

Dynamic Graph TSP / Dynamic Graph Exploration (1/2)

Dynamic graph $\mathcal{G} = (G_1, G_2, G_3, \dots)$

static graphs based on the same vertex set V

Constant connectivity: $\forall i \in \text{lifetime}, G_i$ is connected

Dyn. graph TSP / Dyn graph exploration problem

| Given \mathcal{G} and $s \in V(\mathcal{G})$, find (the length of)
| a foremost strict journey going through every node

Differently speaking:

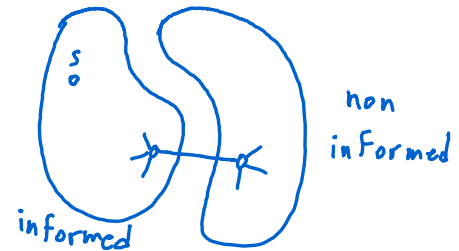
Exploration by a mobile agent knowing the dynamics

NP-hard to compute but what about the exploration time?

Dynamic Graph TSP / Dynamic Graph Exploration (2/2)

Temporal diameter: $\leq n-1$ ($n = |V|$)

\Rightarrow Expl. time: $O(n^2)$
 $\Omega(n)$



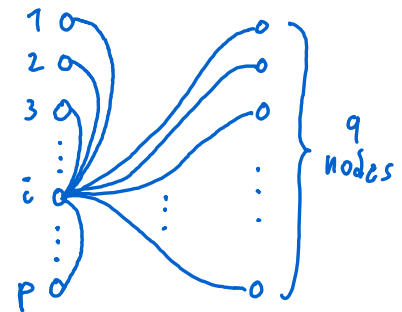
Some graphs have expl. time in:

- $\Theta(n)$: cycles (see whiteboard)

- $\Theta(n^2)$: let $p+q = n$ At time $i \bmod p$

(Take $p=q = \frac{n}{2}$)

Minimum time: $p \times q$



More generally, for \mathcal{G} such that Footprint $\cup G_i$ has m edges, exploration time in $\Omega(m)$

"Open" problem: can we explore in time $O(m)$?
 (not known for cactuses)

