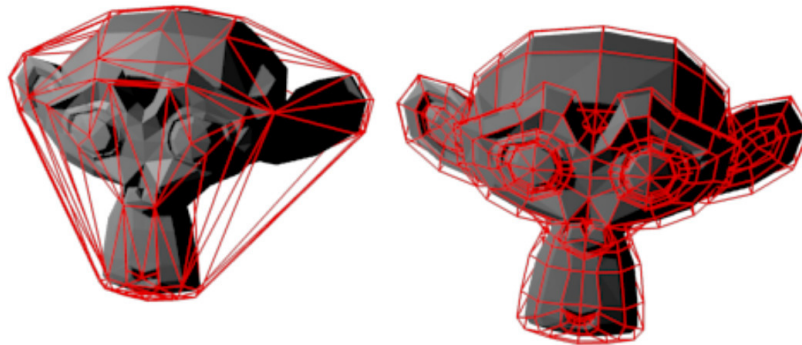
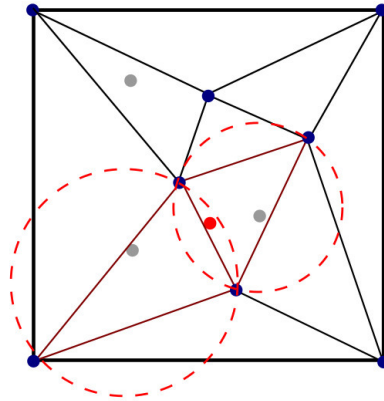


Computational Geometry



Choice of Data Structures

Example of the STL in C++:

`std::vector`

`std::list`

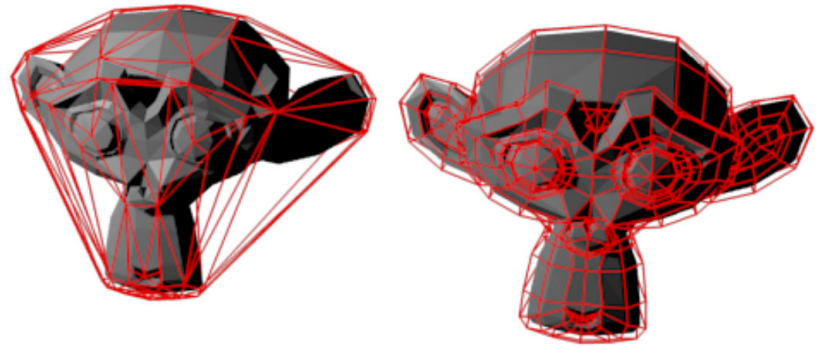
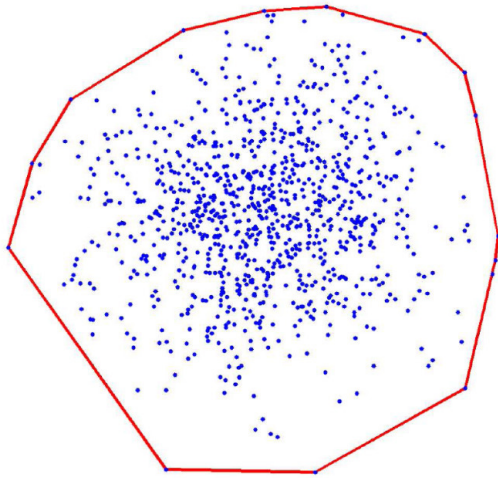
`std::set`

`std::map`

`std::unordered_map`

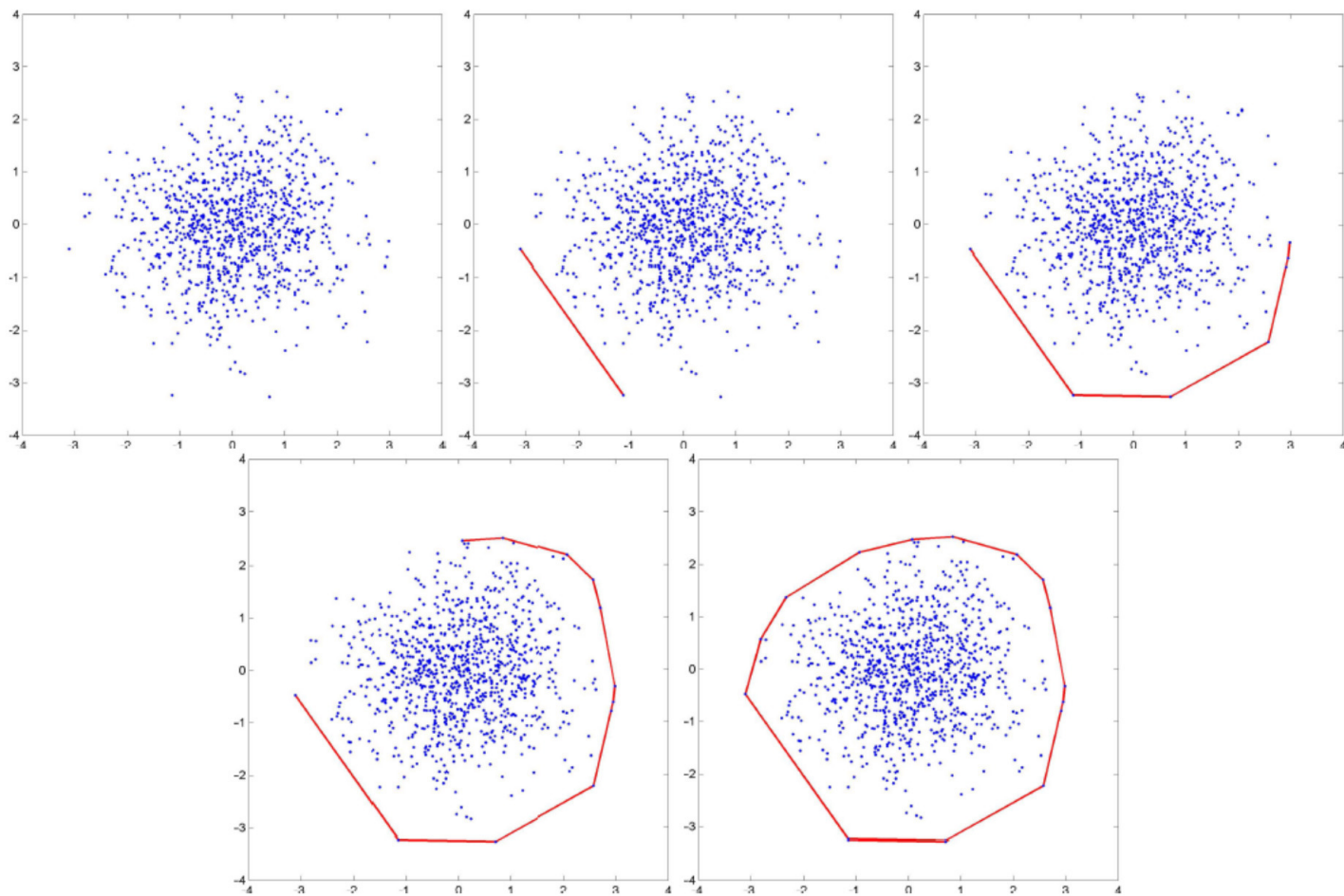
Add, Delete, Find, Access, ...

Example of algorithm: Convex Hull



The smallest convex polygon which contains all points.

Jarvis Algorithm

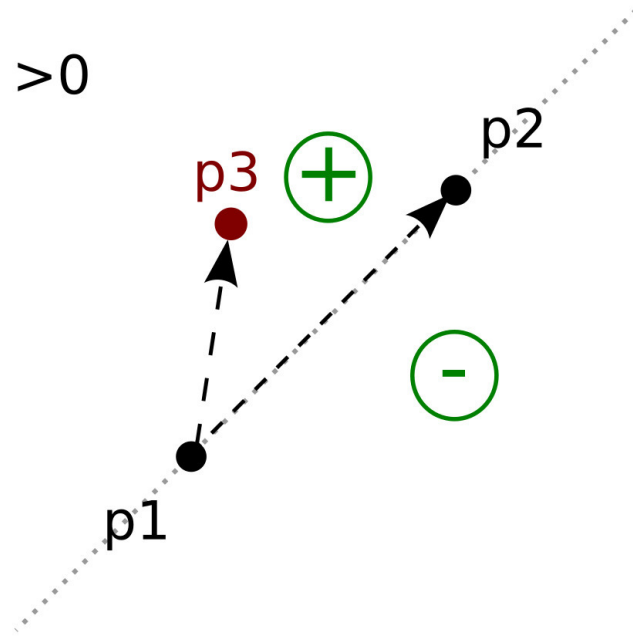


Jarvis Algorithm

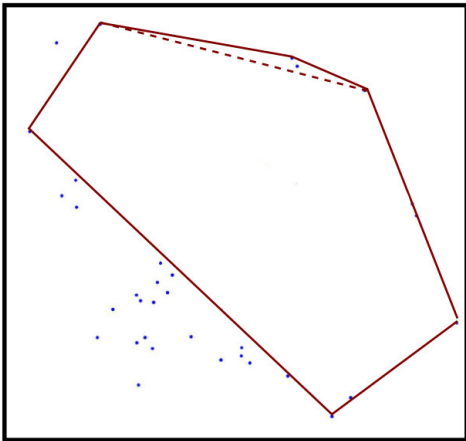
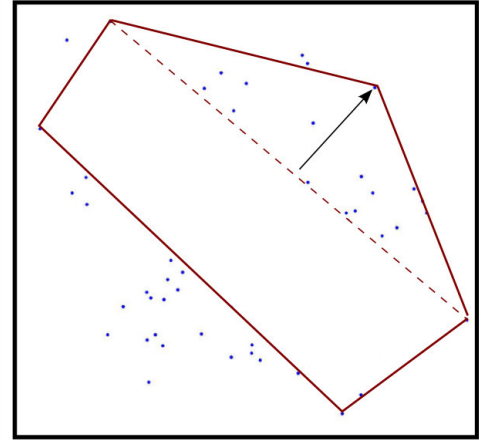
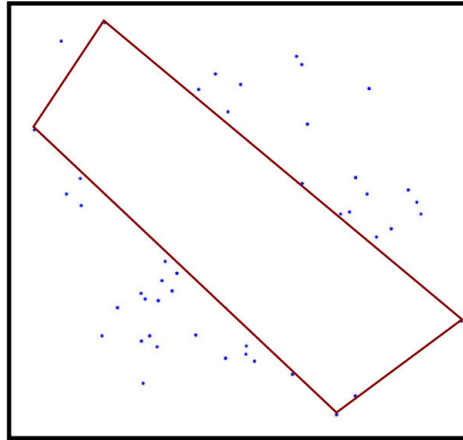
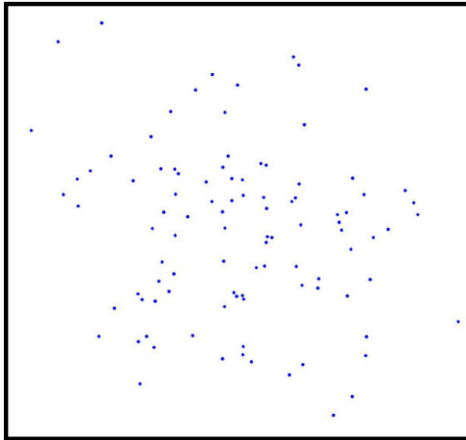
Reminder

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

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

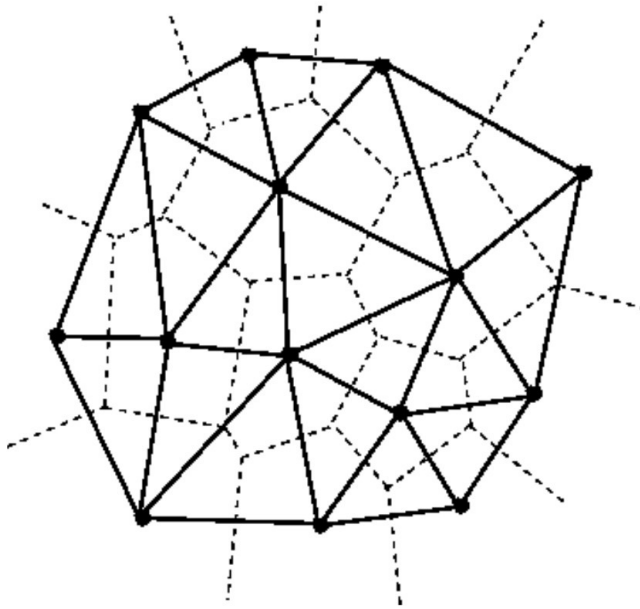


Quick Hull Algorithm

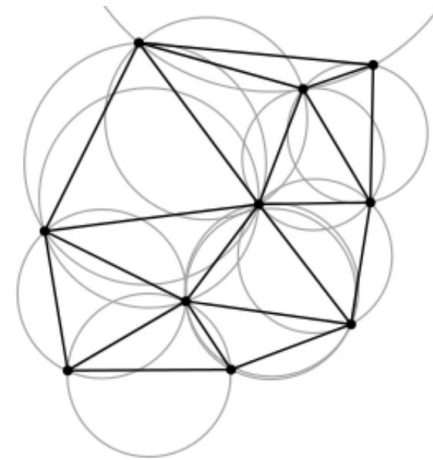


...

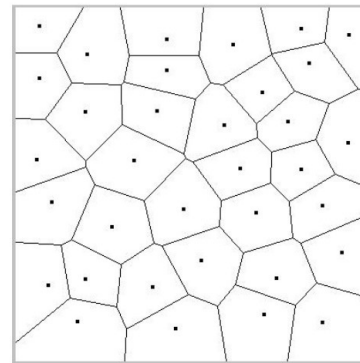
Delaunay Triangulation



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

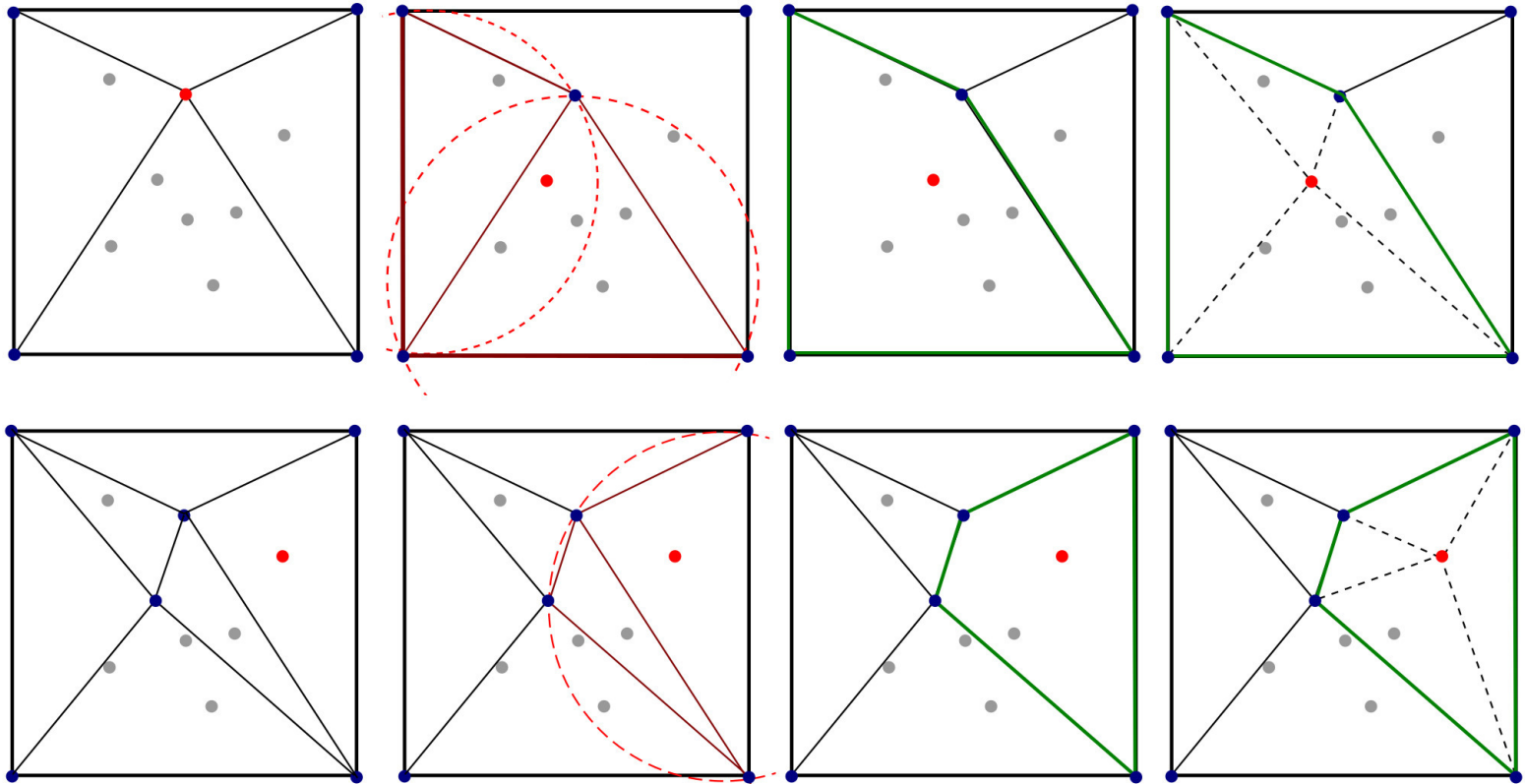


Delaunay criteria

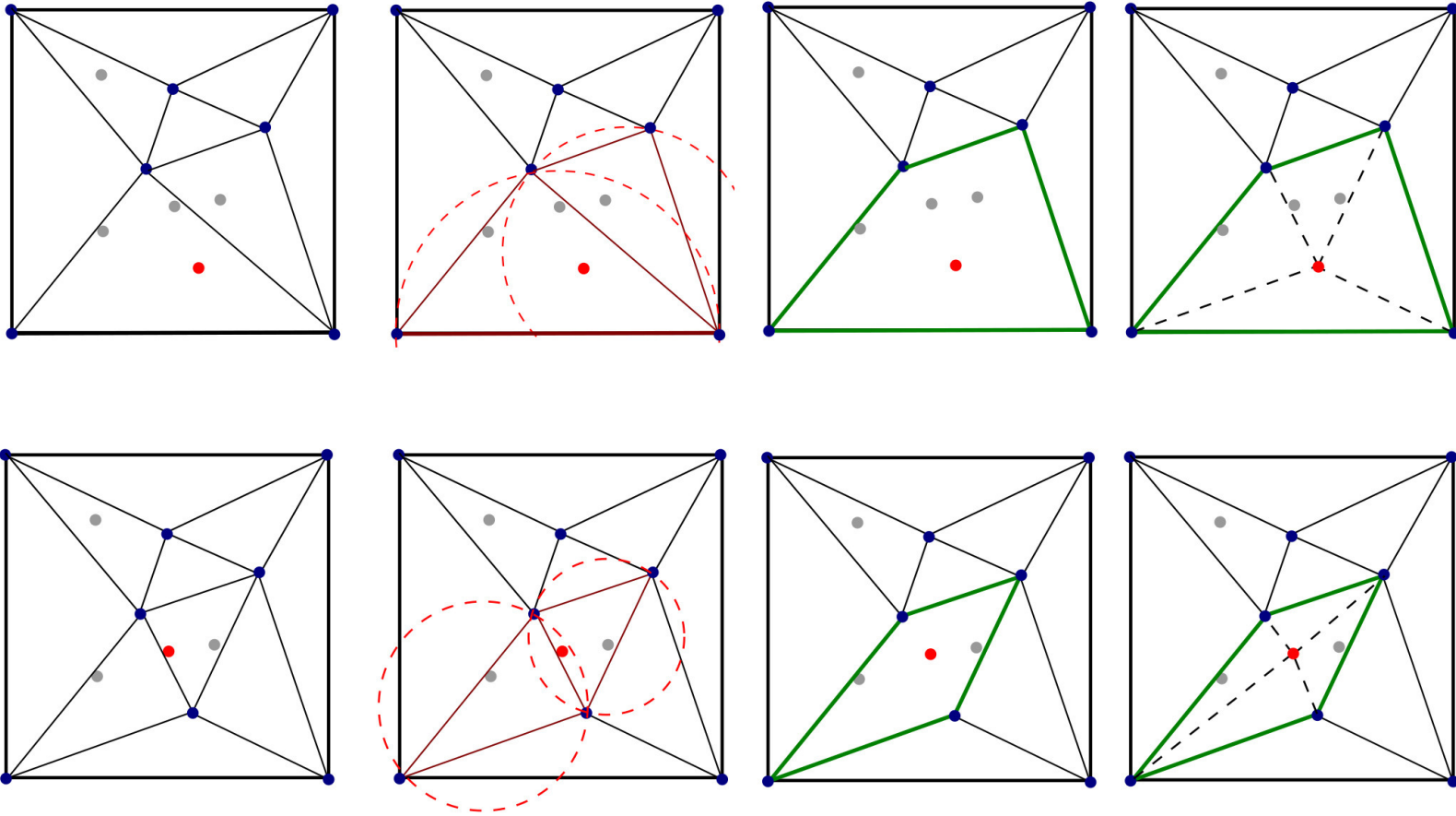


Voronoi cells

Bowyer Watson Algorithm



Bowyer Watson Algorithm



Bowyer Watson Algorithm

