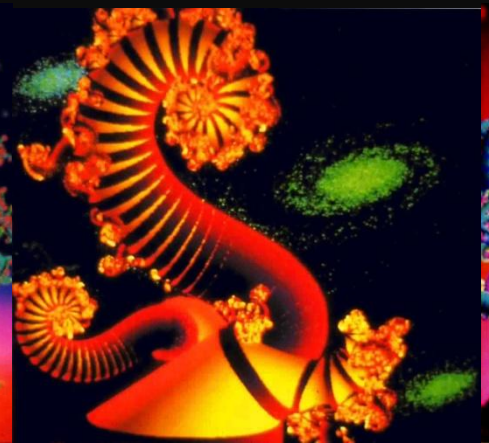
Information Changes the World



Interface of Art and Technology
～Total Performance, Where Information and Other Arts and Life Fuse～

Global Focus on Knowledge
Technology, Science and New Art

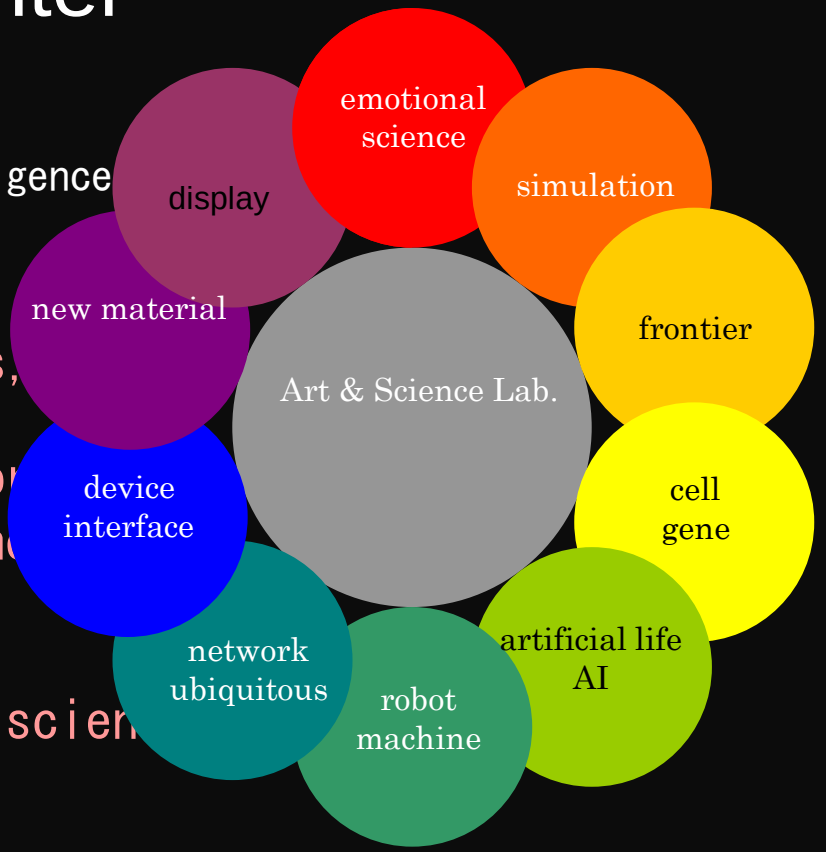
Interfaculty Initiative in Information Studies, UT
Yoichiro Kawaguchi

Research Goals

Art and Science Center

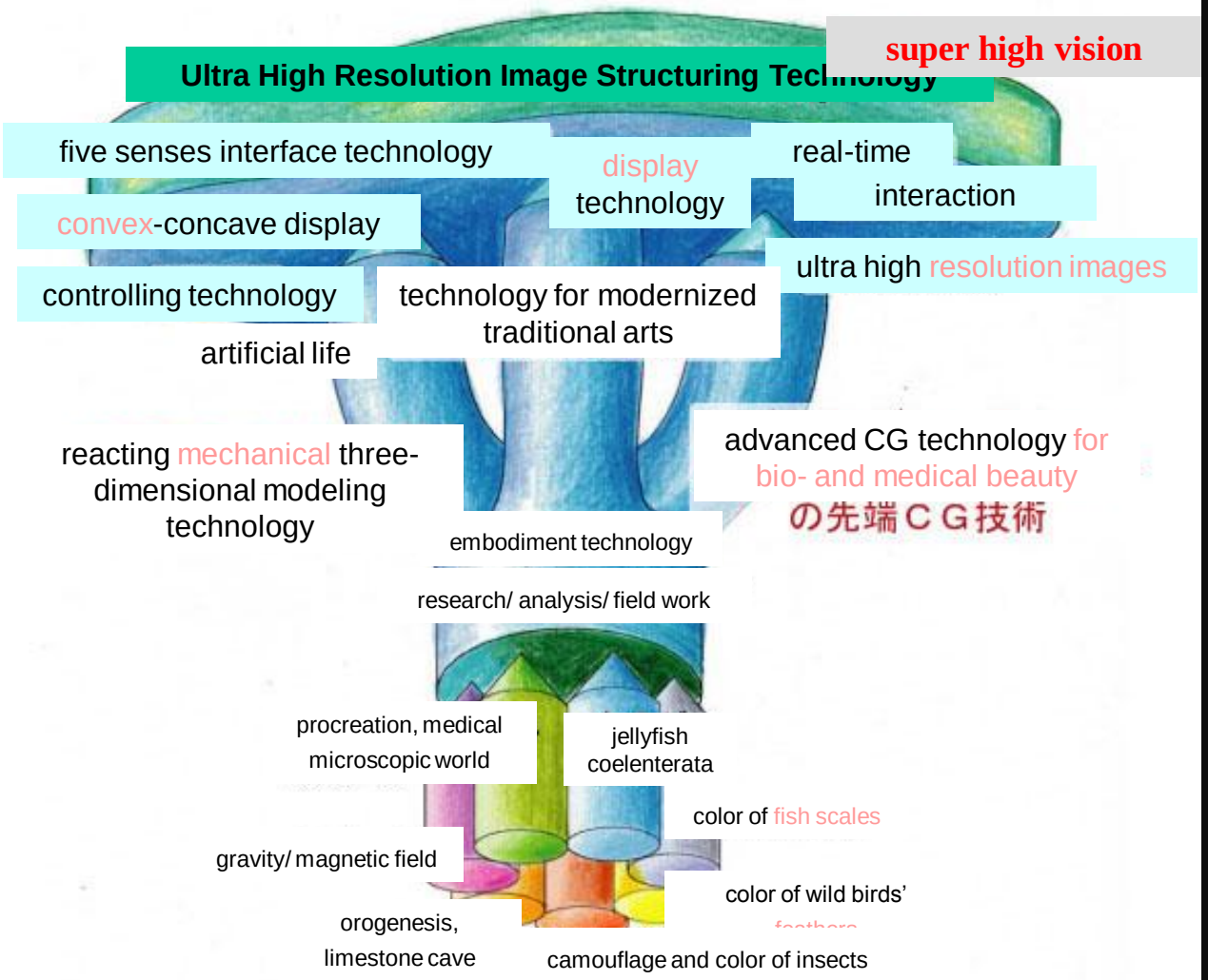
- display research
- artificial life, artificial intelligence
- research on simulation
- robotics, engineering
- Research on sensors, devices, interfaces
- research on ubiquitous netwo
- research on cells, genes, an
- material research
- frontier research (space, deep sea)
- Research on Asian emotional scien



concept

Creation of a Media Space That Reacts Like Organisms

(Formation of a center of excellence by the Art and Science Center)



Beauty of Science Originated from Life

<Formative Design of Spaces>

Physical simulation

Simulation of natural phenomena

Simulation of biological evolution, morphongenesis

Self-organizational models

Complex science

Urban Transportation Design

3-D Visualization

<Virtual Reality>

Computer graphics

Computer animation

Digital archive

Mixed reality

Ultra high-resolution images

Digital cinema

<Formative Design of Moving Objects>

Artificial life

Physical cognitive science

Artificial intelligence

Emotional design

Bio-mechanics

Visual sensing

<Formative Design of Senses>

Substantive displays

Ubiquitous interfaces

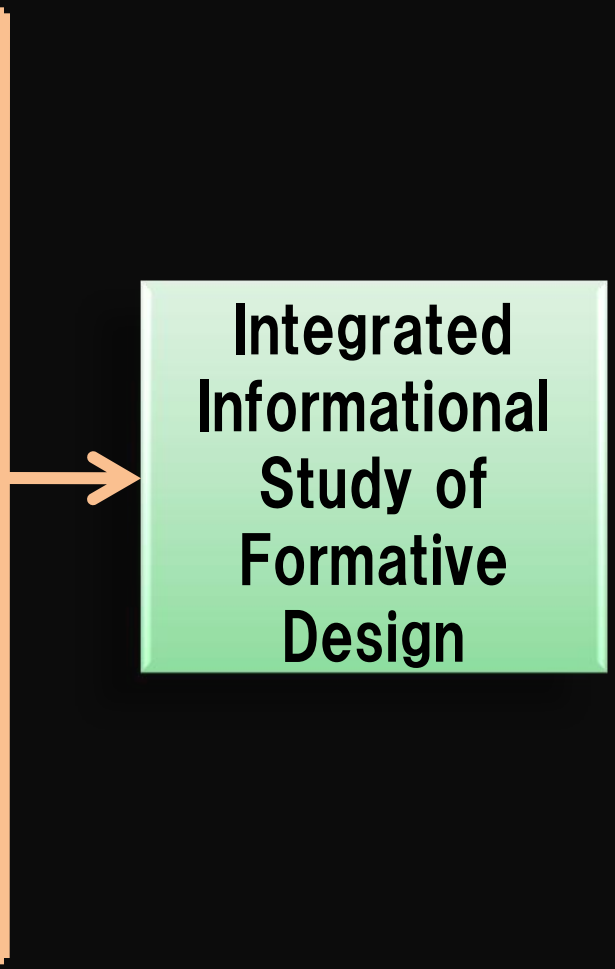
Wearable computers

Tangible interfaces

Haptic interfaces

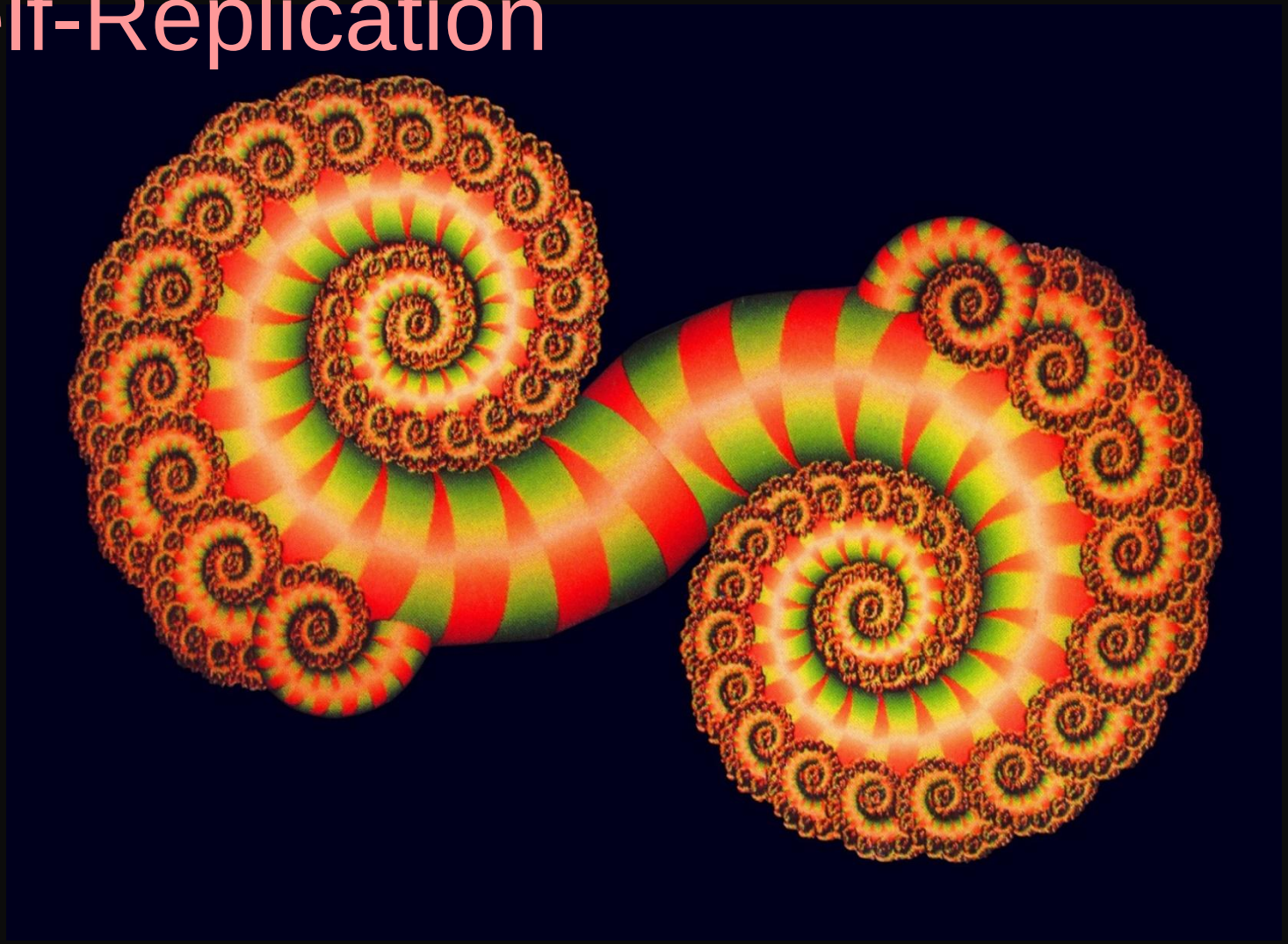
Intellectual tele-existence

Collaborative Crossover Disciplines



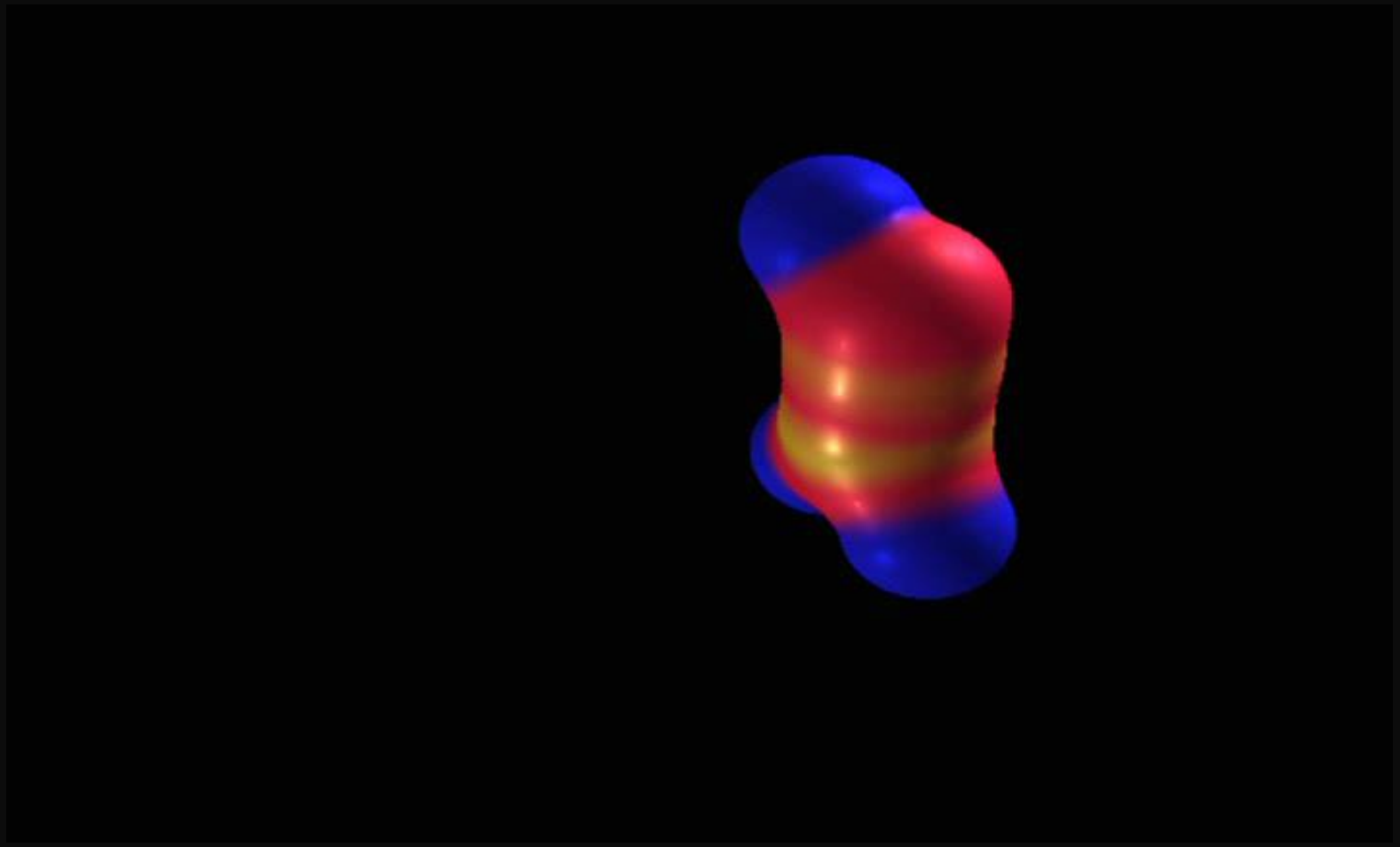
Integrated Informational Study of Formative Design

The Origin of Beauty – Infinite Loop, Self-Replication



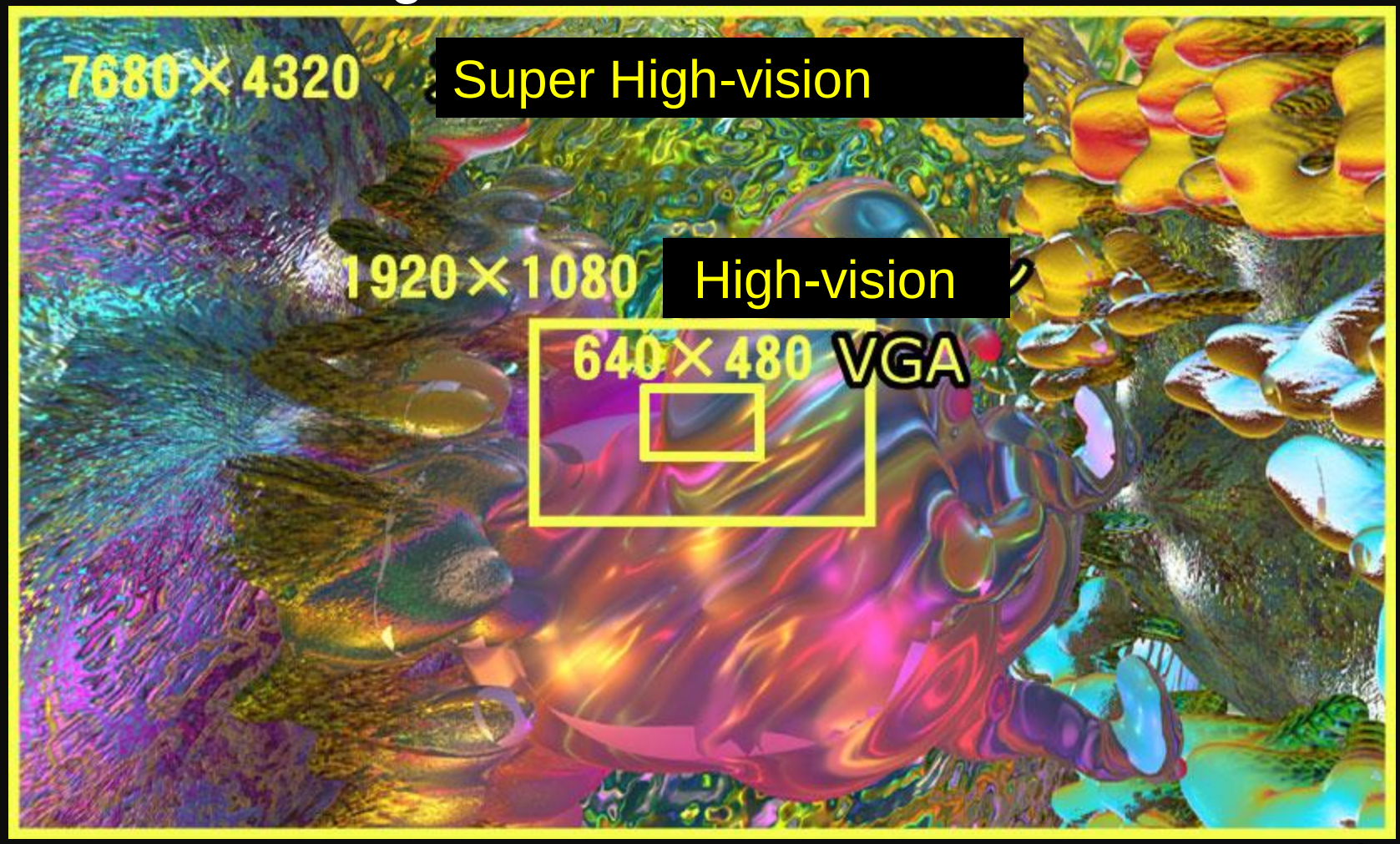
Growth Model SIGGRAPH’82 Boston

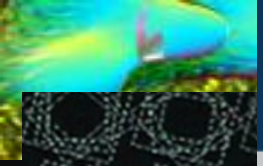
GROWTH: A Mysterious Galaxy

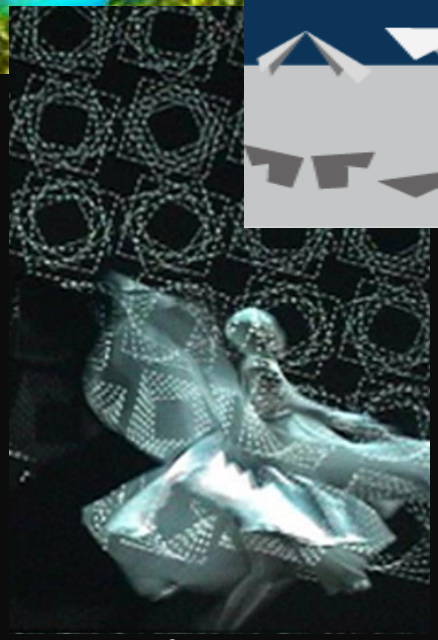


SIGGRAPH’83 Detroit
メタボール（濃度球）による自己増殖

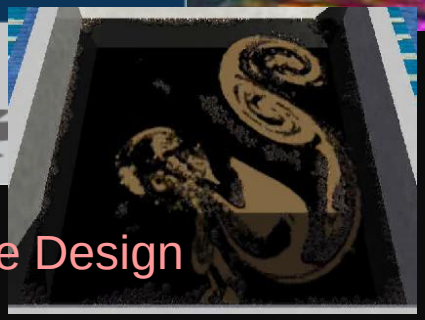
Super High-vision That Enables Ultra High-resolution Image





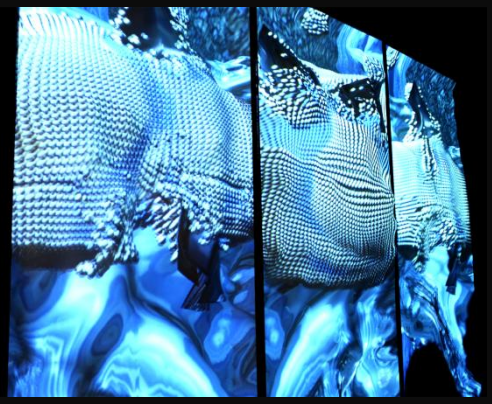


Flight – Dynamics Analysis, Formative Design

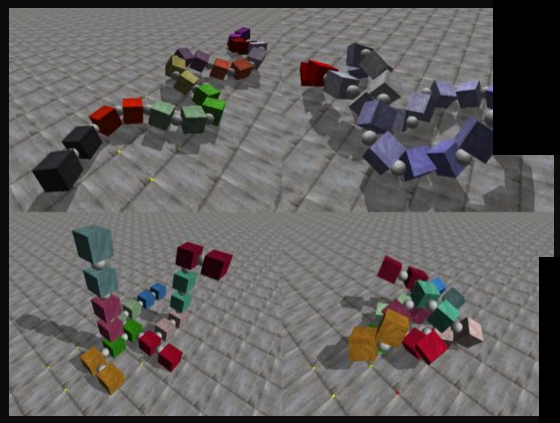


Bubbles – Simulating Flow

Interactive Art



Gemotion Screens



Simulation of Evolution

CGI

Mathematical Simulation of Structuring Colors

Planet-Survival Robots

Creation of a New Performing Space for Japanese Classic Arts

- "Japanese classic art" is a term distinguishing arts before Western

Japanese classical dance

ancient court music

tea ceremony

Nogaku

Kabuki

Bunraku

Source :

Wikimedia commons
http://commons.wikimedia.org/wiki/Main_Page

“Gemotion Dance”

ACM SIGGRAPH Paris 2005 Memorial Performance for the Minister of Culture from France

Collaboration of Kimono and CG

SIGGRAPH’07 San Diego

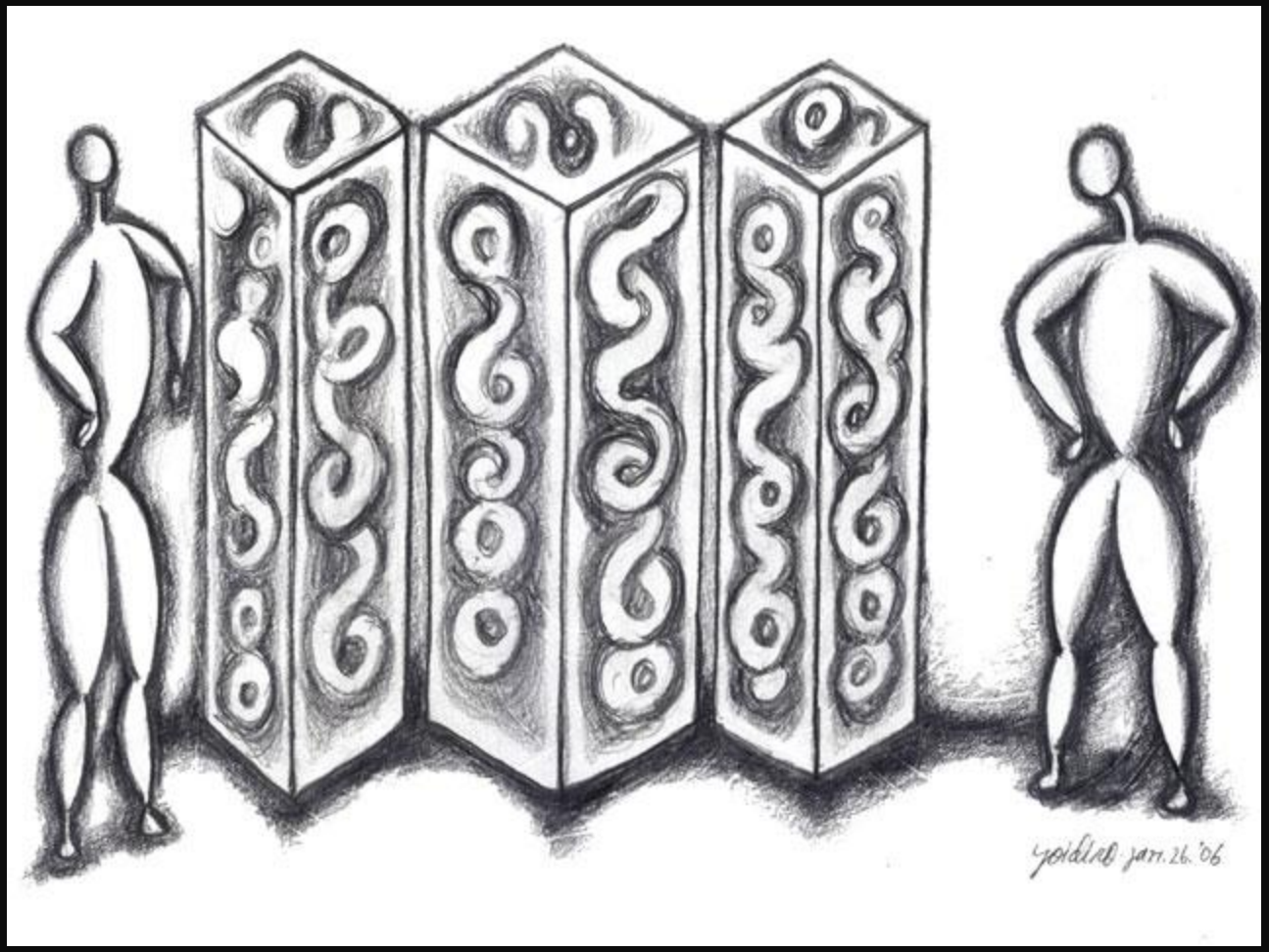
Fan designed by CG

ASIAGRAPH ’07 in Akihabara

Gorgeous Kimono Designed by CG

ASIAGRAPH ’07 in Akihabara

Collaboration of Classic Art and Interactive Images



Planning 3D Images – a Folding Screen

Folding Screen and Banner Designed by Lenticular 3D

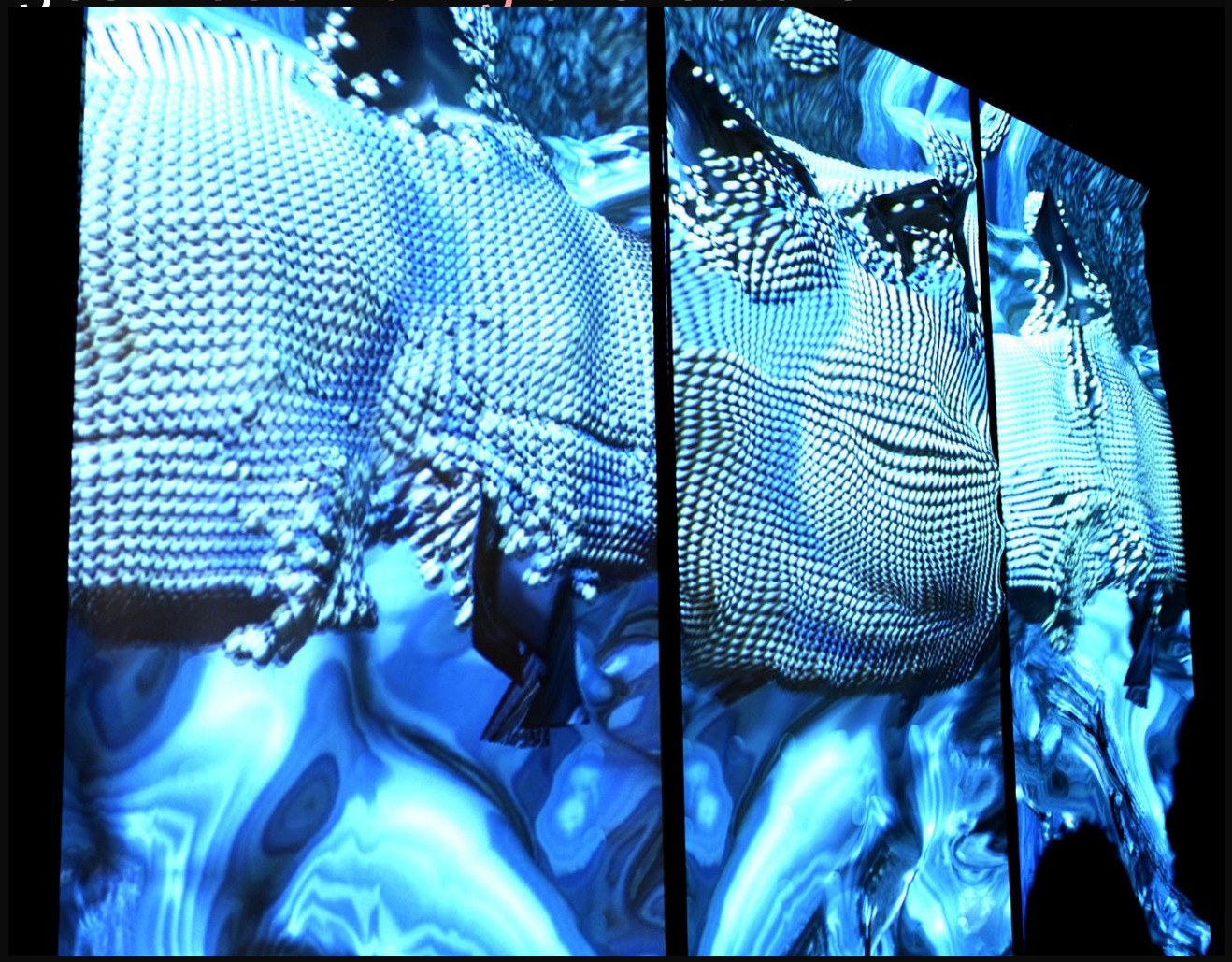
ACM SIGGRAPH 2005 Art Gallery

Folding Screen and Banner Designed by Lenticular 3D (red version)

ASIAGRAPH 2006 in Yokohama

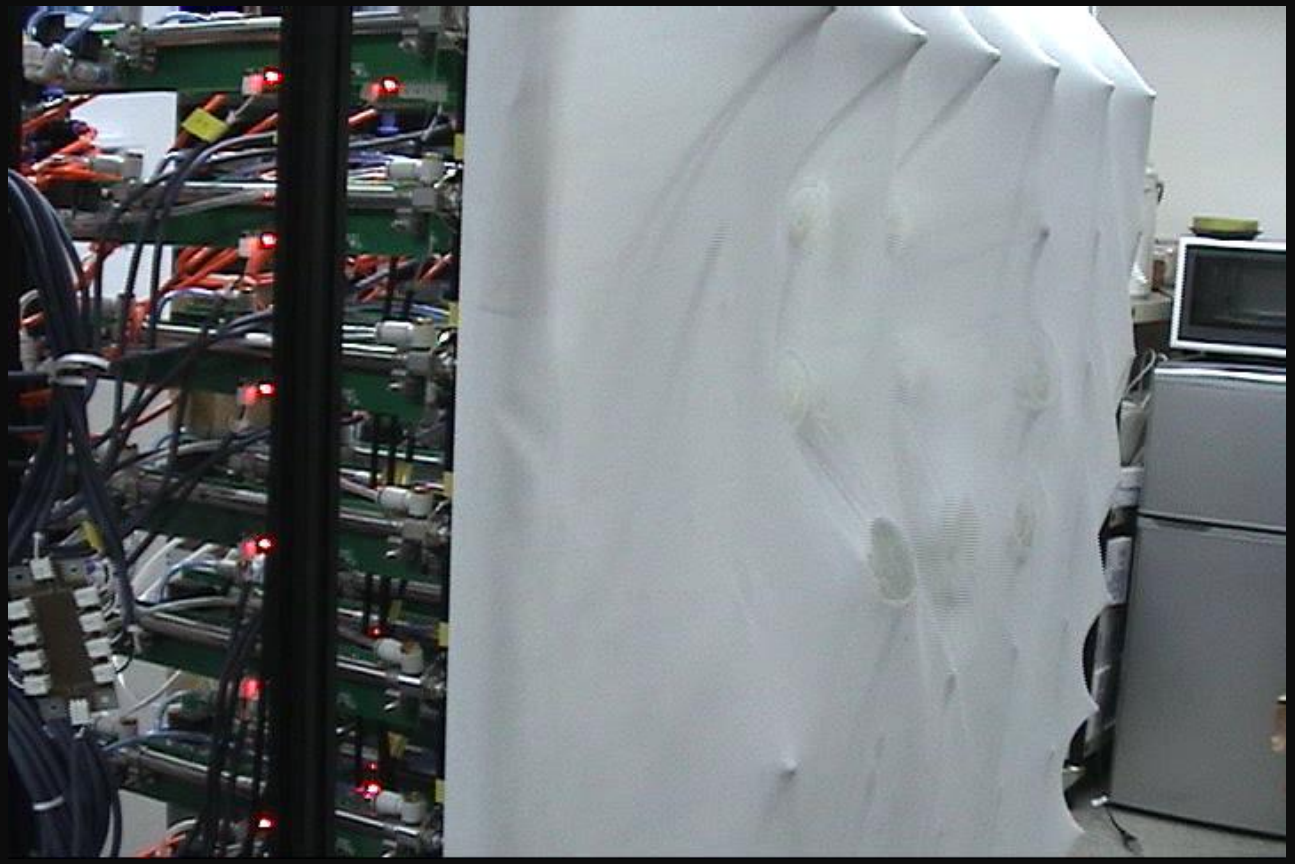
Gemotion screen

–Sliding Door That Reacts Up and Down to CG Images Resembling a Creature



[S.Tsuruoka, Y.Kawaguchi, et al., SIGGRAPH 2007 in San Diego]

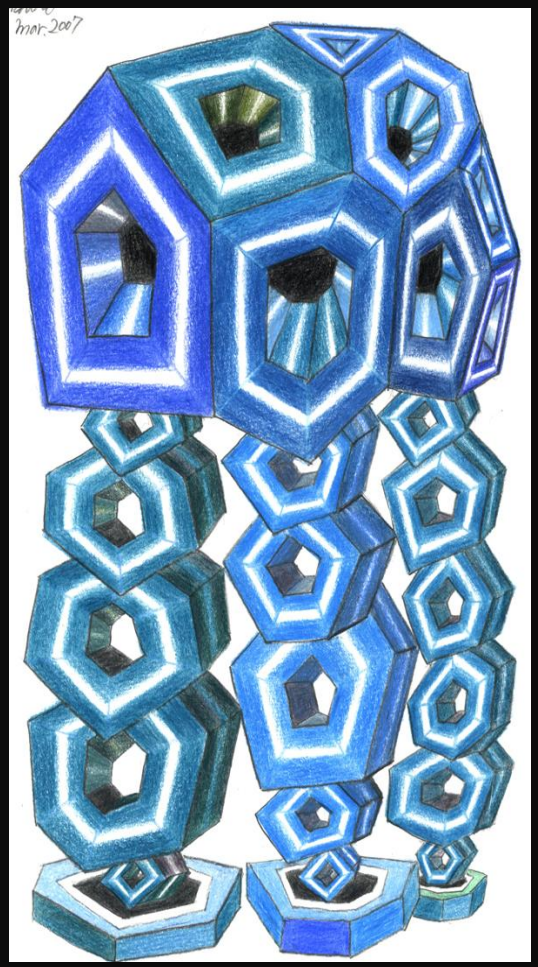
Gemotion screen –Reacting Mechanisms

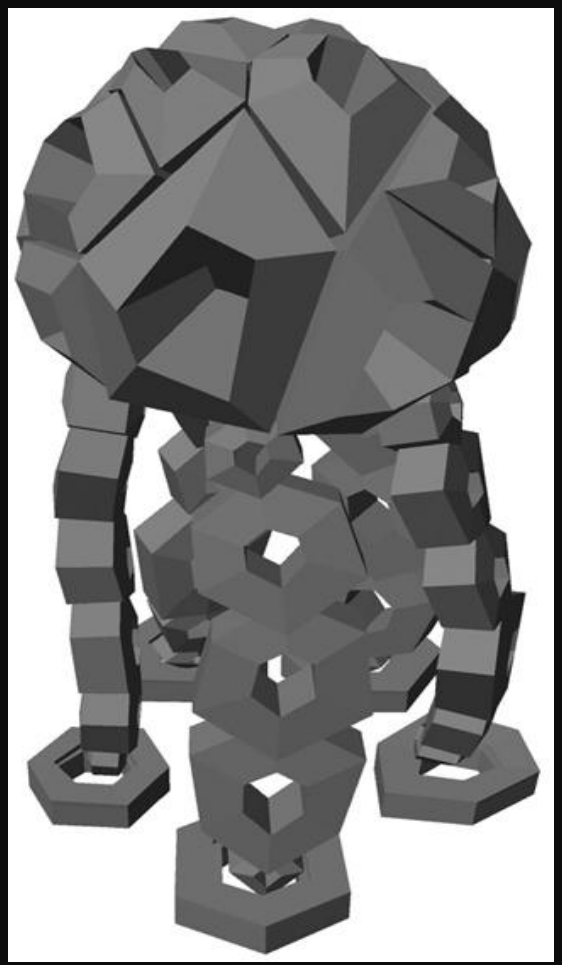


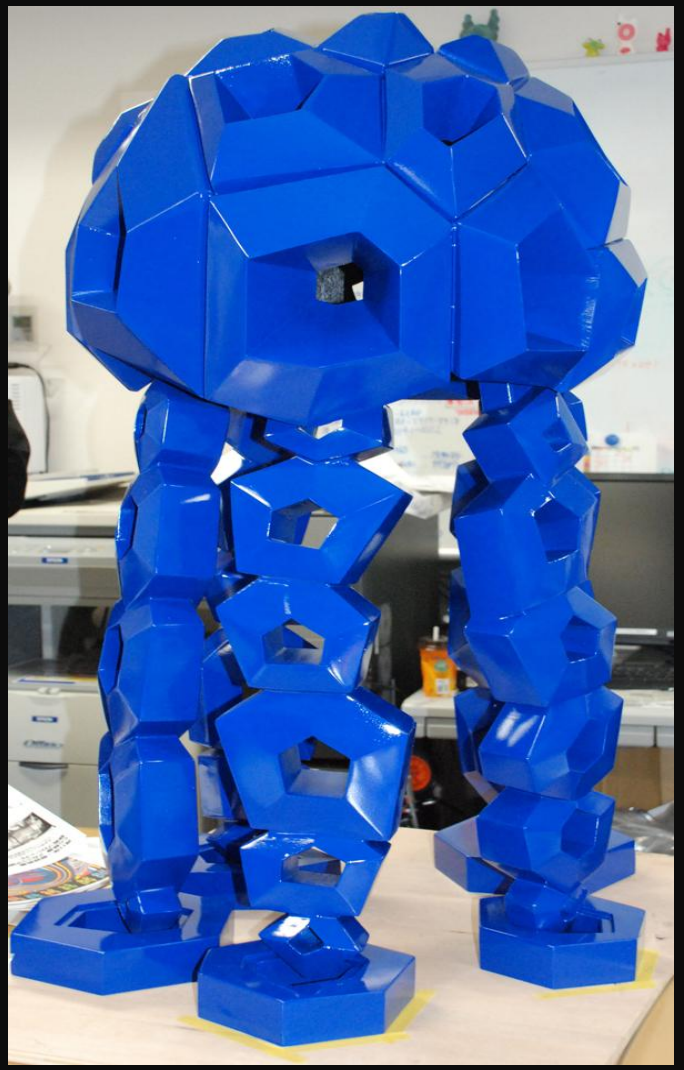
[SIGGRAPH 2006, in Boston]

Designing Planet-Survival Creatures

Designing Planet-Survival Creatures

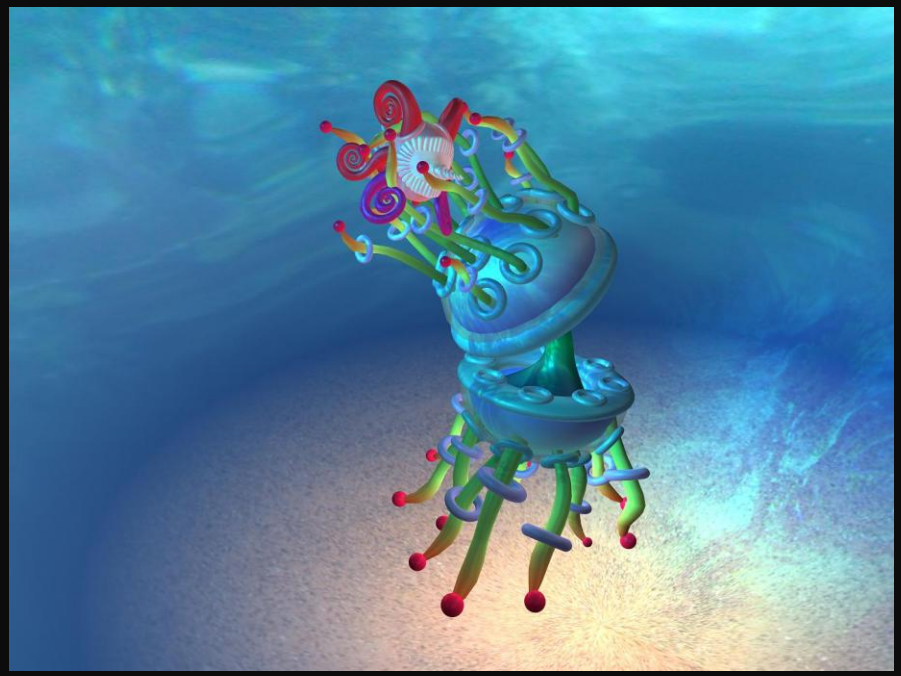




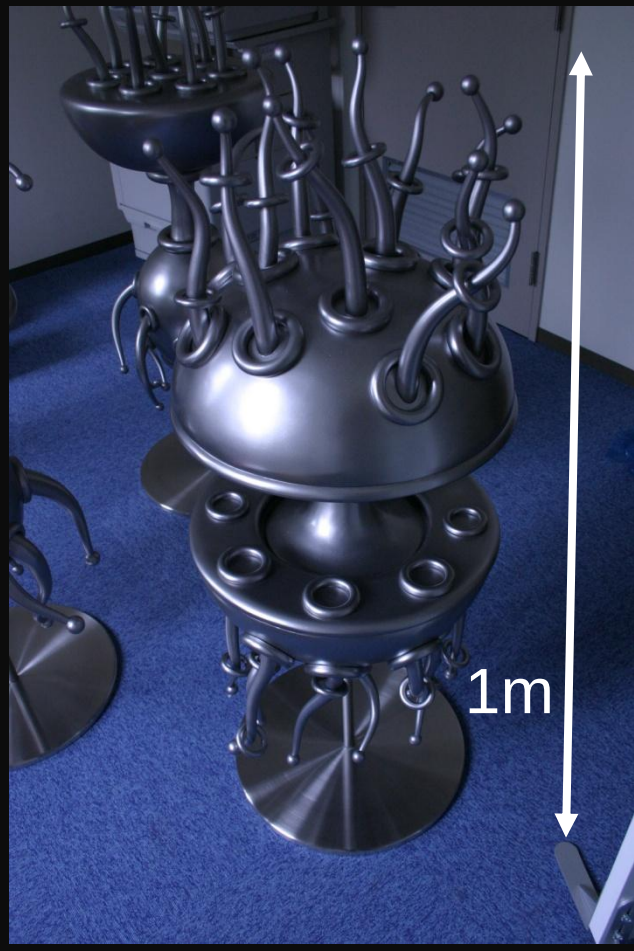


進化型クラゲの歩行実験用立体造形

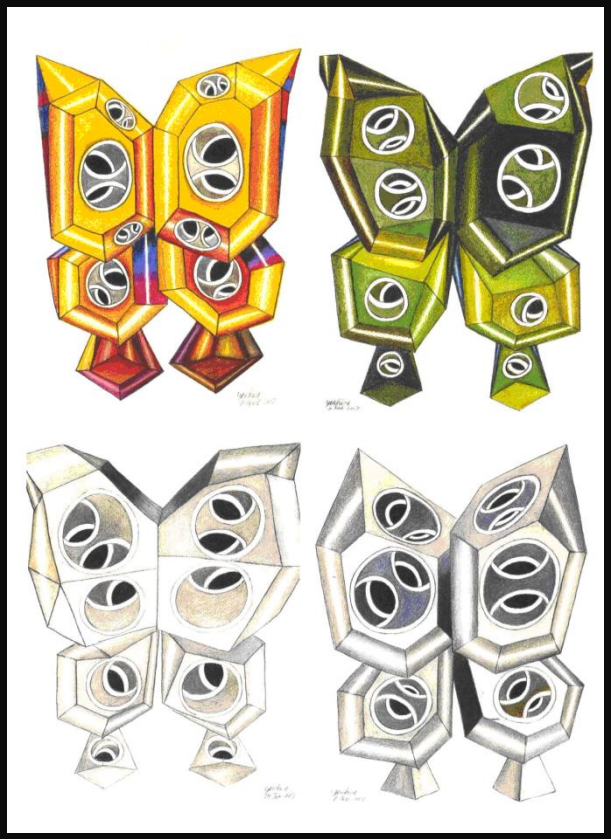
Designing Planet-Survival Creatures



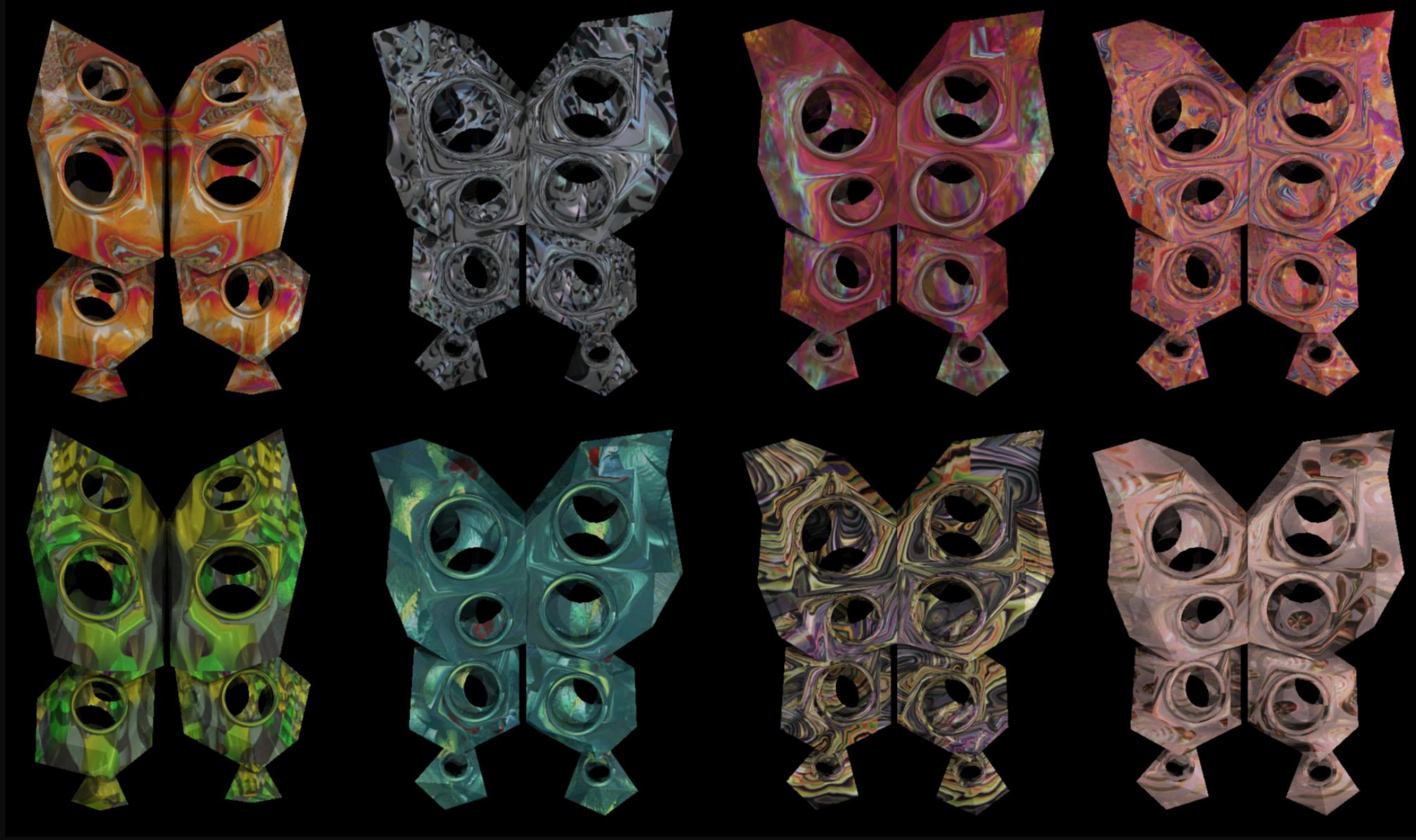
3-D Planet-Survival Creatures

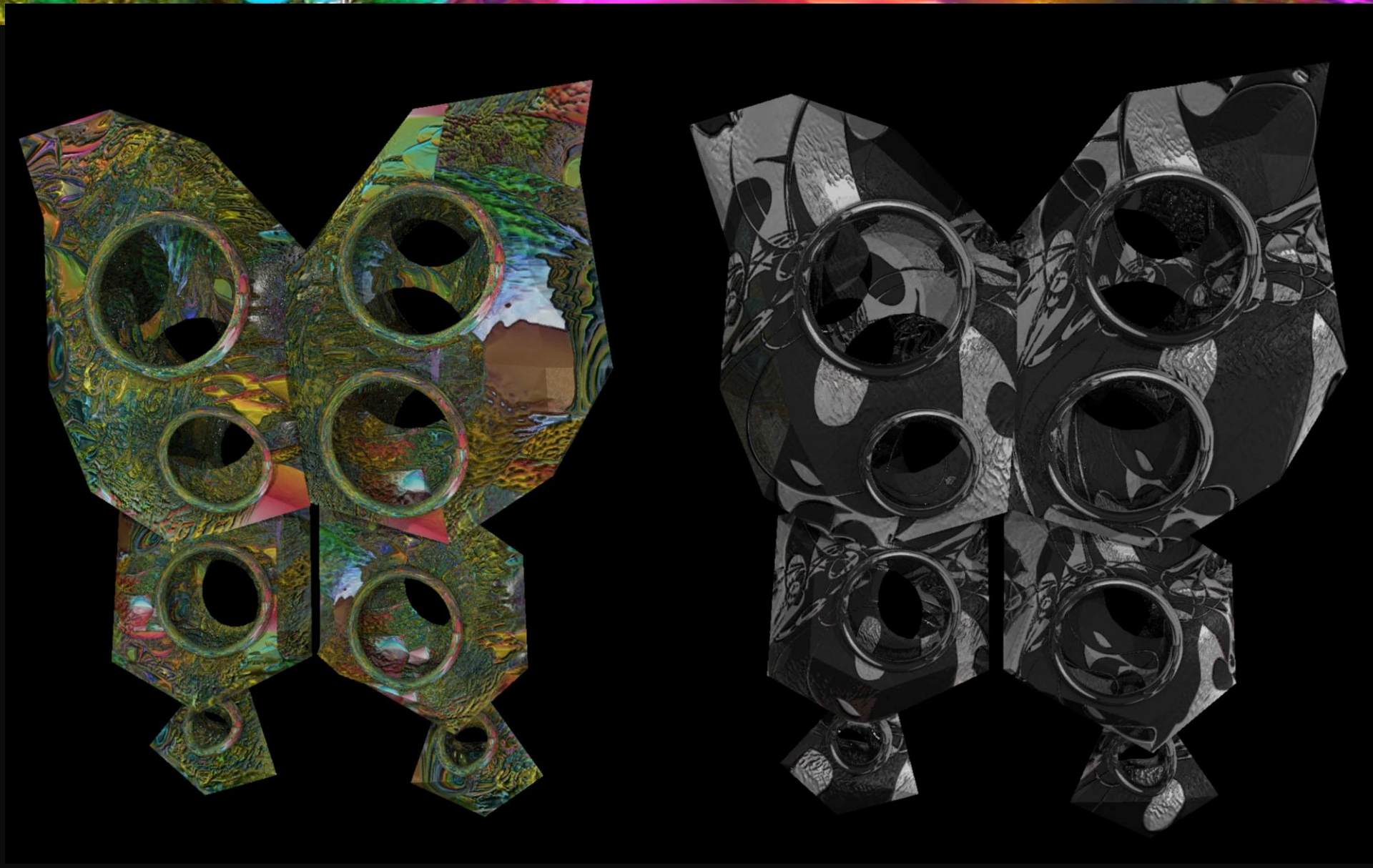


Designing Butterflies using a Multi-Dimensional Structure



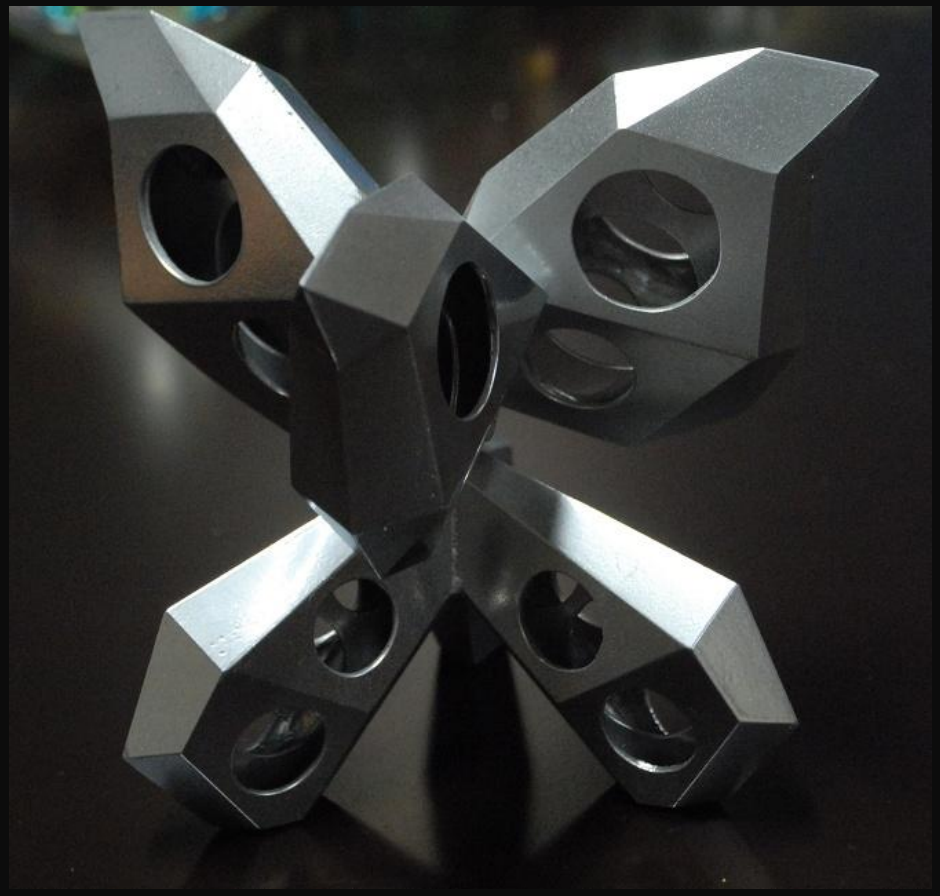
Multi-Dimensional Butterfly –CG Images



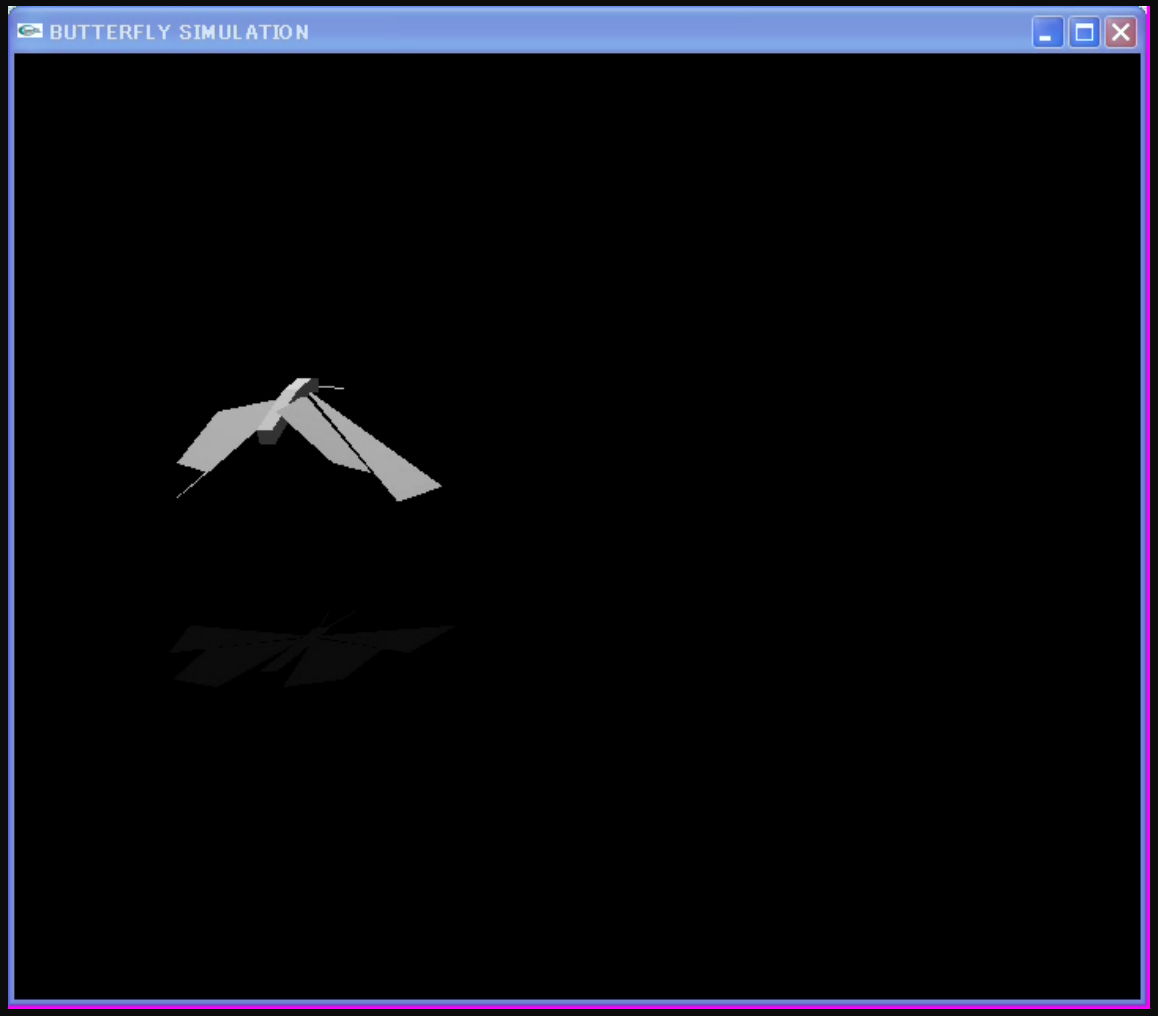


Multi-Dimensional Butterflies – 3D Forms

Multi-Dimensional Butterfly – 3D Forms



Simulation of flight dynamics

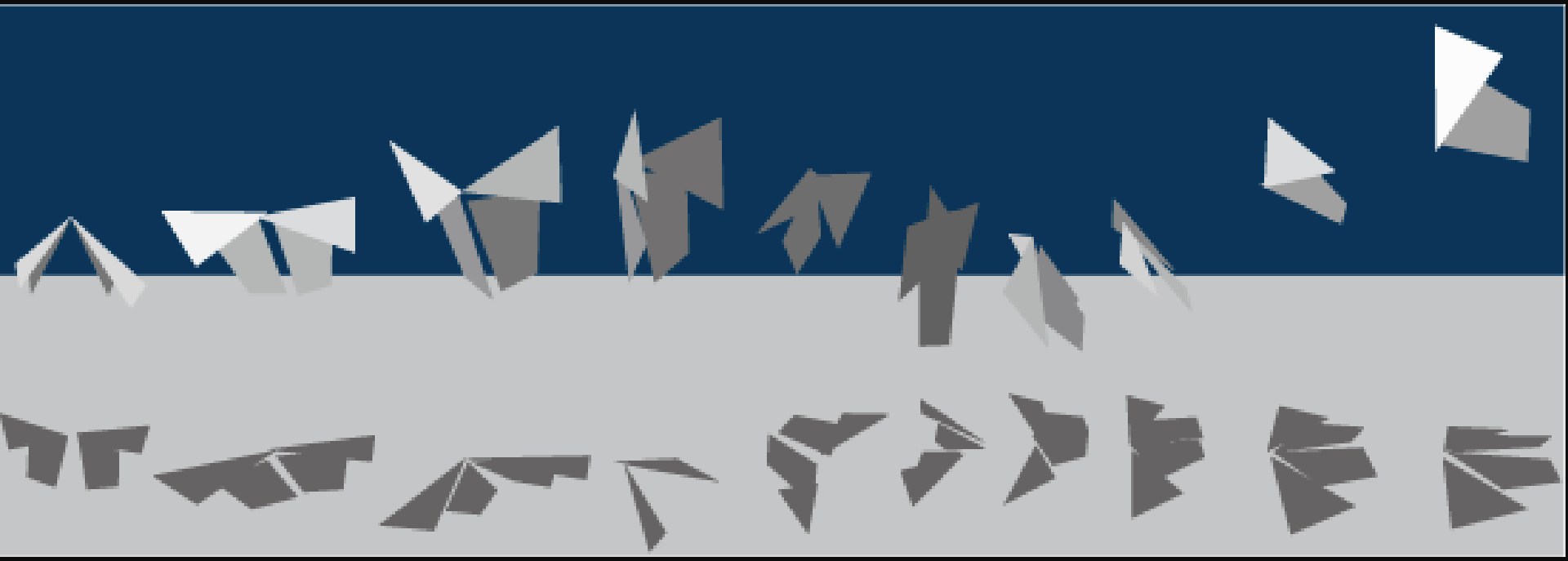


Assumptions:

1. Air-flow is constant
2. Wings do not deform
3. Left-right wings do not effect each other
4. Wings oscillate at most at 30 [Hz]

[H. Yano, Y.Kawaguchi, 2006]

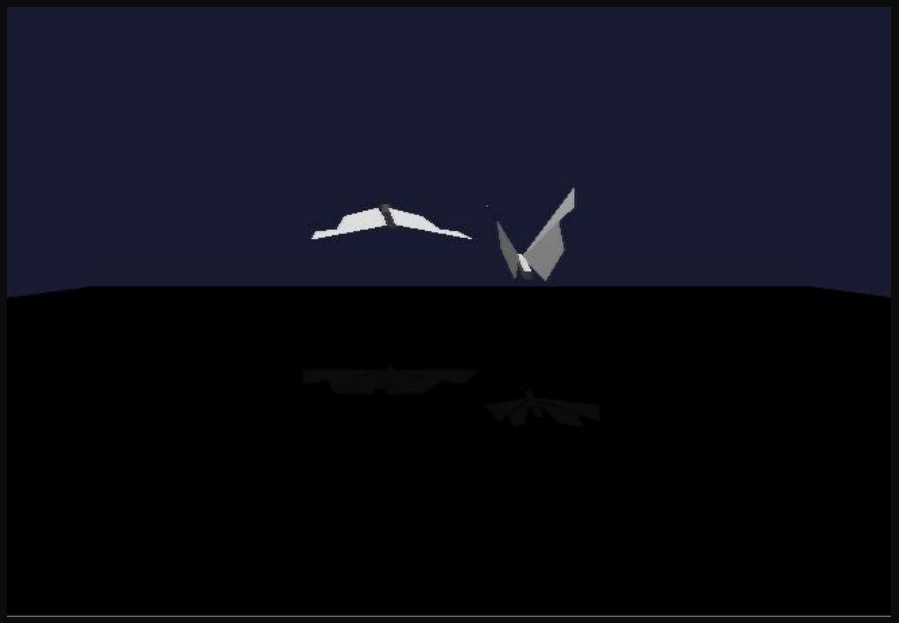
Result of the simulation



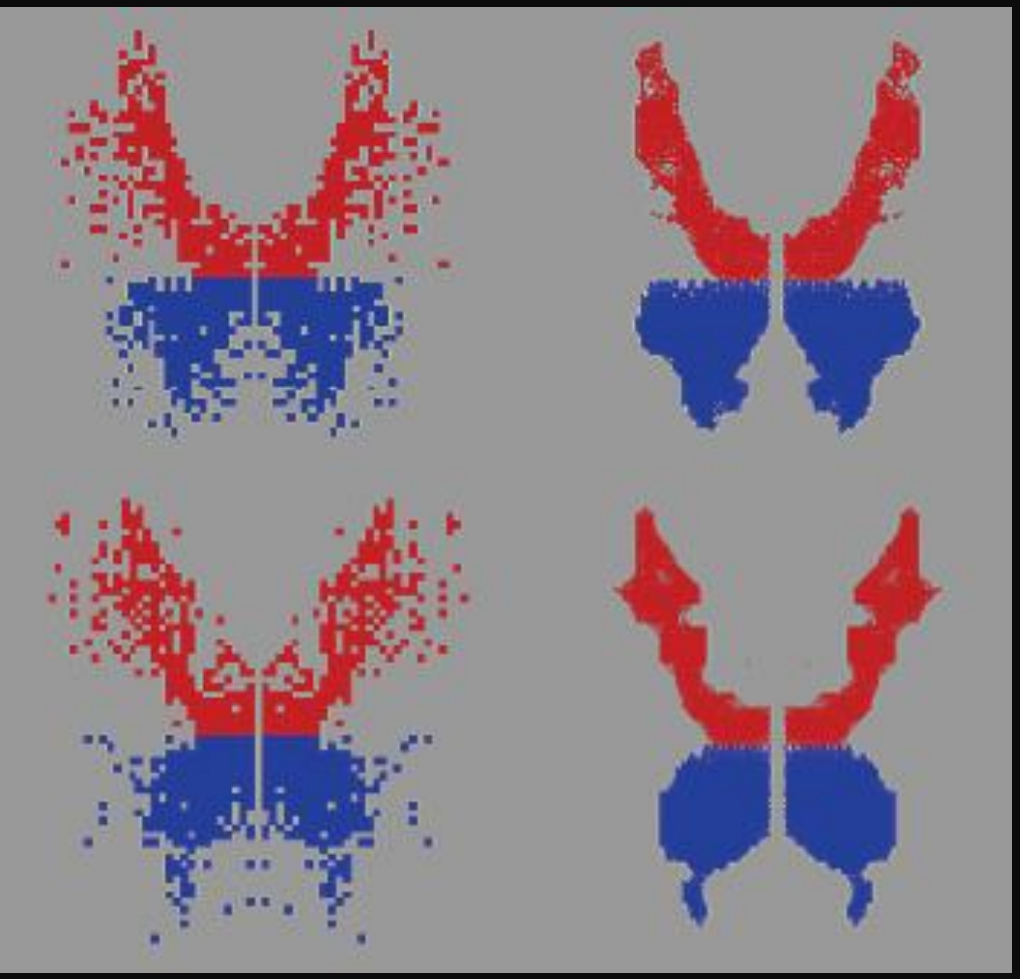
Trajectory of the simulated butterfly

[H. Yano, Y.Kawaguchi, 2006]

Experiments with simulated butterflies



Evolutional computation of wings



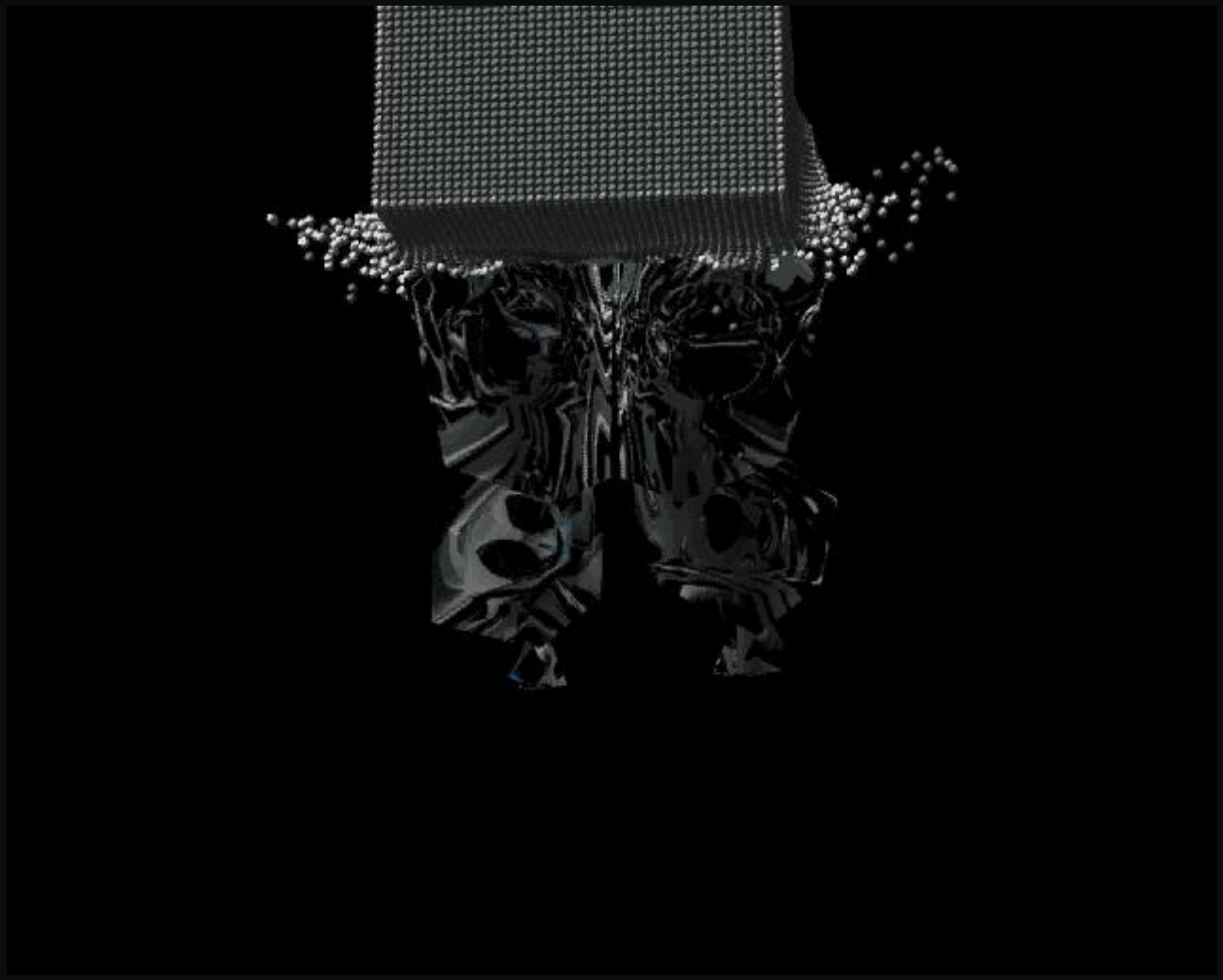
Optimization of shapes using a genetic algorithm

Butterflies evolve so that they can fly longer

Tails of wings emerged as a result of evolution

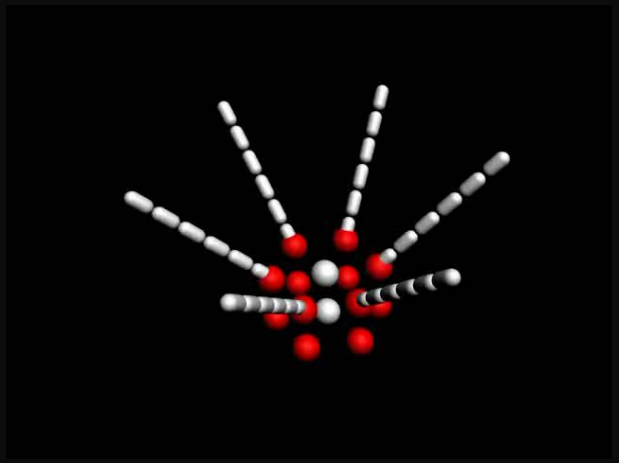
[H. Yano, Y.Kawaguchi, 2006]

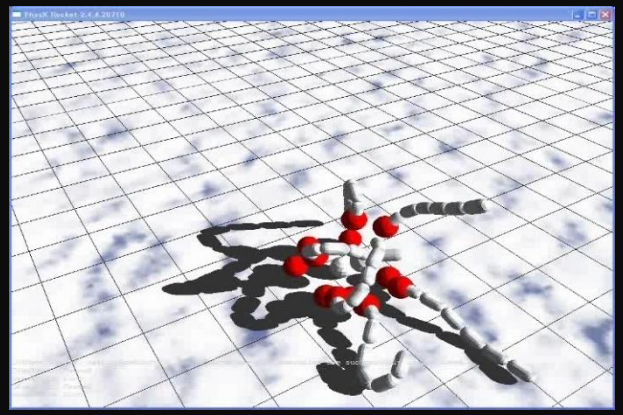
Entering the Arctic Circle of Mars

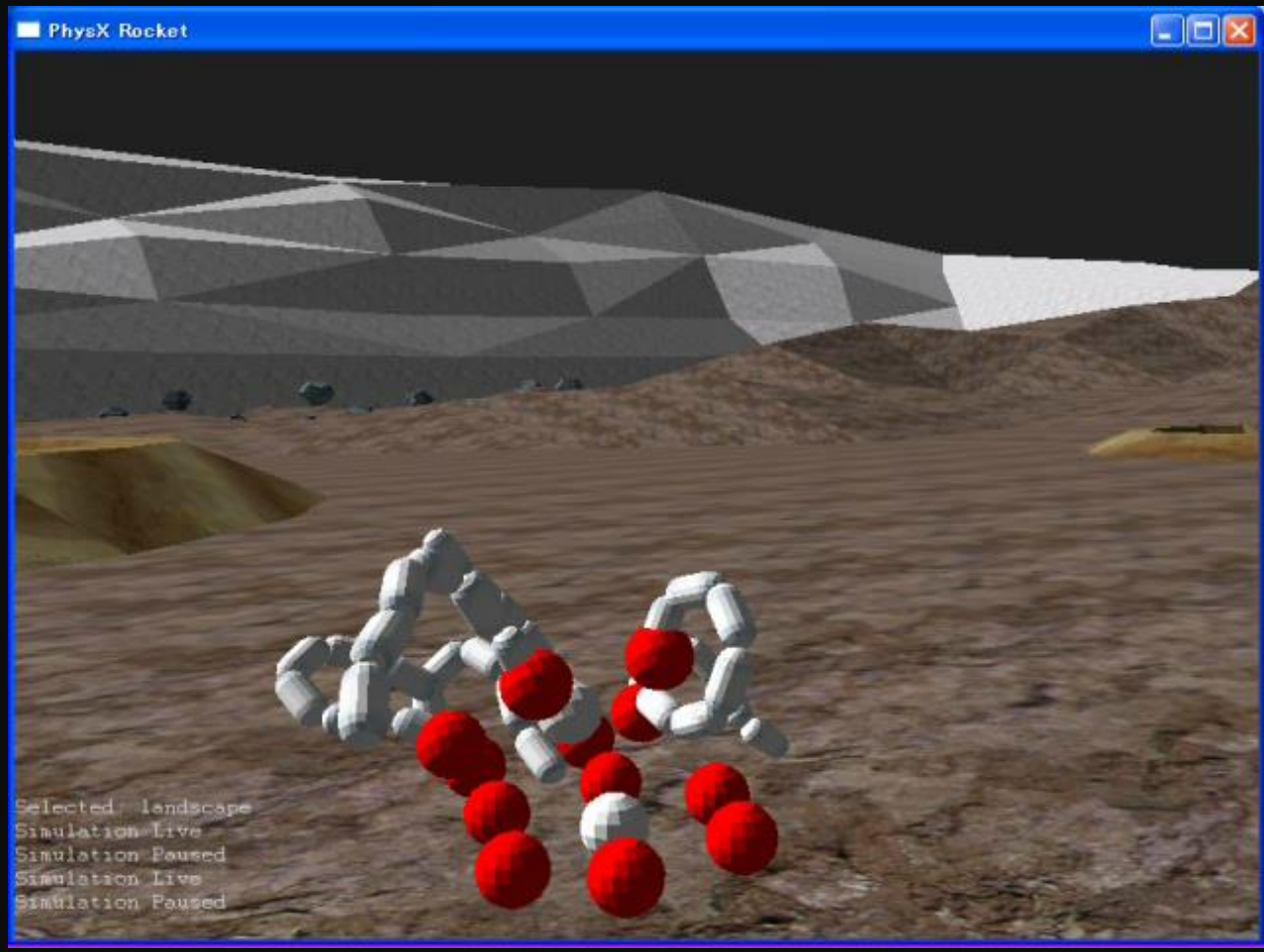


[S.Tsuruoka and Y.Kawaguchi, 2006-]

Planet-Survival Creatures Mollusk-Type

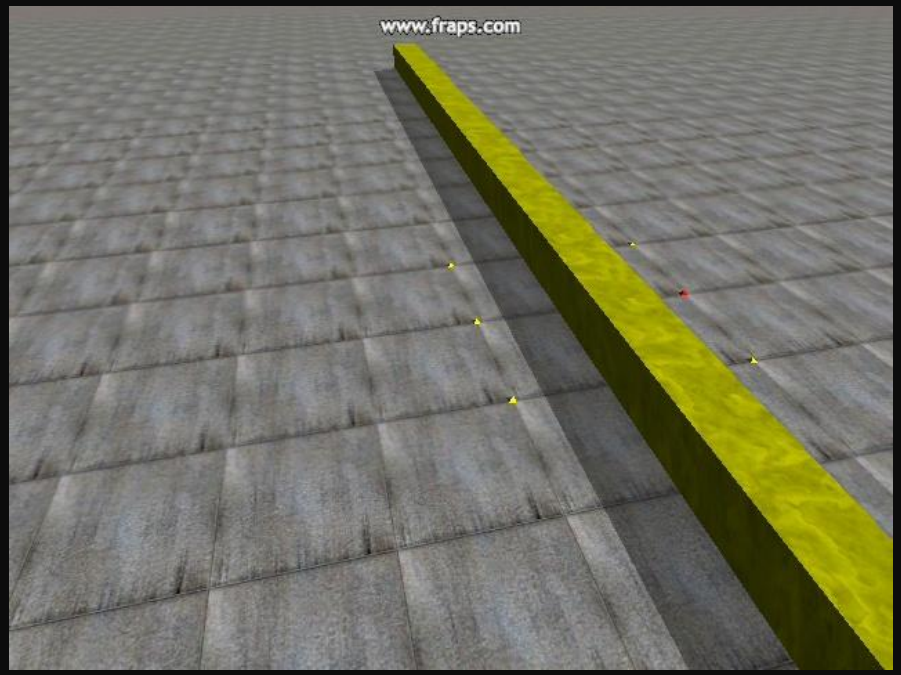




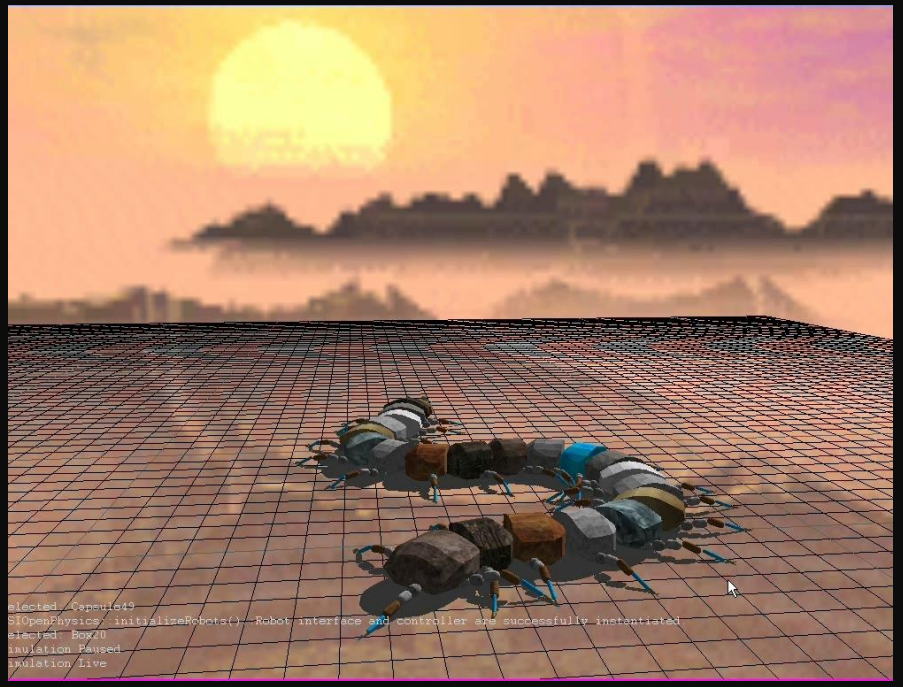


[S.Yonekura, Y.Kuniyoshi, and Y.Kawaguchi, 2006-]

Planet-Survival Creatures Anarthrous Type



[S. Ohno, Y.Kawaguchi, 2006]

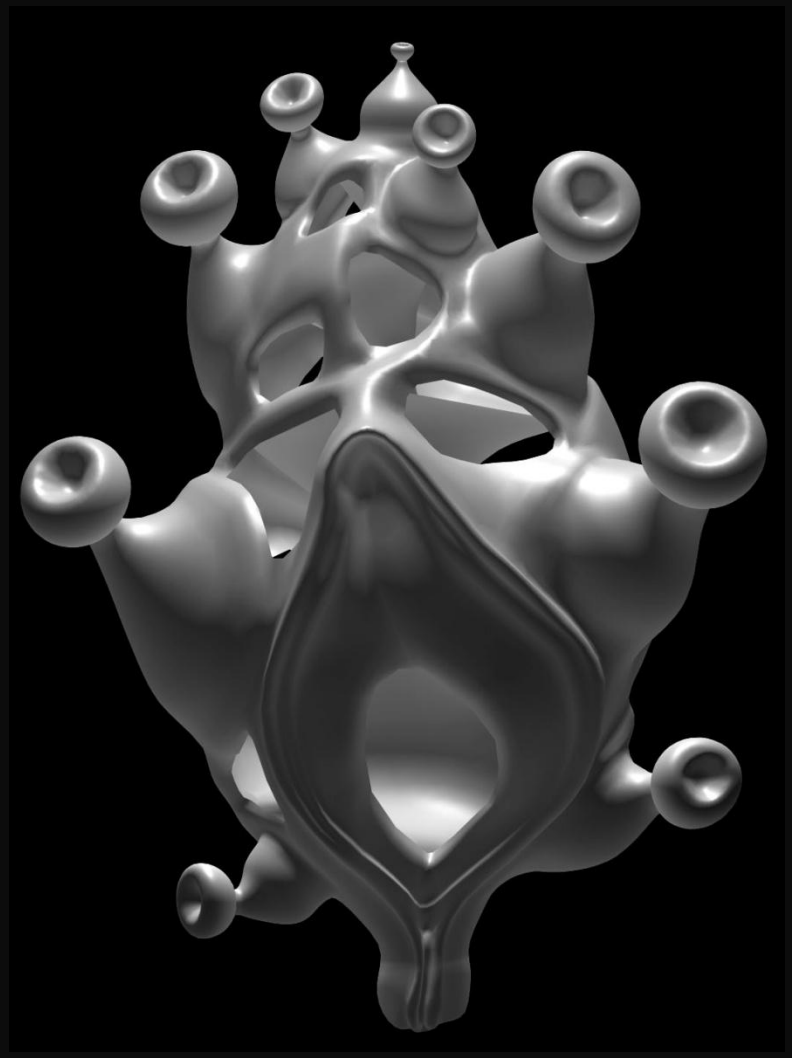


[S. Yagi, S. Yonekura, Y.Kawaguchi, 2007]

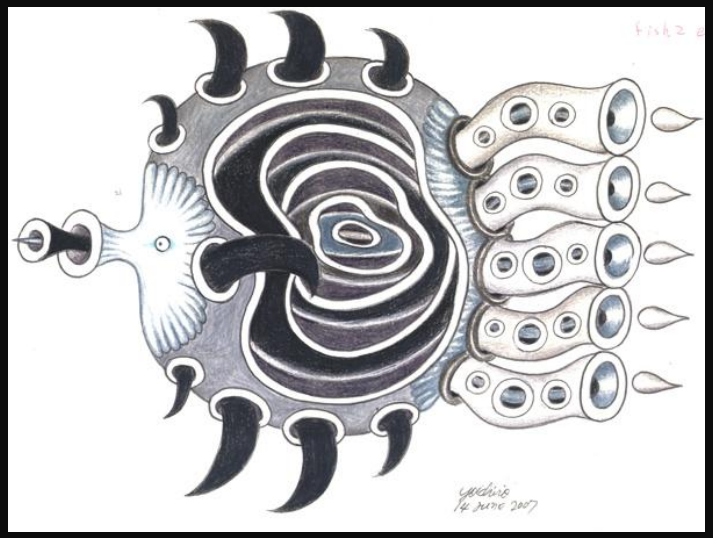
Movements of a Survival Creature Modelled Using the Nervous System

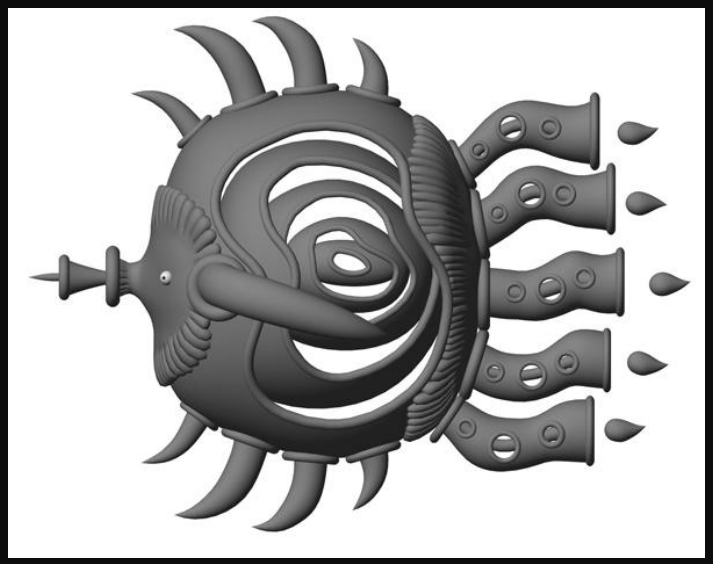
[S. Yagi, S. Yonekura, Y.Kawaguchi, 2007]

Development of Technology for Creating an Emotional 3D Structure



Designing Planet-Survival Creatures



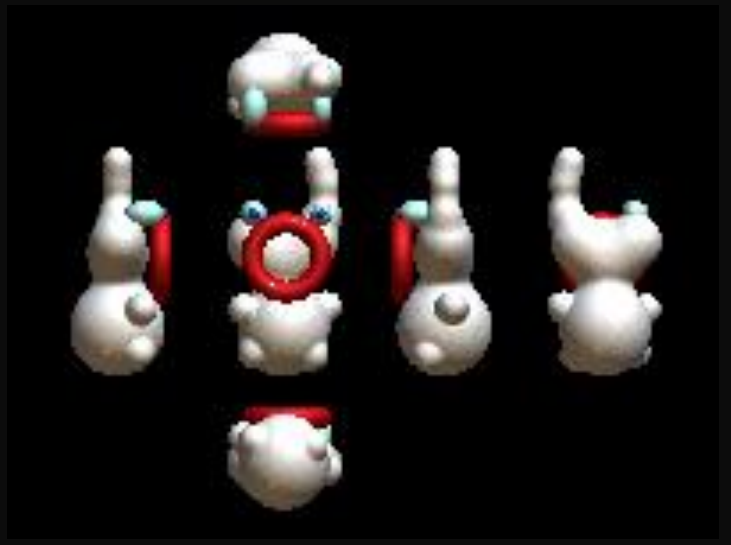


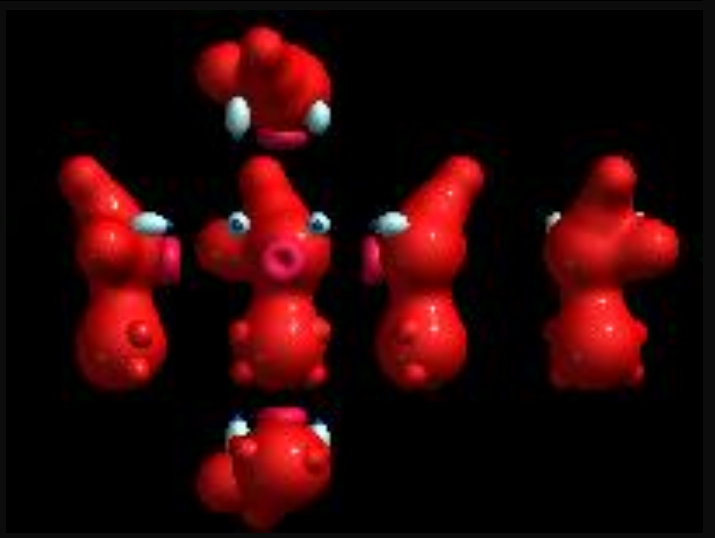
Development of Technology for Creating an Emotional 3D Structure

Development of Technology for Creating an Emotional 3D Structure

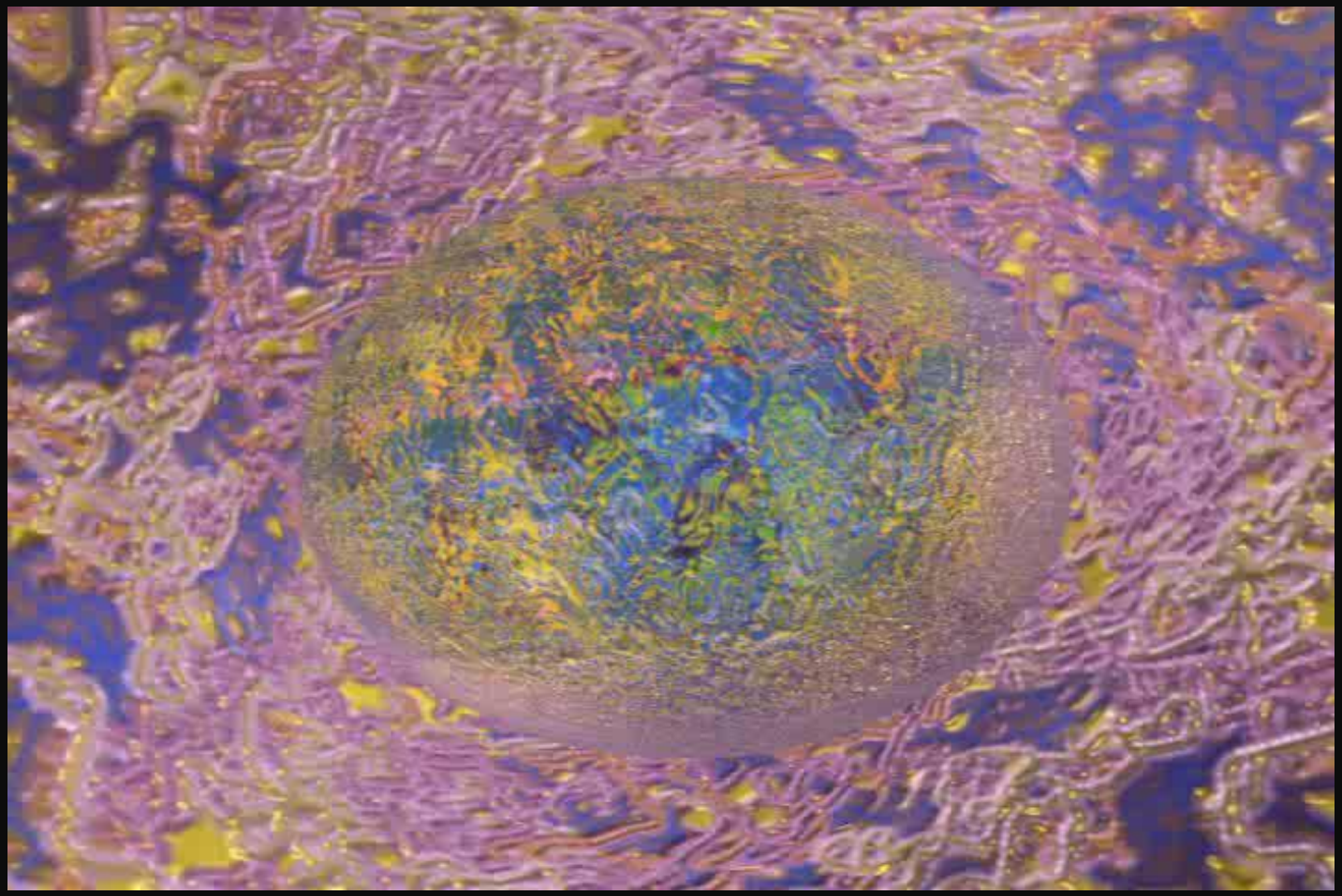
Development of Technology for Creating an Emotional 3D Structure

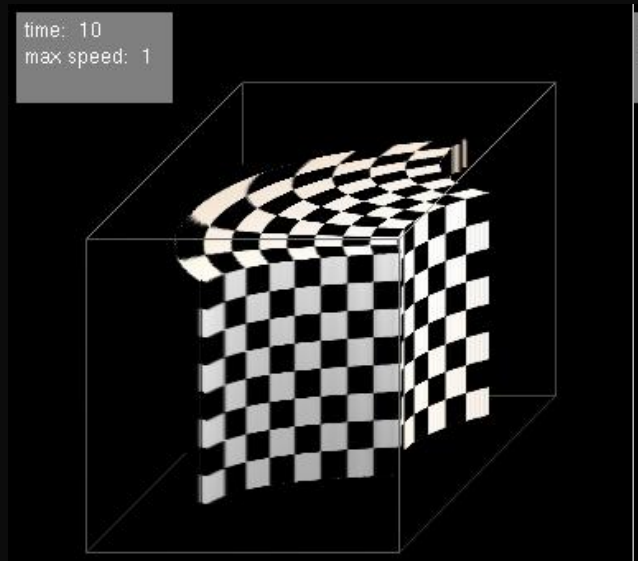
Eggy boy – a sketch· CG





Eggy boy –3D Form

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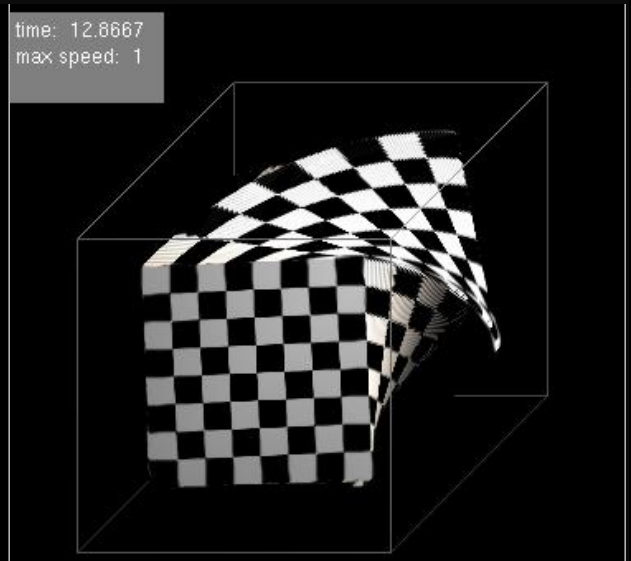
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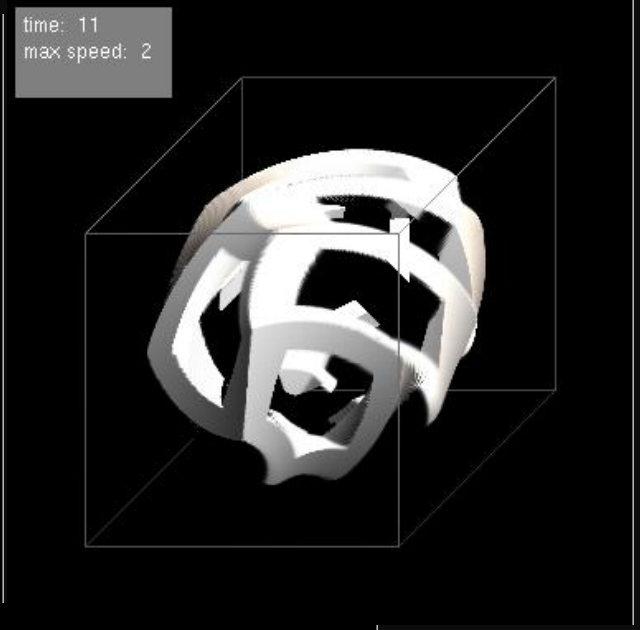
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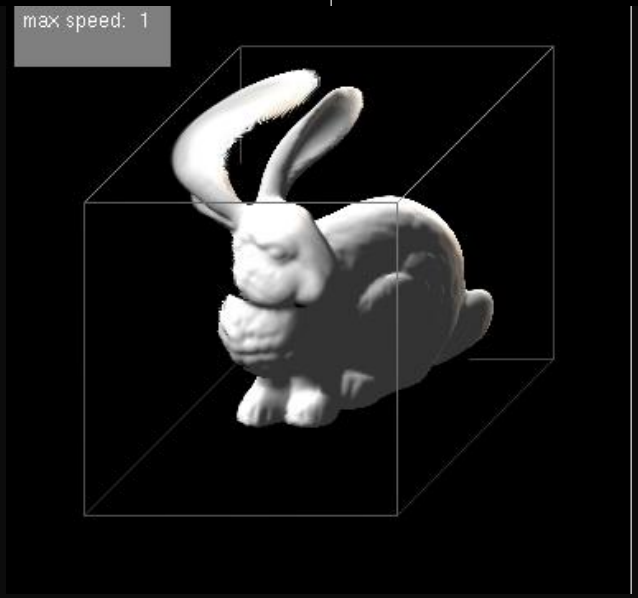
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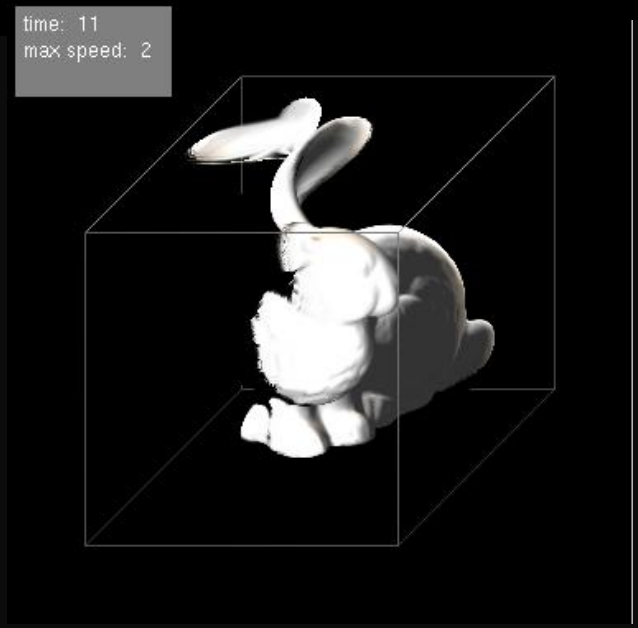
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