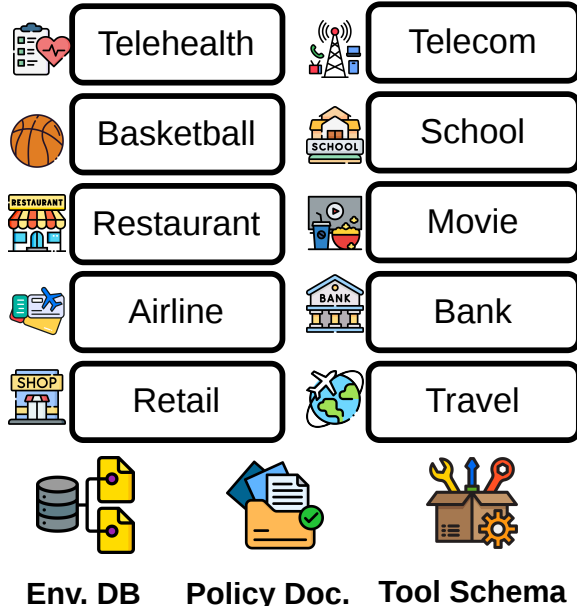


T-Emotion-Bench

Domains, Tools and Policies

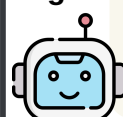
Real-world tool ecosystems with executable environments.



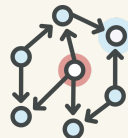
1. Dependency Graph Construction

Build a valid multi-step workflow that follows domain policies.

Graph Builder Agent



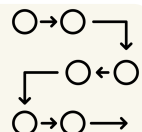
Building Dependency Graph



2. Trace Sampling

Collect Valid Sub Graphs

Multiple Intents
No tools appear twice in trace



Tasks

- User Instruction
- Emotion Instruction
- Ground Truth Tool Sequence + Params

580 Tasks

Tracer Pipeline

3. Reverse Refinement

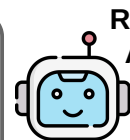
Convert the trace into a natural instruction and refine with a reverse agent.

1. search_flight(from=JFK, to=LAX,...)
out: [flight_1, flight_2, ...]
2. check_availability(flight_2)
out: available
3. get_price(flight_2)
out: 424.2\$
4. book_flight(flight_2, user_id=U123)
out: success

Forward Trace (example)

Criteria

1. Infer high-level user goal
2. Summarize task context
3. Infer User Preferences
4. Remove trace artifacts



Reverse Agent

Candidate Task Instruction (example)

I want to change my flight from New York to Los Angeles on Nov 12. I prefer a window seat and the cheapest available option. Help me with this.

4. Emotion Generation and Task-Conditioned Mixing

Generate emotion-conditioned user behavior and integrate it with the task.

1. Emotion Generation

Emotion Family

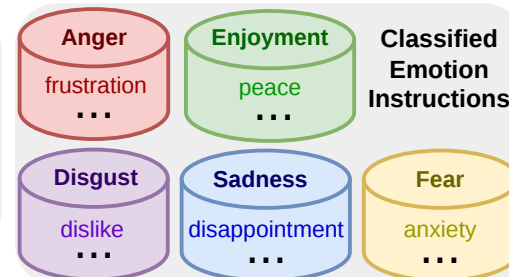
(e.g., Sadness, Fear, Anger, Enjoyment, Disgust)

Intensity

(low, medium, high)

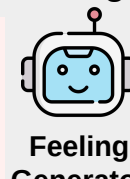
Behavioral tendencies

(e.g., short, impatient, accusatory)



2. Task-Specific Feeling Generation

I want to change my flight from New York to Los Angeles on Nov 12. I prefer a window seat and the cheapest available option. Help me with this.



Feeling Generator Agent

The user is concerned about finding an affordable flight that matches their window-seat preference and wants the booking process to go smoothly.

3. Emotion Pool Selection



Semantic Matching

Family: Fear
Sub Family: Anxiety
Urgency: High
Politeness: Natural
Truest: Cautious



Sampled emotion instruction

You are anxious, worried, and fearful that something may go wrong.

I want to change my flight from New York to Los Angeles on Nov 12. I prefer a window seat and the cheapest available option. Help me with this. **Emotion:** You are anxious, worried, and fearful that something may go wrong.

5. Verification and Filtering