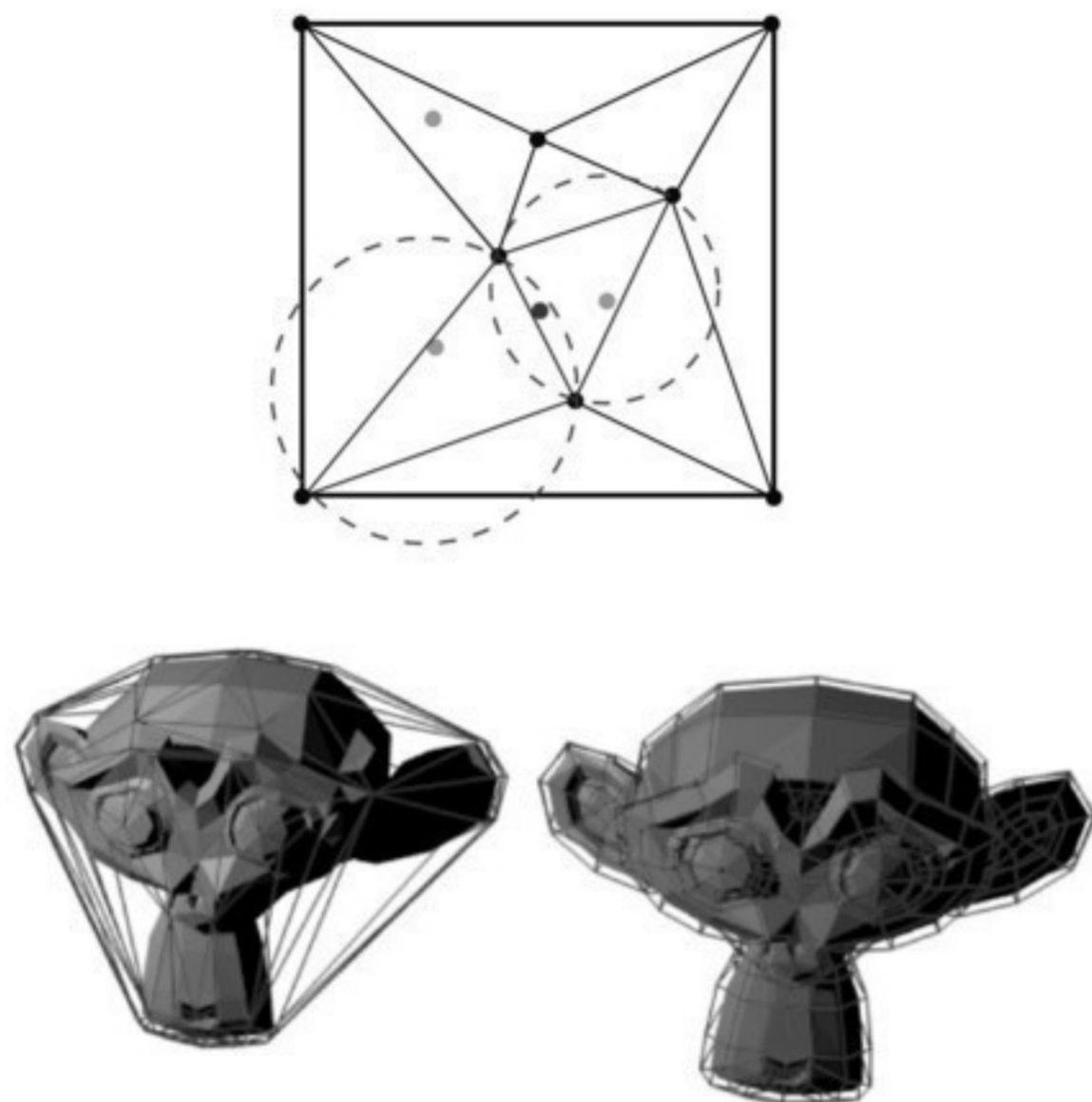


Computational Geometry



000

Choice of Data Structures

Example of the STL in C++:

```
std::vector  
std::list  
std::set  
std::map  
std::unordered_map
```

Add, Delete, Find, Access, ...

001

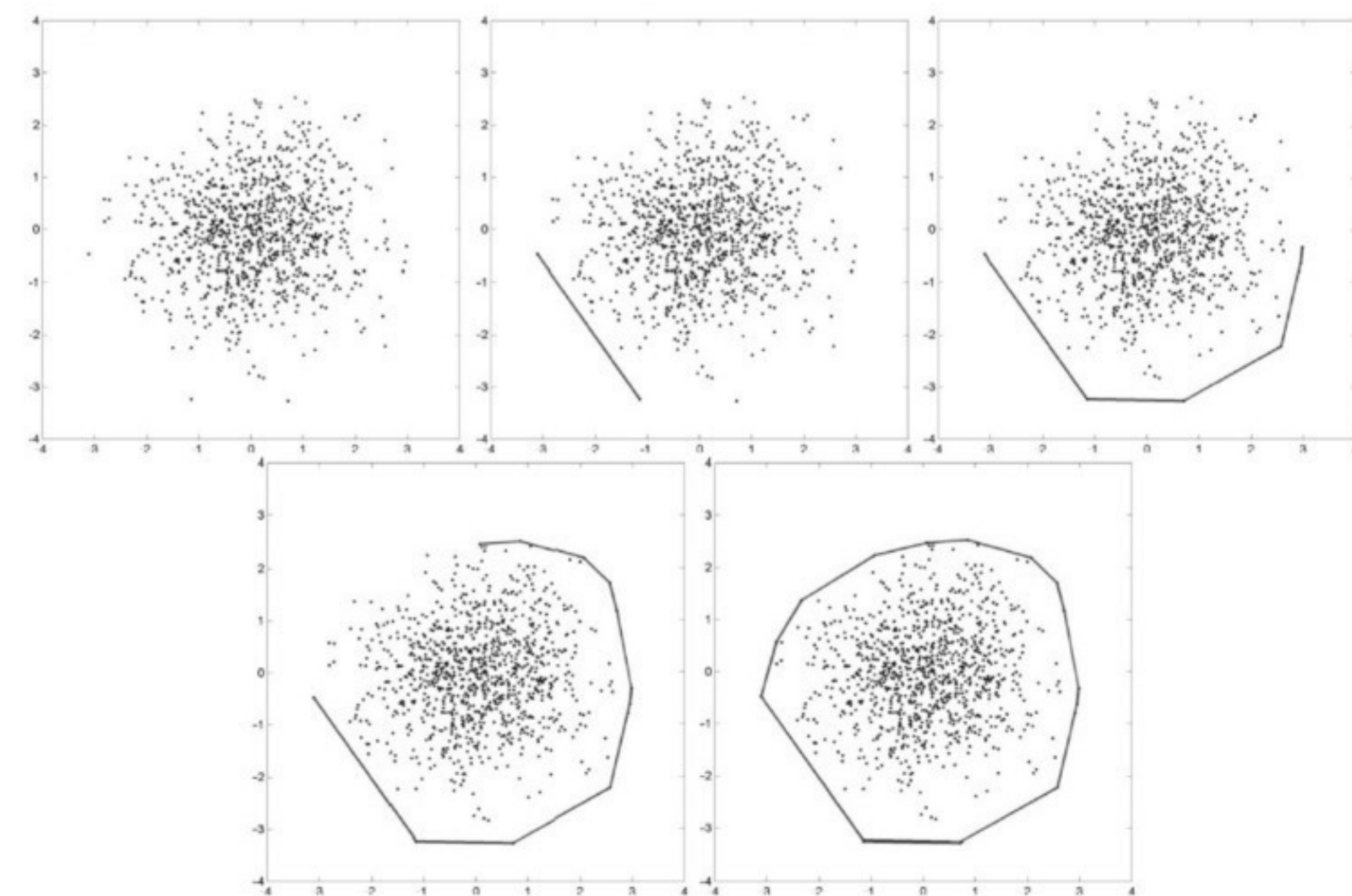
Example of algorithm: Convex Hull



The smallest convex polygon which contains all points.

002

Jarvis Algorithm



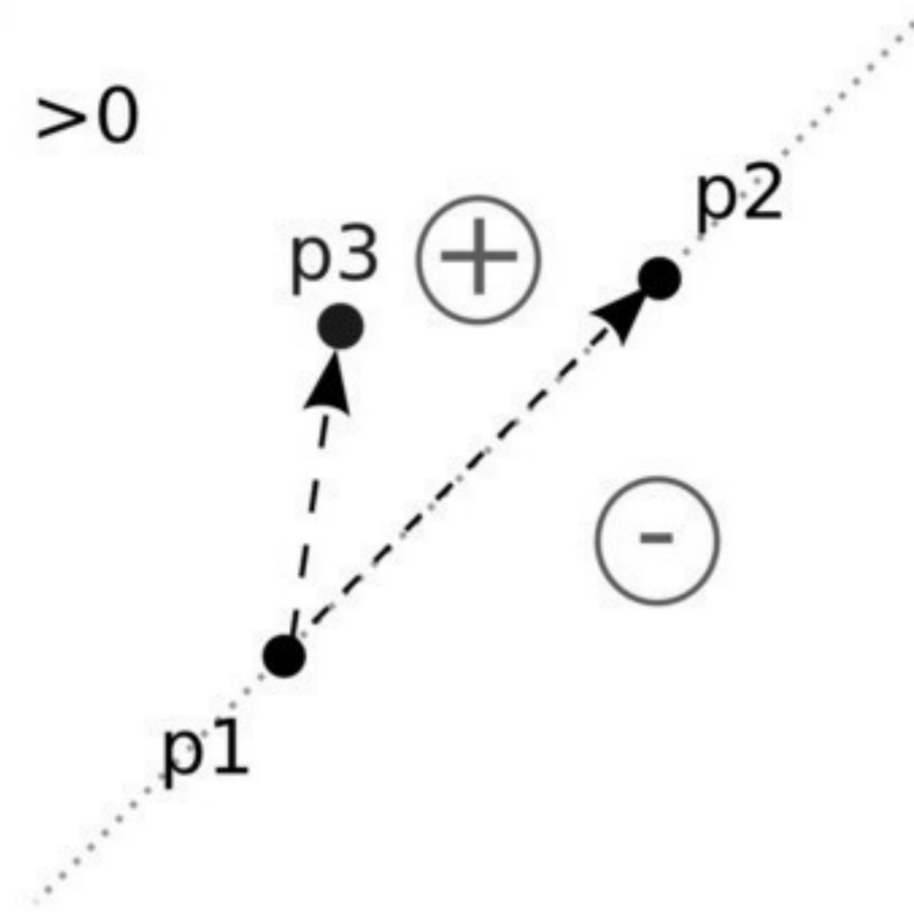
003

Jarvis Algorithm

Reminder

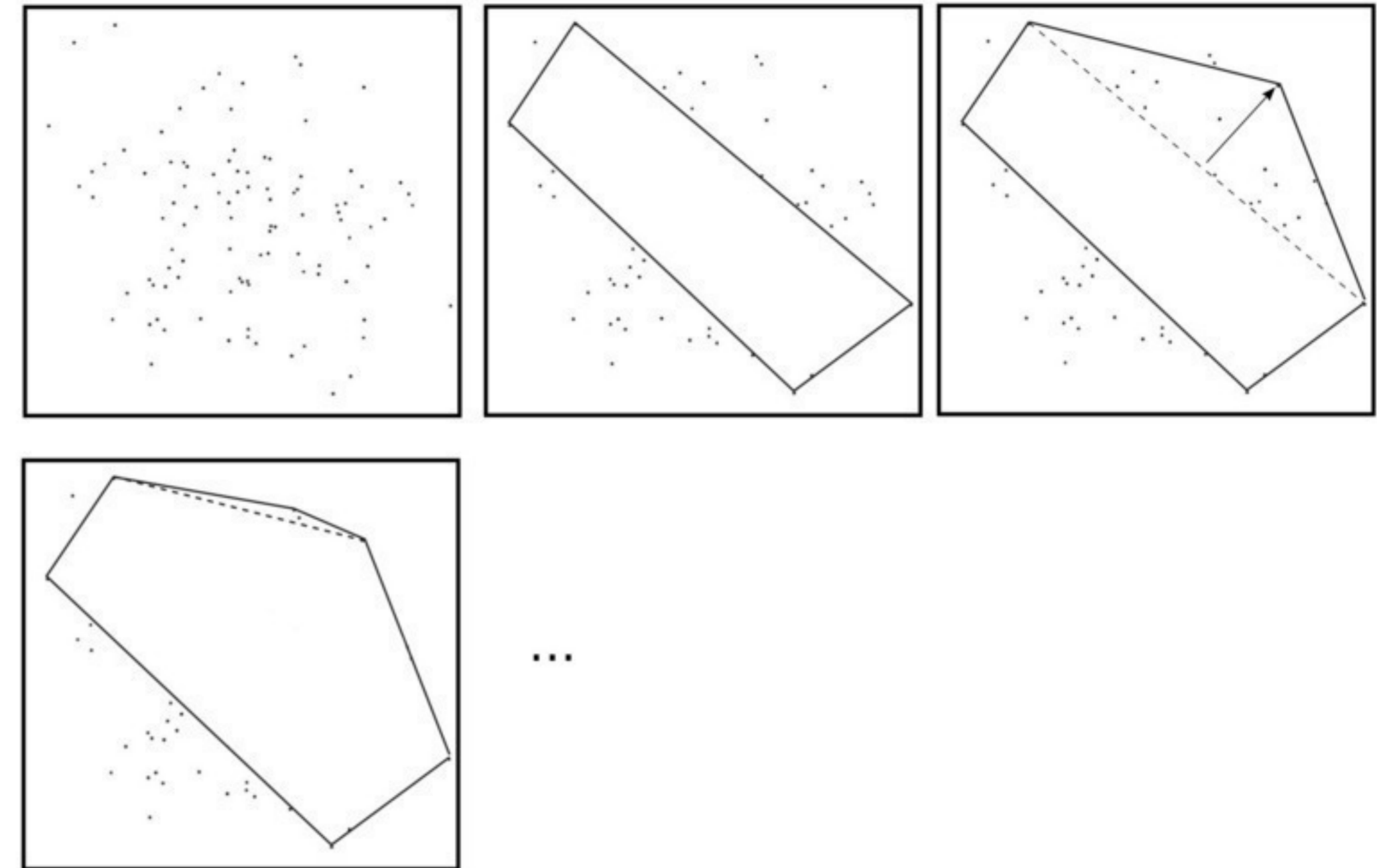
(x_3, y_3) is on the left (/right) of $[(x_1, y_1), (x_2, y_2)]$ if

$$\begin{vmatrix} x_2-x_1 & x_3-x_1 \\ y_2-y_1 & y_3-y_1 \end{vmatrix} > 0$$



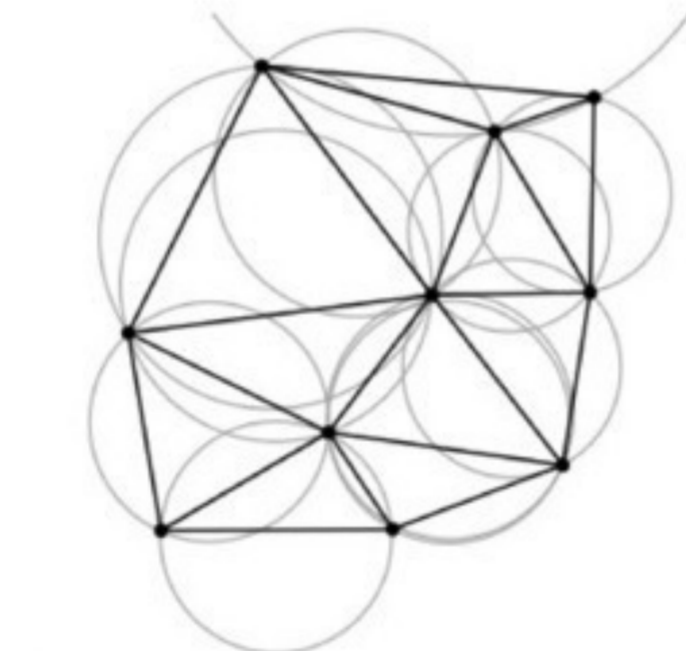
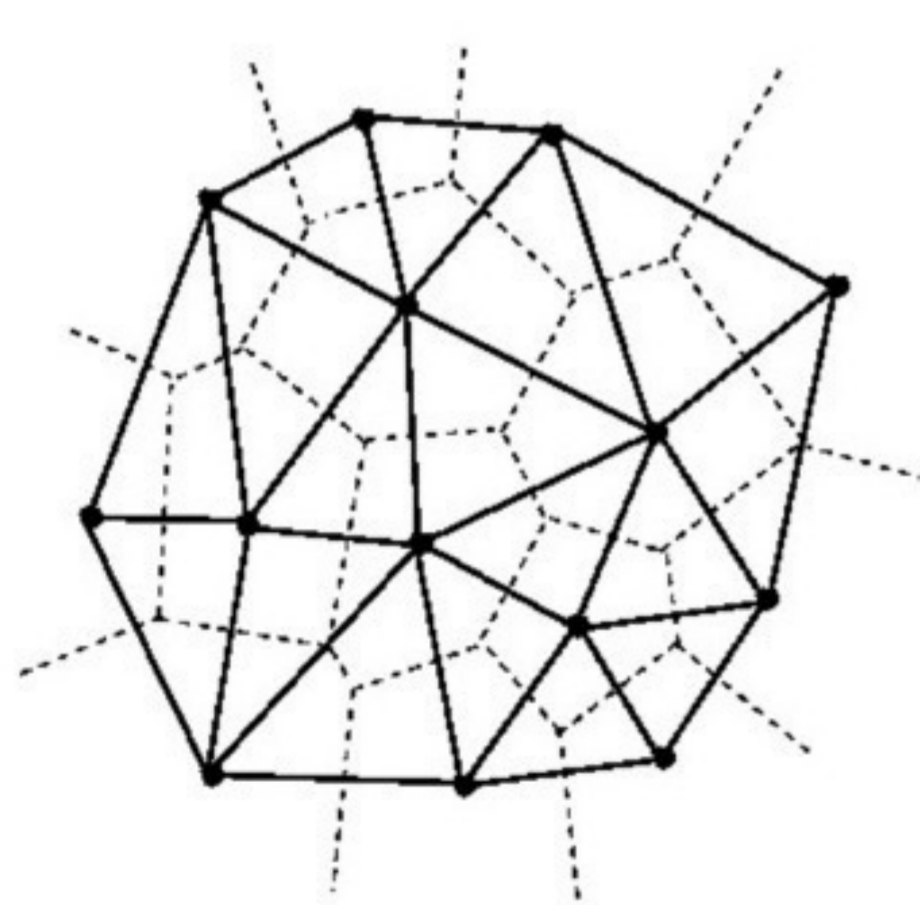
004

Quick Hull Algorithm



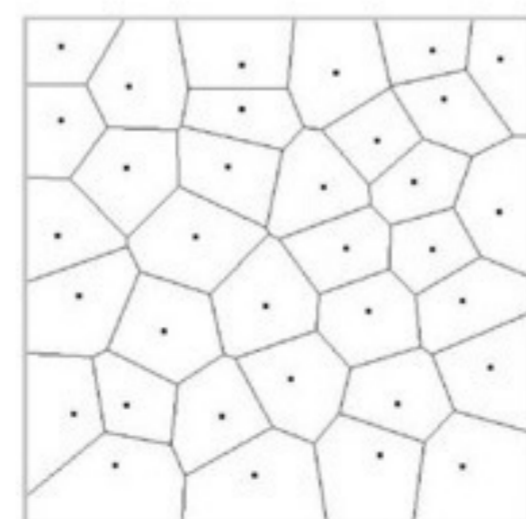
005

Delaunay Triangulation



Delaunay criteria

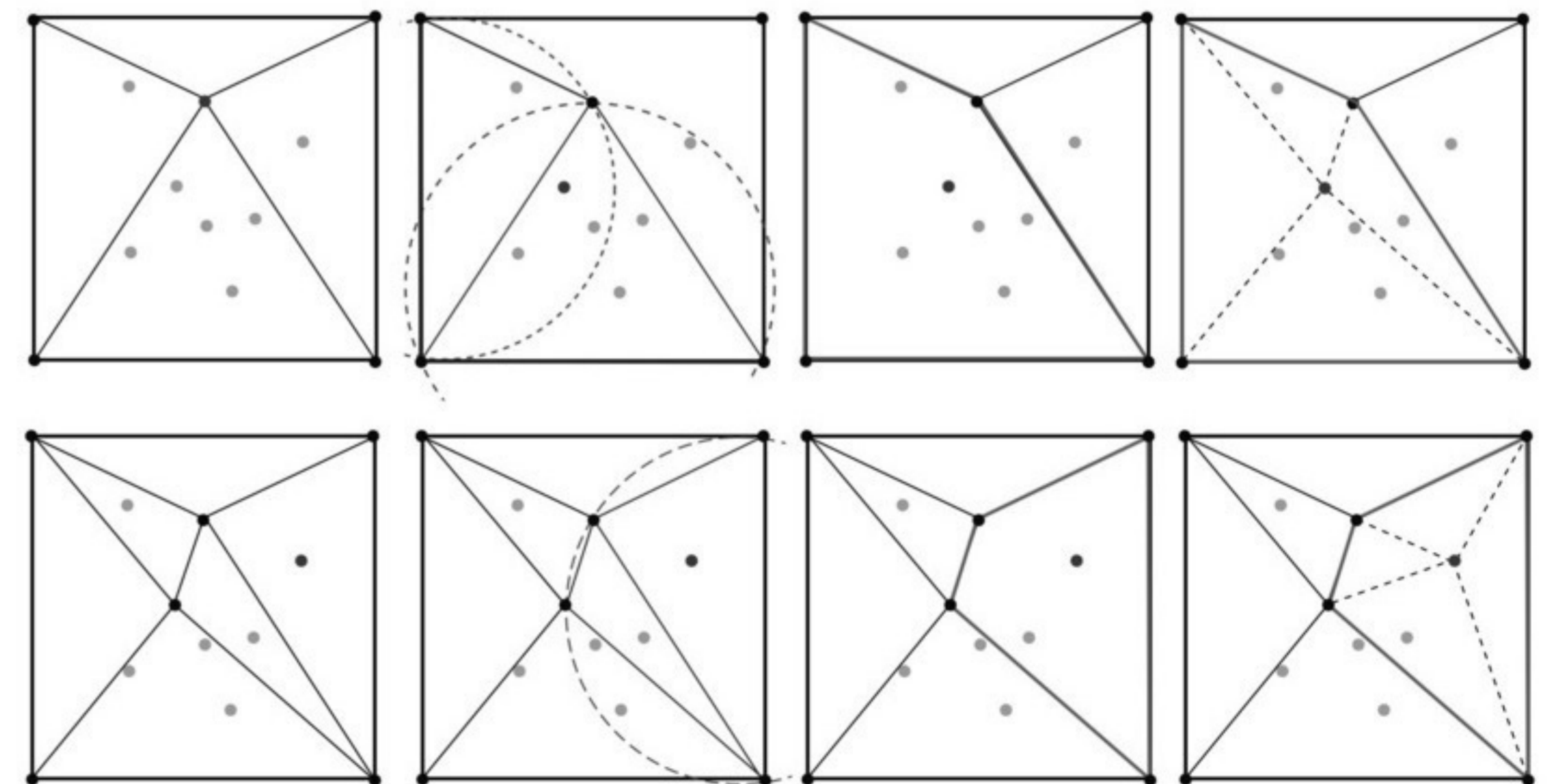
A triangle is Delaunay if the circle passing by its three vertices do not contains any other vertex of the mesh.



Voronoi cells

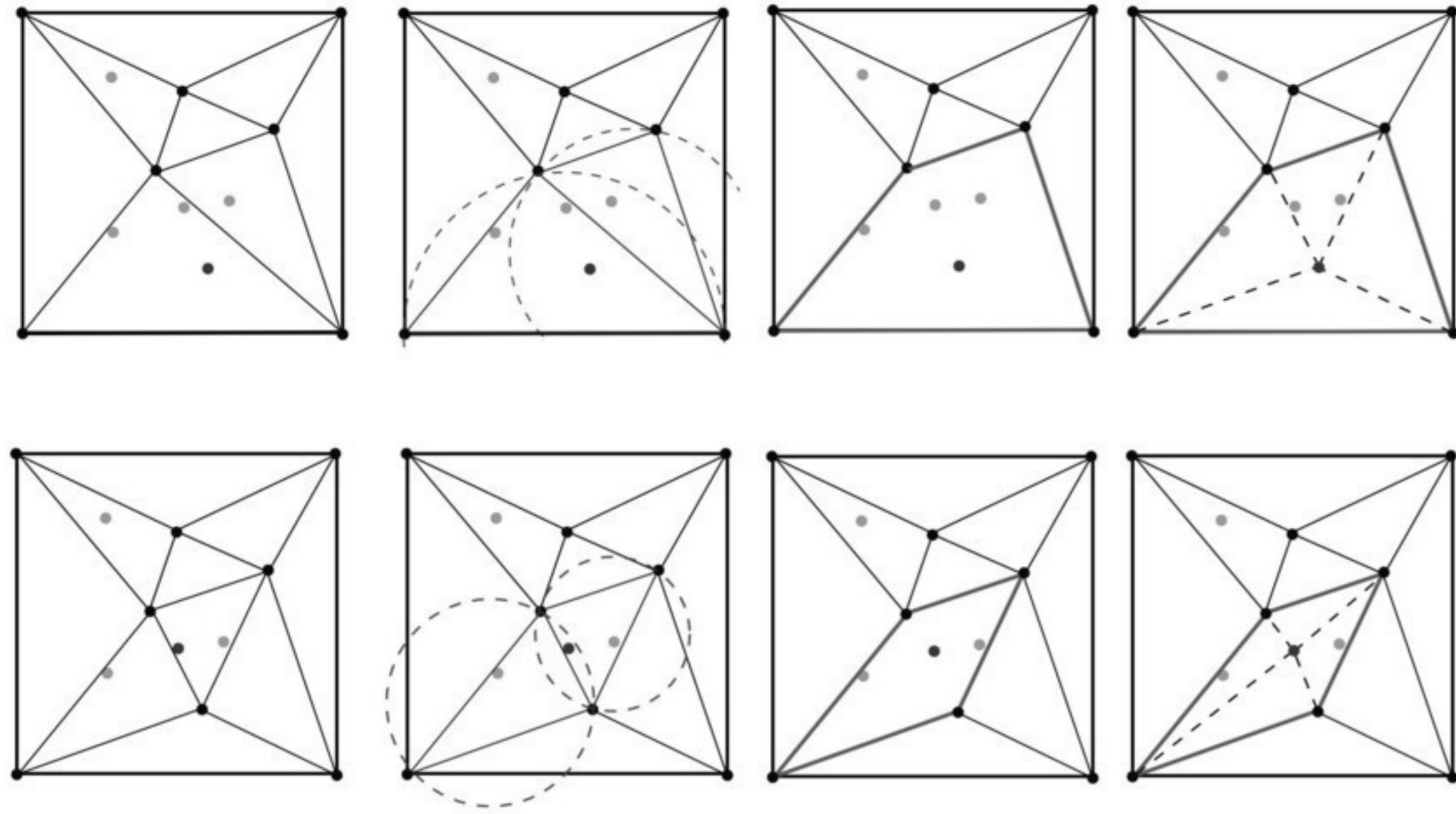
006

Bowyer Watson Algorithm



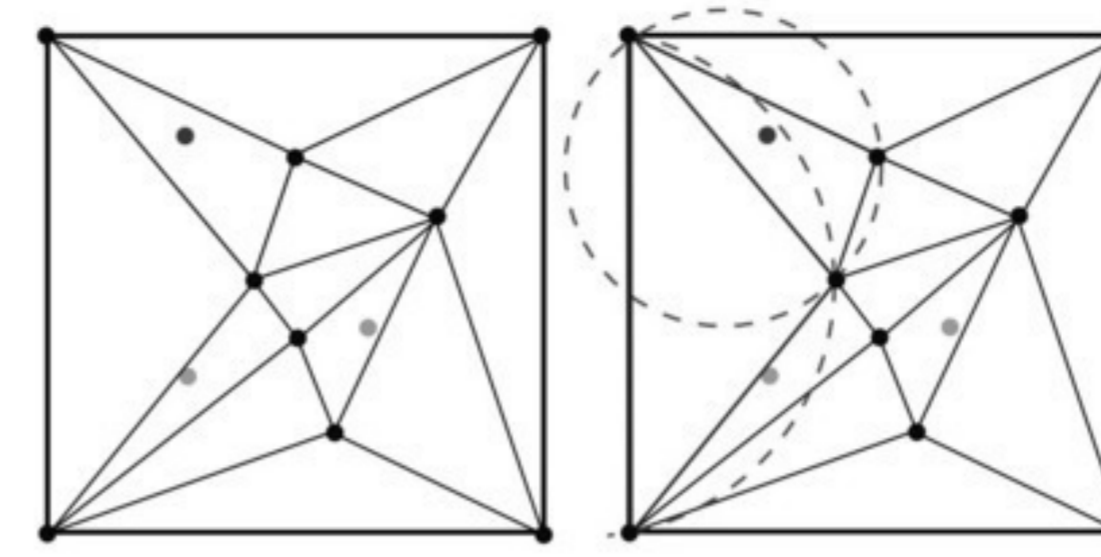
007

Bowyer Watson Algorithm



008

Bowyer Watson Algorithm



009