Delaunay Triangulation

Proximity Graph

- Gabriel Graph

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❖ For any p, q ∈ S, pq ∈ GG(S)   iff

$$|pq|^2 \;=\; \min\{\; \boxed{|pr|^2 + |rq|^2} \;|\; r \in S \}$$

❖ pq belongs to GG(S)   iff

- the $\boxed{\text{disk}}$ taking pq as its diameter is $\boxed{\text{empty}}$

- pq spans an $\boxed{\text{acute}}$ angle w.r.t. every r ∈ S\{p,q}

- pq intersects with the common boundary between Cell(p) and Cell(q)

❖ The second equivalent definition implies that $\boxed{\text{GG(S)} \subseteq \text{DT(S)}}$
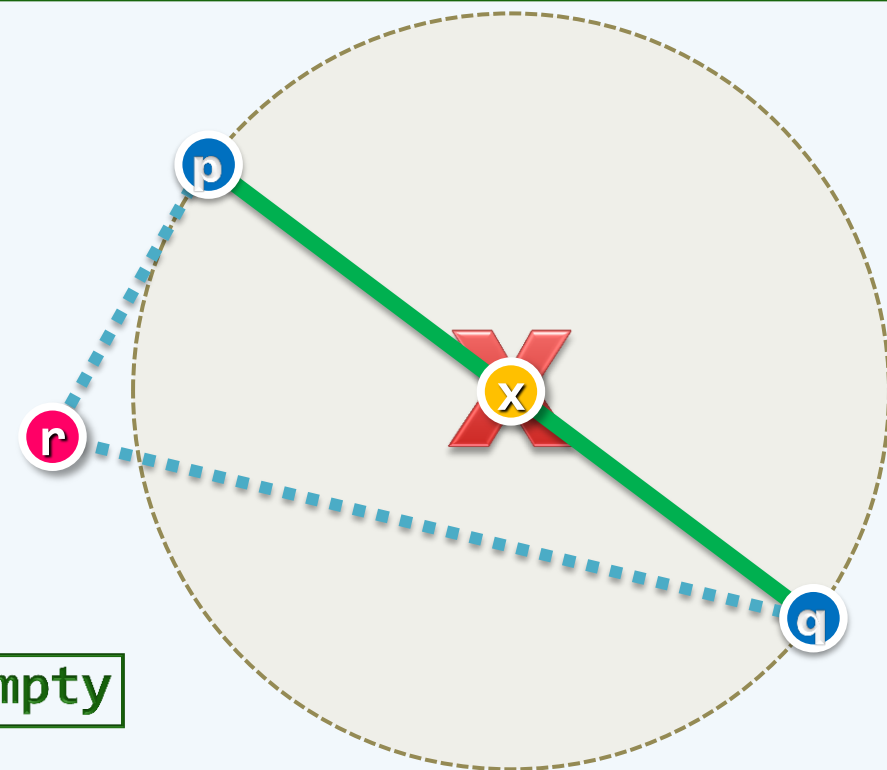
Construction

❖ [Matula, 1980]

    GG(S) can be constructed from VD(S)

      in $O(n)$ time

❖ By the third equivalent definition of GG(S),

  we can

   - construct VD(S) and //O(nlogn)

   - intersect each candidate segment pq

   with the common boundary between Cell(p) and Cell(q) //O(n)