ARCH1291 - Visual Studies II
FALL 2014
Assignment 4: Refining Digitized Models

ASSIGNMENT INTRODUCTION

This assignment will further refine the model selected from the iterations for the module that will be utilized in the forthcoming project. Variation in the module unit will be created with the addition of a variable aperture system

Rhino skills:
• Polysurface editing
• Cage Editing
• cplane to object
• Offset curve, trim, split
• Join, fillet, chamfer
• Rotate Copy
• Layer Organization
• History
• Align
• Set Point
• Curve Through Point
• Surface from Corner Points
• Array
• Polar Array
• Scale
• Control Points
• Edit Point

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/

Folding Design Options & Diagrams
   • http://openlab.citytech.cuny.edu/12101291coordination/folding-diagrams/

ASSIGNMENT INSTRUCTIONS

1. Choose the iteration that you find strongest and will refine and carry through to the upcoming Park Pavillion project.

2. Select and create a varying aperture system. Model three different states of the opening.
   a. Begin by identifying the guiding geometric principles of your folded form and modeling this system with history enabled. For example, a folded cupcake wrapper consists of two alternating sets of angled curves that have been polar arrayed (arrayed along a circle about a center point).
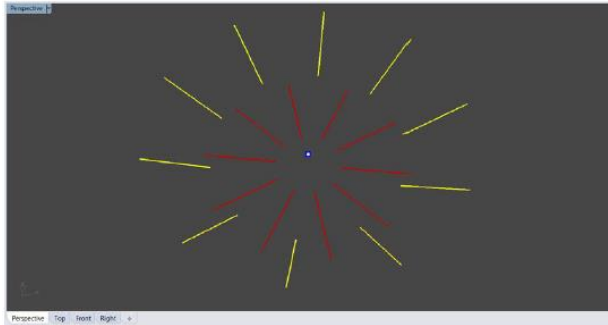
   b. Translate, scale, and rotate the parent curves of your polysurface model to experiment with redesigning your original form using the tools available to you in Rhino.
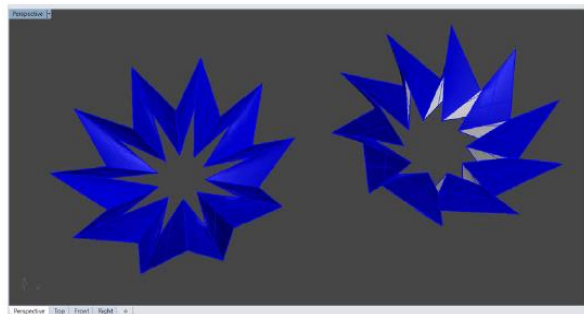
3. Triangulate your polysurface and add apertures by:

   a. Extracting the most basic repeating element of your form – depending on the symmetries in your form this could be as simple as one or two single surfaces.
   b. Use the polyline command and end point object snapping to draw two triangles over any quadrilateral surface. It is up to you whether you wish to triangulate by the long dimension or the short dimension.
   c. Use the offset command to offset your triangular polylines to create apertures – the longer the offset distance, the smaller your aperture will be, and vice versa.
   d. Use the planar surface command to create surfaces from your polylines.
   e. Depending on your axes of symmetry, use mirroring, copying, and arraying to recreate your entire polysurface model, triangulated and trimmed with apertures.
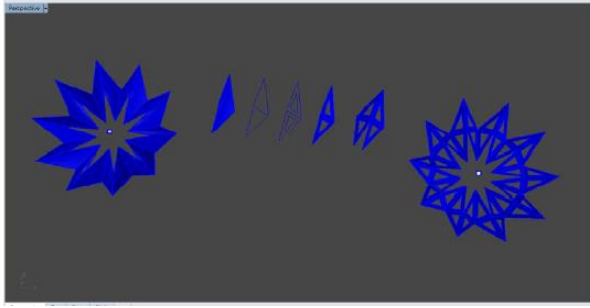
3. Use surface from edge curve, sweep, or loft tools, and explore the different settings in creating the different surfaces.

4. Use the Cage Edit/Polysurface editing commands to create an iteration of the form.

5. Each version of the model should be labeled in Top View with the transformation used (ie. Rotate 30 degrees, Rotate 60 degreees, etc.)

6. Once your model is established, and you have chosen the strongest form, you can create three to five gradated (going from one extreme to another, e.g. larger openings to smaller;

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 polysurface/cageediting and transformational properties

GRADING

To receive a grade, your Rhino file must be submitted to your Dropbox folder by the beginning of the next class. Assignment 2 will be graded as follows:

1. Are your files named properly and the iterations content/techniques labeled?   15%
2. Does your Rhino file contain the use of cage/polysurface editing?   10%
3. Does your file show reasonable design refinement of your model from Assignment 3? 25%
4. Is the Rhino model a reasonably accurate translation of the original physical object? 25%
5. Are the only naked edges on the outermost boundary of your joined polysurface?   10%
6. Are your surface normals pointing upward (or outward) from the model?   15%
7. Did you digitize a second model?   25% EC