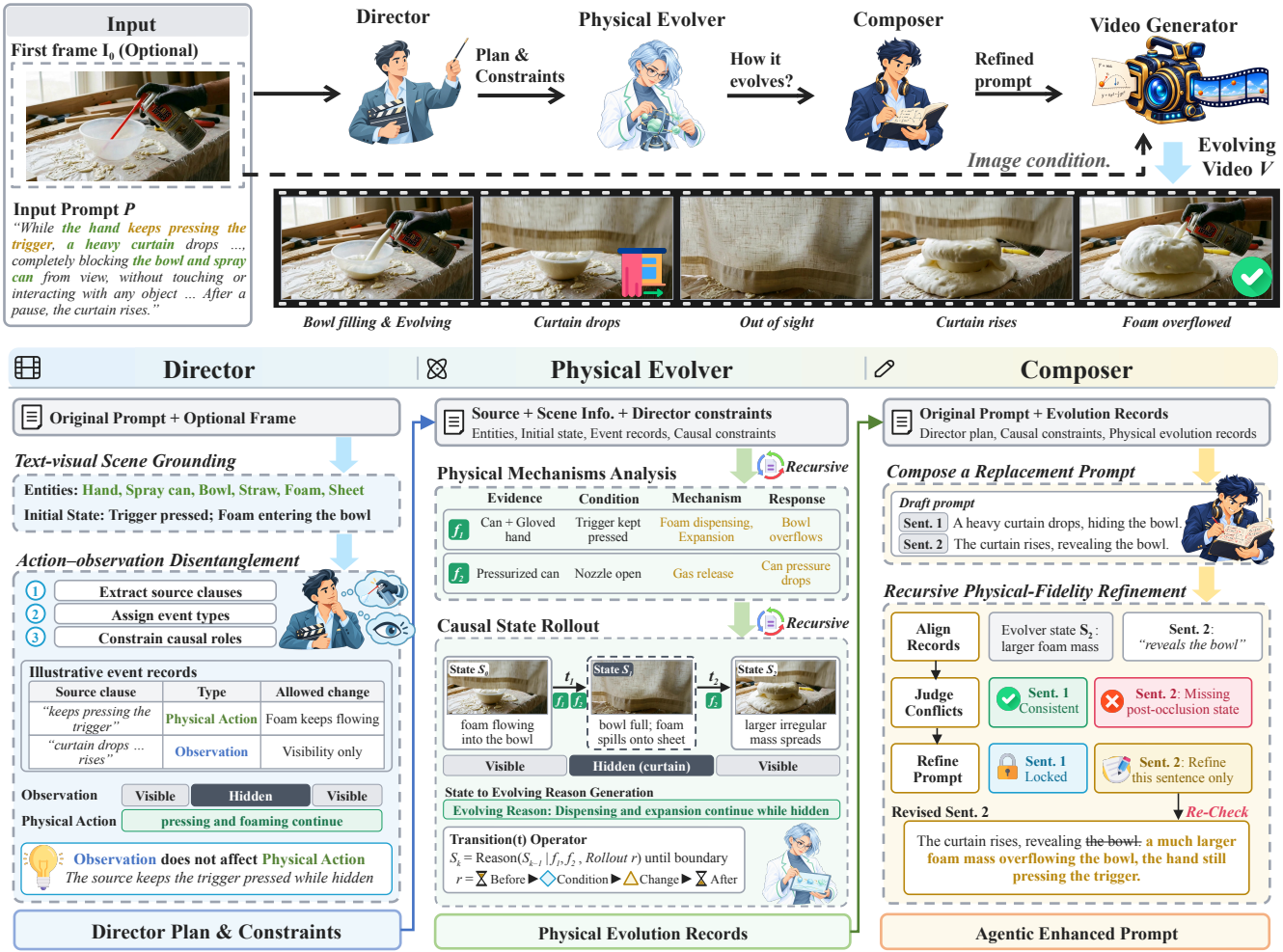
Input
First frame I_0 (Optional)
Input Prompt P
"While the hand keeps pressing the trigger, a heavy curtain drops ..., completely blocking the bowl and spray can from view, without touching or interacting with any object ... After a pause, the curtain rises."
Director
Plan & Constraints
Physical Evolver
How it evolves?
Composer
Refined prompt
Video Generator
Image condition.
Evolving Video V
Bowl filling & Evolving
Curtain drops
Out of sight
Curtain rises
Foam overflowed
Director
Physical Evolver
Composer
Original Prompt + Optional Frame
Text-visual Scene Grounding
Entities: Hand, Spray can, Bowl, Straw, Foam, Sheet
Initial State: Trigger pressed; Foam entering the bowl
Action–observation Disentanglement
1 Extract source clauses
2 Assign event types
3 Constrain causal roles
Illustrative event records
Source clause | Type | Allowed change
"keeps pressing the trigger" | Physical Action | Foam keeps flowing
"curtain drops ... rises" | Observation | Visibility only
Observation: Visible | Hidden | Visible
Physical Action: pressing and foaming continue
Observation does not affect Physical Action
The source keeps the trigger pressed while hidden
Director Plan & Constraints
Source + Scene Info. + Director constraints
Entities, Initial state, Event records, Causal constraints
Physical Mechanisms Analysis
Recursive
Evidence | Condition | Mechanism | Response
f_1 Can + Gloved hand | Trigger kept pressed | Foam dispensing, Expansion | Bowl overflows
f_2 Pressurized can | Nozzle open | Gas release | Can pressure drops
Causal State Rollout
Recursive
State S_0
foam flowing into the bowl
t_1 f_1 f_2
State S_1
bowl full; foam spills onto sheet
t_2 f_2
State S_2
larger irregular mass spreads
Visible | Hidden (curtain) | Visible
State to Evolving Reason Generation
Evolving Reason: Dispensing and expansion continue while hidden
Transition(t) Operator
S_k = Reason(S_{k-1} | f_1, f_2 , Rollout r) until boundary
r = Before ▶ Condition ▶ Change ▶ After
Physical Evolution Records
Original Prompt + Evolution Records
Director plan, Causal constraints, Physical evolution records
Compose a Replacement Prompt
Draft prompt
Sent. 1 A heavy curtain drops, hiding the bowl.
Sent. 2 The curtain rises, revealing the bowl.
Recursive Physical-Fidelity Refinement
Align Records
Evolver state S_2: larger foam mass
Sent. 2: "reveals the bowl"
Judge Conflicts
Sent. 1 Consistent
Sent. 2: Missing post-occlusion state
Refine Prompt
Sent. 1 Locked
Sent. 2: Refine this sentence only
Revised Sent. 2
Re-Check
The curtain rises, revealing ~~the bowl.~~ a much larger foam mass overflowing the bowl, the hand still pressing the trigger.
Agentic Enhanced Prompt