

EE365: Shortest Path Example

Stochastic shortest path example



- ▶ chain of $n = 100$ nodes
- ▶ move from node 10 to node 90 in $T = 100$ steps
- ▶ can move forward one node, move backward one node, or stay put
- ▶ at each time step, lightning strikes with probability 0.3
 - ▶ t to move right
 - ▶ -50 to move left
- ▶ minimize total expected cost

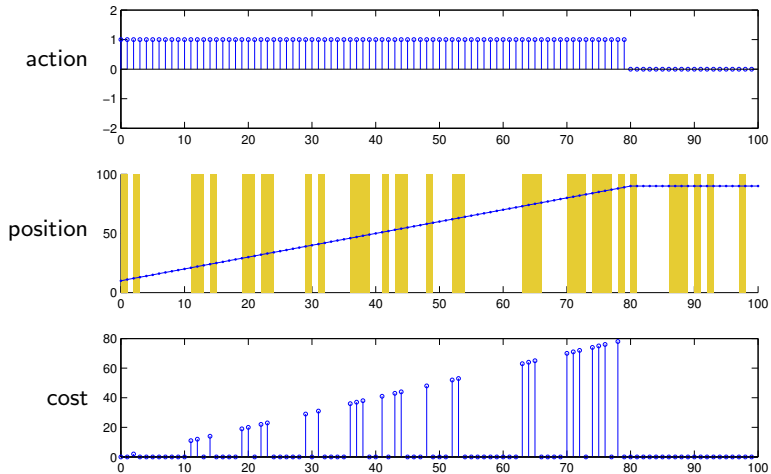
Information patterns

three different information patterns:

1. *open loop*: only know probability of lightning strike
2. *current*: at each time, know whether lightning is striking now
3. *prescient*: know times of all future lightning strikes

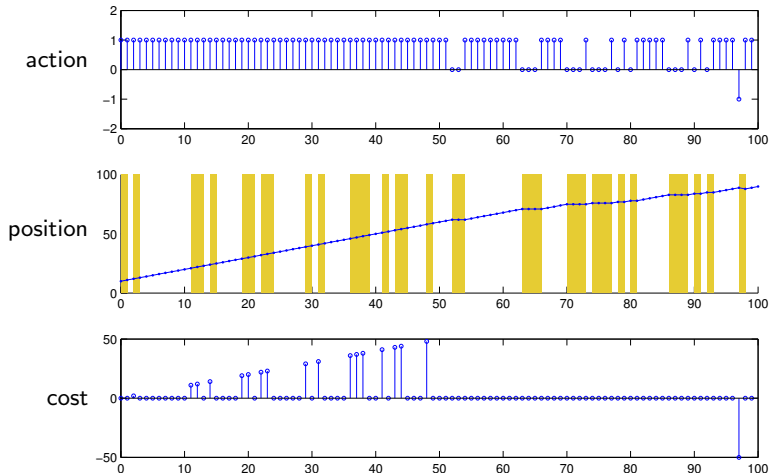
Open loop

37 lightning strikes, in yellow. Total cost = 1283



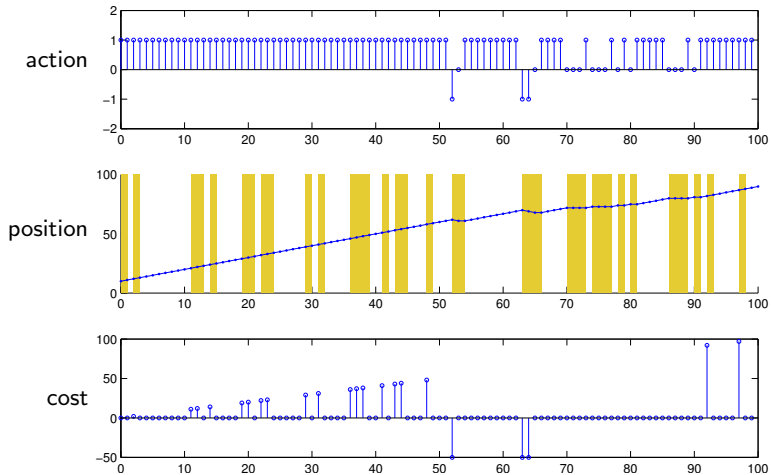
Prescient

Total cost = 420

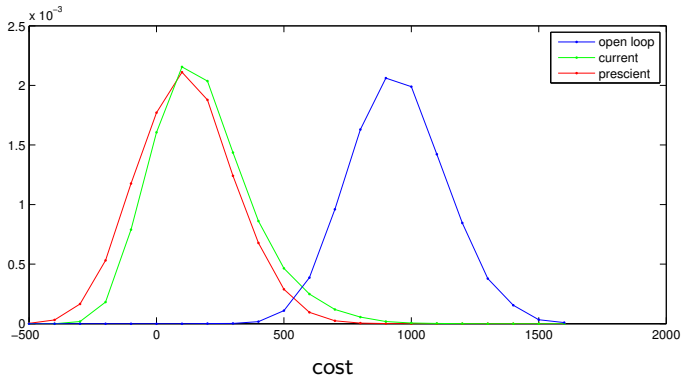


Current

Total cost = 509



Cost distributions



- ▶ cost distributions for each information pattern
- ▶ clearly shows value of information, recourse