

# Hierarchical Experience Memory

## Workflow

- BookFlight
1. Open {{App\_Name}}
  2. Search flight: {{Origin}} to {{Dest}}
  3. Select Date: {{Date}}
  4. Click Search & Select Flight

## Subtask Skill

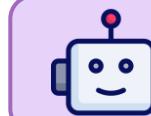
### Input Flight Details

1. Tap "From" bar and Type {{Origin}}
2. Tap "To" bar and Type {{Dest}}
3. Tap "Departure Date" and Scroll to {{Date}}

## Failure Pattern

Fix: Ensure date field is not empty.  
Pattern: Do not click {{Search\_Btn}} before {{Date}} is selected.

Book a flight from San Francisco to NYC on March 15.



## MLLM GUI Agent

Policy Update

## Stratified Group Sampling

Strong Guidance

Prompt: Query + Retrieved Workflow+ Subtask + Failure Pattern

Weak Guidance

Prompt: Query + Retrieved Workflow

No Guidance

Prompt: Query (Pure Exploration)

## Dynamic Curriculum

Guidance  $\downarrow$  as success rate  $\uparrow$

Memory Update

# Self-Evolving Loop

## Policy Optimization



No-guidance bonus



Guidance-aware Reward

Group Advantage Estimation

## Generated Trajectories

Group size = G

R1=0.8

R2=0.6

R3=0.2

## Experience Abstraction

### Successful Trajectories

Extract Plans & Replace "NYC" -> {{Dest}}

### Failed Trajectories

Failure Diagnoses to avoid