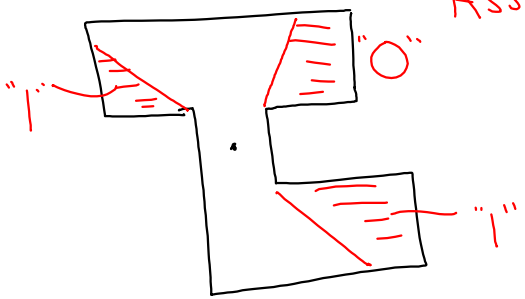


Associate a label with each gap/shadow region

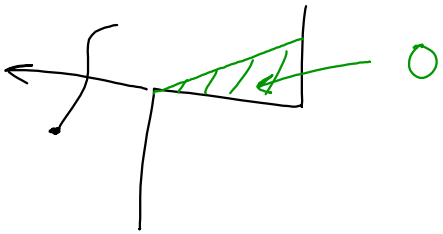
1 = the shadow region might contain the evader

0 = it certainly does not

2D cells: the gaps are the same

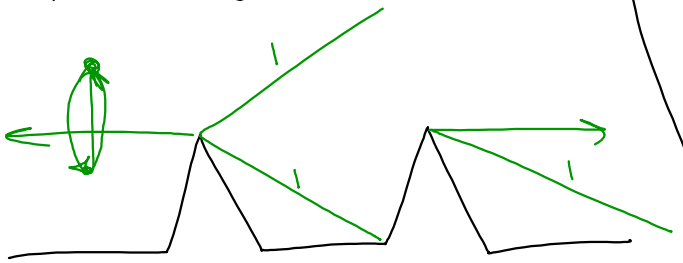
Critical change occurs only when cell boundaries are crossed

1) Appear : A gap appears



2) Disappear: Do nothing

3) Split : A gap splits into 2



$1 \rightarrow 1,1$

$0 \rightarrow 0,0$

4) Merge

$0,0 \rightarrow 0$

$1,1 \rightarrow 1$

$0,1 \rightarrow 1$

Sec 12.4

In a 2D cell with k gaps, there are 2^k possible labelings

Initially, start in any 2D cell. All labels are "1"

Task: Arrive in any cell with all labels being "0"

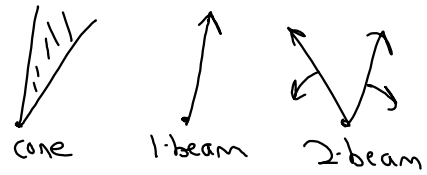
Directed graph of cells in Pow(X)

↳ vertex: 2D cell + labeling

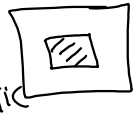
Systematic search → complete algorithm

Variations

Visibility regions



environments: - holes



- piecewise-analytic
- 3D

Multiple agents: Different teams

Ex red and blue teams

Labels: no blues, at least one red

3 blues, 2 reds

7 agents

⋮

- stochastic control theory
- input-output representations
- system identification

James Kuffner

Mike Stilman