



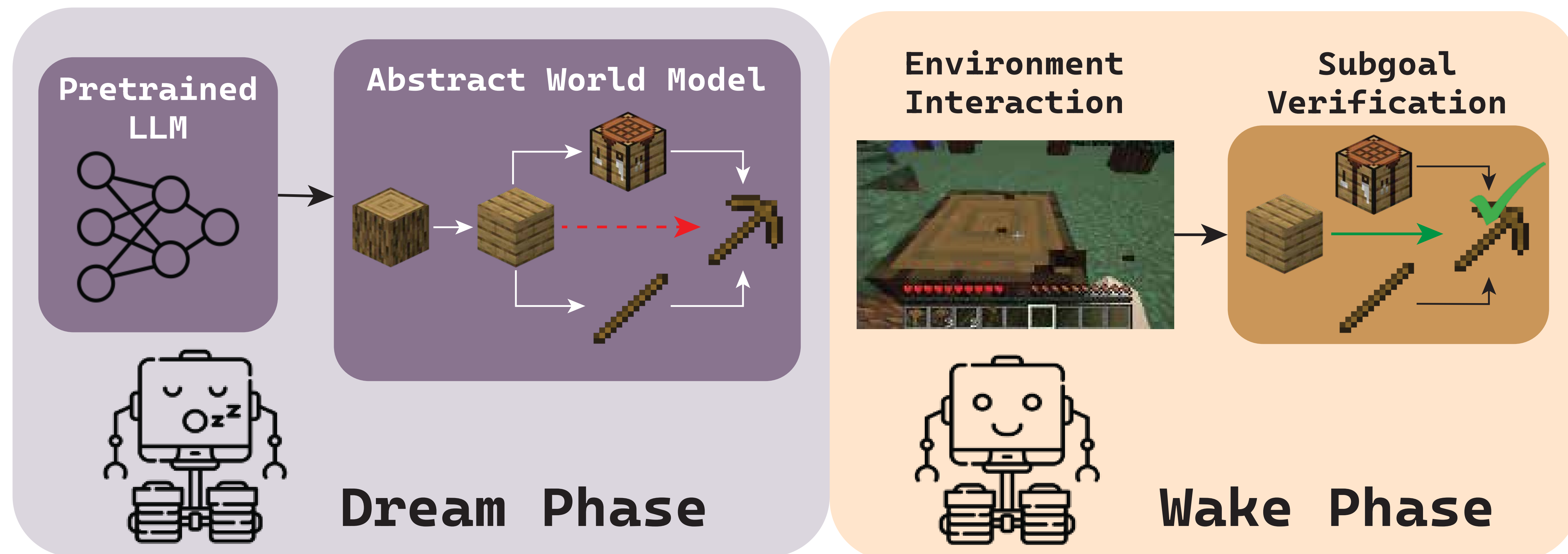
# Do Embodied Agents Dream of Pixelated Sheep?

Embodied Decision Making using Language Guided World Modelling

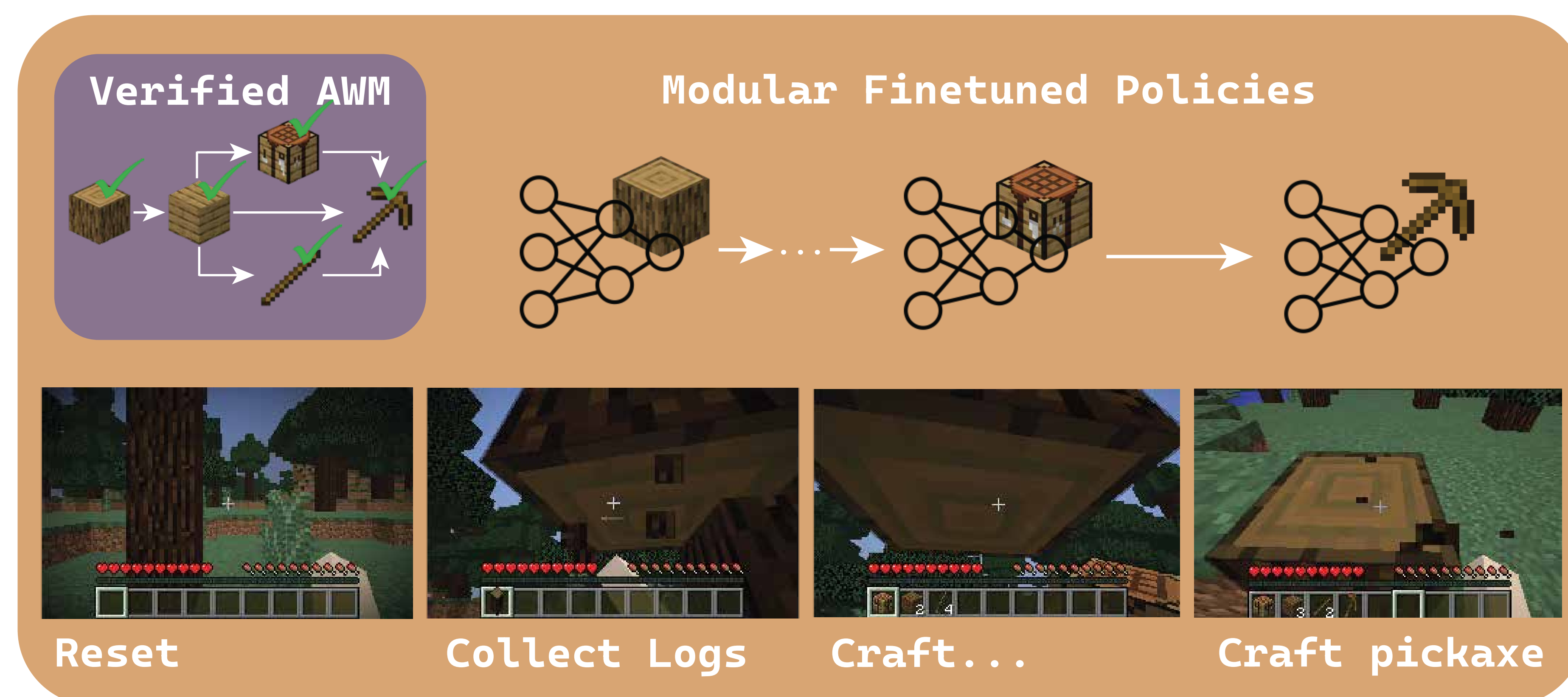
Kolby Nottingham<sup>1</sup> Prithviraj Ammanabrolu<sup>2</sup> Alane Suhr<sup>2</sup> Yejin Choi<sup>3,2</sup> Hannaneh Hajishirzi<sup>3,2</sup> Sameer Singh<sup>1,2</sup> Roy Fox<sup>1</sup>

1: University of California Irvine 2: Allen Institute for AI 3: University of Washington

## DECKARD Training



## DECKARD Inference



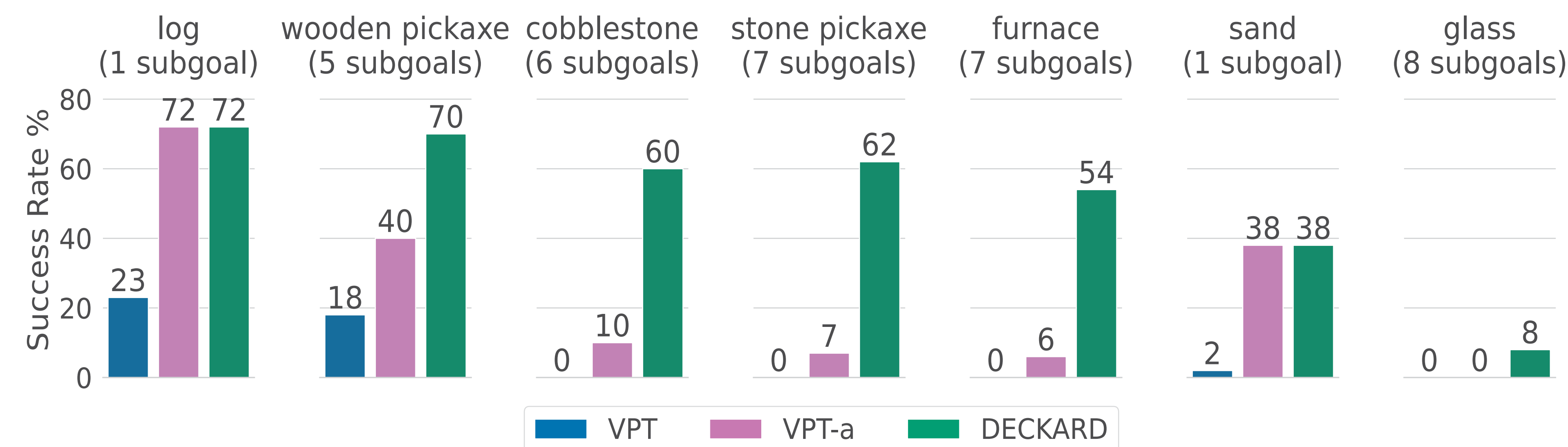
## Motivation

- Rather than learning tabula-rasa, RL agents can leverage existing knowledge.
- LLMs for decision making should have a way to verify output and correct errors.

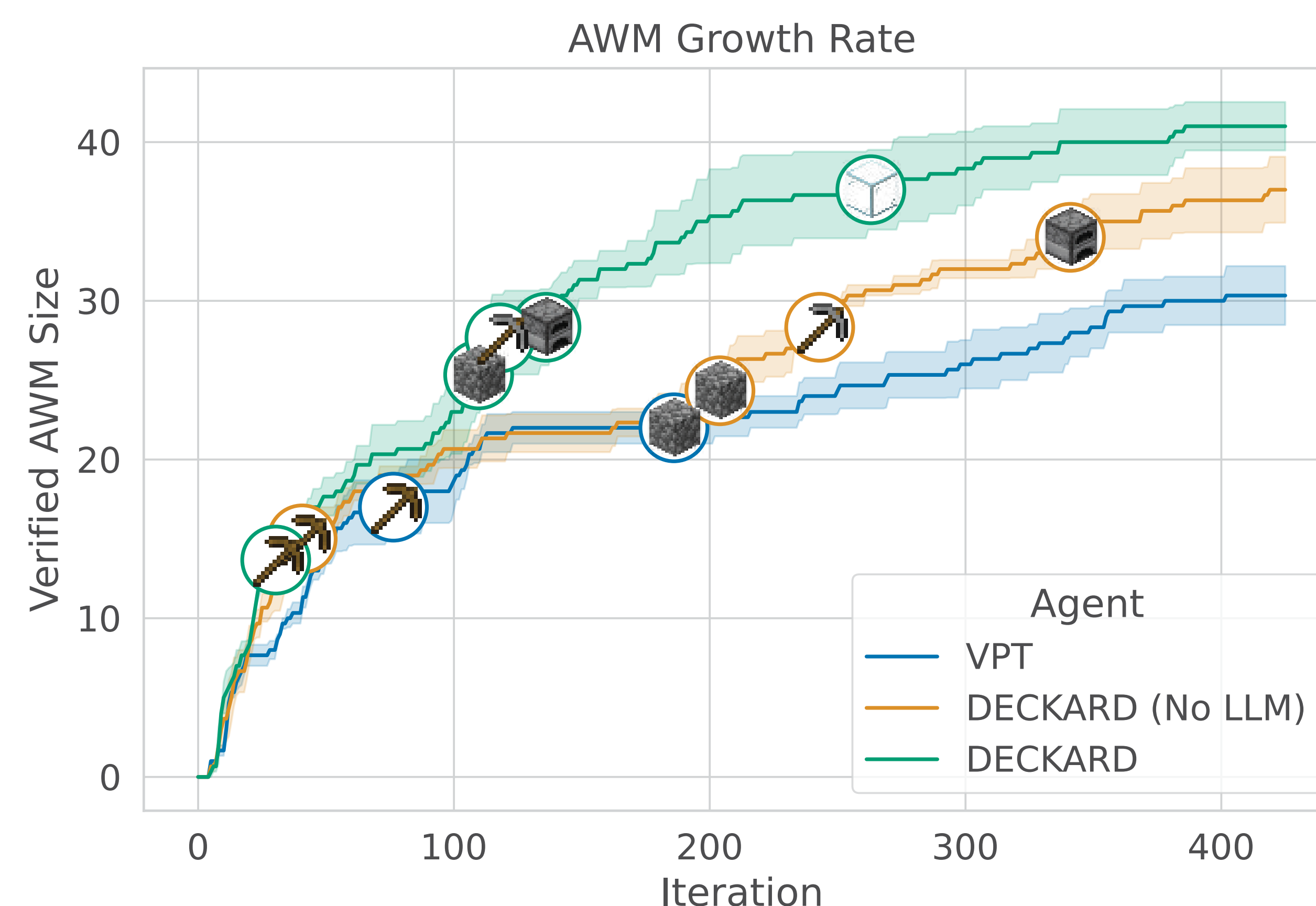
## Method

- DECKARD operates in two phases
1. Dream Phase
    - Sample the next subgoal from an LLM
  2. Wake Phase
    - Agent explores to reach subgoal
    - Subgoal is verified or corrected

## Results

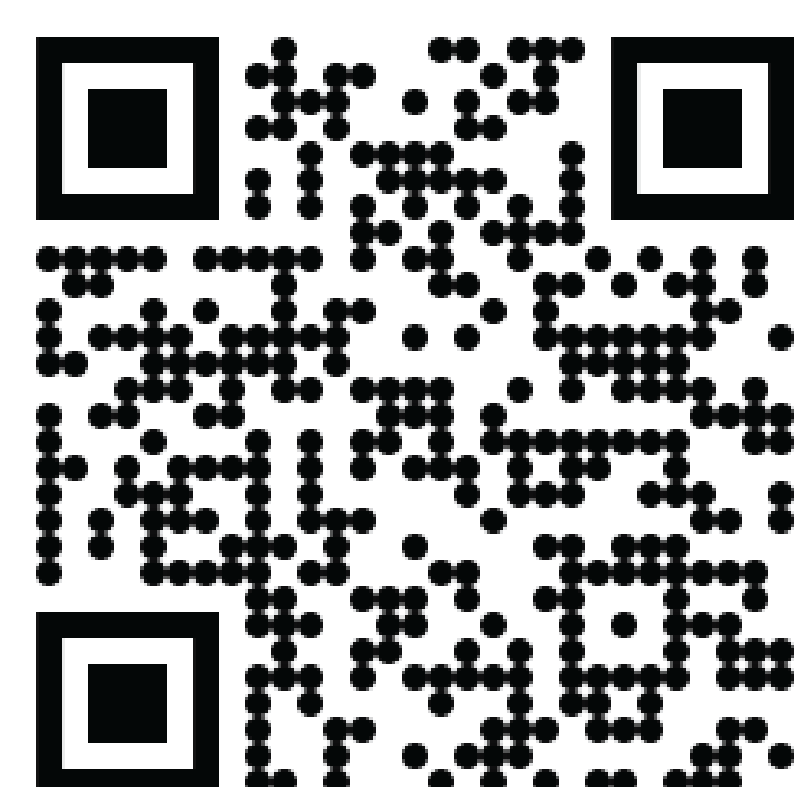


- DECKARD outperforms pretrained agents (VPT<sup>1</sup>) and RL finetuned agents (VPT-a) on crafting tasks.



- DECKARD discovers new recipes faster than baseline agents and ablations.

- LLM guidance is key to exploring the state space.



[deckardagent.github.io](https://deckardagent.github.io)  
[knotting@uci.edu](mailto:knotting@uci.edu)

1. Baker, B., Akkaya, I., Zhokov, P., Huizinga, J., Tang, J., Ecoffet, A., Houghton, B., Sampedro, R. and Clune, J., 2022. Video pretraining (vpt): Learning to act by watching unlabeled online videos. Advances in Neural Information Processing Systems, 35, pp.24639–24654.