Assignment 7: Grasshopper 2 – Data Driven Assemblies

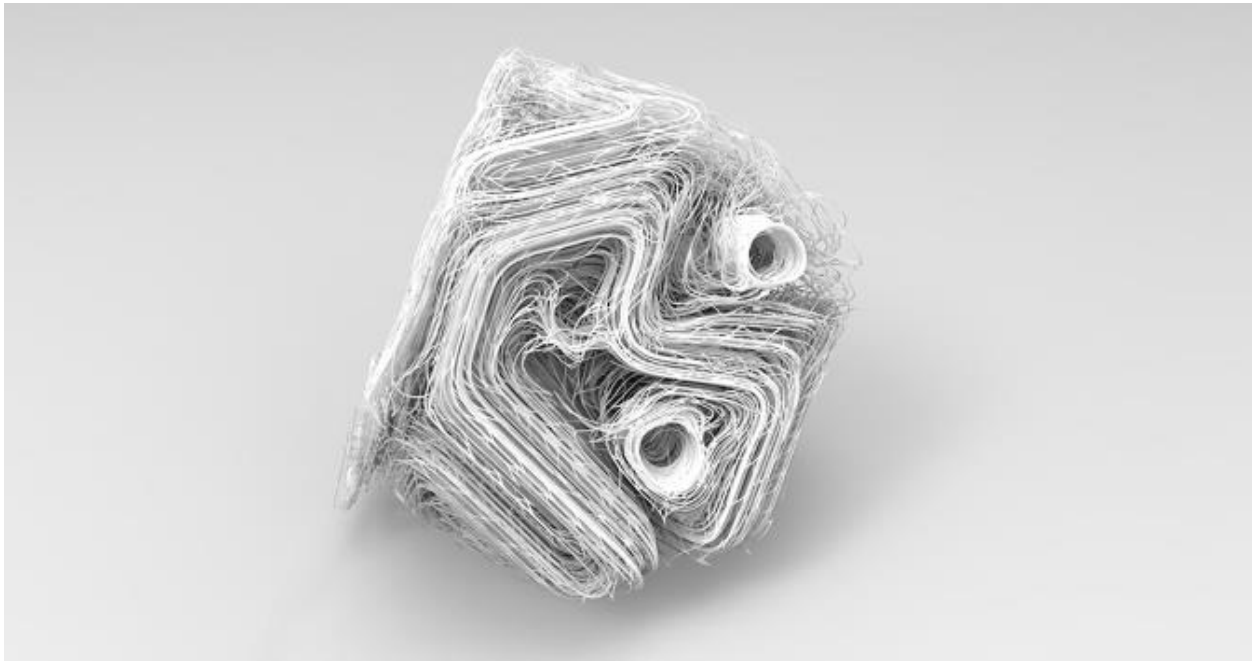

Figure 01: *Giles Retsin* **Dissolved Volumes**

"Field configurations are loosely bounded aggregates characterized by porosity and local interconnectivity. The internal regulations of the parts are decisive: overall shape and extent are highly fluid. Field conditions are bottom up phenomena: defined not by overarching geometrical schemas but by intricate local connections. "

Stan Allen (From Field to Objects, 1997)

The contemporary city and its inhabitants constantly produce and record information leading to the phenomenon of Big Data. If architecture is to harness the power of data it must first learn to capture, manipulate and augment it in a manner that is architecturally productive. This assignment asks you to produce data-driven assemblies by mining your studio project for data that can be deployed within Grasshopper to produce data-driven assemblies across a multitude of scales. In this assignment you will explore how image driven data and proximity data can produce difference across component assemblies.

**Part A: Visual Coding**

1. Through a number of sketches and diagrams analyze your component developed in Project 6 to study how it might be deployed within the context of your studio. Ask how your component operates at multiple scales (as a material effect, as a surface or wall, as a field condition at the scale of a landscape, etc.) and identify what changes you might make to the component to allow it to better facilitate the architectural intentions you are developing in studio.

2. Choose an image that has significance to your studio project and identify the data contained within the image you intend to mine. (Note: Images contain vast arrays of information from pixel color, to brightness values, to the geometric features that comprise the image, etc. Be critical when choosing an image and the data you intend to mine, ask yourself what effects might a particular image produce?)
3. Diagram how your new and improved component can respond to differences produced through the use of **both** attractor data and image based data. Show how this difference might be deployed to further your studios critical narrative.
4. Diagram the relationships between the parameters of your component and its relationship to an attractor curve/point. (For example - how does distance between your component and an attractor impact your component?)
5. Diagram the relationships between the parameters of your component and its relationship to the data contained within an image. (For example - how does the brightness of a pixel impact your component?)

**Deliverables Part A:**

- All diagrams that communicate your new and improved component and how you understand its productive capabilities relative to your on-going studio explorations.
- Diagrams that clearly identify the sources of data you are interested in exploring and produce a pseudo-code to show how attractor data and image- based data influence your component assemblies.
- Compile all diagrams and pseudo code onto an 11” X 17” board and post to your blog by 8:00 am Wednesday November 1, 2017.

**Part B: Algorithmic Manipulation – Grasshopper as a Tool for Exploring Manipulation**

1. Revise your grasshopper definition to reflect your new and improved component.
2. Aggregate your component across two surfaces, one surface that operates at the scale of a building element.... an "architectural" scale and one where that allows the component to operate as a field condition at the scale of the site/landscape.
3. Identify which type of data, attractor or image based, will be deployed at the two scales.
4. Execute your pseudo-code to produce a parametric definition that use attractor data to drive your assembly at either the architectural or field/site scale.
5. Execute your pseudo-code to produce a parametric definition that uses image-based data to drive your assembly at the other scale not utilized above.
6. Render each assembly in context.

**Deliverables Part B:**

- All diagrams that communicate how you modified your original component and how attractor based and image-based data drive the assembly.
- Two (2) renders:
    - One (1) that situates the render as a part of an architectural assembly. This render might explore material effects, aperture, water collection, sound attenuation, solar gain/shading, etc.

    - One (1) render that situates your component as part of a large field condition – at the scale of the site.
- The Grasshopper definition and any associated Rhino file.

Compose the Part B deliverables onto one 20” X 30” board. Include all relevant diagrams and the two renders. Upload the board, along with your Rhino and Grasshopper file to your blog by 11:59 pm, Tuesday November 7, 2017.