

## Assignment 2 - Part B

Anti-Surface Surfacing - Generation of surface milling toolpath contours.

**Due : 3/5/13**

Complex surface milling has become a major use of CNC routers. Typical work flows begin with the generation of a complex NURBS or Mesh surface which is then approximated using CAM software to produce toolpaths.

The machine is being used to accurately replicate a digital form in the physical world. But unlike their digital counterparts, these physical manifestations will never be perfect; every device, like every craftsman, produces artifacts of their presence; a laser-cutter will often burn material, 3-D printers will produce striations, and a CNC mill will leave varied surface patterns dependant on the router bit profile. But, with enough control, these same artifacts can be used to generate complex patterns of their own.

Your assignment will be to (IN GROUPS OF TWO) generate toolpaths using Grasshopper, in order to create a complex milled surface without the use of any original surfaces. You will be graded on your ability to control your Grasshopper definition in order to produce the aesthetic affects you desire; both complex and simple patterns are acceptable, but both must exhibit high levels of refinement).

Complete the following tutorials posted on the NYCCT Vimeo site (or on the class web page) to generate your own complex curves.

1. Grasshopper: Sine Curve Toolpaths – Pt. 1 of 4
2. Grasshopper: Sine Curve Toolpaths – Pt. 2 of 4
3. Grasshopper: Sine Curve Toolpaths – Pt. 3 of 4
4. RhinoCAM: Simulate your Toolpaths – Pt. 4 of 4

For class on 3/5, you and your partner should bring Grasshopper definitions as well as at least one “baked” curve variation each (2 variations per group minimum) and the associated RhinoCam STL simulation files. Simulations should use a 1/2” diameter ball end mill and should be approximately 10” x 10” (depth should be between 1/2” and 1”).

### **Video Tutorial Links:**

1. <http://vimeo.com/60590928>
2. <http://vimeo.com/60590929>
3. <http://vimeo.com/60596839>
4. <http://vimeo.com/60597017>

### **Class Website (Profile):**

<http://openlab.citytech.cuny.edu/groups/intermediate-computation-and-fabrication/>

### **Class Website (Site):**

<http://openlab.citytech.cuny.edu/compfab3690sp2013/>