

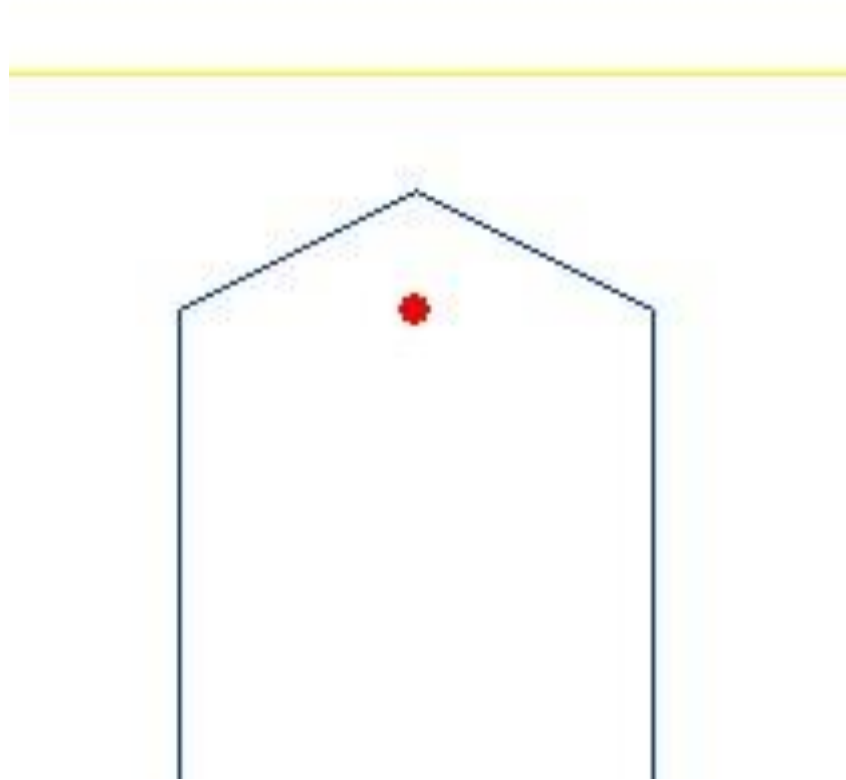
扫描线算法生成Manhattan Voronoi Diagram

丁瑶玲 2011210869

陈展 2012210879

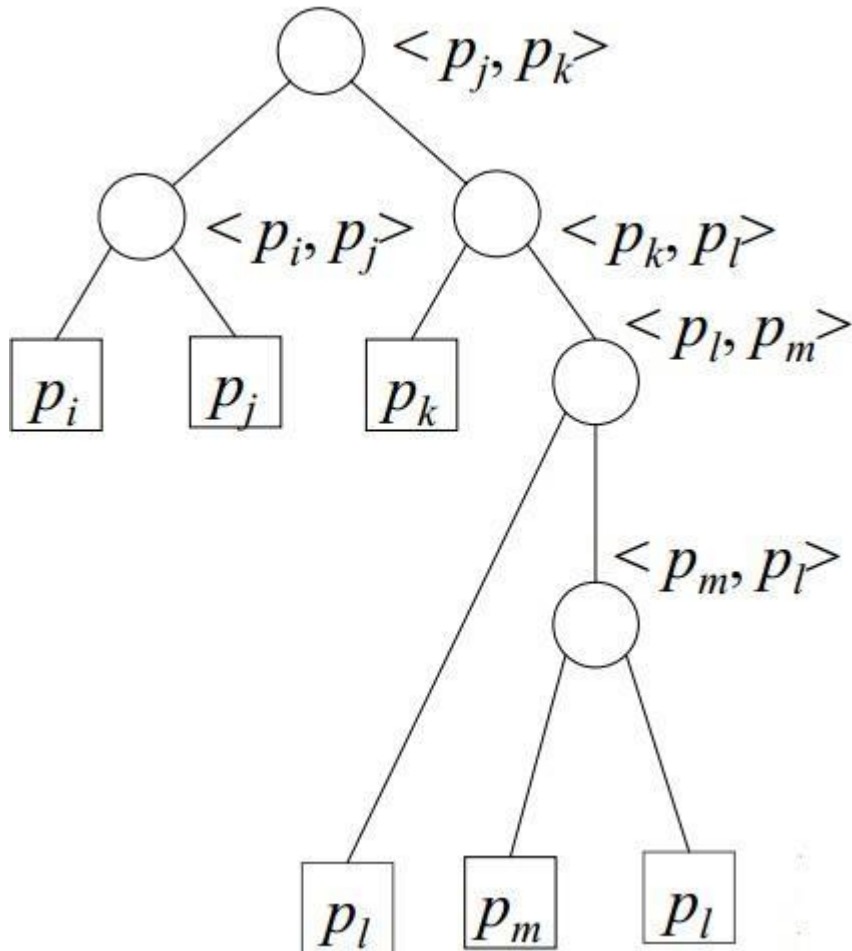
郝泳霖 2012210885

BeachLine & SweepLine形象

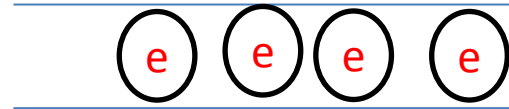


BeachLine & SweepLine数据结构

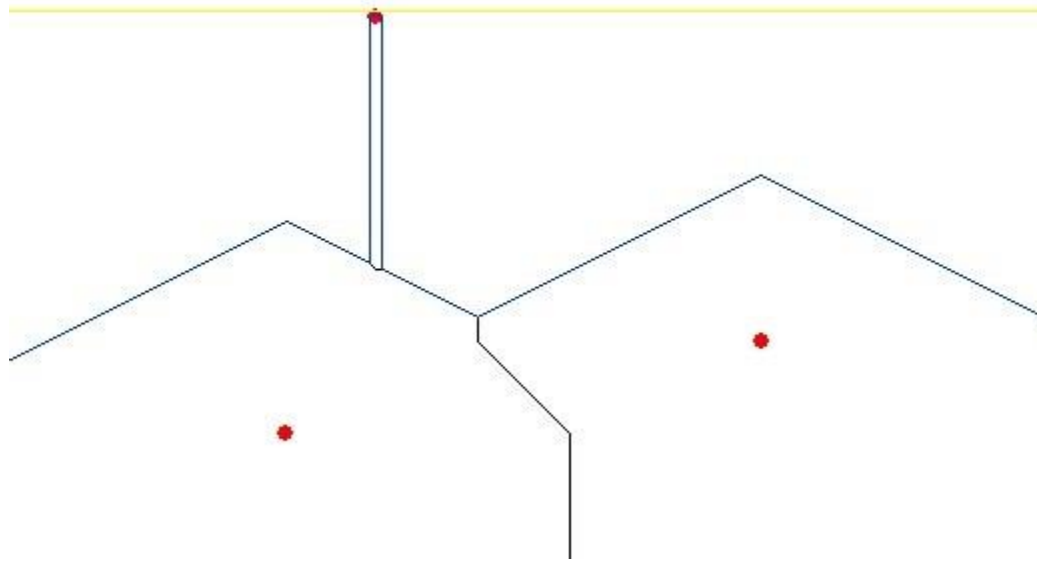
BeachLine=Balanced B-Tree



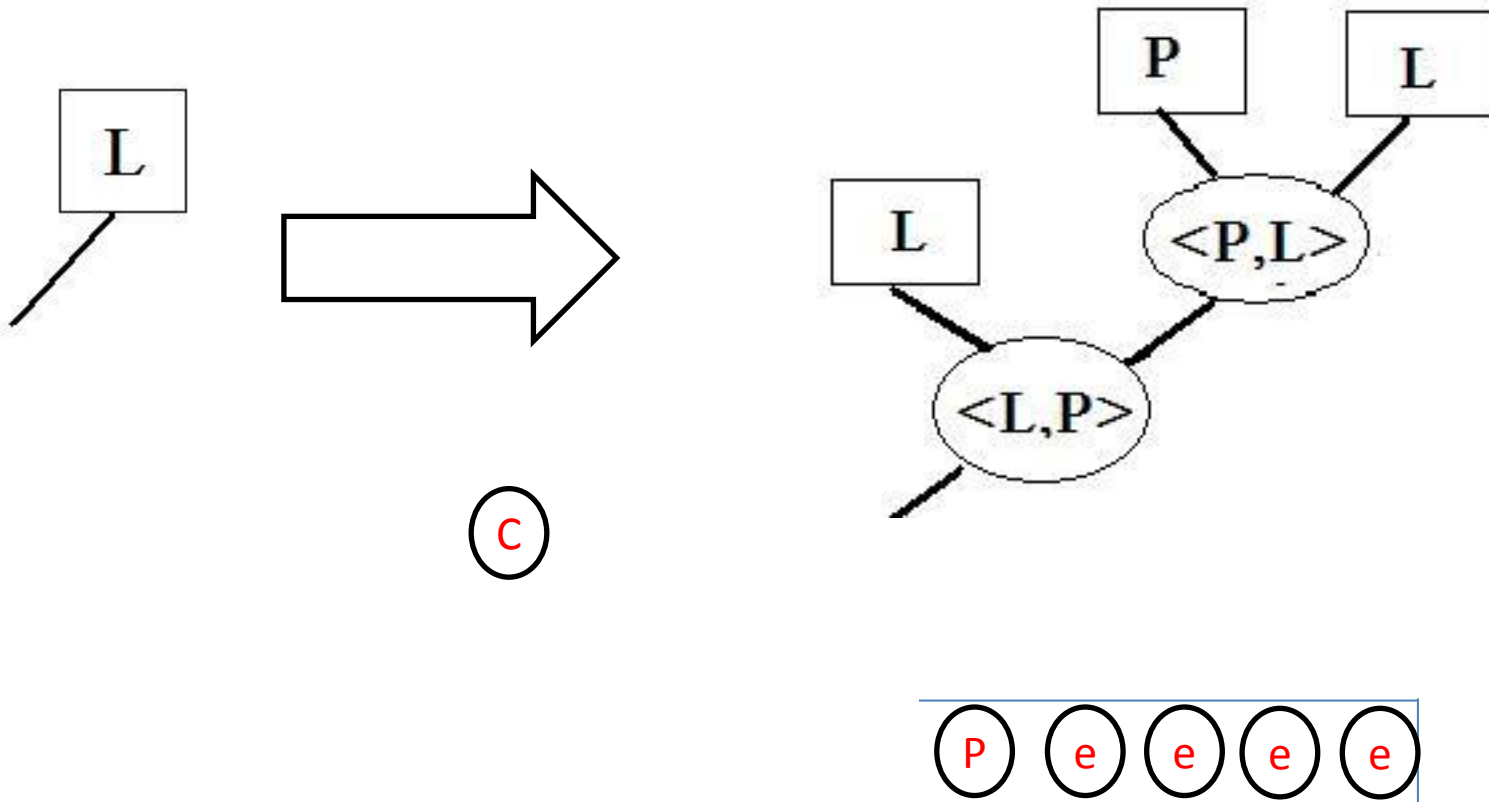
SweepLine=Priority Queue



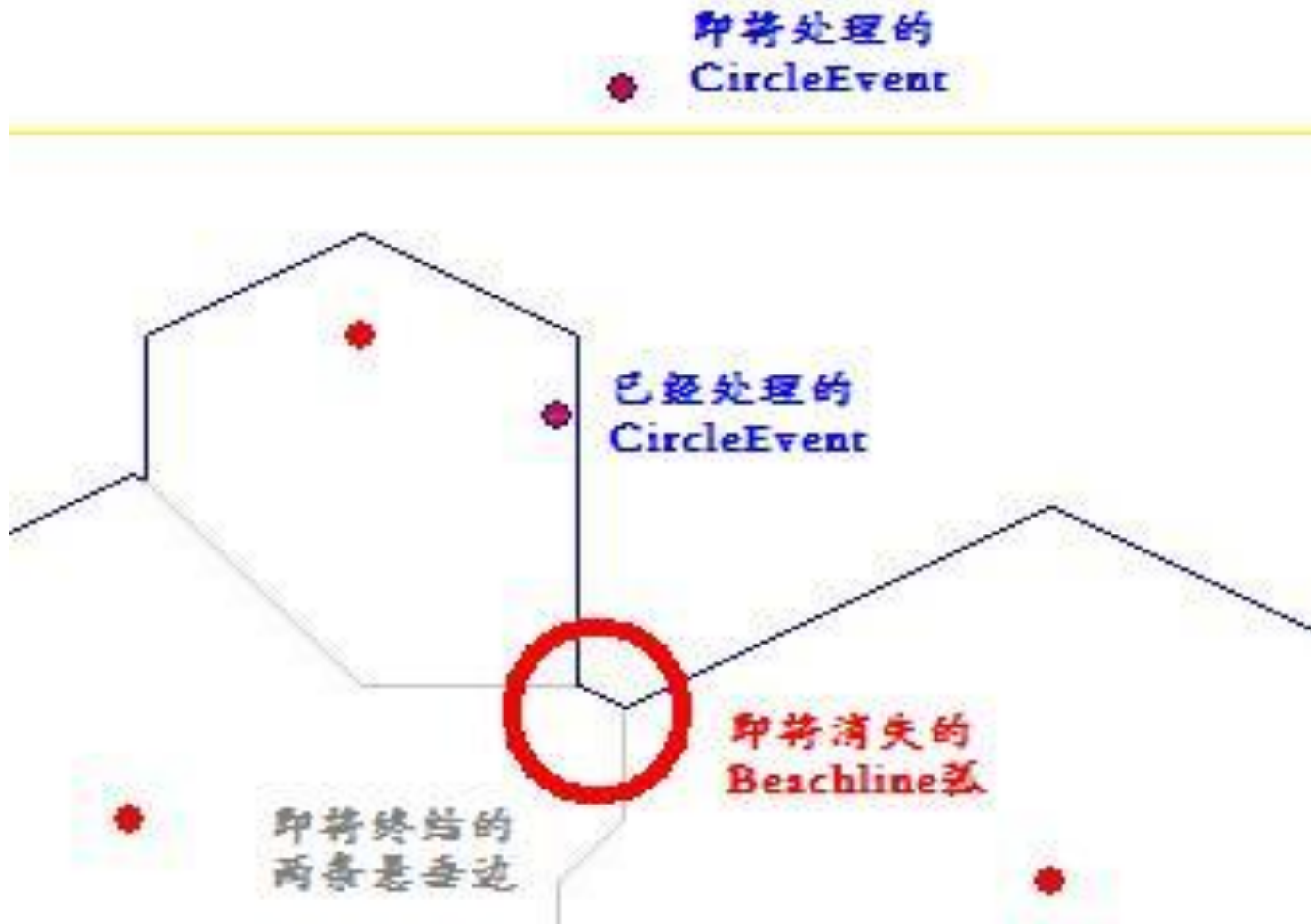
Site Event 几何直观



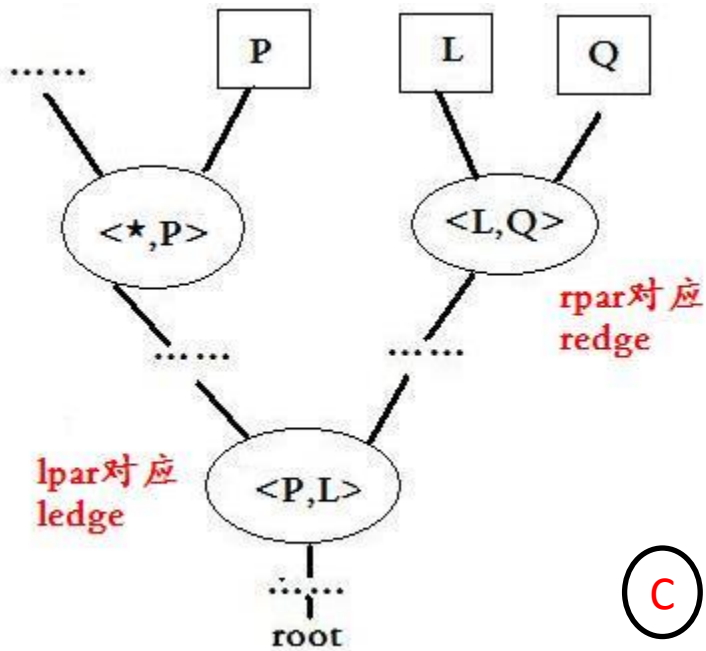
Site Event数据结构操作



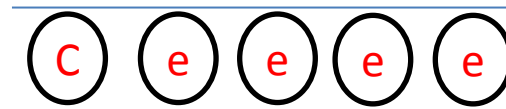
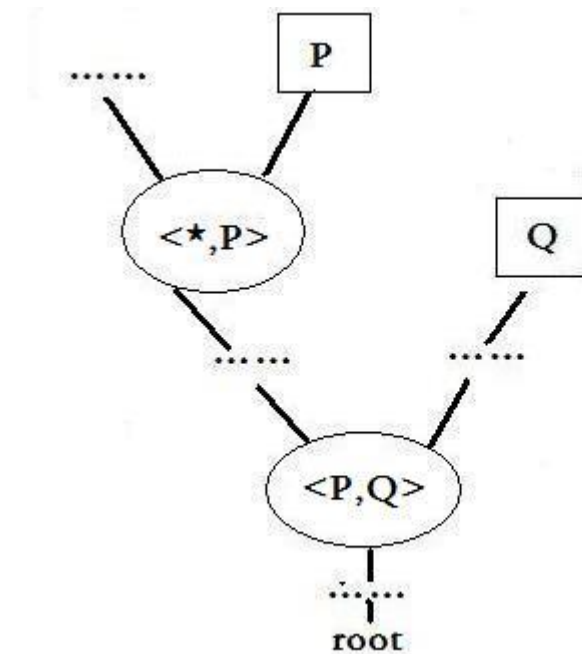
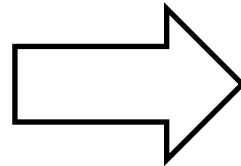
Circle Event几何直观



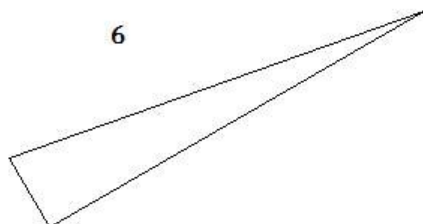
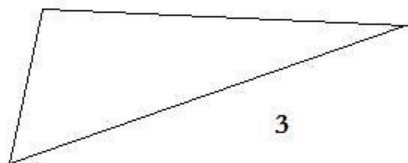
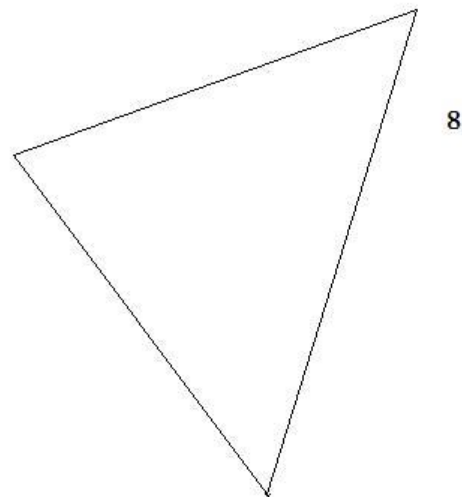
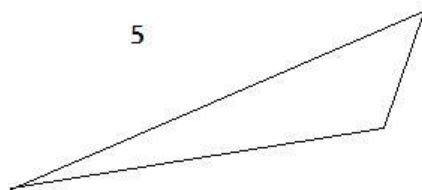
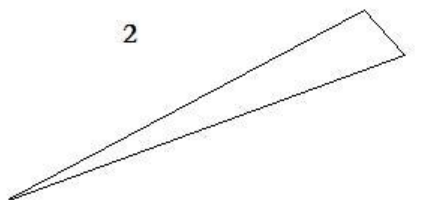
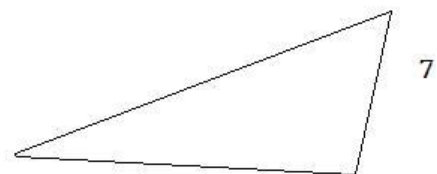
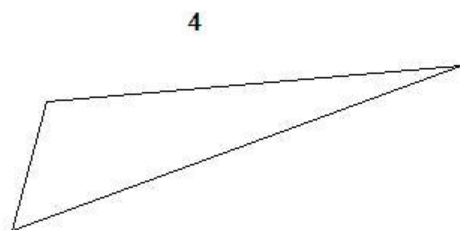
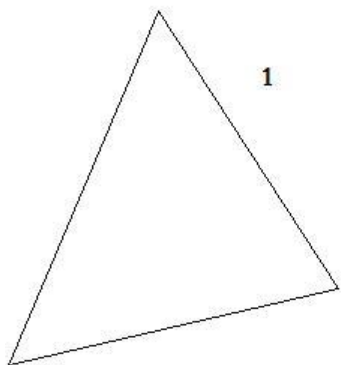
Circle Event数据结构操作



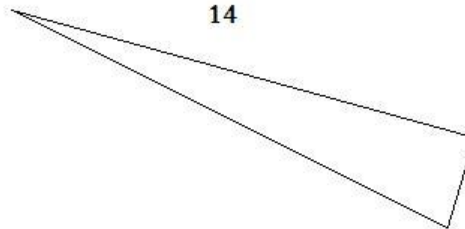
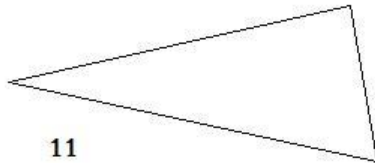
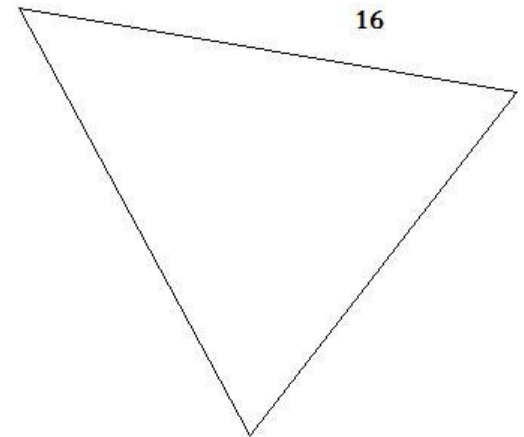
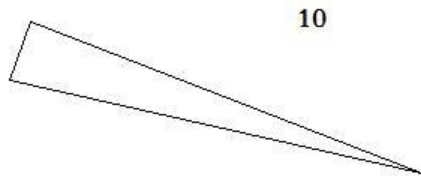
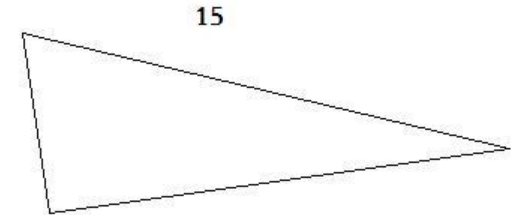
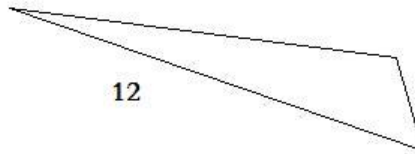
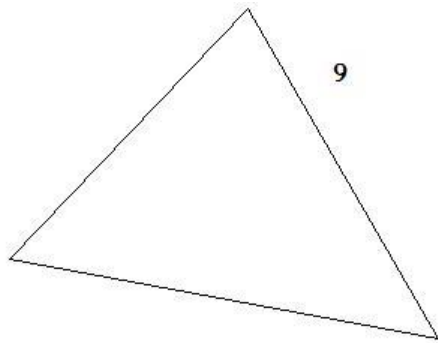
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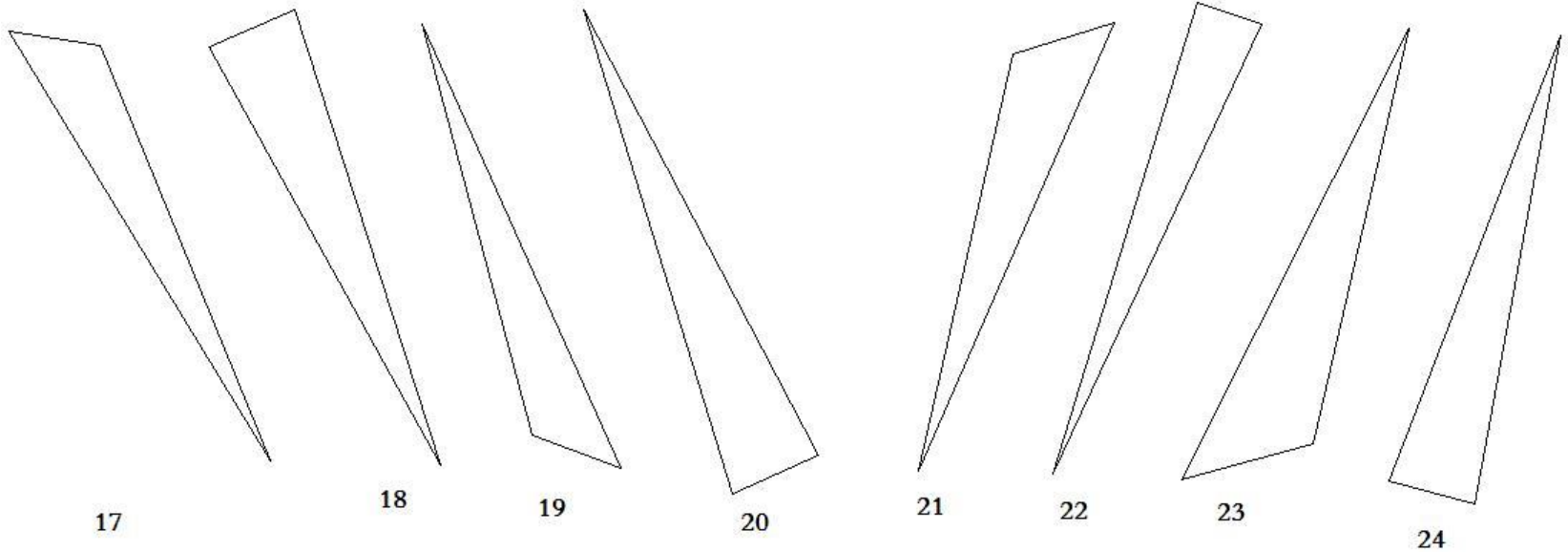
三点存在Circle Event的情况



三点存在Circle Event的情况

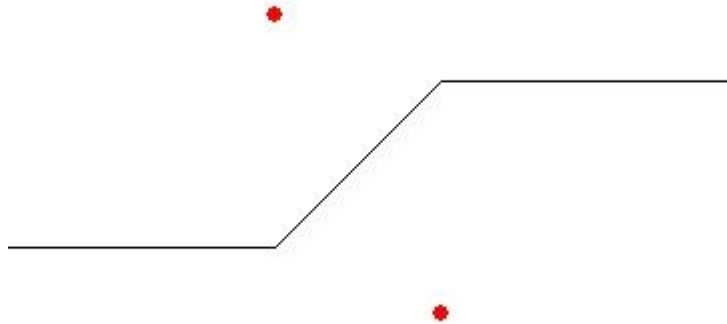


三点存在Circle Event的情况

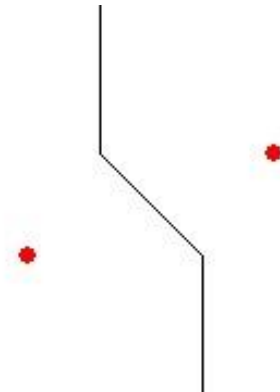


退化分析1: Bisector

$$|y_1 - y_2| > |x_1 - x_2|$$

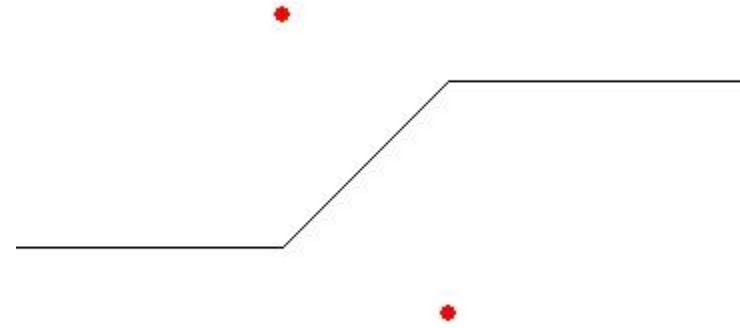
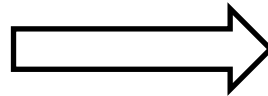
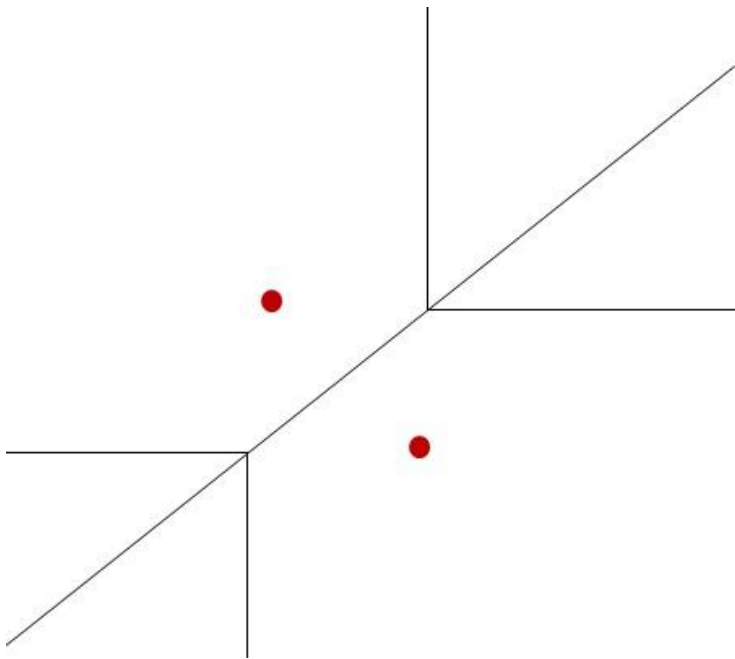


$$|y_1 - y_2| < |x_1 - x_2|$$

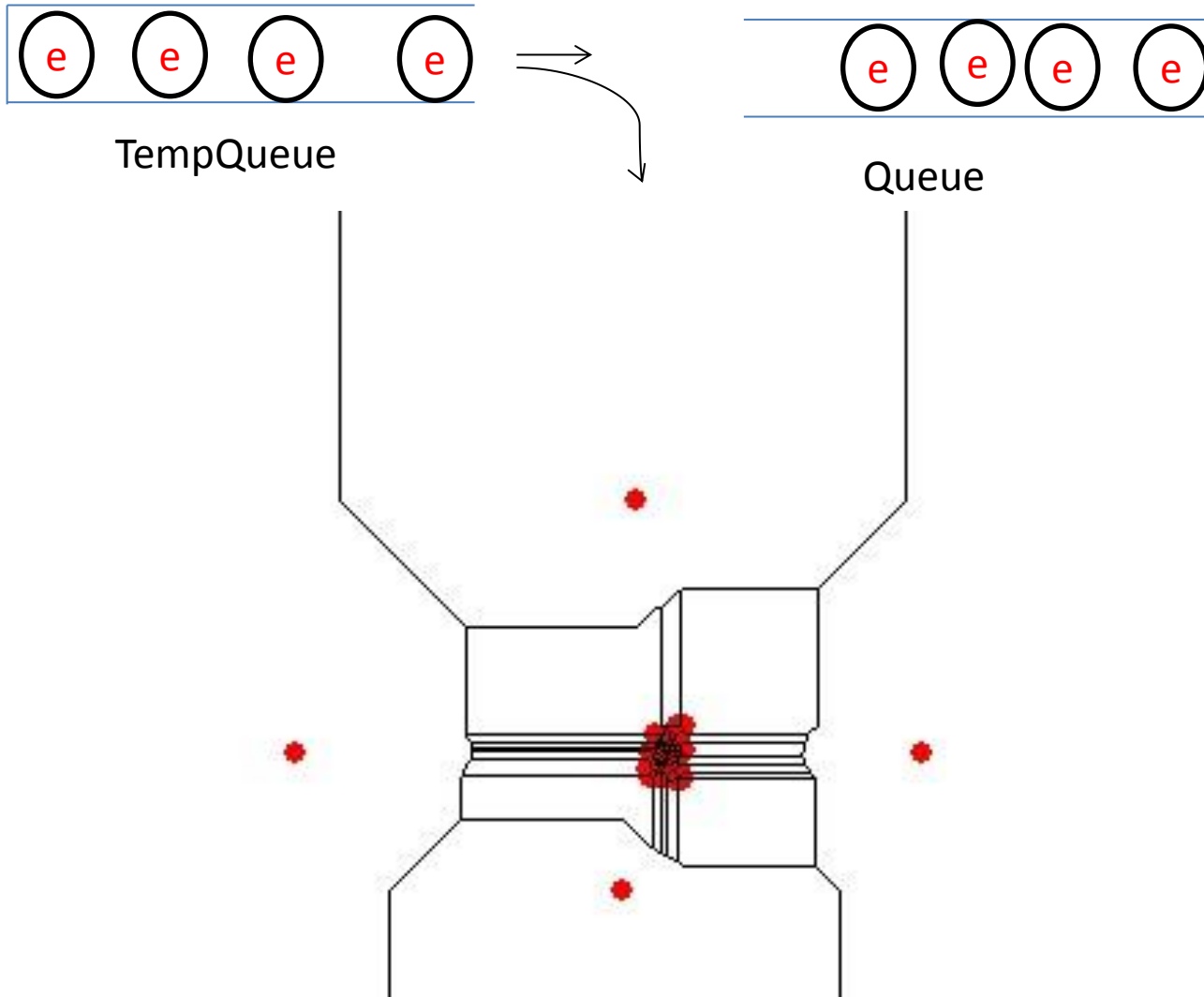


退化分析1: Bisector

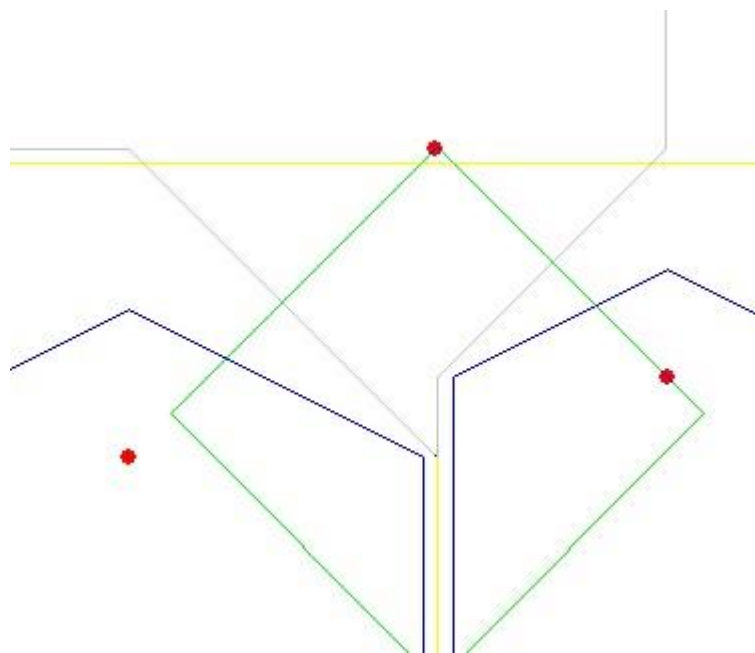
$$|y_1 - y_2| = |x_1 - x_2|$$



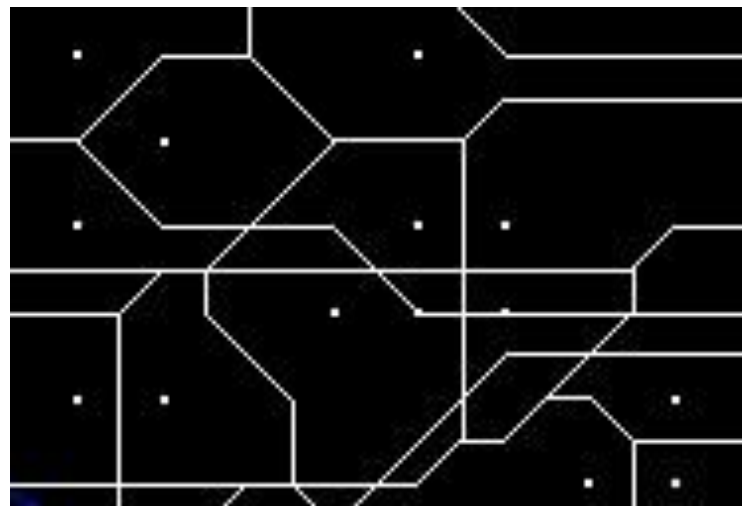
退化分析2:筛选重复输入点



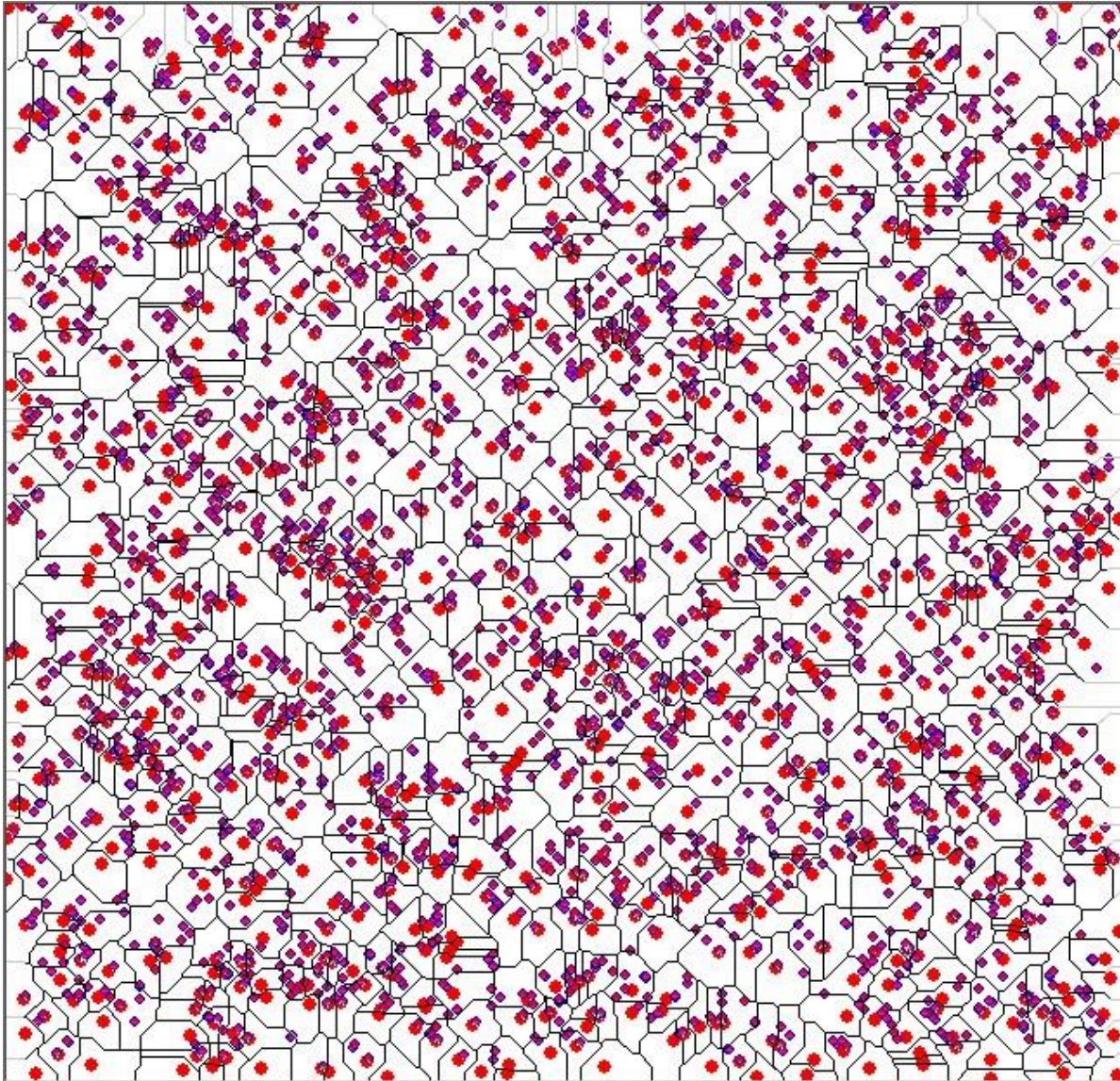
退化分析3:Site Event与Circle Event冲突



当某点既是Site Event
又是Circle Event时，一
定要先处理Circle Event，
否则将出现错误线段

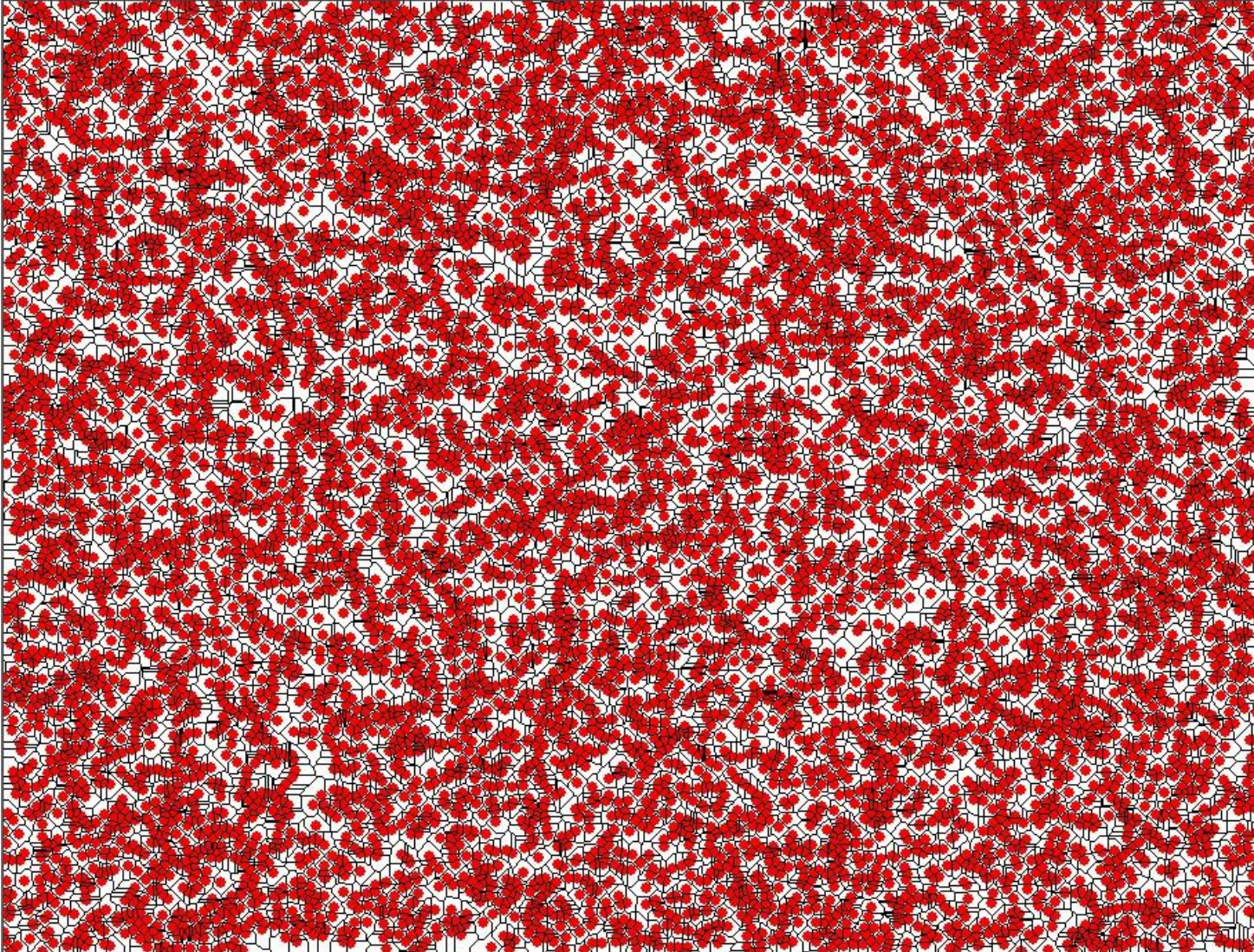


吞吐量



动态显示建议
不要超过1000
个点

吞吐量



“快速显示”和
“实时显示”建议
不要超过
10000个
点
(10000
点需要大
约50s)

参考文献

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- S. Fortune, A Sweepline Algorithm for Voronoi Diagrams, ACM 1986.
- D. T. Lee, Two-Dimensional Voronoi Diagrams in the L_p -Metric, Journal of the Association for computing Machinery. Vol 27. No 4, October 1980, pp 604-618.
- Marina Gavrilova, Proximity and Applications in General Metrics , Chapter 5.

视频演示

