



# Rank the Episodes: A Simple Approach for Exploration in

# **Procedurally-Generated Environments**

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Paper

Code

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### **Background: Exploration is an Open Challenge for RL**



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Episode 1

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Episode 1

Episode 2



Episode 1





Episode 4



Episode 1

Episode 2

Episode 3

Episode 4

• **Procedurally-Generated Environments (PCG):** A new environment is generated in each episode. The agent needs to learn to generalize.



Episode 1



Episode 3

Episode 4

- **Procedurally-Generated Environments (PCG):** A new environment is generated in each episode. The agent needs to learn to generalize.
- Why challenging? The agent is not likely to see a state more than once.











Procedurally-Generated

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• Assumption: Episode-level exploration scores can better generalize.

• Episode-Level Exploration: We propose Exploration via Ranking the Episodes (RAPID)



**Ranking Buffer** 

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### Step 2: Ranking

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## **New SOTA on MiniGrid Benchmarks**



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## **New SOTA on MiniGrid Benchmarks**



- Fast: RAPID Accelerates the convergence with up to 10X.
- *Effective:* RAPID is the only one that works in KeyCorridor-S4-R3.



Paper: https://openreview.net/forum?id=MtEE0CktZht

Code: <u>https://github.com/daochenzha/rapid</u>