National and Kapodistrian University of Athens

Faculty of Sciences

Department of Informatics and Telecommunications

Spring Semester: 2022-23

Computational Geometry Computational Exercise

Implementation 2: Geometric Search

Let P be a set of n points in the plane.

1. Implement an orthogonal geometric search algorithm for the set of points P.
2. Analyze the complexity of the above algorithm.

Application 2:

Consider a set P of 60 points in the plane and a rectangular region. Using the algorithm of your choice, determine which of the points in P lie within the rectangular region.

Application 3: Voronoi Diagram - Delaunay Triangulation

Let P be a set of n points in the plane.

1. Visualize the correspondence between the Delaunay triangulation and the Voronoi diagram for P.
2. Comment on the complexity of the algorithms. How does the number n of points affect the complexity?

Algorithm Implementation:

The implementation of the algorithms can be done either in Python or using the CGAL library in C++.

Submission Guidelines:

You will submit a compressed file in the "Assignments" section of e-class. The compressed file should contain:

- All C++ or Python programs.
- A text file with presentation and commentary on the results.
- A presentation file (optional).