Voronoi Diagrams - Divide-and-Conquer

- Partition the set $S$ of points in two equal size subsets $S_1$ and $S_2$ such that $s_1.x \leq s_2.x$. Solve directly if $|S| \leq 3$.
- Solve the problem for the two subsets.
- Merge the two solutions together.
Voronoi Diagrams - Separating Chain

Assume that $VD(S)$ is given. Let $\sigma$ be the set of segments in $VD(S)$ formed by bisectors of one point in $S_1$ and one point in $S_2$.

- Claim: $\sigma$ is always a monotone (w.r.t. $y$-axis).
- How to determine $\sigma$?
- How to construct $VD(S)$ when $\sigma$, $VD(S_1)$ and $VD(S_2)$ are given?
Computational Geometry

Voronoi Diagrams

Separating Chain - Proving \( y \)-Monotonicity

- Separating chain turns upward.
- Separating chain stops.
Computational Geometry  

Voronoi Diagrams

Separating Chain - Proving $y$-Monotonicity

- Two non-crossing separating chains.
- Two crossing separating chains.
Voronoi Diagrams - Divide-and-Conquer
Computational Geometry 

Voronoi Diagrams

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