Deep Learning lab

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Outline

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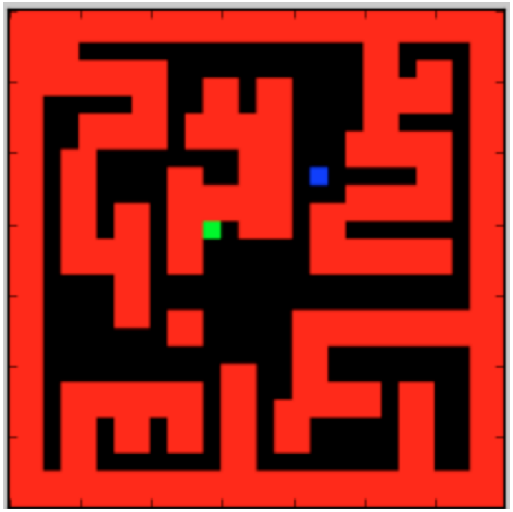
Problem Statement

1. Visual planning imitating A*
2. Changing target



Old results

- The A* star was our baseline for training, it always solves the problem.
- The accuracy of our agent without changing the target was 100%.
- The accuracy of our agent with changing target was on average 31%.

Outline

Adding target to state

In addition to the history of the last 4 states, we save an additional state of the local view of the target position. Average accuracy with saving target: 70% Average accuracy : 31%

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Simple coloring

Dividing the wall into ”districts” with distinct colors.
Average accuracy with colouring: 81%
Average accuracy : 31%

Figure : Simple colouring

Gradient coloring

Coloring the walls with a gradient across the whole map.
Average accuracy with colouring: 66%
Average accuracy : 31%

Figure : Gradient colouring

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Distance accuracy

- Instead of giving a score 0 for not reaching the target, we use the distance accuracy function:

$$\frac{1}{1 + \lfloor d/g \rfloor^2}$$

  where d is the distance from the target and g is a constant.
- The idea is to give partial credit if the agent got close to the target even if it didn't reach it.

Gridding

- We tried to divide the map into grids of size g while sampling target locations (only during training).
- The reason is to ensure that the density of distribution across the map is the same.
- However it turns out that gridding didn't affect the results that much.

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We ran 8 experiments; for each we train 7 times and test 10 for each of them, and these are the average results.

Target	Gridding	Color	Accuracy	Distance Accuracy
No	No	No	31%	-
Yes	No	No	70%	-
Yes	No	Simple	80%	-
Yes	No	Gradient	66%	-
Yes	Yes	Simple	79%	81%
Yes	Big	Simple	77%	82%
Yes	Yes	No	70%	72%
Yes	Big	Gradient	64%	71%