24-681 Project Proposal

Team name: Tessellators
Members: Michelle Kyin, Eliezar Vigdorchik, Harsh Gehani
Project Title: Surface mesh generation
Type: Programming

Mission statement: Implement Delaunay's algorithm to generate a uniform surface mesh given any open ended surface.

Background information:

We are masters' students in mechanical engineering taking this class because the topic is of interest to us. The issue of uniform mesh generation is a common one -- every simulation package has a meshing algorithm so we would like to code our own to get a deeper understanding of the procedure. We will generate a uniform mesh for an open ended 3D surface using Delaunay's algorithm. First we want to accomplish mesh generation for 2D planar surfaces then extend the algorithm to 3D freeform surfaces. After generation of the non-uniform mesh on the surface, we hope to space out the mesh uniformly to a user provided mesh size. We plan to display the surface mesh in a GUI.

Program Step:
1) Read surface input
2) Visualize surface on GUI
3) Mesh the surface
4) Display meshed surface on GUI
5) Take user input for mesh size
6) GUI continuously shows updated mesh shape until convergence of uniformity is reached

Task Sharing Plan:
Harsh and Eli: Implementing Delaunay's algorithm to generate points for a uniform surface given an STL surface file
Michelle: GUI implementation and user input