Tiebreaking Strategies for A* Search: How to Explore the Final Frontier

Classical Planning in a Deep Latent Space

(WIP project idea)

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1 Classical Planning

Scalable, Highly-optimized solver for complex combinatorial problems

Guided by **domain-independent** heuristics

Requires an explicit encoding of the real world, written by human

2 Reinforcement Learning

Policy function π(s): S $\rightarrow$ A — returns action a for state s

Optimal Policy π^*(s)

Goal: Find the best approximation of π^*

3 Reinforcement Learning in Latent Space

4 Deep Reinforcement Learning

5 Comparison

Classical Planning	**Deep Reinforcement Learning**	**Deep Reinforcement Learning**
Scalable, Highly-optimized solver for complex combinatorial problems	Works on the **implicit encoding** of the real world	Works on the **implicit encoding** of the real world
Guided by **domain-independent** heuristics	Reasoning is limited to the **1-step future** of the current state	Reasoning is limited to the **1-step future** of the current state
Requires an explicit encoding of the real world, written by human	guided by **instance-specific learned knowledge** (specific object, situation, goal)	guided by **instance-specific learned knowledge** (specific object, situation, goal)

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