

terr-cost + reward + noise

/
from,to
2,3,4
 $\Delta = 1$

a-r

[0
1]

indicator
node $\in G$

b-noise

$U[-1, 1]$

$$|path| \leq \max X \cdot \max Y = |Map|$$

$|G|$

$$\frac{20 \times 5}{10 \times 10}$$

$$\frac{1}{200} \cdot 100 \cdot 1 =$$

$$\text{Noise} = \sum_{i=1}^{|path|} b \cdot \text{noise}[i] = b \cdot \sum \text{noise} \leq b \cdot |path| \cdot 1 =$$

$$\frac{1}{2}$$

terr-cost + reward + noise

/
from,to
2,3,4
 $\Delta = 1$

$$|\text{path}| \leq \max X \cdot \max Y = |\text{Map}|$$

a-r
[0
1
indicator
node $\in G$

b-noise
 $U[-1, 1]$

$$[-0.005; 0.005]$$

$$\begin{aligned} \text{Noise} &= \sum_{i=1}^{|path|} b \cdot \text{noise}[i] - \\ &= b \cdot \sum \text{noise} \leq b \cdot |path| \cdot 1 = \end{aligned}$$

- 1) ter_cost + noise
 - 2) ter_cost + reward
 - 3) ter_cost + reward + noise
- ↓
- Δ_{fc} Δ_r

$$\text{Noise} = \sum_{i=1}^{|path|} b \cdot z \leq b \cdot |\text{Map}| < \Delta_r = \frac{1}{2|G|}$$

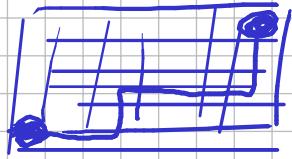
$b = \frac{1}{4 \cdot |G| \cdot |\text{Map}|}$

$b < \frac{1}{2 \cdot |G| \cdot |\text{Map}|}; |G| \leq |\text{Map}|$

$b \leq \frac{1}{2 \cdot |\text{Map}|^2}$

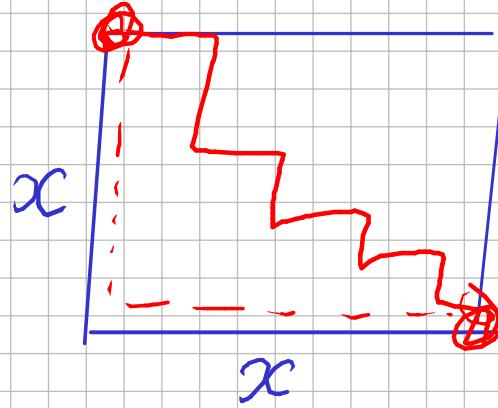
$$|\text{path}| \leq |\text{Map}|$$

10×10



$$|\text{path}| \sim 2 \sqrt{|\text{Map}|}$$

$$\Sigma = |\text{Map}|$$



$$S = \Sigma c^2 \quad \begin{matrix} \text{(n10mug6)} \\ \text{kbagpata} \end{matrix}$$

$$B \cdot |\text{path}| < \Delta_z = \frac{1}{2|G|}$$

$$B < \frac{1}{2|G| \cdot |\text{path}|}, \quad |\text{path}| \in \left[\frac{|M_{\text{ap}}|}{2\sqrt{|M_{\text{ap}}|}} \right]$$

$$B = \frac{1}{4 \dots}$$

double newCost =

$$= \underline{\text{curr. cost}} + \text{terrainCost} + \\ + a \cdot \gamma + b \cdot \text{noise}$$

$$\text{newCost} \sim \sum_{i=1}^{|path|} \text{terrainCost}[i, i+1] \sim$$

$$\sim \langle \text{terrainCost} \rangle \cdot |path| \sim$$

$$\sim \frac{2+3+4}{3} \cdot |path| \sim 3 \cdot |path| \xrightarrow{\text{big}}$$

$$b \sim \frac{1}{4 \cdot |G| \cdot |path|} \sim \text{small}$$

$$\text{newCost} = \text{big} + \text{small}$$

$$\delta = \frac{\text{newCost}}{6} = 3 \cdot |\text{path}| \cdot 4 \cdot |G| \cdot |\text{path}| =$$

$$= 12 \cdot |G| \cdot |\text{path}|^2$$

1) $|\text{path}| \sim |\text{Map}|$, $|G| \sim |\text{Map}| \cdot \frac{1}{2}$

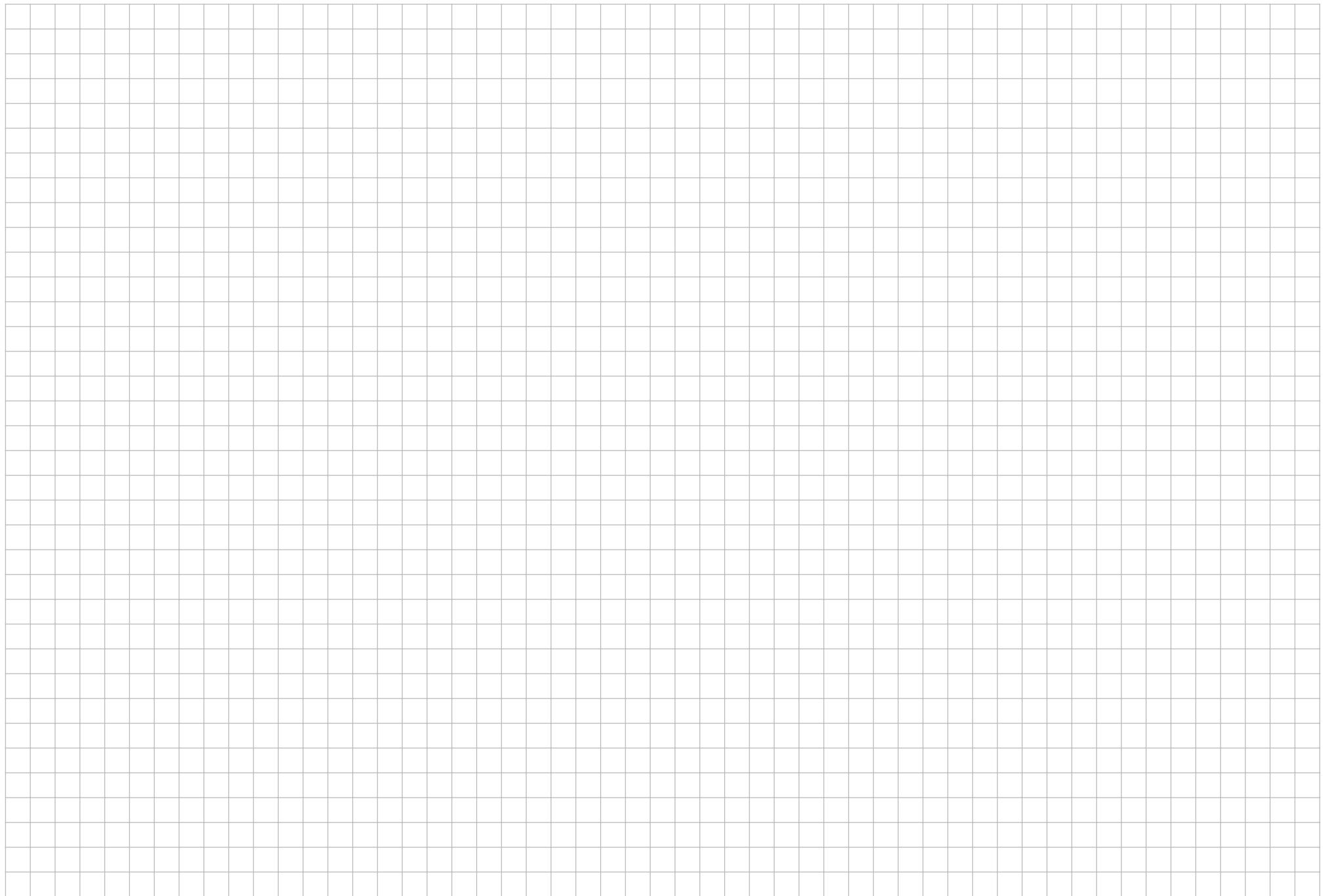
$$\delta \sim 12 \cdot \frac{1}{2} \cdot |\text{Map}| \cdot |\text{Map}|^2 = 6 \cdot |\text{Map}|^3 =$$

$$= 6 \cdot (100)^3 \sim 6 \cdot 10^6 \quad \text{pessimistic estimate}$$

2) $|\text{path}| \sim 2\sqrt{|\text{Map}|}$, $|G| \sim |\text{Map}| \cdot \frac{1}{2}$

$$\delta \sim 12 \cdot \frac{1}{2} \cdot |\text{Map}| \cdot (2\sqrt{|\text{Map}|})^2 = 24 \cdot |\text{Map}|^2 =$$

$$= 24 \cdot (100)^2 = 2.4 \cdot 10^5 \quad \text{optimistic estimate}$$



calculateNextMove

trajectory = findBestTrajectory

if trajectory is better than current memorized, then update

EMove = ...

return Emove;

findBestTrajectory

generate many trajectories



25 random noise restarts

for each 'g' from 'Goals'

continuousPath(pPos, g)

*while 'Goals' not empty
next = bfsNearest*

trajectory complete;

calculateExplorationProgress