CourseNo: ARCHA4778_001_2014_1

METATOOL

(formerly Digital Jig)

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Spring 2014 // Thursdays 1pm - 3pm // 200 Buell North

"The user of the electric light -- or a hammer, or a language, or a book -- is the content. As such, there is a total metamorphosis of the user by the interface. It is the metamorphosis that I consider the message." Marshall McLuhan

The architect encounters a site. Armed with an arsenal of tools, she undergoes processes of observation, research, and analysis. These operations unearth constraints and situations, which in turn define the field of possibilities in terms of space, event, and movement. Other tools allow her to sketch, improvise, represent, modify, analyze, critique, and explore this field. And over a long process of deliberation, introspection, and collaboration, she arrives at a singular decision that creates a new kind of site and a new context altogether, when set in motion.

It goes without saying that the architect's tools are her most prized possessions. They are akin to bodily prostheses: new augmentations that not only alter what can be done, but what can be represented and thus what can be conceptualized. It could even be said that the architect is indelibly influenced by the logic and agency of those tools.

This critical architect might ask: Where does the tool come from? What does the tool want to do? What new tools can be created? Should not every process of design be one that reinvents new methods of thinking, and new tools for creation? **In other words: Architects should not only be able to *use* tools, but should have the ability to *create* new critical / experimental design tools.**

METATOOL is a course about designing experimental design tools, utilizing the Grasshopper software environment as a meta-tool: a tool that enables the creation of other tools.

The course is grounded in a solid technical understanding of Grasshopper and hovers around a set of critical history/theory texts and group discussions. Each new experimental tool will result from an examination of an existing design tool, and will be oriented towards the creation of a new design process within Grasshopper (with the optional integration of Python/C#/VB.net).

Knowledge of Rhino is assumed, and a basic knowledge of Grasshopper is recommended, but not necessary. A database of Grasshopper introduction videos, developed in conjunction with the ADR2 curriculum, will be available. A custom created Grasshopper component, Hairworm, will be used in conjunction with Github, a cloud-based platform for sharing code. The course will be the starting seed for the Grasshopper Exchange, a new online-based tool arsenal. Over the duration of the course, students will collectively amass this shared database or 'arsenal' of new Grasshopper-based tools into a suite of experimental design processes that will enable and augment new, experimental design possibilities.

SCHEDULE

Week 1 (1/23): Introduction: What is(n't) A Tool?
Lecture/discussion: Conceptual introduction to course - what is a tool? What isn't a tool? How does a tool not just amplify, but alter design processes? Collaborative processes?
Example/Tutorial videos: Grasshopper intro, clusters, new interface examples; collaborative design with *Hairworm* + Github
Assignment: Analyse an existing tool: Critique the tool by 'breaking' its default inputs and assumptions, and create new processes and designs.

Week 2 (1/30) Feedback loops: simultaneous data analysis and design
Lecture/discussion: What kind of analysis alters the design process? How does data need to be processed and composed in order to be understood?
Reading excerpt: Graham Harman, *Tool-Being: Heidegger and the Metaphysics of Objects,* pages TBD; Mark Hansen, *Bodies in Code: Interfaces with Digital Media,* p42-44,
Example/Tutorial videos: Grasshopper trees/data manipulation, spatial data analysis & calculation. Using data & interface simultaneously as a new tool.
Assignment: Given a series of constraints, propose and prototype a new tool that improves/breaks/hacks/alters an existing tool for the sake of a given goal, based on the previous assignment.

Week 3 (2/6) Representation As Manipulation: More Output
Lecture/discussion: How can the representation of analysis actively alter the design process?
Reading excerpt: Reading: excerpt from Bruno Latour, "Visualisation and Cognition: Drawing Things Together", pages TBD
Example/Tutorial videos: Creating custom Grasshopper representation/interfaces, camera manipulation, representation through coloring/hatching/shading/projection techniques.
Assignment: Propose and prototype a representational scheme for the tool that drastically alters the use/functionality/purpose of the tool beyond formal/aesthetic purposes.

Week 4 (2/13) Beyond the Keyboard and Mouse: Other Inputs
Lecture/discussion: The keyboard and mouse allow a specific kind of interface - what other input devices can be harnessed to create new design possibilities? What is an input?
Reading excerpt: TBD
Tutorial/Example: Using plugins: Firefly, gHowl, and connecting external devices via OSC or UDP to Grasshopper to store/create/manipulate geometry. ex) iPhone accelerometer/GPS; Razer Hydra, microphone, webcam, etc.
Assignment: Propose and prototype a new design tool that creates geometry without using the keyboard or the mouse.

Week 5 (2/20) Computational Collaboration: loops & evolutionary solvers
Lecture/discussion: How can we utilize the computer to collaborate with computational abilities, without being either subserviently deterministic to computation, or simply amplifying existing processes?
Tutorial/Example: Extending Grasshopper - Galapagos/Octopus and genetic algorithms, Hoopsnake solvers, Python loops. Incorporating solvers into a multi-step collaborative process.
Reading Excerpt: TBD
Assignment: Either modify or create a prototype of a new tool that works in collaboration with a loop-based solver or a genetic algorithm.

Week 6 (2/27) Desk crits (Studio Midreviews)

Week 7 (3/6) Desk crits (Studio Midreviews)

Week 8 (3/13) Final Review - date TBD