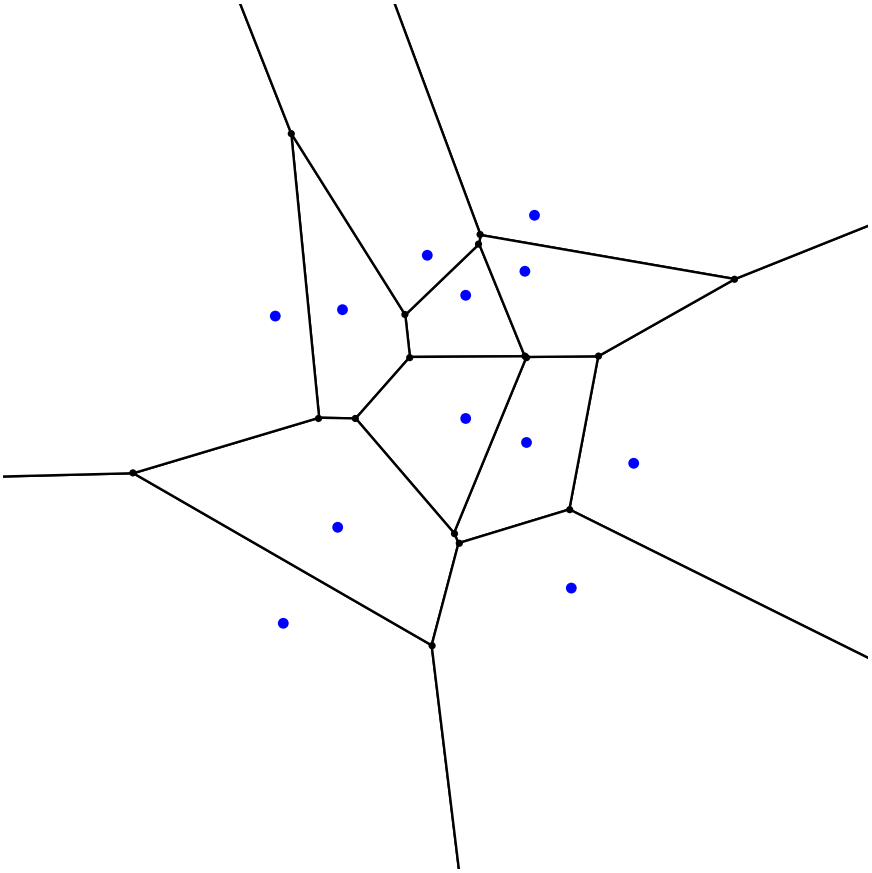
Voronoi Algorithms

MATH 261 Computational Geometry

1. Suppose we have an existing Voronoi diagram, constructed from a set of sites $\{p_1, p_2, \ldots, p_k\}$. We want to add new site p, and to update the diagram to include the region $\text{Vor}(p)$.



(a) How does the diagram change when site p is added?

(b) Describe an algorithm for updating the Voronoi diagram to include the new site.

(c) What point location and line intersection operations does your algorithm require?

(d) What is the computational complexity of your algorithm?

2. How would your algorithm handle the following special cases?

(a) The new site is outside of the convex hull of the existing sites.

(b) The new site is on a Voronoi edge or Voronoi vertex.