CS478 - Computational Geometry

Project Proposal

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We are going to implement a program for calculating and visualizing the Voronoi Diagram of a set of points in:

- 2D using the following three approaches:
  - Randomized Incremental Algorithm that we will discuss in class.
  - Fortune's Algorithm that uses a sweepline across the plane.
  - The Flipping Algorithm that starts with an arbitrary triangulation and converts it by flipping the diagonals.

We are planning to use C++ and its STL. However, we may utilize libraries such as Boost to speed up the implementation or for visualization. The program should allow for the generation of random points using different distributions. The program should allow parameter specification such as point count, zoom, and translation. The program should be able to do visualization and should include assigning different colors to Voronoi cells for clarity. Furthermore, the program should visually run Fortune’s Algorithm, showing the evolving Voronoi Diagram. The program should also show three approaches with multiple test cases.