Scene-Graph-based Prompting Messages Responses

1. System Message

You are an AI visual assistant in a 3D scene...

2. Demonstrations

Scene Graph Context:

{'sofa-1': {'attributes': {'color': 'red'}, 'relations': ['to the right of chair-2', 'in front of table-3']}, 'chair-2': {'attributes': {'color': 'brown'}, 'relations': []}}

Human-labeled Responses

3. Query(a new scene)
Scene Graph Context

1) Object scene caption

2) Scene caption

3) Dialogue(O-CoT)

4) QA(O-CoT)

5) Planning

Potential Issues:

- 1) Wrong Answers
- 2) Negative Responses
- 3) Responses with IDs
- 3) Others

Refined Responses

1. Wrong Answers

There are two curtains in the room.

2. Negative Responses

Question: Where is the football table? Thought: football table-17 Answer: unknown

3. Responses with ID

The kitchen cabinet-9 and kitchen counter-10 are parts of the kitchen.

4. Others

Unnecessary content (Thought, etc.)

1. Answer Refinement
There are 3 curtains in the room.

2. Removing Negative Responses The negative responses will be removed.

3. GPT-based rewriting
The kitchen features a cabinet and a counter.

4. Others

Remove unnecessary content.

Dialogue(O-CoT):

Dialogue Context: high level task: organize the bedroom. low level task: check some objects.

Human: I need help organizing my bedroom. Can you assist me? Thought: no specific objects

Assistant: Of course! What specifically do you need help with?

Human: Can you check if there are any clean clothes hanging on the wall?

Thought: clothes-13

Assistant: I'm sorry, but the clothes hanging on the wall are messy.

Human: Thanks for your help! Thought: no specific object

Assistant: You're welcome! If you need any further assistance, feel free to ask.



Scene Caption:

In this room, there is a wooden floor that is clean and flat. A tall wardrobe stand on the right side of a desk, close to a basket. The wardrobe is in front of a chair, a bed, and behind a bedside table. Clothes are hanging on a white wall, to the right of a closed curtain. The bed is wide, clean, and covered with blue blanket. The room has a comfortable and organized setting with functional furniture.

Object Scene Caption:

The showcase is supported by the wall and positioned behind, close to, and to the left of the shelf. The wall is flat, architectural, and dark in color. The shelf is made of wood and has a low size.

QA(O-CoT):

Question: Where is the printer located? Thought: printer-8

Answer: standing on the desk

Question: How many blankets are on the bed? Thought:

blanket-16, blanket-17 Answer: 2

Question: What is the type of the room? Thought:wardrobe-

2, desk-7, chair-11, bed-15 Answer: bedroom

Planning:

High-Level Task: Organize and tidy up the bedroom. Low-Level Actions:

- 1. Clean the floor by sweeping to remove any dirt.
- 2. Make the bed by arranging the blanket and pillows.
- 3. Place any loose items or belongings into the basket.
- 4. Arrange items on the shelves and showcase in a tidy way.