Design Scripting   - Formal Design Knowledge and Programmed Constructs -

Homepage: **http://cat2.mit.edu/4.564**

First class meeting: 10:00 am, Thursday, February 6 at Room 3-442

Course Number: 4.564 for graduate students, 4.504 for undergraduate students

Prerequisites: Experience in Rhino 3D modeling. No previous programming experience is needed.

Scripting Languages Used:

>   RhinoScript (VBscript on Rhino 5, No Python), Processing, Arduino, UnityScript (optional)

Instructor: Takehiko Nagakura (takehiko@mit.edu)

Teaching Assistant: Rachelle B Villalon (rvill@mit.edu)

Class hours and room: (subject to change)
  • Lectures and demos Thursday, 10:00am-11:30am (room 3-442)
  • Labs and workshop Thursday, 11:30am-1:00pm (room 3-442)

Requirement: **6** (bi-) weekly programming assignments and a small final project.

(Final Grade = Attendance (10%) + Bi-weekly Assignments (55%) + Final project (35%).)

Cost: $40 per student to cover the cost of circuit board for one of the assignments.

Introduction
This course examines how architectural form and design process can be described by scripting in a computer programming language. For instance, instead of describing a staircase by a drawing, we will see how it can be described by a software script that generates a staircase. We will see how such a script can be made to represent staircases of different measurements which fit in different contexts. We will see availability of various generative strategies that allow different representation for a staircase. We will see how a script can be made smart enough to consider stylistic preference, site condition, materiality, building's function and performance on cost and lighting. We will also see how we can use such a description in different visualization/fabrication strategies. Instead of designing a particular staircase, imagine you are designing a Rhino command that incorporates your design knowledge of staircase and generate its form for various purposes.
A broader question presented in this course is: *what kind of tool helps architectural design process and how it could be actually implemented through coding*. And the course will provide students various practical and theoretical foundations and examples to explore relevant issues. The first half of the course will mainly focus on learning a popular scripting language (RhinoScript). In the second half, a more generic programming platform (Processing) is examined and we will also see its application (Arduino) to control of physical devices such as LED and magnetic sensors. The final small project asks each student to propose a situation in the context of an architectural design process, identify a requirement for a necessary tool, and develop a script to realize it.