2D sketch to 3D Transform

Team 07

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1 UPDATED MILESTONES

S. No.	Milestone	Member
	Mid evaluation	
1	Implementation of canvas	Saumil Lakra
2	Delaunay Triangulation	Ananya Gupta
	Final evaluation	
3	Elevate the spine and complete the object	SaumiL Lakra
4	Rotation	Ananya Gupta
5	Painting	Saumil Lakra
6	Cutting	Ananya Gupta
7	Extrusion	Saumil Lakra
8	Smoothening of object	Ananya Gupta

Milestones 2 has been changes.Pruning was done to make the surface more curvy but since we are gving points manually, the smoothness will depend on the number of points user has entered.

2 APPROACH

We used linear bezier curves to connect two adjacent points with a line segment. This helped us build the initial canvas of the 2-D figure we were constructing. We implemented the canvas from assignment 1 (cubic bezier), the more points the user can give to make the mesh, the better delaunay triangulation will be.We imported a library called Triangle in our code. Triangle has functions which aid to perform delaunay triangulation or constrained delaunay triangulation(CDT). We first removed the duplicate control points with the help of set in cpp in a seperate function and added them to a new array called controlPointswithoutdups. Then we described our triangulate function to generate a node or poly file. This file stores all points, their attributes, whether they are boundary points and segment information as well. It gets generated automatically each time the project is run. Next we prescribed some keys for specific functions like left mouse button for adding points, right for selecting points and tab button to do triangulation after atleast 3 points are drawn. Next we described our readele function which reads the .ele file generated line by line and pushes the points in a vector in a set of 3 as per the triangles to be constructed in CDT.

3 CHALLENGES

We faced many challenges which first and foremost was understanding how the triangle library worked. We had to research on the syntax followed. Because of our main while loop running again and again there was duplicacy in our points which we had to resolve in order to correctly generate our poly file. To solve this challenge we used the set data structure to parse these points beforehand. Second, we faced challenge of CDT while reading .ele

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file. The triangulation seemed to work sometimes and other times it wouldn't especially when we increased our number of points. Then figuring out how to perform delaunay triangulation by exploiting the poly and ele files.

4 RESULTS

Delaunay triangulation works on 2-D points and are used to generate triangulation in the 2-D figure but doesn't result in the 3-D mesh yet.

REFERENCES