MIT Department of Architecture
4.112 Architecture Design Fundamentals I, Fall 2012, M/W 2:00-5:00
Instructor: Skylar Tibbits

4.112 Project 1: "The Drawing Machine"

Analyze and understand one of the precedents of nano-scale phenomena/systems/technologies listed below, as a series of inputs, processes and outputs. Study the inherent characteristics of your precedent by asking any of the following questions: Why/how does it work? What scale does it exist? What are the limits of the system? What are its fundamental logics? Translate your observations into to a series of simple logic diagrams. Use *Processing* to expand, transform, and take-on your precedent logic, creating a series of four drawings. Imagine, what if you system could be used to produce drawings, what would it show, what would be represented, how would the logic work, what density would be displayed, how do you represent time, would it happen in 2D or 3D etc. In these four drawings, a gradual change of state should happen with a noticeable degree: Vary the density, modify the form, and show time/transition. Your drawings together should demonstrate a significant and gradual change of state and make for a self-explanatory series.

Precedent list: (Please feel free to add to the list and find your own precedents. Please explore both natural and synthetic, biological and artificial nano systems. Some of these may not be explicitly nano-scale but still may be used.)

-Self-Regeneration & Repair
-Protocells
-Nano-Robotics
-Medical Devices – Drug Delivery, Stents etc.
-Cohesion/Adhesion of Water Molecules
-Asexual Reproduction (Parthenogenesis – switching)
-Self-Replicating Machines
-Nano-Materials
-Silicon Based Technologies – Cellular Automata
-DNA Computing & Molecular Microchips
-Protein Folding
-DNA Origami
-Fluid Dynamics/Mechanics
-Maxwell's Demons
-Oscillating Chemical Reactions
-Neural Networks
-Cell Division/Replication
-Horizontal Gene Transfer
-Non-linear Growth
-Mutation
-Virus Self-Assembly
-Cancerous Growth

Schedule (Note: The schedule may change slightly throughout the project):

Week 1	**Research + Analysis**
W	Introductions/ Syllabus Overview and Discussion Introduction to "*Nano-Machines*" / Tutorial
Week 2	**Building Logic**
M	Research Review and Documentation of Self-organizing Systems Desk Crits / Tutorial
W	Research Document Presentation/ Introduction to "Drawing Machines": Think of drawings as relating to one (or more) of your system's characteristics/behavior. Tutorial

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Week 3	**Digital Drawing Machine**
M	Studio: Use your diagrams and develop further analytical drawings that accounts for “logic drawings” / Tutorial
W	Studio: Use *Processing* to further expand on the preliminary sketch by extending the logic of your system to create an original sketch. Tutorial
Week 4	**Processing Drawings**
M	Studio: Project 1 Interim Review
W	Continue to use the original sketch as the basis for gradual changes of state in creating a total of four digital drawings/ Desk Crits / Tutorial
Week 5	**Final Review**
M	Final Review for Project 1
W	Introduction to Project 2 – In Studio working Day

Final Deliverables:

A Research Document
A Series of “Logic Diagrams” Based on *Nano-Machines* Precedents
A Series of 4 Generative Drawings (24”x36”)

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