

GSAPP Spring 2014 - VISUAL STUDIES WORKSHOPS

Laura Kurgan - Director of Visual Studies ljk33@columbia.edu
Josh Uhl - Coordinator of Visual Studies jdu1@columbia.edu

Session A: A4524 - Topological Study of Form

Jose Sanchez Thursday 6-8pm 114 Avery

Architectural form has traditionally been implemented neglecting the mathematical substratum of post-Euclidean geometry. With the advent of advanced time-based computer modeling techniques, architects are able to embed quantifiable data into the architectural design process. The inherent dynamics of the architectural program can therefore generate both, traditional relationship diagrams and form. Since these diagrams carry the ever-changing programmatic behavior of a building, generative geometry derived from diagrammatic programmatic connections allows designers to generate and drive geometrical formations. Traditional line-based systems can also generate a structure of forms that incorporate architectural space-form relations. Based on this approach to design, morphology can be studied using the time-based mathematical models inherent in modern software-based digital tools.

The first half of the class will start with an introduction of Polygon tools, NURBS tools and procedures use in form making for industrial design. From the industrial design introduction, we will focus on the topological study of form using anamorphic time-based geometry tools. Following recent developments in software simulation of physics and topology, we will study particles and fluids as morphological systems with volumetric characteristics, as opposed to following the normative approach of regarding fluids as just vector systems. Also, we will analyze how the generative morphological behavior of Fractals can generate 'structures' of form that incorporate space-form relation. Finally, we'll study the "design" of a material using Maya's nCloth system, which allows for a mesh to have structural behavior by assigning material properties to its topology.