ARCH1291 - Visual Studies II
FALL 2014
Assignment 3: Iterating Digitized Models

ASSIGNMENT INTRODUCTION

This assignment will examine the translation of a developable geometric design from a digitized Rhino 3D model (created through point selection and the building up of surfaces) to a series of iterations of the original in which the fundamental design concept will be explored and strengthened through a second phase of a process of the imposition of geometric rules by the student, i.e. recognizing symmetry, the use of grids, projecting objects to planes, and the use of Rhino's alignment and set point tool sets.

In this Assignment, you can "perfect" the geometry through the imposition of geometric rules and grids in Rhino. This idealized version should follow the same parameter types as your original folded piece (linear accordion, conical accordion, chevron fold, etc.) but use different parameter values (angles of folds, quantity of folds, heights of peaks and valleys, lengths of creases).

Rhino skills:
- Mirror
- Rotate Copy
- Layer Organization
- History
- Align
- Set Point
- Curve Through Point
- Surface from Corner Points
- Array
- Polar Array
- Scale
- Control Points
- Edit Point

In the review at the beginning of class, the models will be analyzed to identify repeating patterns in the form, analyze appropriate regular geometric grids that could be used with the form (linear and radial), and specify organizing geometric principles.

ASSIGNMENT RESOURCES

Rhino Primer
- http://openlab.citytech.cuny.edu/12101291coordination/rhino-prim

Video Tutorial for Assignment 2
- http://openlab.citytech.cuny.edu/12101291coordination/assignment-4-digitizing-folded-models/
- http://openlab.citytech.cuny.edu/12101291coordination/assignment-5-folded-model-unroll-and-lasercut/ (first part)

Folding Design Options & Diagrams

- http://openlab.citytech.cuny.edu/12101291coordination/folding-diagrams/

INSTRUCTIONS

1. Begin by identifying repetitive patterns in your model
2. Next create regular geometric grids that can be used with your model (linear or radial)
3. Create a series of iterations of your model using the transform tools: array, polar array, mirror, rotate, etc.
4. Use surface from edge curve, sweep, or loft tools, and explore the different settings in creating the different surfaces.
5. Each version of the model should be labeled in Top View with the transformation used (ie. Rotate 30 degrees, Rotate 60 degrees, etc.
6. Save your Rhino file to your course Dropbox using the proper naming convention. Your final Rhino file for the assignment should include the following information organized into proper layers:
   a. Original digitized point and curve geometry (messy!)
   b. Aligned point and curve geometry with construction curves or alignment diagram (clean!)
   c. Surface model generated from aligned geometry
   d. At least 10 iterations using the various transformational properties and labeled to indicate the transformation used

GRADING

To receive a grade, your Rhino file must be submitted to your Dropbox folder by the beginning of the next class. Assignment 3 will be graded as follows:

1. Are your files named properly and iterations labeled? 10%
2. Does your Rhino file contain the required ten iterations? 10%
3. Does your Rhino file contain the aligned digitized data with construction geometry? 10%
4. Does your Rhino file contain a surface model generated by the digitized data? 15%
5. Does the Rhino model show advances through design exploration of the original physical object? 30%
6. Are the only naked edges on the outermost boundary of your joined polysurface? 10%
7. Are your surface normals pointing upward (or outward) from the model? 15%
8. Did you produce ten additional iterations of the model? 20% EC