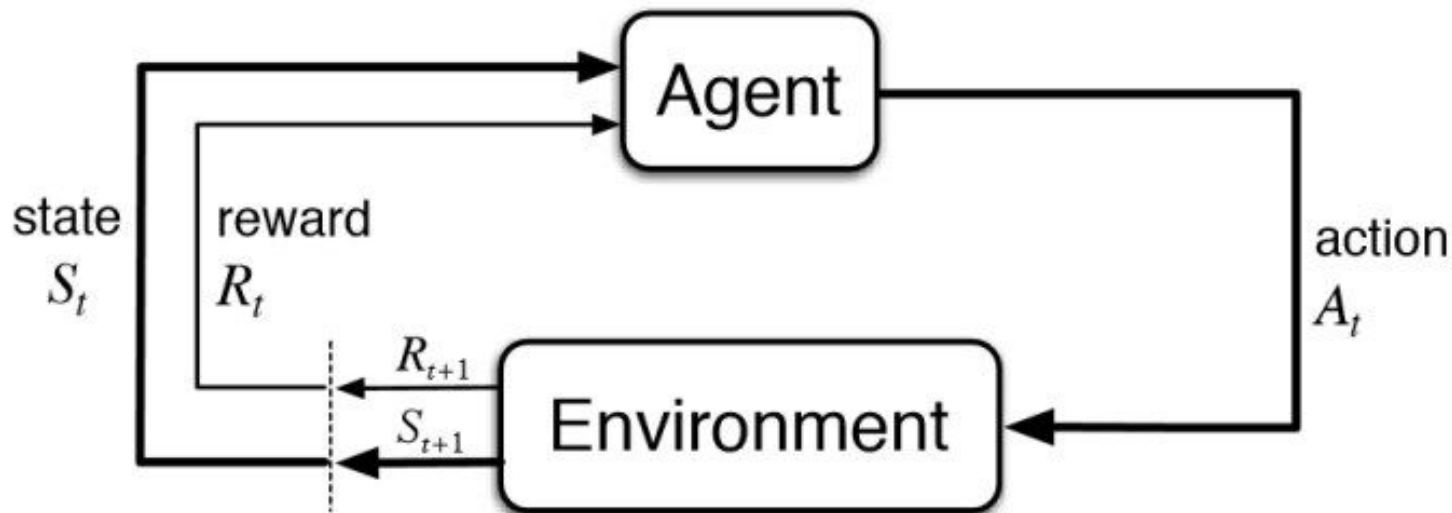


Improving Reward Shaping Via Language Instructions

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Reinforcement Learning (RL)



RL Tasks (Atari Games)

- Problem: **Sparse** rewards

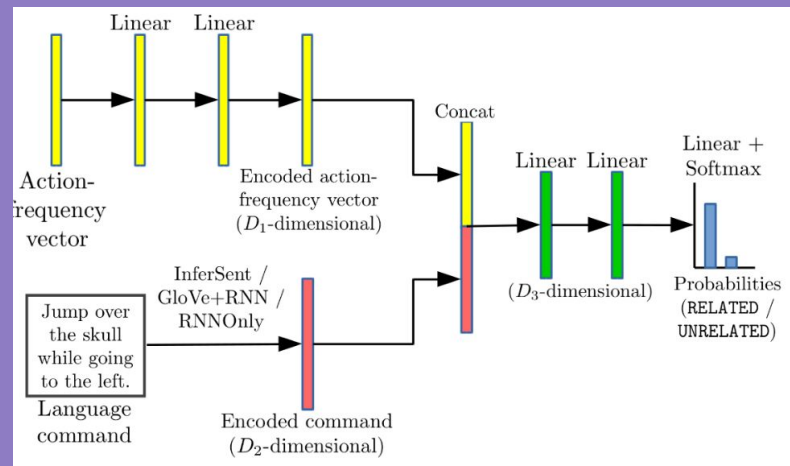
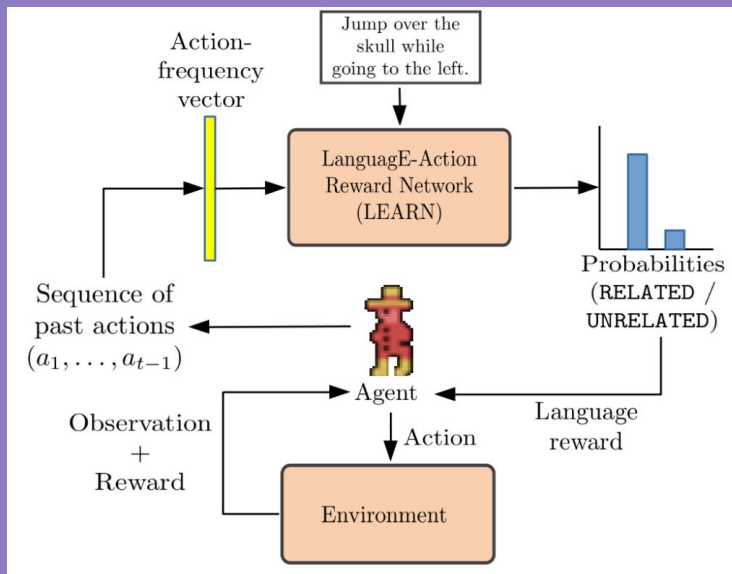


Figure 1: The Atari game Montezuma's Revenge is a classic task which shows the difficulty for solving sparse reward problems. Through out the game, the agent must perform long sequences of actions before receiving a reward at checkpoints.

1.	wait
2.	using the ladder on standing
3.	going slow and climb down the ladder
4.	move down the ladder and walk left
5.	go left watch the trap and move on
6.	climbling down the ladder
7.	ladder down and running this away
8.	stay in place on the ladder.
9.	go down the ladder
10.	go right and climb up the ladder
11.	just jump and little move to right side
12.	run all the way to the left.
13.	go left jumping once
14.	go left
15.	move right and jump over green creature then go down the ladder
16.	hop over to the middle ledge
17.	wait for the two skulls and dodge them in the middle
18.	walk to the left and then jump down
19.	jump to collected gold coin and little move
20.	wait for the platform to materialize then walk and leap to your right to collect the coins.

Figure 3: Examples of descriptions collected.

LanguageE-Action Reward Network (LEARN)



Our Planned Contribution

- Temporal ordering
- State-based Rewards
- Reward Function Modification