Voronoi Diagram

Divide-And-Conquer
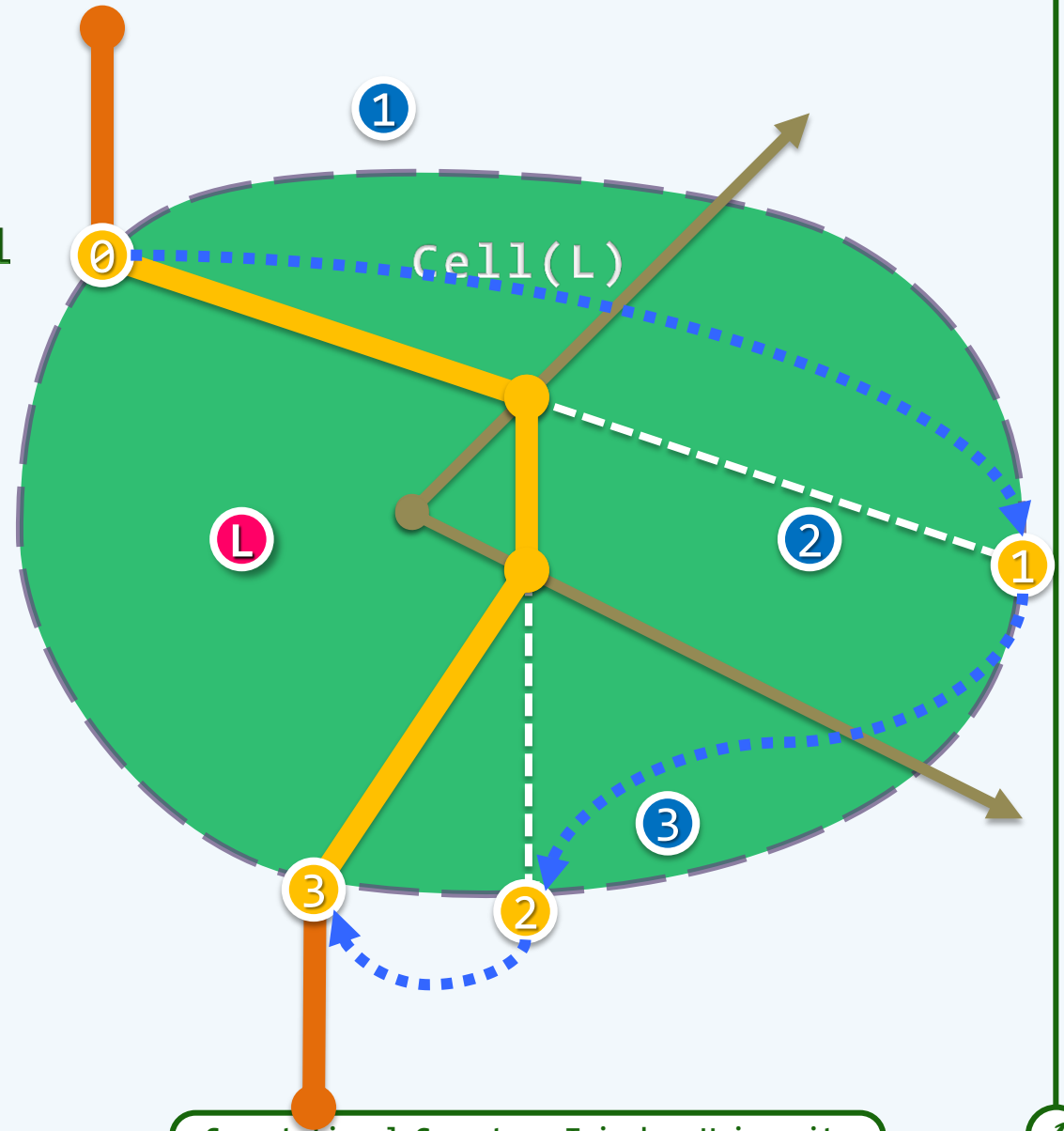
- Avoiding Rescans

θ4-L-11

Junhui DENG

deng@tsinghua.edu.cn

❖ **Each time we flip a cell,**

   we add an edge to the un-flipped cell

❖ **Furthermore,**

   since each cell is itself convex,

   we know that ...

❖ **Consecutive edges added to**

   a same cell of the L̄/R̄ sub-diagram

   always make an R̄/L̄ turn

Cell(L)

Amortization

❖ By keeping track of

the last (failure) position,

we needn't to start each scan

from the right beginning

❖ As a result,

all the intersection tests with a cell

can be done in a total time

of $O(n)$

Cell(L)
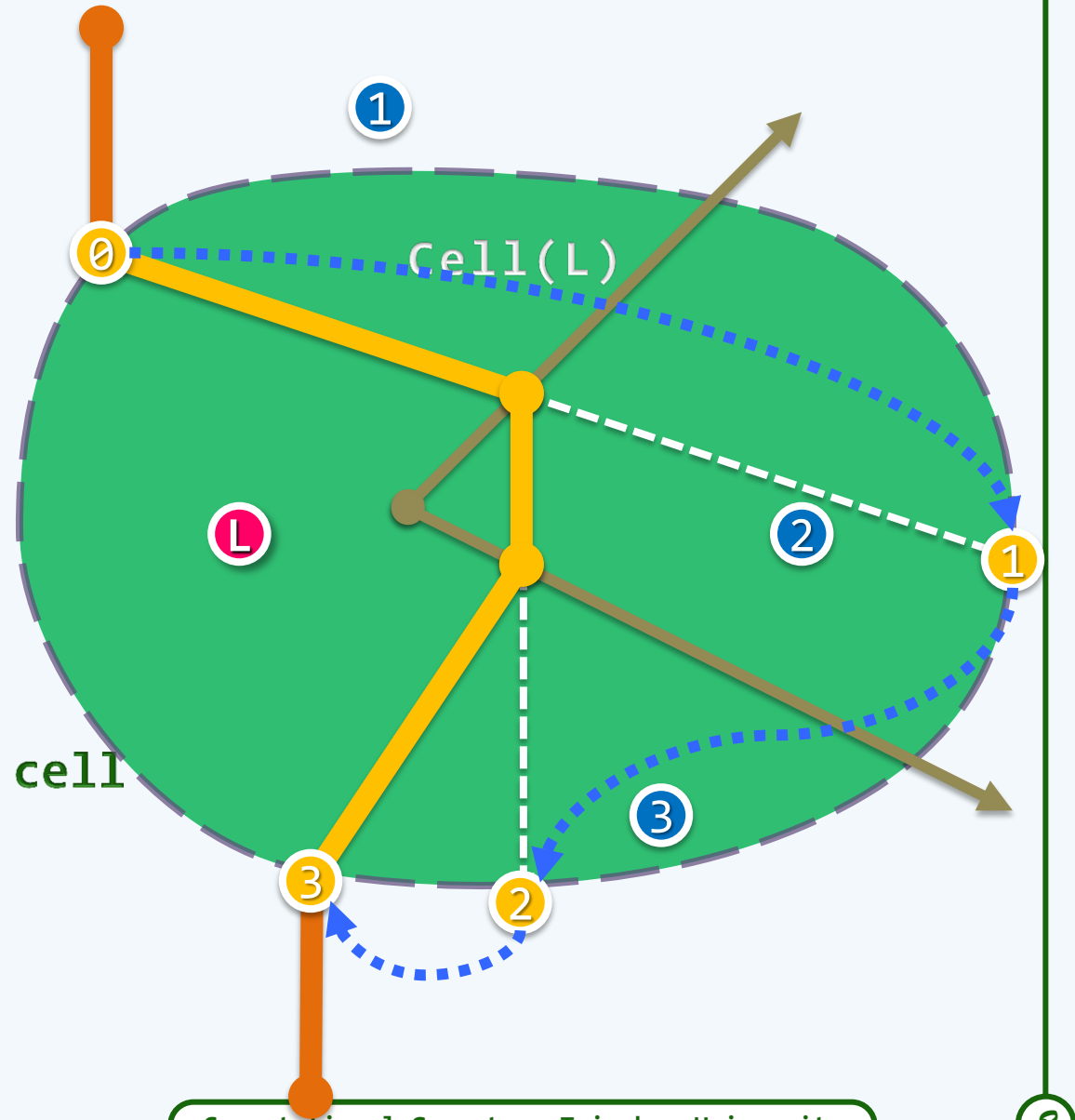
Complexity

❖ Up to now, we know that

    - The upper tangent can be computed in $\boxed{O(n + m)}$ time;

    - cells will be clipped by the contour in $\boxed{O(n + m)}$ time; and

    - we spend $\boxed{O(n + m)}$ time to flip all cells

❖ As a whole,

    - two sub-diagrams can be merged in $\boxed{O(n + m)}$ time, and

    - the divide-and-conquer algorithm computes the VD in $\boxed{O(n\log n)}$ time