CALVIN benchmark

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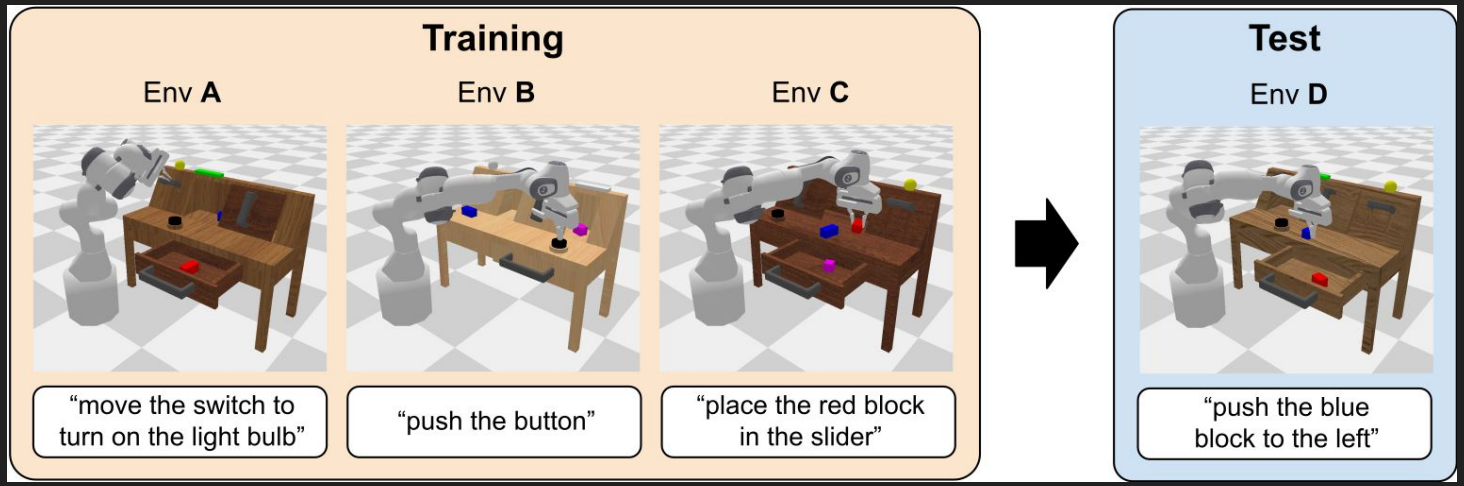
TL;DR

CALVIN consists of a novel manipulation benchmark for learning Goal Conditioned policies using either goal images or language as free-form text. It includes a simulated manipulation environment, an annotated dataset taken from Play, and a baseline algorithm (MCIL) introduced by Lynch & Sermanet (2).



Background

The key takeaways from previous work are listed below:

- **Learning Latent Plans from Play**
  - Goal Conditioned Behavior Cloning
  - Dataset generation via Goal Relabelling
- **Language Conditioned Imitation Learning over Unstructured Data**
  - MultiContext Imitation Learning

Dataset Generation via Goal Relabelling

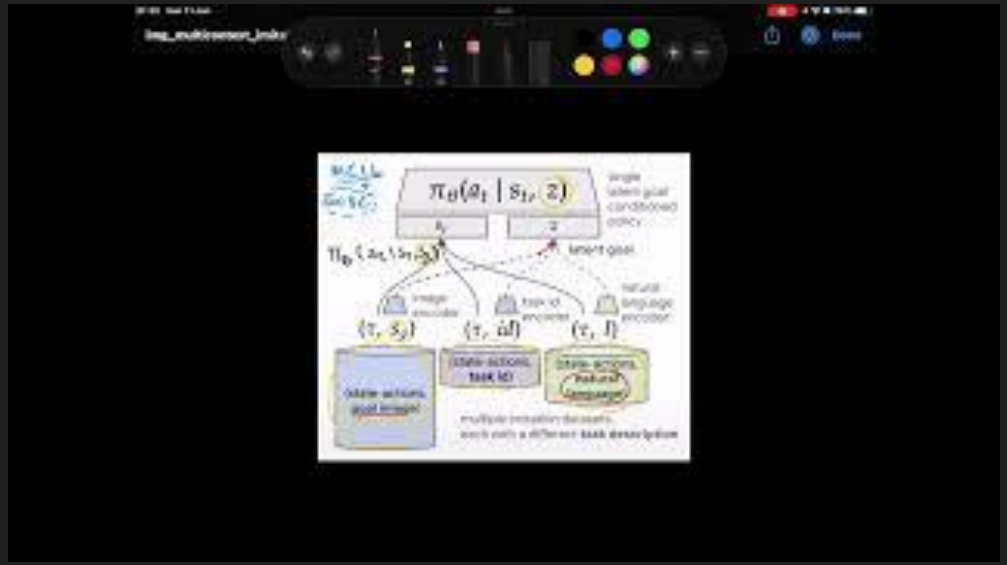
The data collected from Play is later separated into small 1-2 second sequences, from which the last step of this trajectory is labeled as a goal state which is used to condition the policy.

Goal Conditioned Behavior Cloning (GCBC)

The key idea of GCBC is to use a conditioning goal state to make the policy follow a specific task given by the goal image.

Multi Context Imitation Learning (MCIL)

MCIL key idea is to allow the user to condition using various sources, like goal images, or goals given by natural language. The idea is to have separate encoders that map the various contexts into a single latent goal vector.



References

1. Mess, Oier et. al. *CALVIN: A Benchmark for Language-conditioned Policy Learning for Long-horizon Robot Manipulation Tasks.*
2. Lynch, Corey & Sermanet, Pierre. *Language Conditioned Imitation Learning over Unstructured Data*.
3. Lynch, Corey et. al. *Learning Latent Plans from Play*