CourseNo: ARCHA4792_001_2014_1
Meeting Location: AVERY HALL 115
Meeting Time: R 08:00P-10:00P

Instructor Information:
Maider Ainara Llaguno
Biayna Bogosian

// OVERVIEW

In the last decade, through the development of information technologies our relationship with objects and the built environment have become intrinsic, defining a material semiotic that has allowed the world to become a live information platform. This attitude replaces the idealistic abstraction of history with a materialistic concretion of the present and invokes a new site specificity of the territory and its users. We are becoming ever more connected to our immediate environment based on our agency over altering the intensity of the context by our specific searches and tags, as well as changing the way location is registered by others. Thus, the openness and rapid processing of information has taken us to a place in which built environments must be constructed by a multiplicity of physical and non-physical parameters, posing the question of how to define what can be considered an appropriate design methodology. In this context, the constantly added resolution of information that is contained within a project calls more intricacy to the role of an architect.

As a mediator between immaterial and material, human and technology, the architect operates simultaneously across a multitude of domains using an array of tactics. The digital age has accelerated the multiplicity of strategies and need to collaborate with other disciplines, synchronously opening new possibilities of conveyance of concept and method. On the other hand, as we are able to harness and access more data about our immediate and non-immediate surroundings, our understanding of the environment has become more than ever redefined and customized by the specifics of our virtual and physical place. A new generation of architects envisions the discipline as a mixture practices and seeking alternative territories. The question being posed here is how to develop built forms out of the environmental *big data* (physical-climatic and non-physical-user data) instead of as previously, occupying it with an imported simulacrum.

The term convergence in mathematics refers to the idea that certain functions and algorithmic relationships approach a limit when arriving at certain conditions. In evolutionary computing, the term refers to the tendency of a tested population to reach stabilization over time. This course, however, propose that a convergence of interoperational toolsets holds the potential to unlock an even deeper exploration of the designer's agenda. At this conflux of methodologies, where the distance between generation and evaluation substantively compresses, dexterity across multiple digital platforms amplifies the designer's ability to both explore options across an expanding design-space and achieve depth and speed of analysis.

This course emerges from the assertion that the architect of the very near future will design workflow and software as integrally as projects and buildings. Navigating explorations through, between, and within multiple applications, our students launch into agenda-driven opportunities for advanced and fluid interoperations. The working methodology advocated in this course encourages versatility and interchangeability in the human-machine relationship while aiming to build subjectivity and reprogrammability into the design process. The goal is to approach a convergence of varied and disparate computational platforms of design, with a specific focus on integrating techniques of digital and human craft and analysis into a near-seamless and active coexistence.

// ASSIGNMENTS

OPERATION 1: *Concept Workflow Sketching*

Students are asked to sketch an initial design problem to study through various methodologies throughout the course. The design agenda will consist of a parametrically derived architectural component and a devised automated workflow.

Deliverable: Sketches, diagrams, and description of the proposed design problem.

OPERATION 2: *outsourced Operations (Cross-Platform Scripts and Data Streams)*

Students are expected to build custom, cross-platform workflows (using provided scripts as groundwork) to dynamically connect Rhino/Grasshopper as a modeling platform with generative and/or evaluation software for testing of component designs. Workflow connections will be explored using various methodologies for intercommunication. Additionally, students will be asked to produce an animation/video of dynamic processes in action (via CamStudio or similar recording software) and final renderings of output.

Deliverable: Workflow diagram of dynamic system; matrix of final interoperable designs; animation/video of dynamic processes and rendering; GH definitions (noted definitions – no Rhino files) and associated software files posted to course repository.

// SCHEDULE

Week01 ORIENTATION + GH OPERATIONS

Course Overview: Thinking Explicitly

Grasshopper Demo: Download/Plug-in, Interface Overview

Components and Operations: Math, Vector, Curve, Surface, Intersect, Transform

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Operation 1 Assigned: Concept Workflow Sketching

Week02 LOGICS + DATA MANAGEMENT

Operation 1 Due (Proposed Workflow Presentation)

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Data Management: Data Matching, Data Trees, Logics

Conditional Statements: Functions / Expressions / Booleans / Dispatches

Week03 GH EXTENSIONS: intraOPERATIONS

Toolset Extensions: Accessing Plug-ins

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Operation 2 Assigned: Dynamic Interoperability

Week04 DYNAMIC SYSTEMS: interOPERATIONS

Data Streaming: Dynamic Text File I/O: Processing + Excel

Week05 VISUALIZATION + ANALYSIS

Representation + Documentation Overview

Week06 VISUALIZATION + ANALYSIS

Operation 2 Checkpoint

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Representation + Documentation Overview

Week07 RESEARCH REVIEW

Operation 2 Research Review (Student Presentations and Documentation)

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Collective Tool Library Assessment and Development