

CourseNo: ARCHA4707_001_2013_3

Meeting Location: [AVERY HALL 115](#)

Meeting Time: T 01:00P-03:00P

Instructor Information: [Toru Hasegawa](#) [Mark L. Collins](#)

Digital Detailing: Testing and Analysis

Class keywords: Performance, Geometry, Sustainability, Analytics, Visualization

Class sequence: Technologies (elective)

Please reference the PDF Syllabus [here](#).

From the syllabus:

The goal of the class is to incubate a series of research proposals on the topic of performance design. We define performance as optimally working within a defined context of measurement, including but not limited to structural performance, energy, lighting, acoustics and even aesthetics and beauty. The realization of an environment in which design can perform is even more crucial for designers as sustainability becomes a prominent part of the design process. The seminar will look at several performance modeling software in a workshop environment to explore the role of simulation in design.

Innovation in design computation and fabrication have generated a new context for the production of space. Digital modes of detailing, or specifying design intent, are increasingly scripted, generating millions of potential forms. In this torrent of new design information, search has become a necessary instrument in the designer's toolbox. If a script can generate a million buildings, which one should we commit to?

For the next generation of structures, a critical understanding of concepts such as search, evolution and performance will be necessary to operate in the data deluge. These techniques hinge on being able to assign values to divergent

design schemes. Performance is a broad notion that encompasses any value that is inherent in a given condition - cost, sustainability, efficiency, beauty. Even the most subjective of terms is being made measurable through biometric technologies such as eye tracking and brain computer interfaces.

The course will feature a series of workshops, as well as lectures and discussions around the topics of digital design, computer simulation, performance modeling and physics-based models. The specific performance metrics and methodologies we examine include:

1. Performance Analysis, Platforms & Issues
2. Energy Analysis
3. Solar Analysis
4. Acoustic Analysis
5. Computational Fluid Dynamics (Air Flow)
6. Finite Element Analysis (Structural)
7. Rationalization for Fabrication
8. Bio-Feedback (Eyetracking, EEG, GSR)