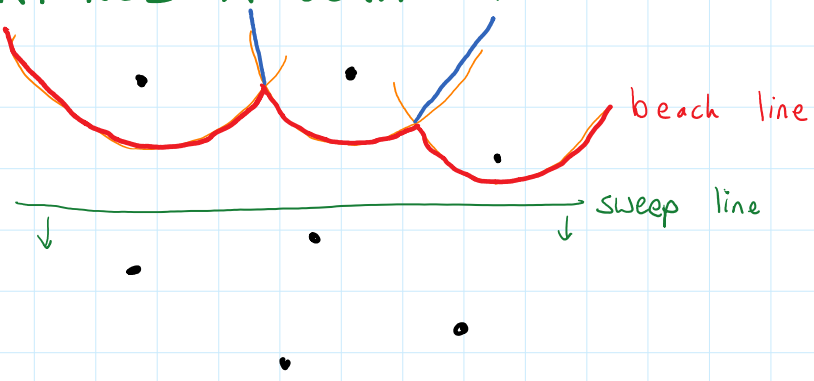
FORTUNE'S ALGORITHM



Track events:

- **site events:** when the sweep line crosses a site, add a new parabola to the beach line
- **circle events:** when a parabolic segment on the beach line disappears, then we encounter a Voronoi vertex

complexity: $O(n \log n)$

$O(n)$ events, each of which is processed in $O(\log n)$ time

n site events, and $\leq 2n-5$ circle events

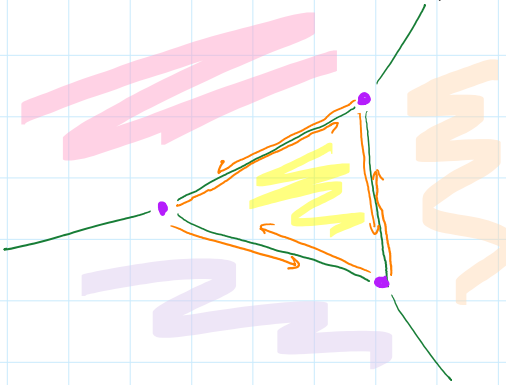
↓

storing beach line as a binary search tree

Storing a Voronoi diagram:

DCEL: doubly connected edge list

Contains records for each vertex, edge, and face, along with adjacency information



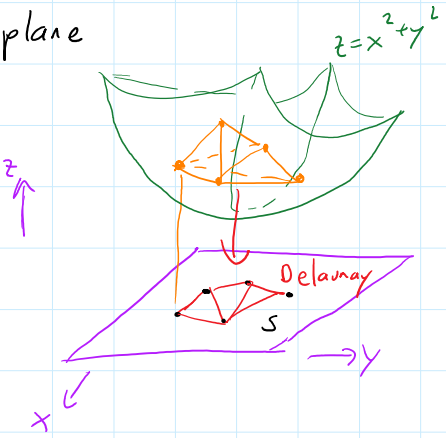
- each vertex stores its coordinates and a pointer to an adjacent edge
- each edge stores pointers to its boundary vertices, adjacent edges, and neighboring faces

really a pair of "halfedges"

- each face stores pointers to a boundary edge.

Convex Hull and Delaunay and Voronoi

- Let S be a set of sites in the plane
- Project each site up to the paraboloid $z = x^2 + y^2$
- Find the convex hull of the 3D points on the paraboloid
- Discard the "upper" faces of the hull, keeping only the "lower" faces
- Project the lower hull back to the xy-plane and obtain the Delaunay triangulation of S.



Also: The upper envelope of the tangent planes of the projected sites is the Voronoi diagram.