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Shape-Approximation and Reconstruction using visibility

Work under:

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I added support for following algorithms in Shape-Approximation project.

Algortihms:

- Delaunay refine: does the triangulation and finds out inner and outer boundaries of tolerance volume
- Find Moats: find dual graph of constrained Delaunay triangulation. Find degree 3 nodes after edge collapse to get hubs and then to get moats.
- Visibility Function: sets up environment for Visilibity library and preprocess each vertex to find
 - o Visibility polygon of it with respect to environment
 - o Visibility length
 - o Visibility area
 - o Divider vector
 - Next candidates for each vertex.
- Construct-shape: does the polygon construction by greedy method. Seed point needs to be chosen.
- Algorithms to visualize greedy construction step by step:
 - o Start construction: begins the greedy construction of polygon.
 - o Next point construction: constructs the next edge of polygon.
- Construct_shape_recursive: does the polygon construction by dp method. (Dynamic programming). No choice of seed point required.

Functions added by me can be seen in cdt.h file.

Files of VisiLibity library which I used is also attached.

Images, Results are put on 'Reconstruction.pptx'

Reference book:

Visibility Algortihms in the Plane – Subir Kumar Ghosh

Reference paper

Separation and Approximation of Polyhedral Objects – Joseph S. B. Mitchell, Subhash Suri.