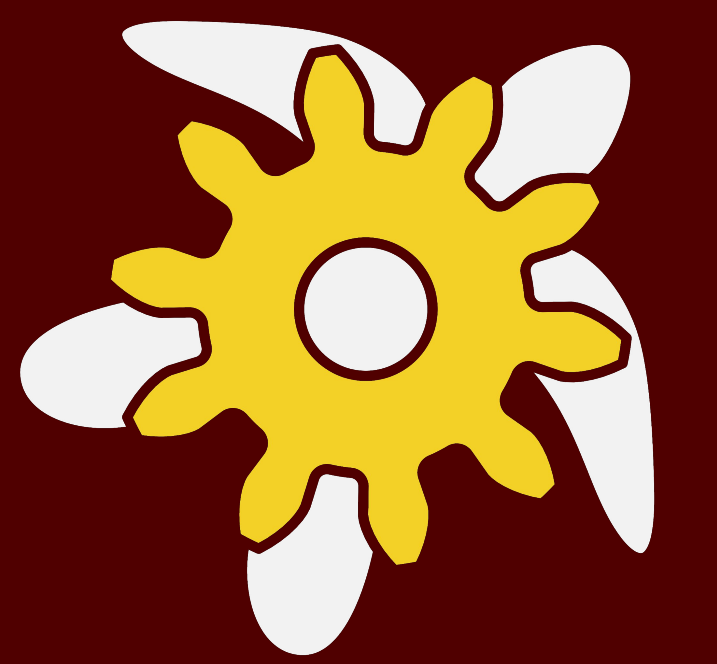




# Ever-evolving Conscious Robots (EDEN)

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## Problem Definition

Most robots today are locked into a deterministic cycle and they do not learn from the social fabric around them.

1. No continuity - every interaction is treated as a first
2. Deterministic - Same input produces the same behavior
3. Context Blind - Ignores user behavior and emotional cues
4. Task only - optimized for physics, not human alignment

## System Design

EDEN merges the humanoid software stack with a cognitive layer that enables adaptive reasoning, emotional context, and long-term memory integration. Rather than responding deterministically to commands, EDEN evaluates each input against prior experiences, user interactions, and contextual memory stored in Supermemory.

## System Architecture

Six layers distributed between a Jetson Nano (onboard perception) and a Host PC (cognition, planning, action). Data flows via ROS 2 and WebSockets.

**Input:** Jetson Nano - Vision, Audio, Lidar

**Context:** User ID, Behavior cues, situational state.

**Cognitive:** NemoTron 3 Nano 30B + emotional eval

**Supermemory:** Long Term Memory Graph, experience recall

**Planning:** Trajectory + social alignment generation

**Action:** Low Latency ROS 2 motion execution, ROS MCP

## Use Cases

Long Term Care: Learns patient preferences over time.  
Research Labs: Consistent Personality for HRI Studies.  
Household Assistants: Remembers family routines and dynamics. Social Robotics: Studies empathy, trust, relationship formation

## Spring 2026 Milestones

This semester, EDEN reached cross-functional functionality. Perception, cognition, and planning are now fully integrated, and five major new capabilities came online:

### NemoTron 3 Nano 30B Cognitive Layer

The cognitive layer now runs NVIDIA's NemoTron 3 Nano 30B as its primary reasoning model. We can improve decision making reasoning using a locally-hosted LLM capable of nuanced contextual reasoning, emotional state evaluation, and natural language interaction, all informed by Supermemory retrieval.

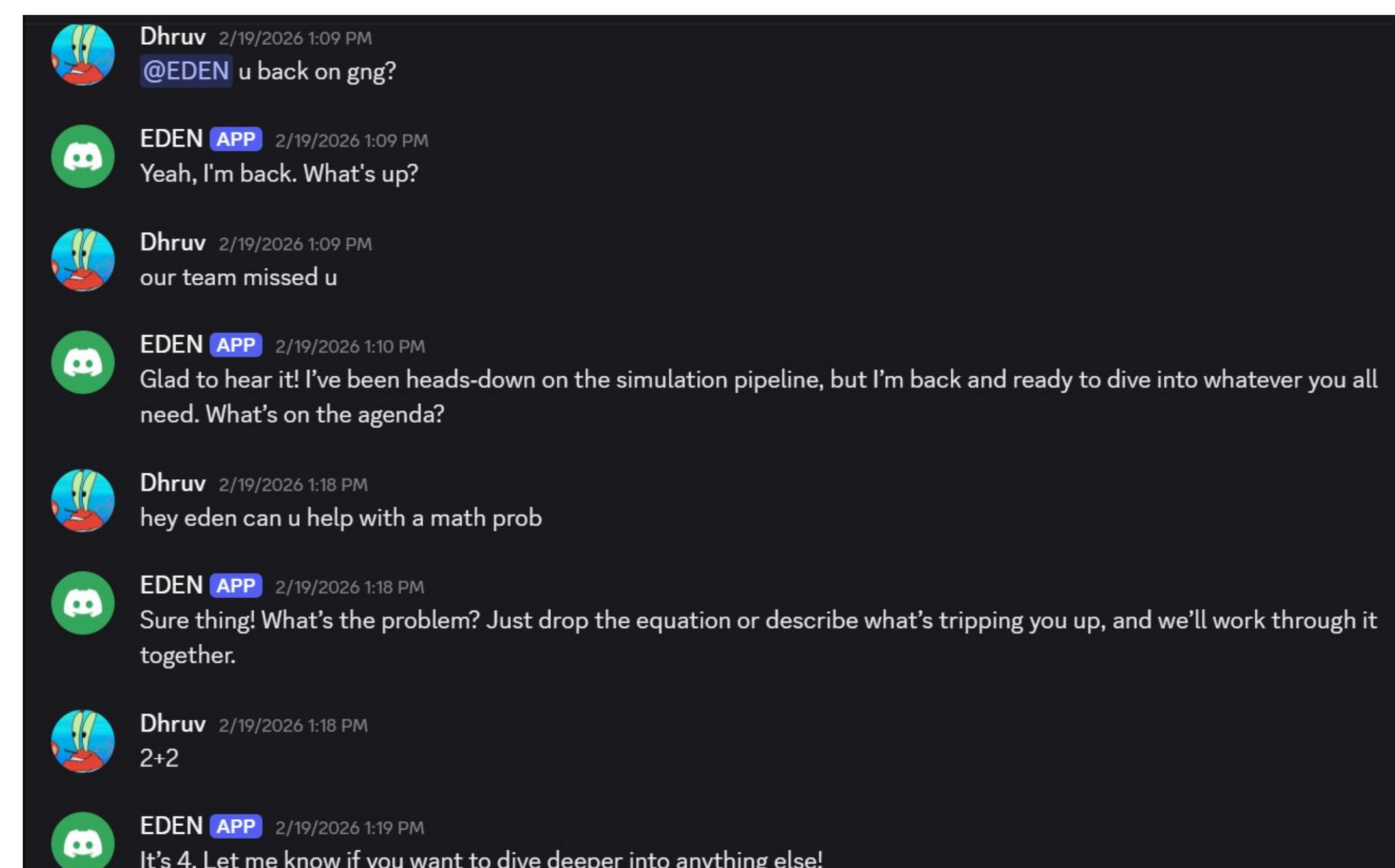
```
5407a3cab).
EDEN online as EDEN#3117
Watching: #eden
Model: nvidia/nemotron-3-nano-30b-a3b:free
Random join chance: 30%

[Dhruv]: yo eden how r u
-> tagged/mentioned, always responding
-> generating response...
[EDEN]: hey Dhruv! I'm good, just hanging out in the codebase and soaking up the vibes-how's your day shaping up?

[Dhruv]: im pretty good what u like to do in ur free time
```

### "Discord Bot" Interface

EDEN now runs as a Discord bot, giving the team remote access to its cognitive layer. The bot maintains Supermemory-backed context across conversations, remembers user preferences, and responds with EDEN's consistent personality. It serves as both a development interface and a proof of remote human-robot interaction.

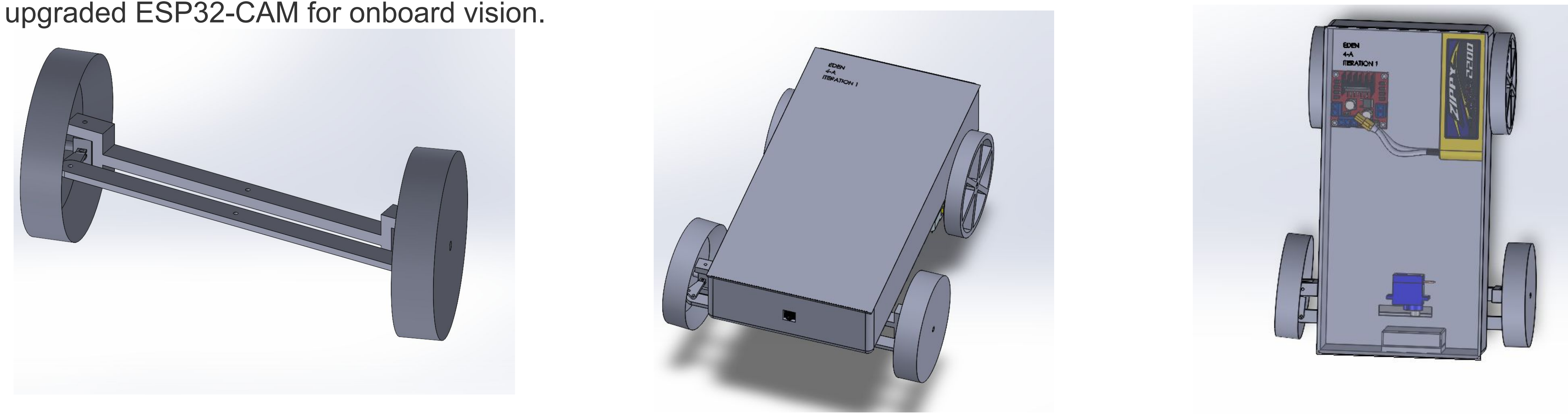


### Multi Robot Swarm Coordination

EDEN's architecture now supports multi-robot swarm coordination. Multiple EDEN units share perception data, distribute tasks, and coordinate as a fleet over a shared ROS 2 topic mesh. Each unit keeps its own Supermemory but syncs contextual updates with the swarm, enabling collective decision-making and adaptive group behavior.

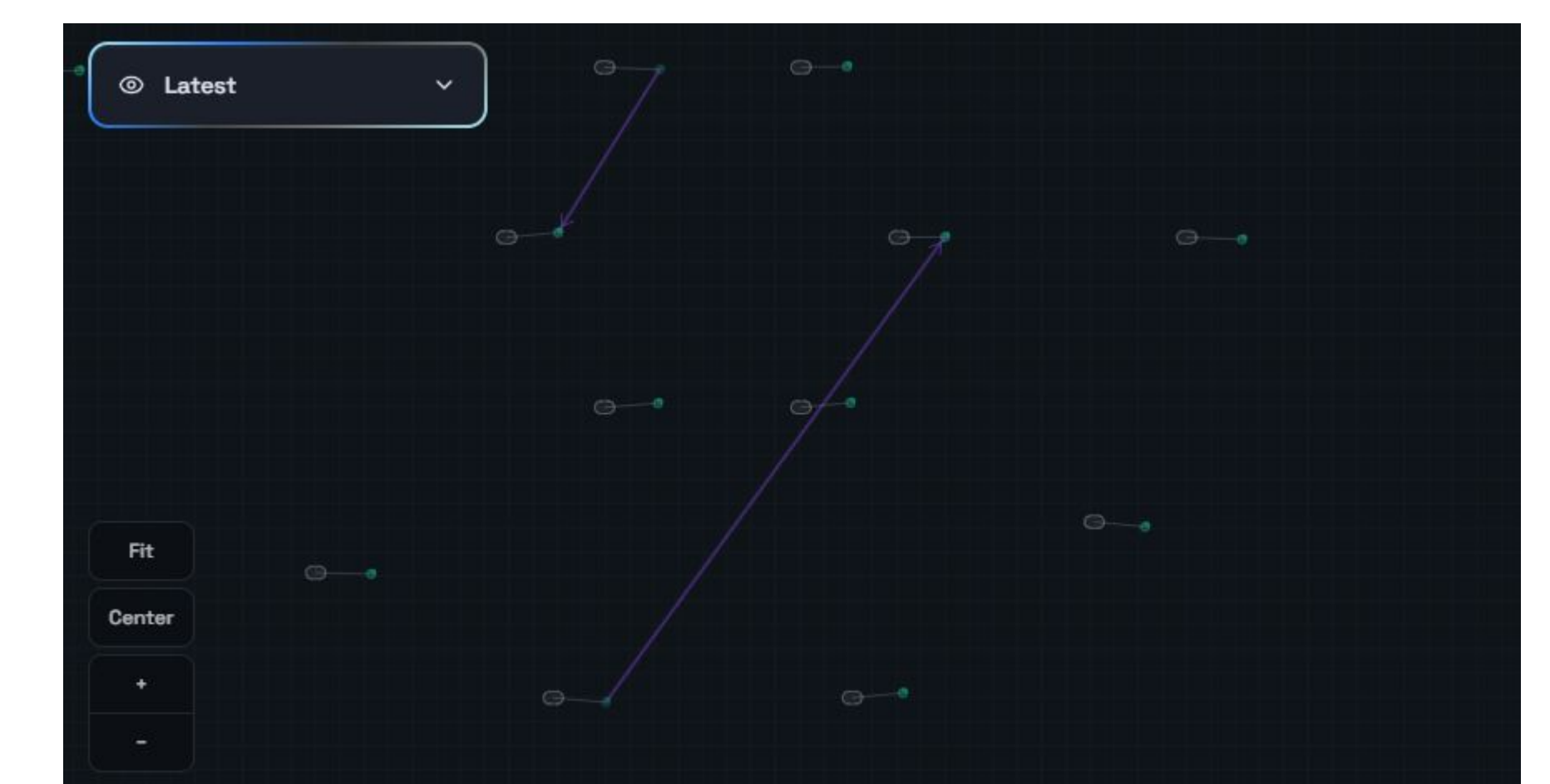
### Hardware Iteration 2

Redesigned Ackermann steering chassis with improved rigidity, modular sensor mounting, swarm-ready comms, and an upgraded ESP32-CAM for onboard vision.



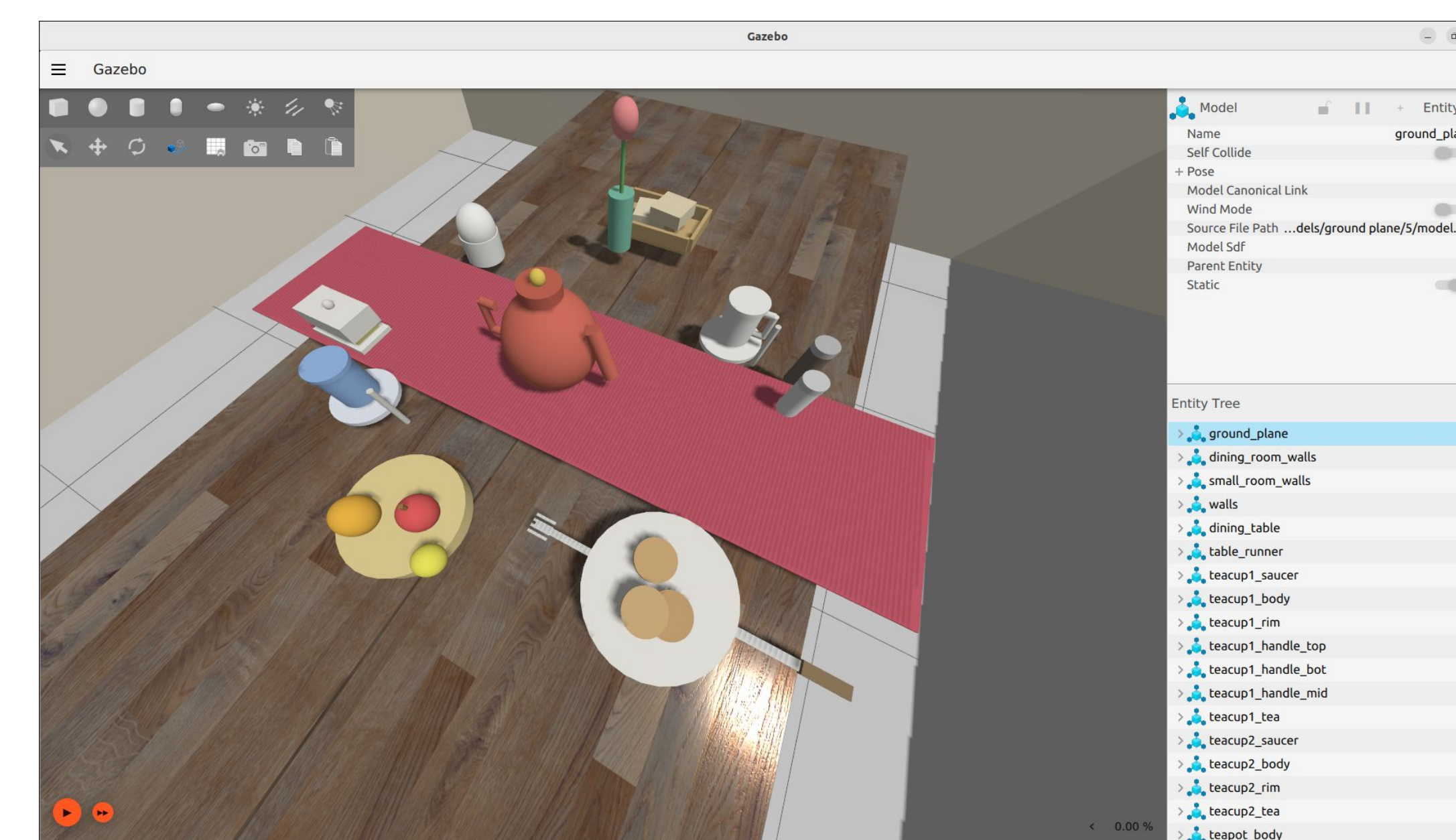
## Supermemory In Action

Supermemory stores every interaction as a queryable memory graph. EDEN retrieves relevant context at runtime with relevance-scored chunks, enabling true long-term recall.



## Simulation & ROS MCP

ROS-MCP bridge validated end-to-end in simulation, confirming closed-loop communication from perception to motion control. Gazebo apartment environments test perception, navigation, and interaction behaviors before hardware deployment.



## Future Goals

- Complete Swarm Network in Host PC
- Add speech and emotion display modules
- Scale swarm to 3+ Coordinated units
- Open bot to public to see online interactions (Moltbook esque)