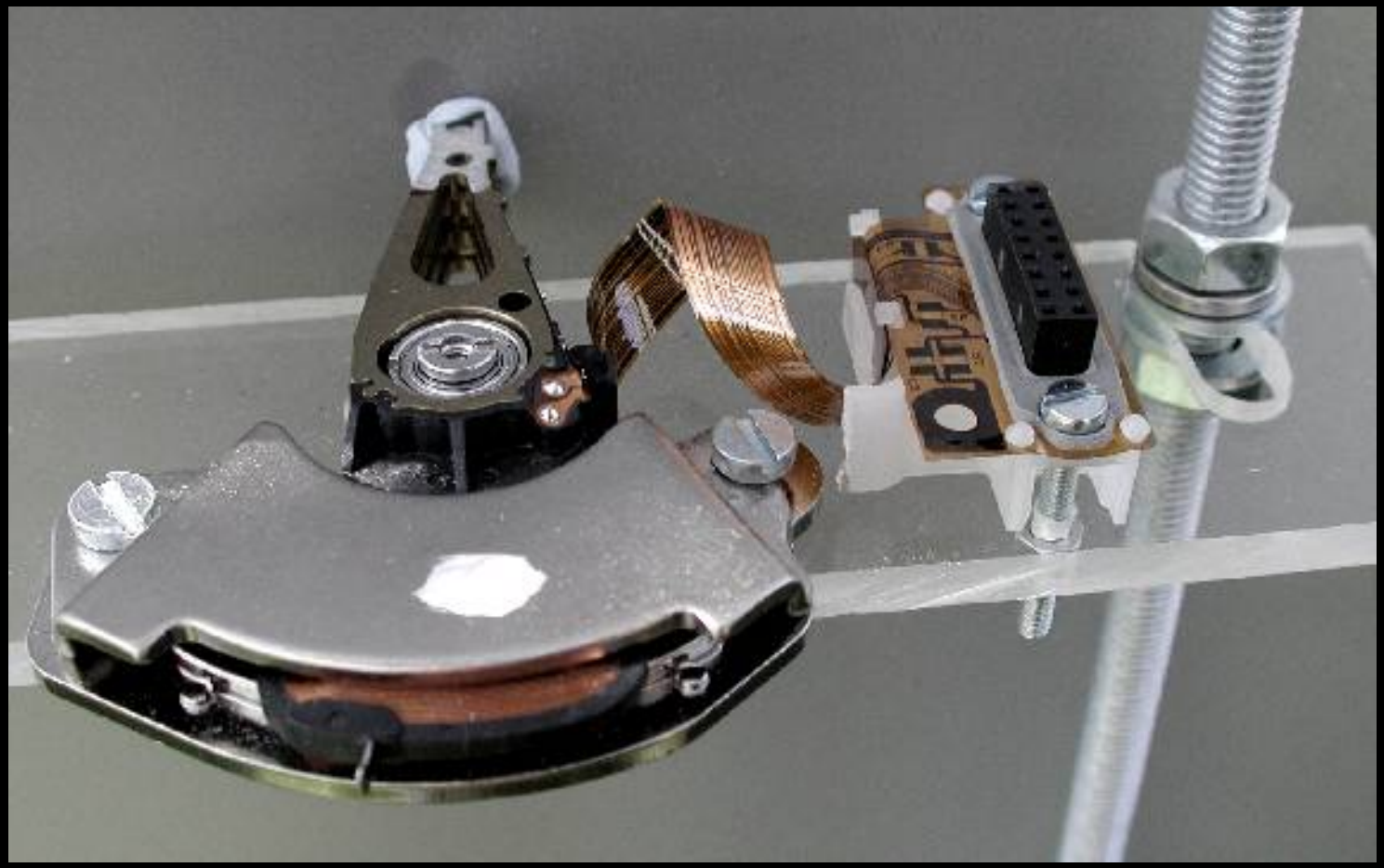








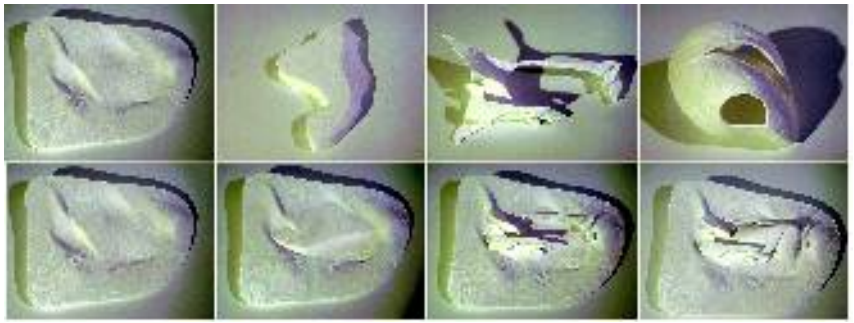


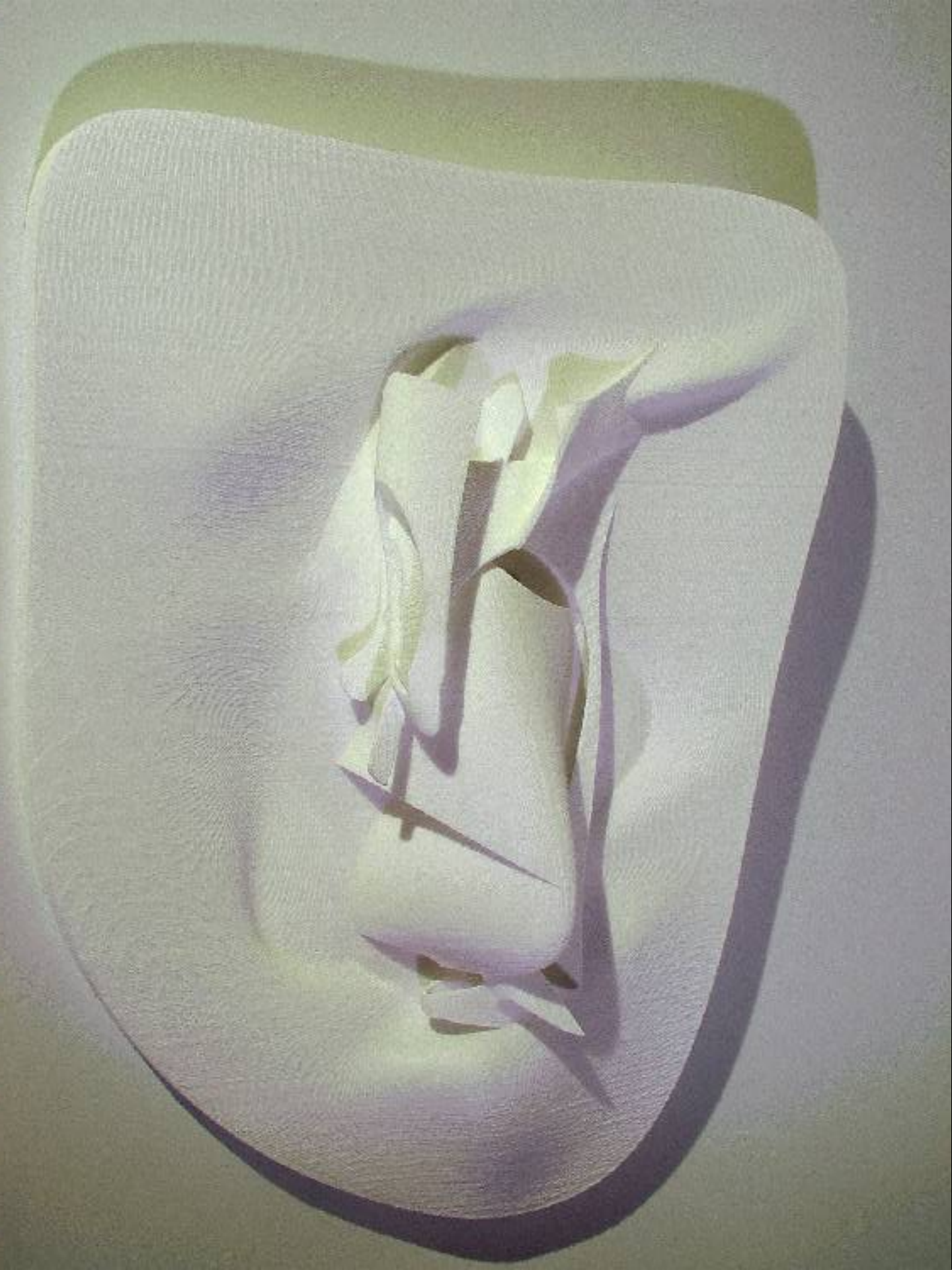


RGER KING

Open-endedness and unfinishedness

The issues of control and negotiation lead to a view of design as being imperfect and changeable rather than aiming to achieve a complete and perfect composition.





Generic concepts

Translation

The manual translation of information from one representation to another.

Involves interpretation. (This is treated earlier in part 3 as an aspect of the nature of computing.)

Example: The figures in an image that is filtered with Photoshop will in the end no longer be recognizable and will lose their representational meaning. The meaning of an abstract diagram will change if we are told what it represents. An abstract colour field can be grafted onto a site and start to represent forces and actors in that site.

Grafting

The 'injection' and implantation of data onto another data set.

Example: the merging of a colour graft with a site as in the Synthetic Landscape project. The technique involves negotiation and coding of the elements. Mentioned earlier in part 3.

Templating

The use of a generative sketch as an underlay for a designed form.

Example: The use of data-animated shapes in the design of the time capsule (a_drift) Templating is discussed earlier in part 3.

Scaffolding

The generation of a (dynamic) mediation device between the elements of a source material or generative diagram and a template.

Example: The skeleton animation for Tøyen Gate in Ambient Amplifiers. Scaffolding is discussed earlier in part 3.

Pattern recognition

Pattern recognition is not to be confused with digital pattern recognition technology. It is used here as human visual thinking, deriving certain structural features from visual and geometric material. Digital techniques are applied to reinforce visual thinking.

Real-life monitoring

The design techniques that start with real-life monitoring collect real-life information to inform the design process and apply digital techniques to reinforce this process.

Specific techniques

Direct modelling (explicit modelling)

The control vertices are manipulated with an input device (Mouse) and there is a correspondence between the movement of the input device and the deformation of the geometries. This is an established category in CAD systems. It relates to direct form generation in the generic techniques but is here exclusively linked to computer use.

Sculpting

In sculpting the geometries are formed with special software that mimics the way we work with clay or similar materials. Either mouse with specialised surface cursors (Maya) or specialised force feedback input (Freeform Phantom) devices are used.

Recoding

To alter the meaning of information. Since all digital information basically is represented in the same form in binary numbers, it is easy to alter what the information represents.

Example: sound can be represented in a visual representation. An image can be translated to ASCII code.

Data reduction and expansion

Data reduction and expansion is a technique where data generated in one software package is recoded and read by another software package. Discussed earlier in part 2.

Parametric design

The geometries are driven by input parameters. The change of the geometries is driven by the parameters.

Interactive Simulations

Virtual environments where the real-time interaction of the user alters and influences the environment.

System simulation

Resembling a real-life situation in a computational set up and letting the computer run to generate results that somehow mimic the real world.

Animation-based techniques

Animation-based techniques are most often crossover categories that can contain elements from parametric design, simulations or mouse-based modelling. But animation is so central in these new techniques that it appears as a category. When the animation process is central to a technique, it is classified in this category.

The Hybrid process

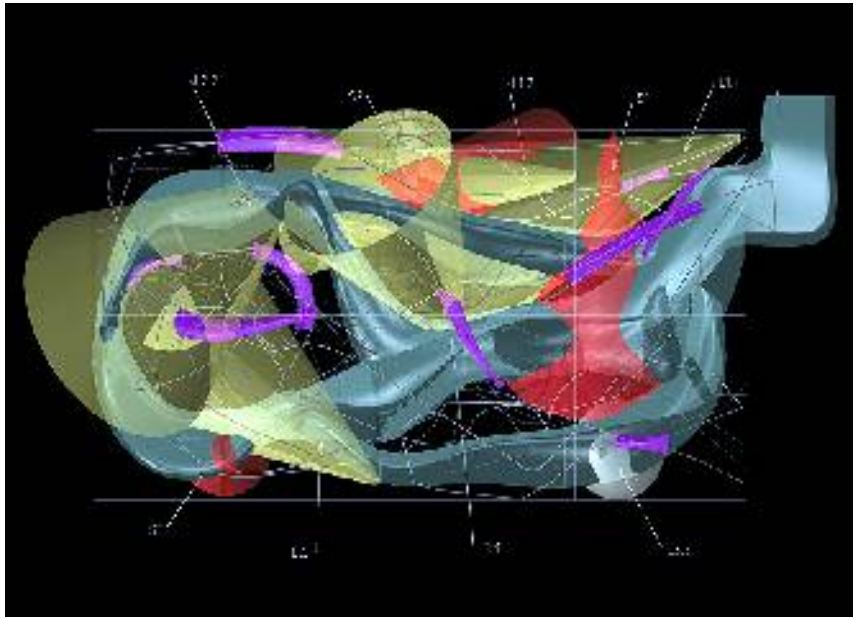
The hybrid process: a global strategy that consciously seeks to take advantage from the connecting of multiple processes, techniques and people, be it the merging of processes, sequencing of processes, networking of processes or interdisciplinary co-operation.

Hybridization strategies

- Inclusive processes
- *Composite processes*
- *Parallel processes*
- *Sequential processes*
- *Networking of processes*
- *Co-operation and interdisciplinarity*

Hybridization as a global strategy

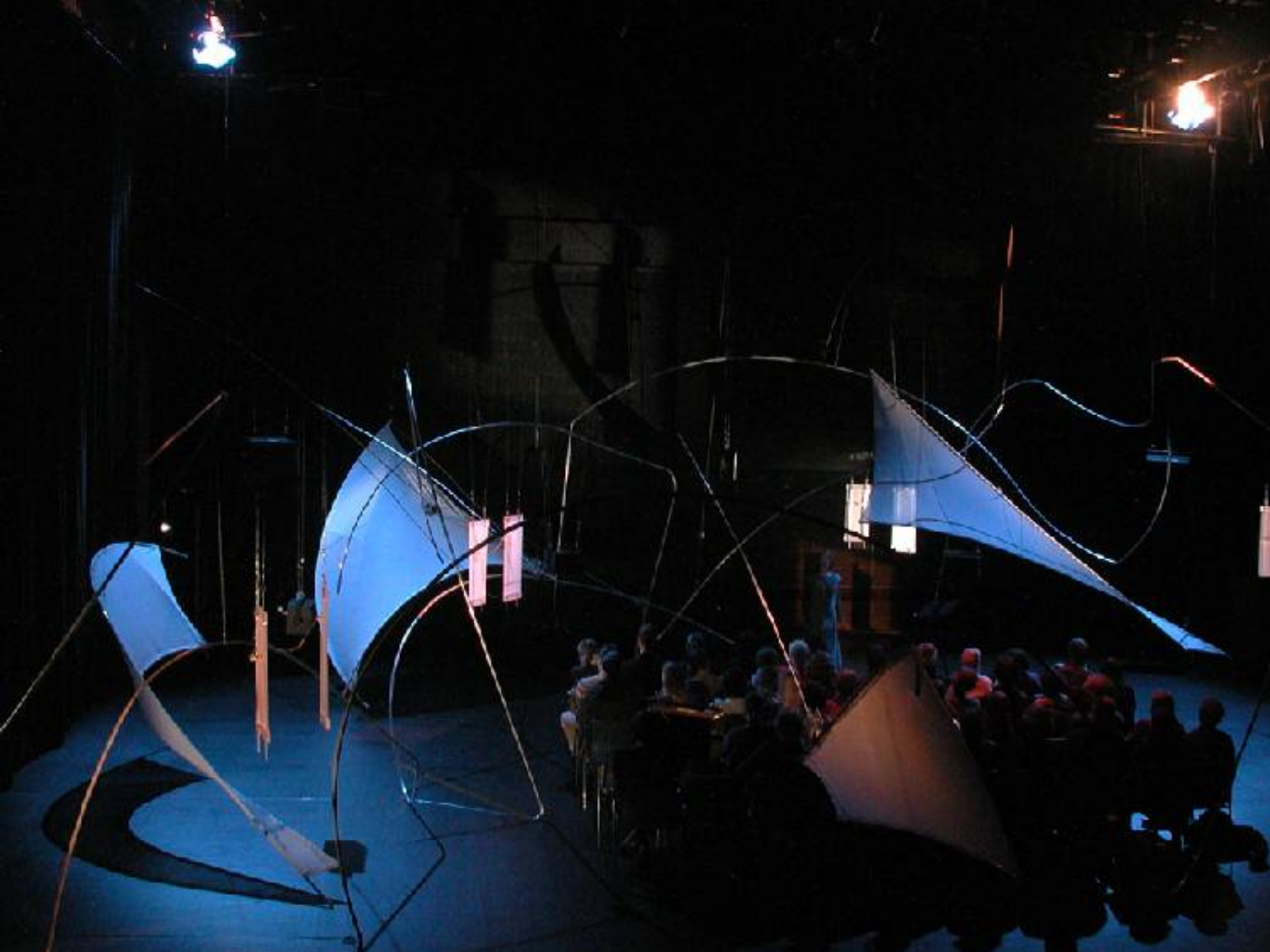
- Hybridization, a strategy for inclusive processes
- Switching and translation to generate leaps at chosen moments to accelerate and diversify the process.
- An important hybridization strategy is the ever ongoing invention of new variations of the design process.
- Hybrid processes as complexity management .

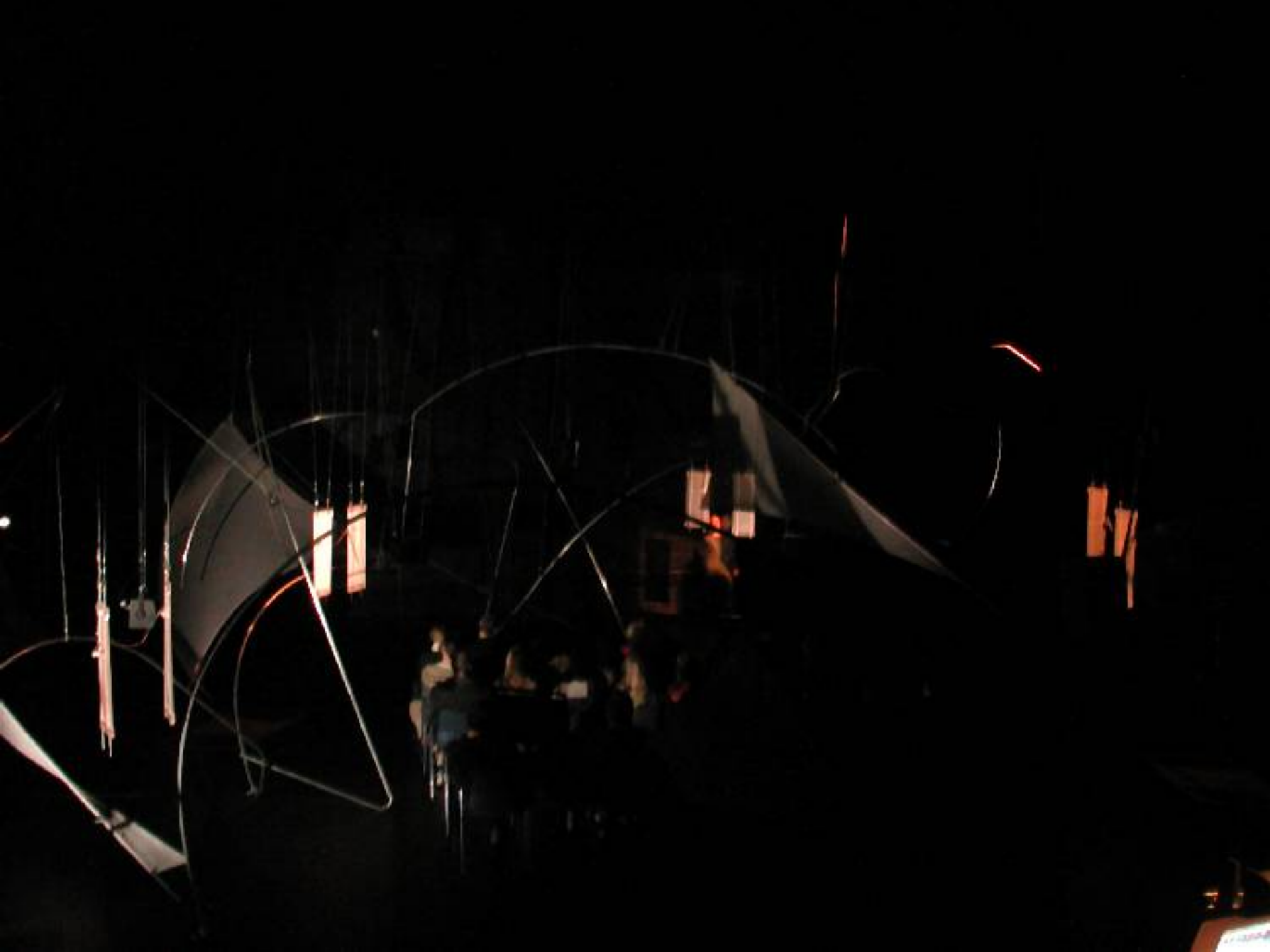


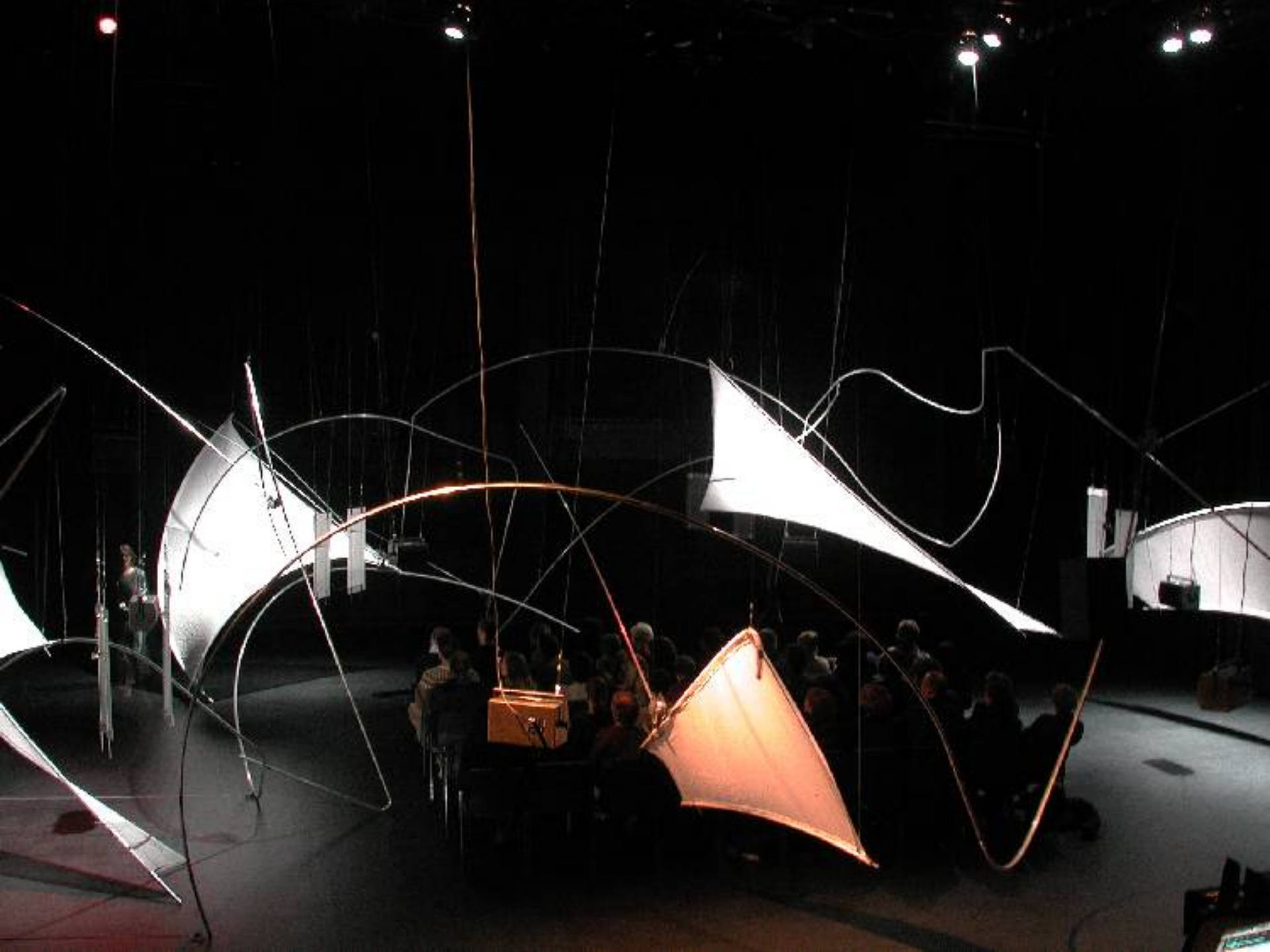
AGORA @ black box

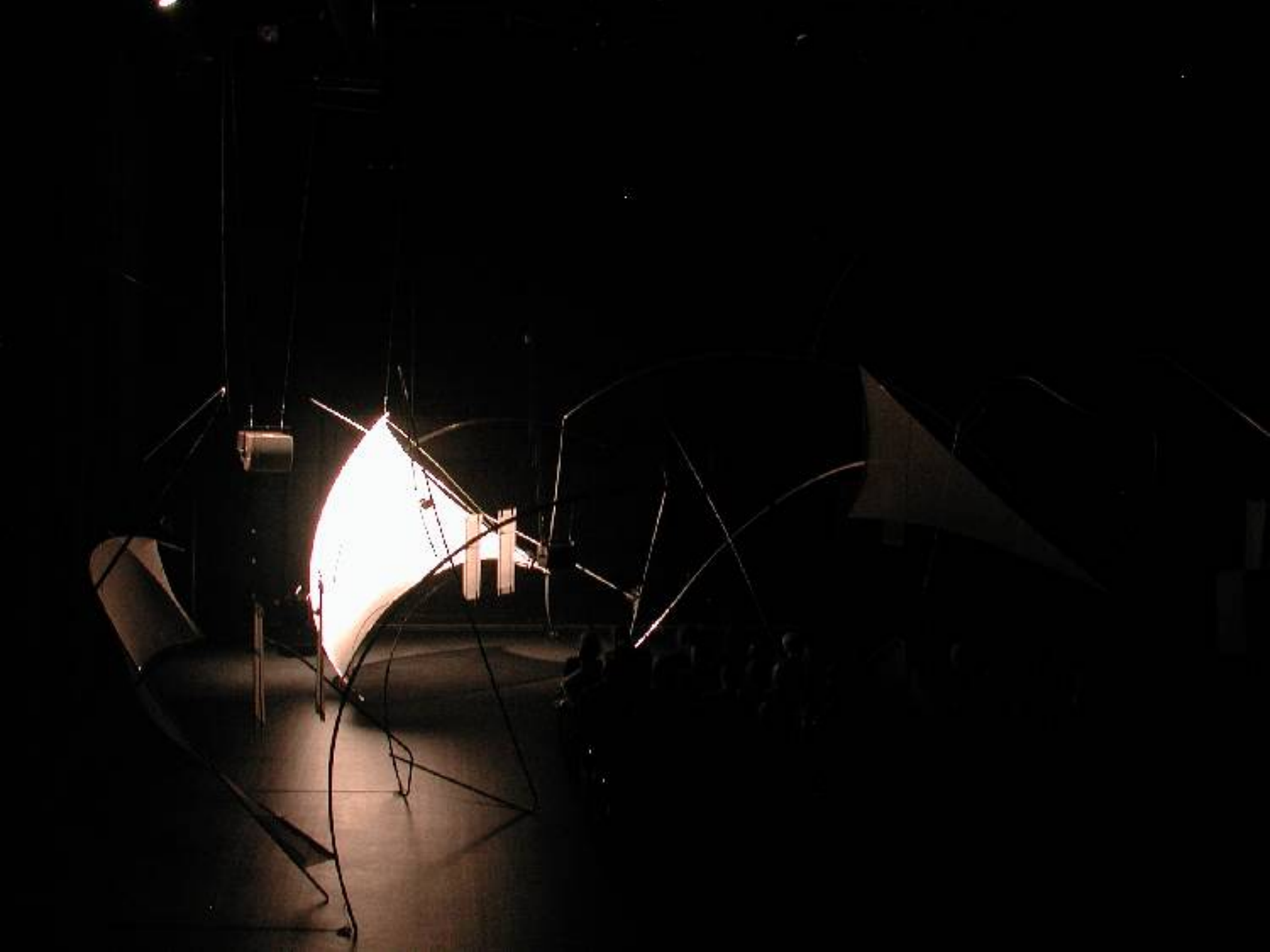
AGORA Black Box Theatre, Oslo from 8th to 12th of May 2003.
Composition: Natasha Barrett
Installation: Birger Sevaldson
with OCEAN NORTH
Soprano: Kristin Norderval
Production: Oslo opera net, Ketil Akerø
Direction assistant: Janne Wettre
Choreography assistant: Jane Hveding
Light: Kurt Hermansen
Reading of old nordic texts: Magnus Rindal, Director of Norsk institutt for forsking om oppvekst, velferd og aldring (NOVA)
Reading of English texts: Michael Benskin, Institutt for britiske og amerikanske studier, UIO.
Reading of Norwegian and English texts: Truls Tveito

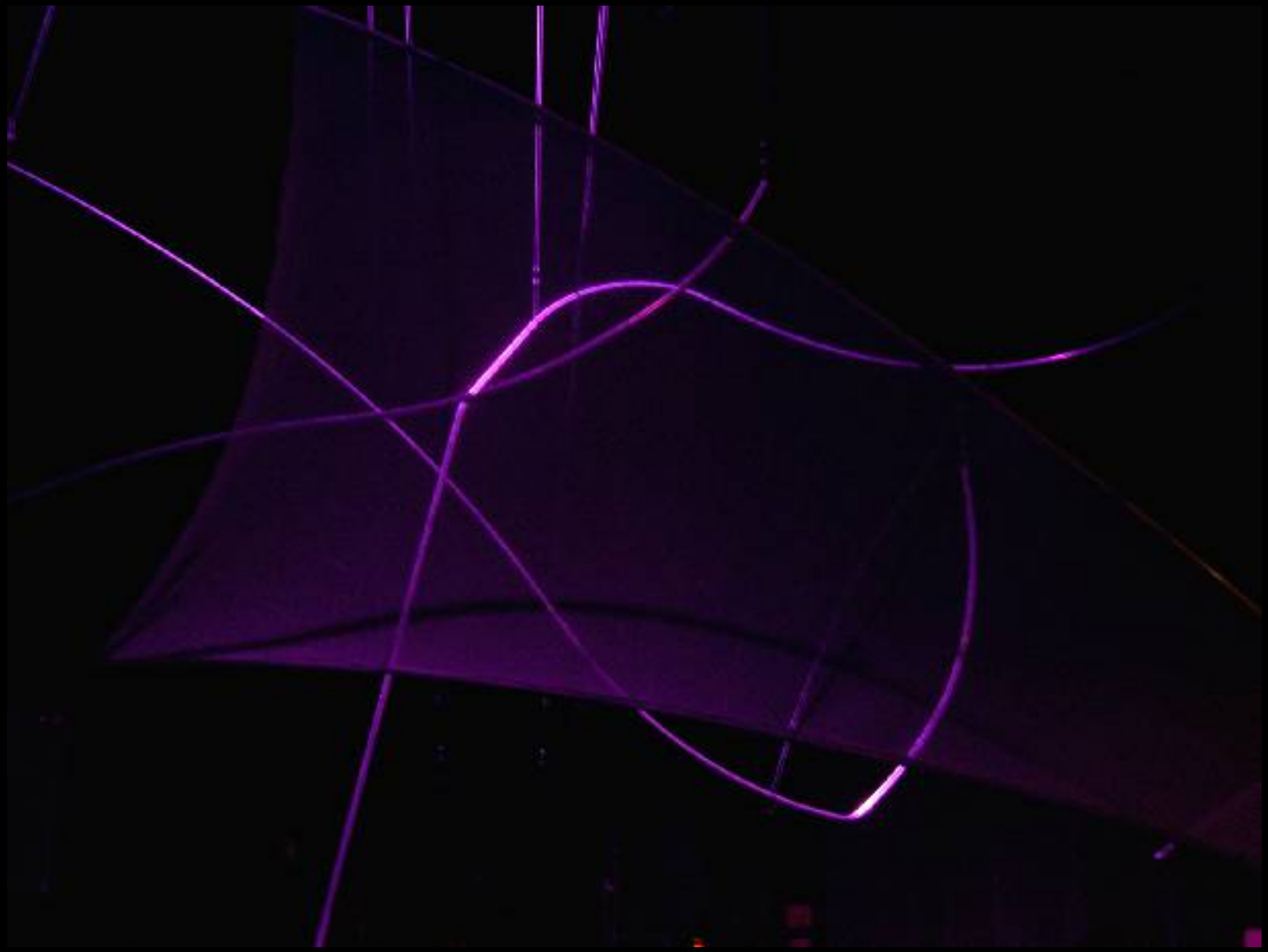
Programming and electronics: Natasha Barrett and Øyvind Hammer
Rigging: All Productions, Håkon Klemtsen
Design, workshop, and rigging: OCEAN NORTH: Tuuli Sotamaa og Michael Hensel.
Markus Høy-Pedersen, Are Nielsen, Hanne Marte Holmøy, Sylvia LeSoil, Heidi Leren, Dan Sevaldson, Svein Berge. Egill Reykdal, Beeke Bartelt, Marianne Askheim, Ruben Sevaldson, Axel Haugen
AGORA is supported by: Norsk kulturfond and Fond for utøvende kunstnere

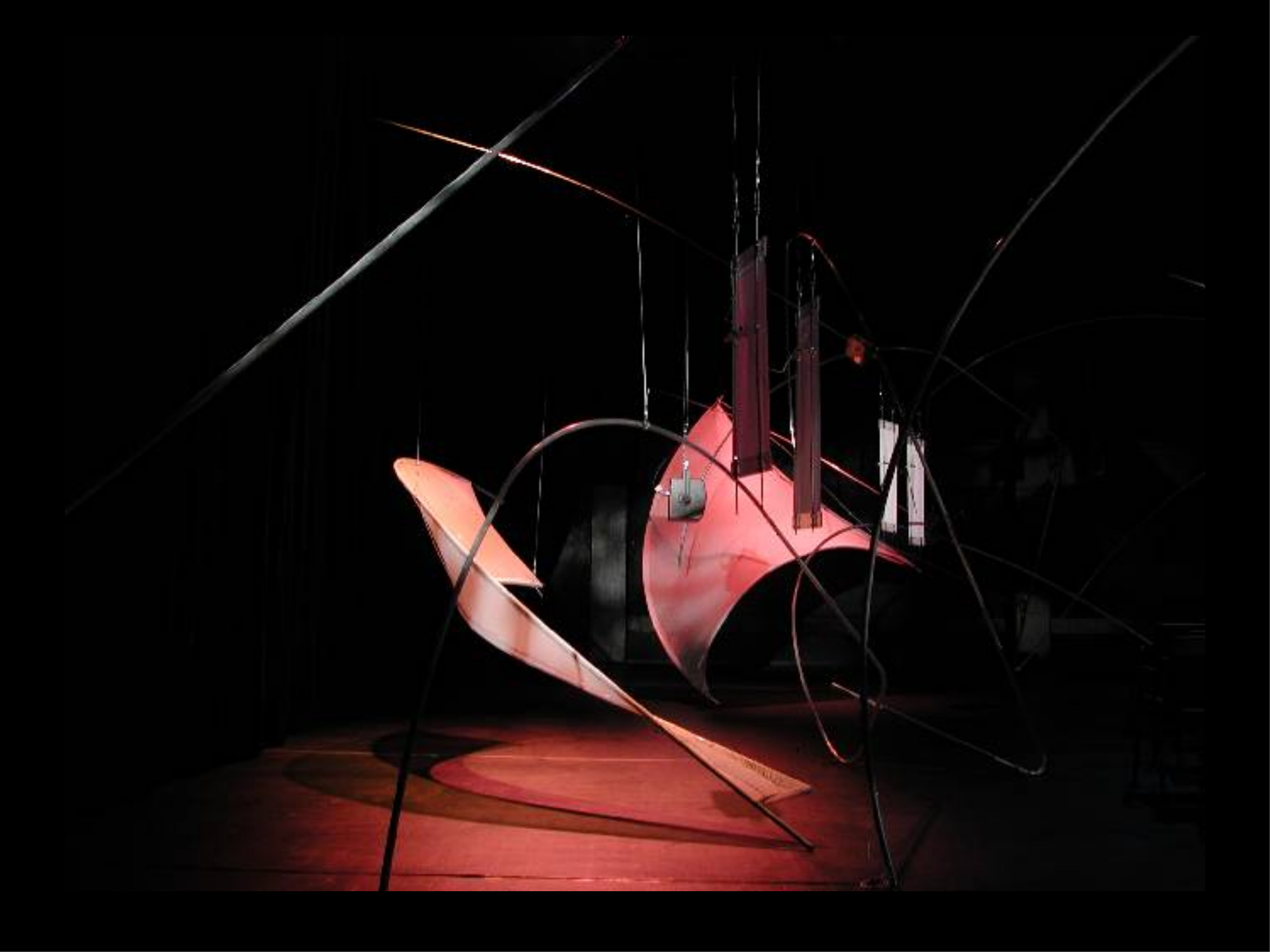


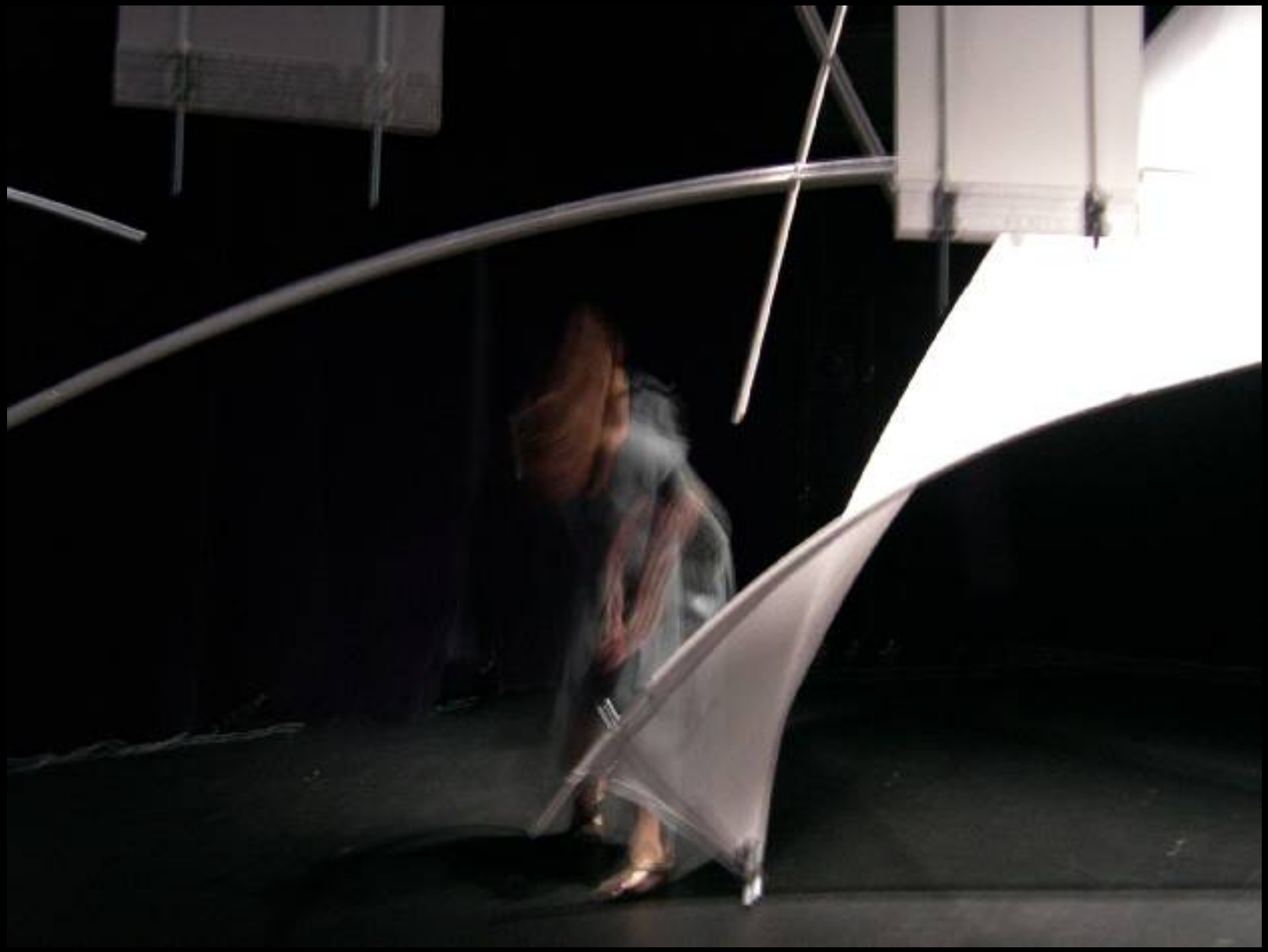


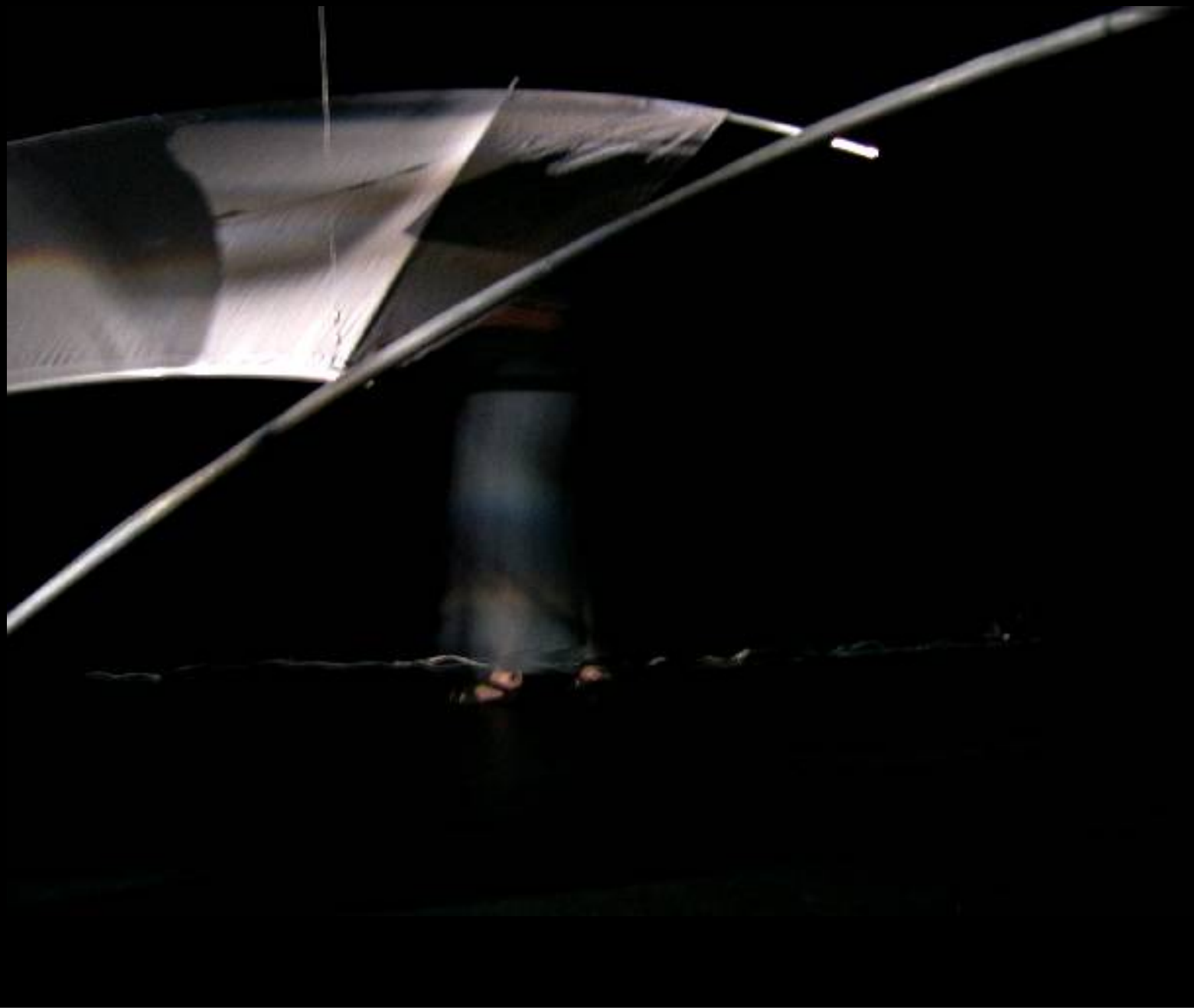












Rich research space

- Researching complex design tasks demands keeping a large amount of issues upfront.
- Making a rich design space and use it for research is a generative technique that nurtures creativity.
- The social space is important

- Resist conformity
- Support Open Source
- Divorce MAC
- Be critical to GOOGLE