RoboFAC Dataset 🪙

Short-horizon Task

Medium-horizon Task

Long-horizon Task

Dynamic Task

spin

Real-World Task

Multiple Scenes & Camera Views

Quantitative Statistics

🔀 **10722 trajectories**
9440 failure | 1282 success

📝 **16 tasks**
12 simulation | 6 real-world

📷 **53 scenes**
Various backgrounds & objects

⚠️ **6 failure taxonomies**
Across 3 hierarchical levels

🔠 **78k Q&A pairs**
70K simulation | 8K real-world

Q&A Annotations

Task understanding
1. The robotic arm is performing <task>
2. Planning: <substage-1>, <substage-2>, ...

Failure analysis
3. The task is NOT succeeded
4. The failure type is <failure type>
5. The error happens in the <substage-k>
6. The error happens because <reason>

Failure correction
7. High-level: The robot should first do <subtask-a>, then do <subtask-b>
8. Low-level: The robot should move towards <direction> to align with ...

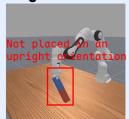# Failure Taxonomy

Task Planning Error

Forget to put the spoon

Pull wrong object
Expected object

Step omission   Wrong object

Motion Planning Error

Reach wrong position
Expected position

Not placed in an upright orientation

Position deviation   Orientation deviation

Execution Control Error

Slip out of the gripper

Grasp before the blue cube arrives

Grasping error   Timing error