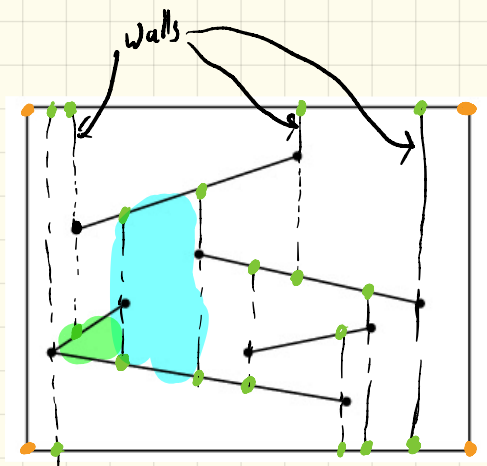
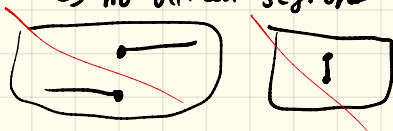


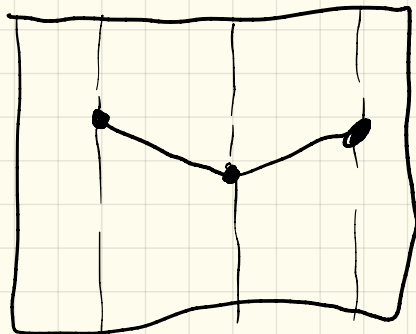
Trapezoidations

2/23

Let $S = \{s_1, \dots, s_n\}$ be a set of line segments
 that do not intersect (except maybe at endpoints)
 Assume no 2 endpoints have the same x -coord (except shared endpoints)
 \Rightarrow no vertical segments



faces; traps in general
 may degenerate to Δ s



example w/
 shared endpoint and
 no Δ

Claim: ✓

given trapezoidation of n segments
trap map has:

- at most $6n+4$ verts
- at most $3n+1$ traps

pf: # of verts

each vertex shoots 2 rays

each ray creates a new vertex

\Rightarrow 1 endpoint from segment creates 3 verts in the trap map

each segment has 2 endpoints

$\Rightarrow 6n$ verts

+4 for the square

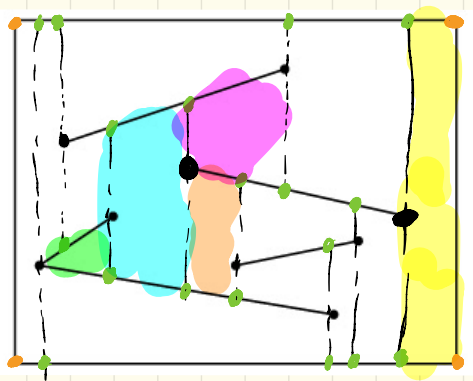
of traps

- each trap in the map
has a left side
defined by a seg endpoint

- the left endpoint for a seg
can be left bounding
vertex for at most 2 traps
(one above, one below)

- the right endpoint of a segment
can serve as left boundy
for 1 trap

\Rightarrow each segment of the subdivision
they can result in 3 traps
+1 trap from the bounding box



Observe:

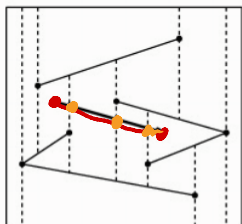
each trap is defined by 4 objects

- seg on top
- seg on bottom
- seg endpoint on left
- seg endpoint on right

Construction as sweepline

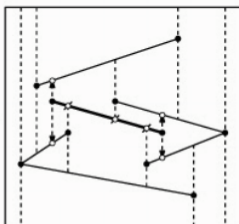
New technique is randomized incremental construction (RIC)

Locate left endpoint and
find wall intersections



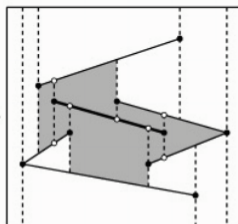
(a)

Shoot bullet paths
and trim walls



(b)

7 newly created
trapezoids



(c)