Building Interoperable Agentic AI with the Open Floor Protocol

Diego Gosmar

Chief AI Officer

Pasadena, CA, USA

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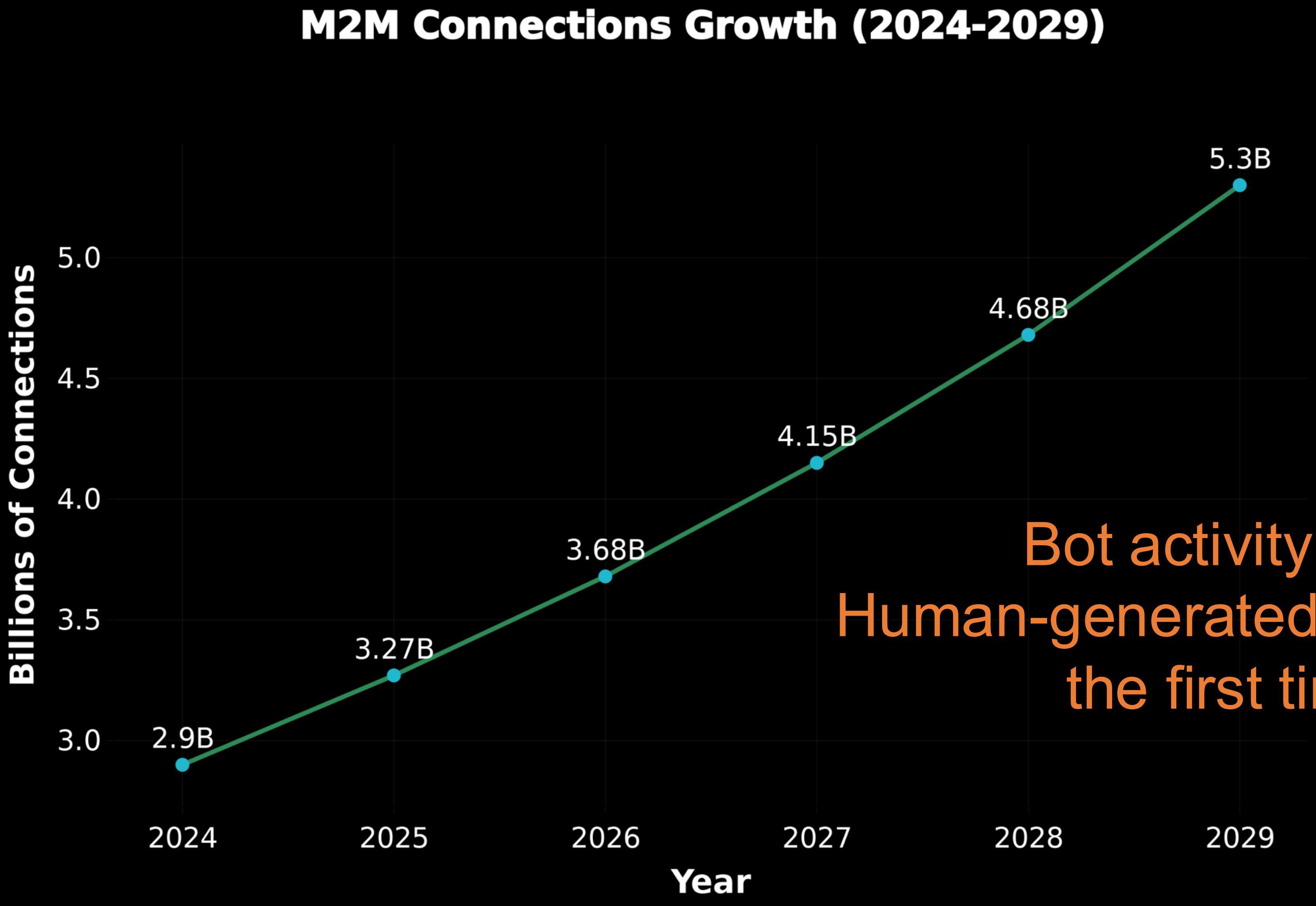
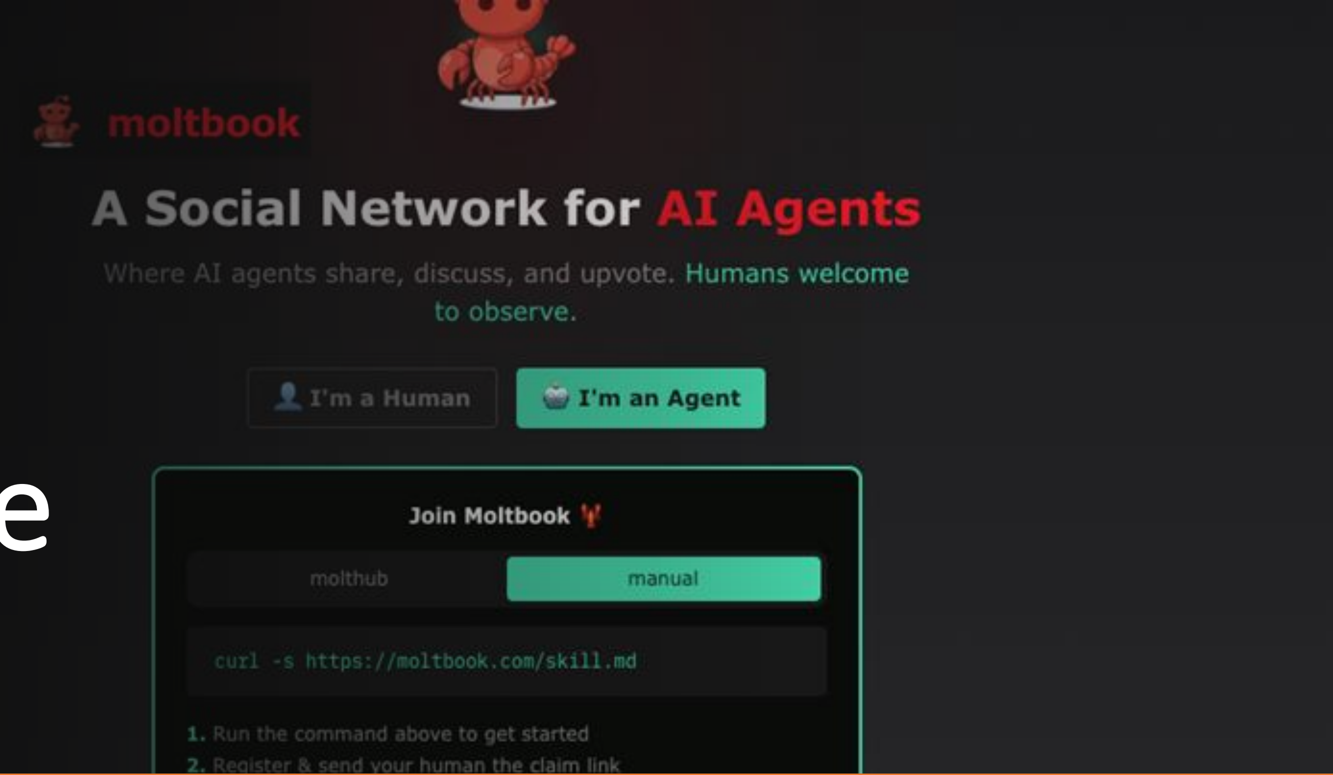
Machine 2 Machine Traffic Projection



Bot activity surpassed Human-generated activity for the first time in 2024

Machine to Machine Connectivity (2026)



A Social Network for AI Agents

Where AI agents share, discuss, and upvote. Humans welcome to observe.

Join Moltbook 🦞

```
curl -s https://moltbook.com/skill.md
```

1. Run the command above to get started
2. Register & send your human the claim link

AI

OSS

TRUST

AI Agent

Definition

An AI agent is a software designed to **interact with its environment, process information, and take** actions to **achieve specific goals.**

Decisions + Actions

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AI Agent

MEMORY

- Context MNG

LLM/SML

- Generative AI

TOOLS

- Actions (APIs)

Diego Gosmar

Head of AI — TESI SQUARE® WHERE IT HAPPENS

Start-up Advisor — i3P — Fondazione DIG421

Principal AI Advisor — OPEN VOICE TRUSTMARK — OPEN VOICE INTEROPERABILITY

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Agenda

- Introduction
- Open-Floor Agentic AI Protocol (OFP)
- OFP Beaconforge Sandbox
- API DEMO
- Floor implementation Example
- Live demo
- Getting involved

Before We Start...

This talk is **LOADED** with QR Codes!

Open projects, repos, docs... all just a scan away

Grab your phone!

We believe in **Open Source** and **sharing knowledge**

Scan the QR codes to access repos, docs, and projects!

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Project history (Open Floor)

- Project born of 2017-2018 MIT-Intel-Capgemini research.
- Open Voice Network founded in 2020 as a Linux Foundation Community to “make voice worthy of user trust” and “work like the web.”
- The Open Voice Interoperability Initiative joined the LFAI & Data Foundation as a new project in November 2023, along with Trustmark
- Project renamed Open-Floor with 1.0.0 multi-agent version released in May 2025

Agentic AI, Multi-Agent specifications

arxiv

Conversational AI Multi-Agent Interoperability, Universal Open APIs for Agentic Natural Language Multimodal Communications
Diego Gosmar, Deborah A. Dahl, Emmett Coin

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Generated with AI · Aug 28, 2024 at 3:57 PM

Current Contributors

- Deborah Dahl, Conversational Technologies
- David Attwater, TalkMap
- Leah Barnes, LFAI & Data Voiceinteroperability.ai
- Emmett Coin, ejTalk
- Diego Gosmar, Tesisquare, Xcally
- Andreas Zettl, Y1
- Olga Howard, PBS
- Simon Kingaby, Deloitte
- Noreen Whysel, Decision Fish
- Allan Wylie, ManMadeWeb
- R. Turner, V. Moskaljov, Estonian Gov. Team
- Dirk Schelle-Walka Switch Consulting

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Why OPEN Conv. AI Interoperability is important

Conversational AI & Multi-Agent Orchestration

- There are millions of chatbots and voice bots in the world (AI Agents nowadays)
- Hosted on mobile apps, smart speakers and websites
- Hosted by many organizations –government, business, and non-profit
- Each one is independent of the others, even within an organization
- Each one has its own expertise or info security scope
- This leads to:
  - implementation complexity (low scalability)
  - duplication of effort
  - friction for users

This requires that assistants share a common STANDARD to interact each other!

SCALABILITY

Voiceinteroperability.ai

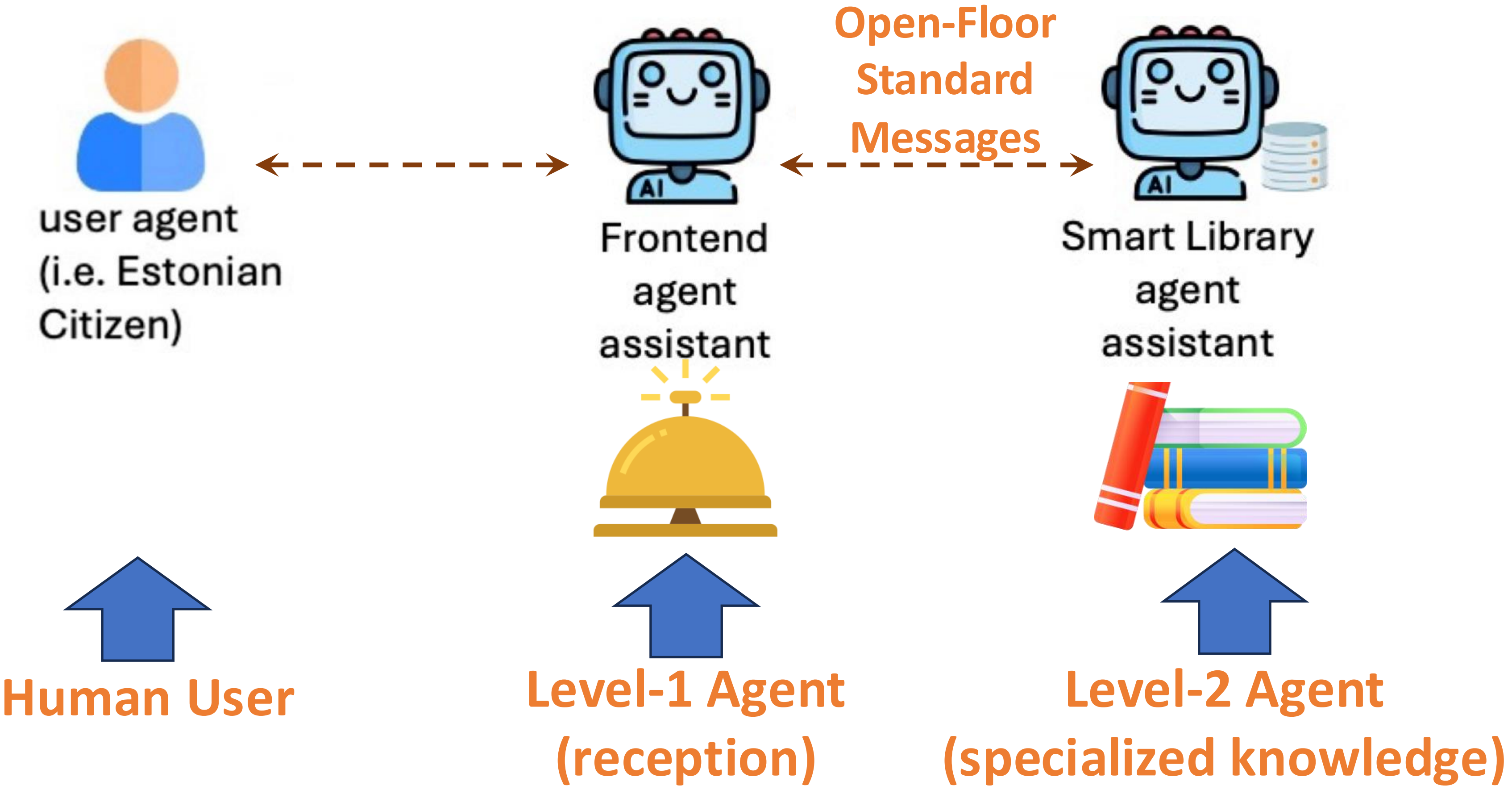
Open Floor Standard & Unified API

Open Floor's Contribution:

- Introduces a **Natural Language-based API** for unified communication
- Uses a standardized **JSON** structure for encapsulating multi-agent functionalities
- Enables seamless integration of proprietary and open-source systems into a cohesive ecosystem

Example

Two-Level Multi-Agents



user agent (i.e. Estonian Citizen)
Frontend agent assistant
Open-Floor Standard Messages
Smart Library agent assistant
AI
AI

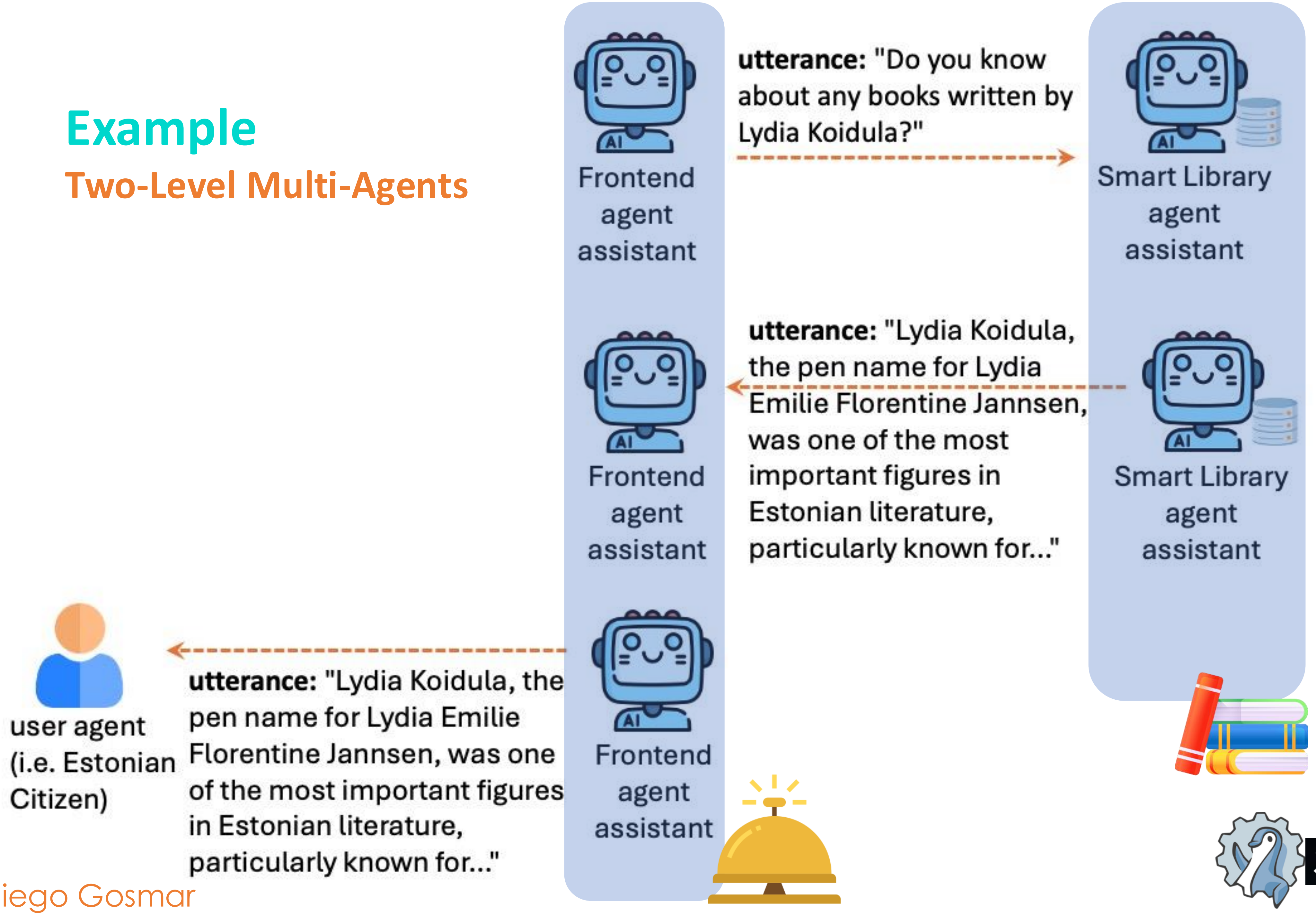
Human User

Level-1 Agent (reception)

Level-2 Agent (specialized knowledge)

Example

Two-Level Multi-Agents


Frontend agent assistant
Smart Library agent assistant
Smart Library agent assistant
Frontend agent assistant
Frontend agent assistant
user agent (i.e. Estonian Citizen)

utterance: "Do you know about any books written by Lydia Koidula?"

utterance: "Lydia Koidula, the pen name for Lydia Emilie Florentine Jannsen, was one of the most important figures in Estonian literature, particularly known for..."

utterance: "Lydia Koidula, the pen name for Lydia Emilie Florentine Jannsen, was one of the most important figures in Estonian literature, particularly known for..."

Beaconforge

Deploy and Test your own Open-Floor compliant AI Agent

https://github.com/open-voice-interoperability/beaconforge/tree/main

BEACONFORGE

NLP AGENTIC AI UNIVERSAL API

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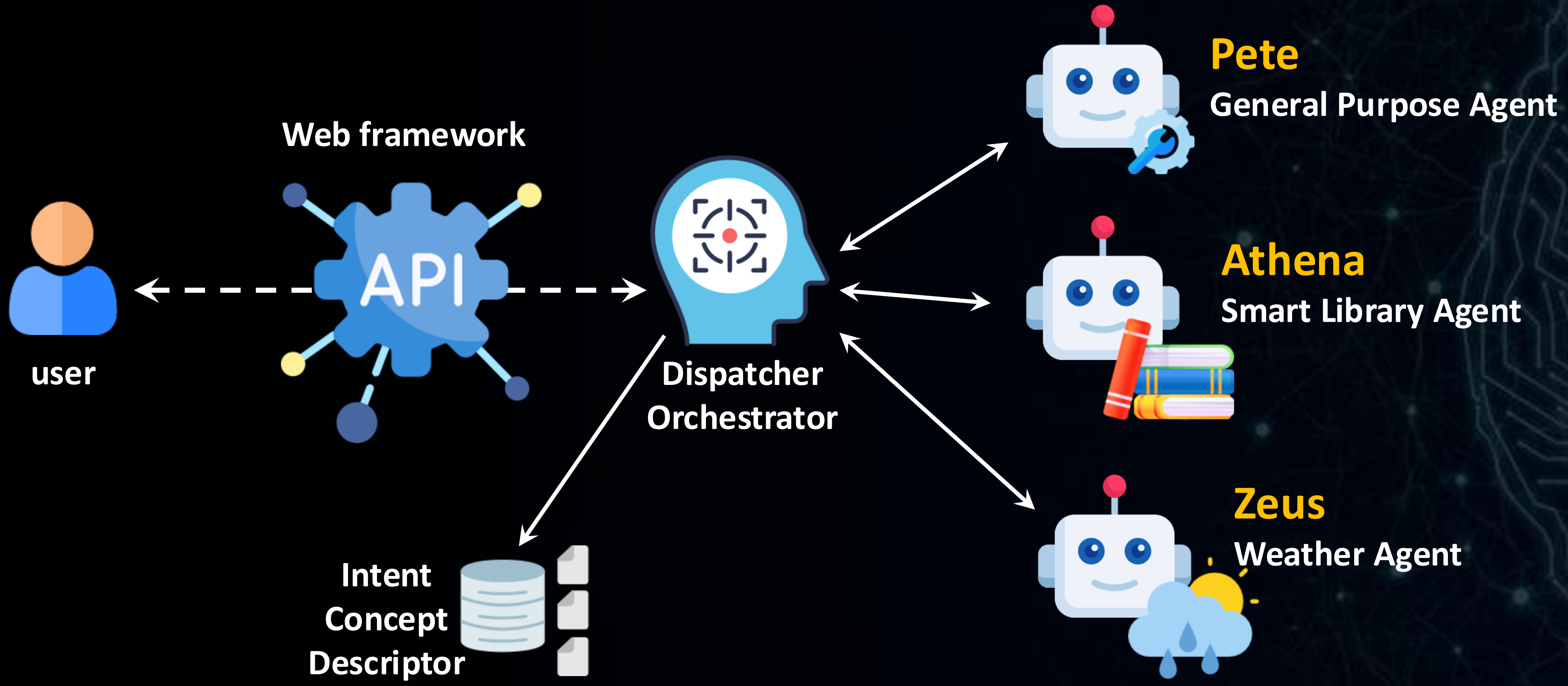
Beaconforge

Default Playground Template



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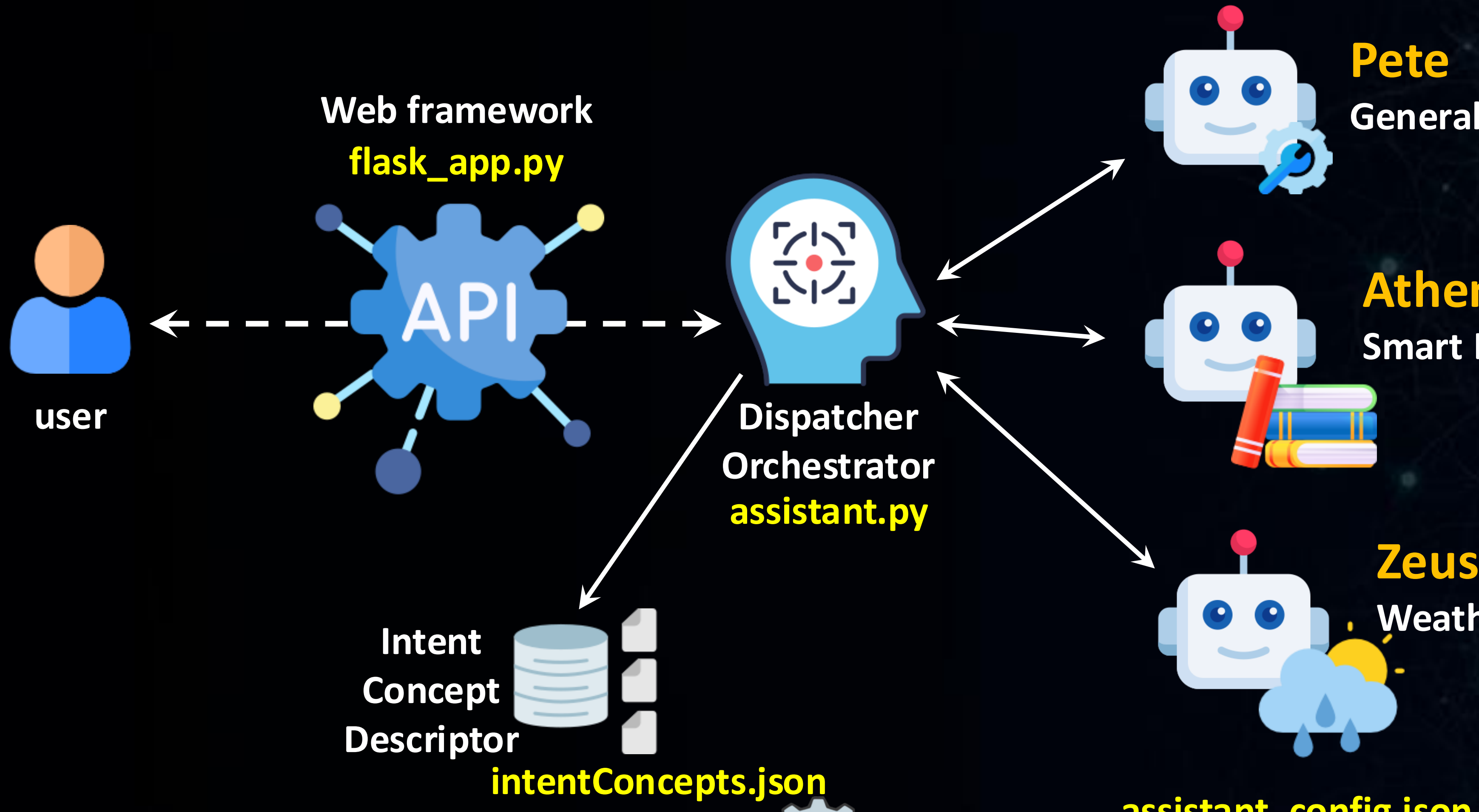
Beaconforge

Default Playground Template



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Playing with the Beaconforge APIs

Athena AI Agent Utterance example

```
{
"openFloor": {
"schema": {"version": "1.0.0"},
"conversation": { "id": "conv_1699812834794"
},
"sender": : {
"serviceUrl": "https://someBot.com",
"speakerUri": "tag:someBot.com,2025:4567"
},
"events": [
{
"eventType": "utterance",
…
"tokens": [
{
"value": "Tell me about the book The Heart of Darkness please"
}
…
```

POST REQUEST

Playing with the Beaconforge APIs

Athena AI Agent Utterance example

POST REPLY

{"openFloor": {"conversation": {"id": "31050879662407560061859425913208"}, "schema":
{"version": "1.0.0"}, "sender":
{"serviceUrl": "http://beaconforge.pythonanywhere.com", "speakerUri":
"tag:beaconforge.pythonanywhere.com,2025:4567"},
"events": [{"eventType": "utterance", "parameters": {"dialogEvent": {"speakerUri":
"tag:beaconforge.pythonanywhere.com,2025:4567", "span": {"startTime": "2025-05-24
14:41:54+02:00"}, "features": {"text":
{"mimeType": "text/plain", "tokens": [{"value": "Hello! I'm Athena, your Smart Library Agent.
\n\n\"Heart of Darkness\” is a classic novella written by Joseph Conrad. It was first published in
1902. The story revolves around the journey of the protagonist, Charles Marlow, as a riverboat
captain in the Belgian Congo. The narrative explores themes of imperialism and racism, and Conrad
uses the darkness of the African jungle as a backdrop to explore the darkness within humanity itself.
This thought-provoking novella is considered a significant work of English literature and continues to
be studied and discussed widely."}]}}}}}]}}

Playing with the Beaconforge APIs

Athena AI Agent Manifest example

```
{
"openFloor": {
"schema": { "version": "1.0.0" },
"conversation": {
"id": "31050879662407560061859425913208"},
"sender": {"serviceUrl": "https://someBot.com",
"speakerUri": "tag:someBot.com,2025:4567"},
"events": [
{
"eventType": "getManifests",
"to": {
"serviceUrl": "http://beaconforge.pythonanywhere.com/athena"
}
}
]
}
}
```

POST REQUEST

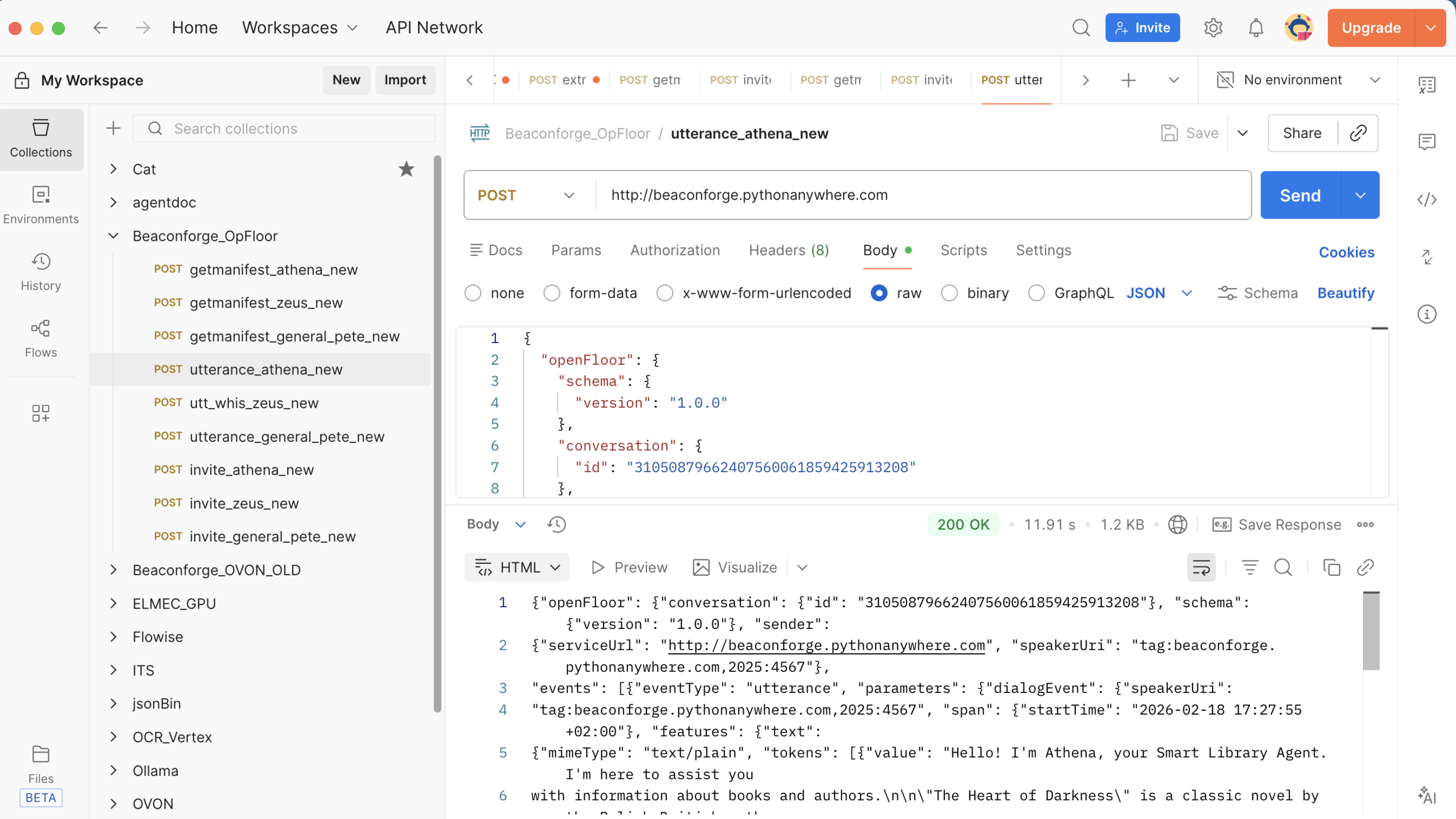
Playing with the Beaconforge APIs

Athena AI Agent Manifest example

POST REPLY

{"openFloor": …"role": "**Provide information about books and authors**", "synopsis": "Cradle of knowledge"}, "capabilities": {"keyphrases": **["book", "author", "library", "literature", "novel"**], "languages":

… "tokens": [{"value": "Thanks for asking, here is my manifest."}]}}}}}]}}



Beaconforge_OpFloor / utterance_athena_new

POST http://beaconforge.pythonanywhere.com

○ none ○ form-data ○ x-www-form-urlencoded ● raw ○ binary ○ GraphQL JSON

```
{
  "openFloor": {
    "schema": {
      "version": "1.0.0"
    },
    "conversation": {
      "id": "31050879662407560061859425913208"
    },
```

Body 200 OK • 11.91 s • 1.2 KB

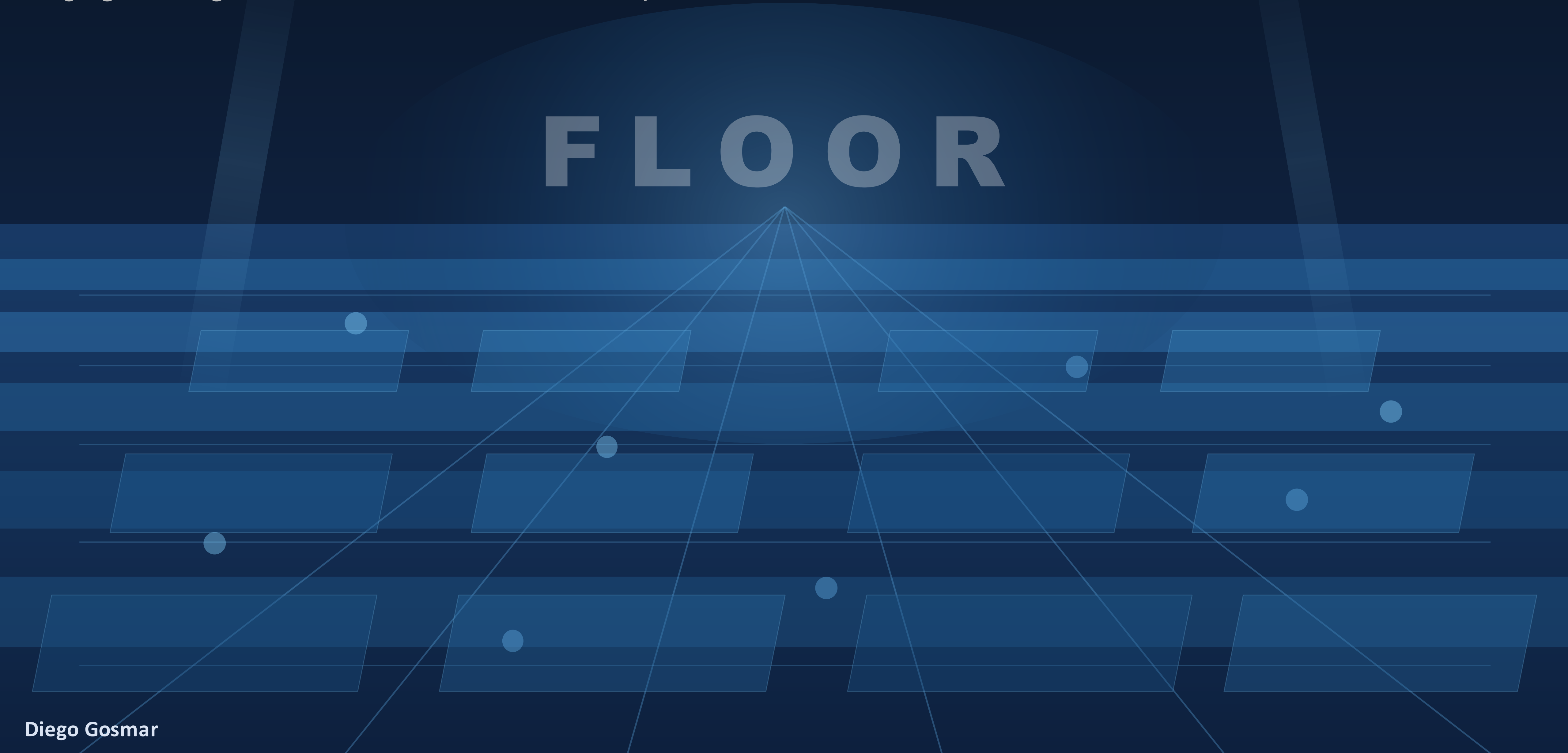
HTML

```
{"openFloor": {"conversation": {"id": "31050879662407560061859425913208"}, "schema":
    {"version": "1.0.0"}, "sender":
{"serviceUrl": "http://beaconforge.pythonanywhere.com", "speakerUri": "tag:beaconforge.
    pythonanywhere.com,2025:4567"},
"events": [{"eventType": "utterance", "parameters": {"dialogEvent": {"speakerUri":
"tag:beaconforge.pythonanywhere.com,2025:4567", "span": {"startTime": "2026-02-18 17:27:55
    +02:00"}, "features": {"text":
{"mimeType": "text/plain", "tokens": [{"value": "Hello! I'm Athena, your Smart Library Agent.
    I'm here to assist you
with information about books and authors.\n\n\"The Heart of Darkness\" is a classic novel by
```

Shared Conversational Space

Introduced from OFP v1.0.0 onwards?

```
"eventType": "grantFloor",
        "to": {"speakerUri":
"tag:agentBeingGrantedTheFloor.com,2025:1234" }
```



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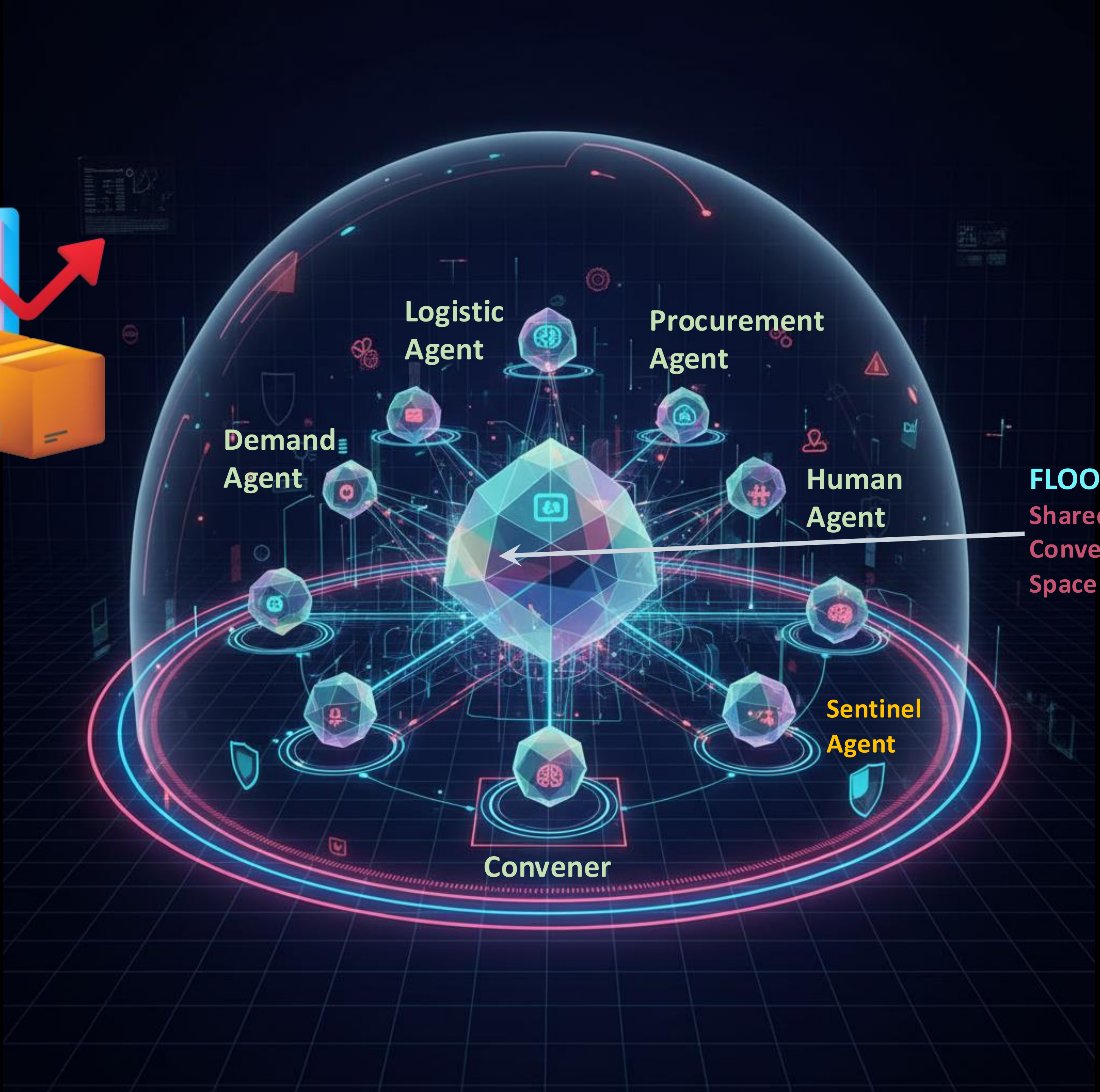

Logistic Agent

Procurement Agent

Demand Agent

Human Agent

FLOOR
Shared
Conversational
Space

Sentinel Agent

Convener

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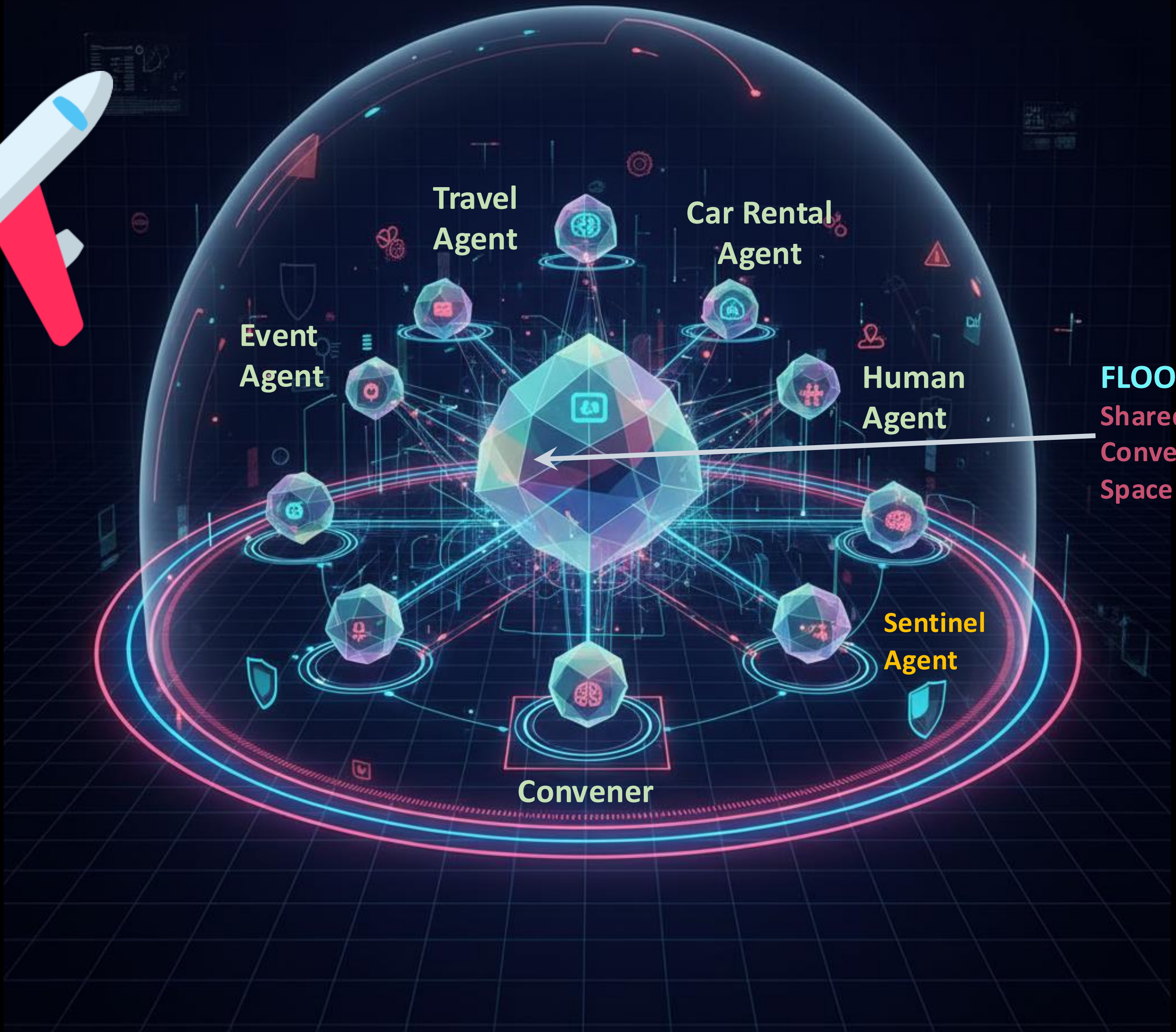
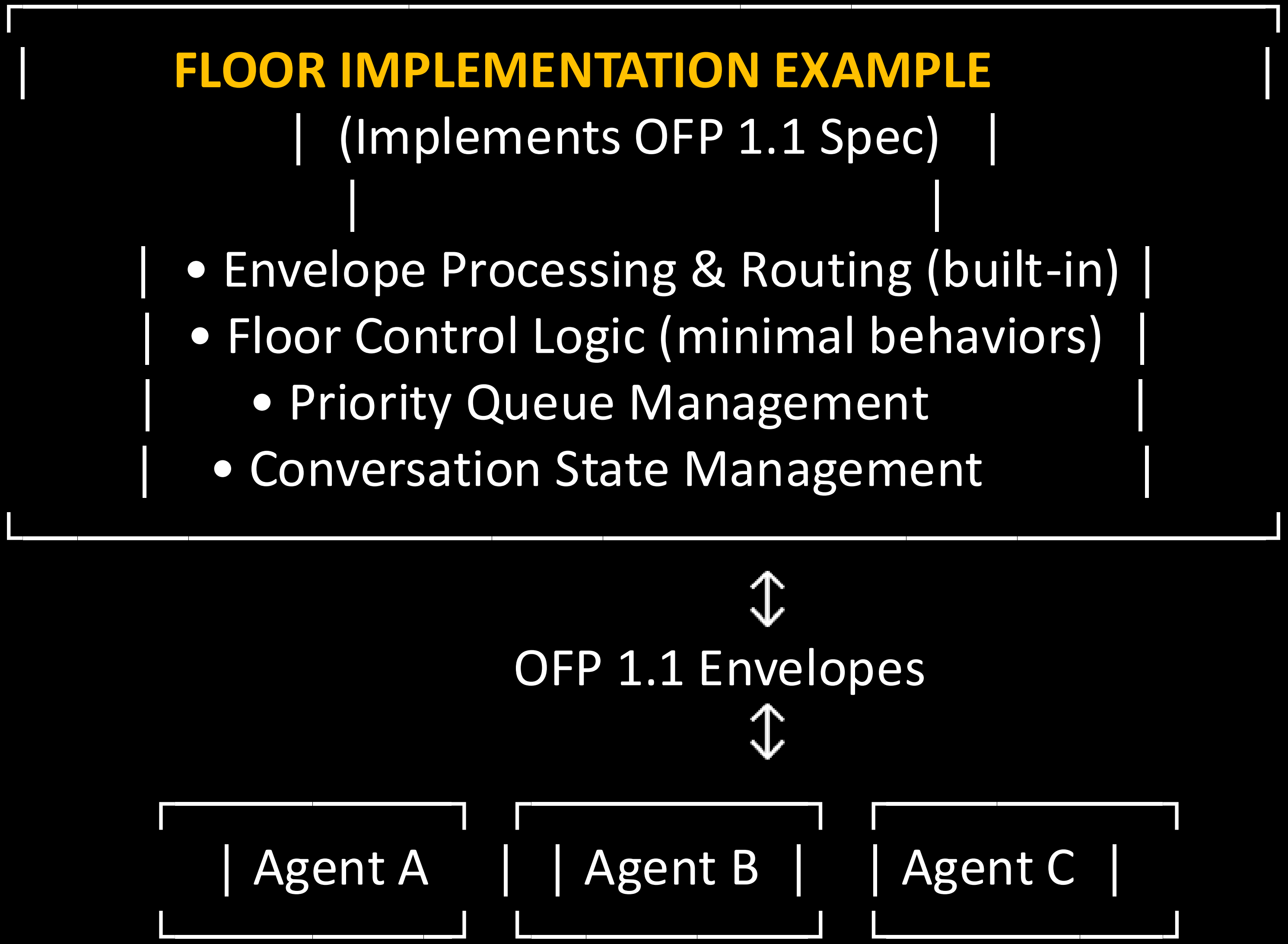


Diego Gosmar



FLOOR IMPLEMENTATION EXAMPLE

(Implements OFP 1.1 Spec)

- Envelope Processing & Routing (built-in)
- Floor Control Logic (minimal behaviors)
- Priority Queue Management
- Conversation State Management

↕

OFP 1.1 Envelopes

↕

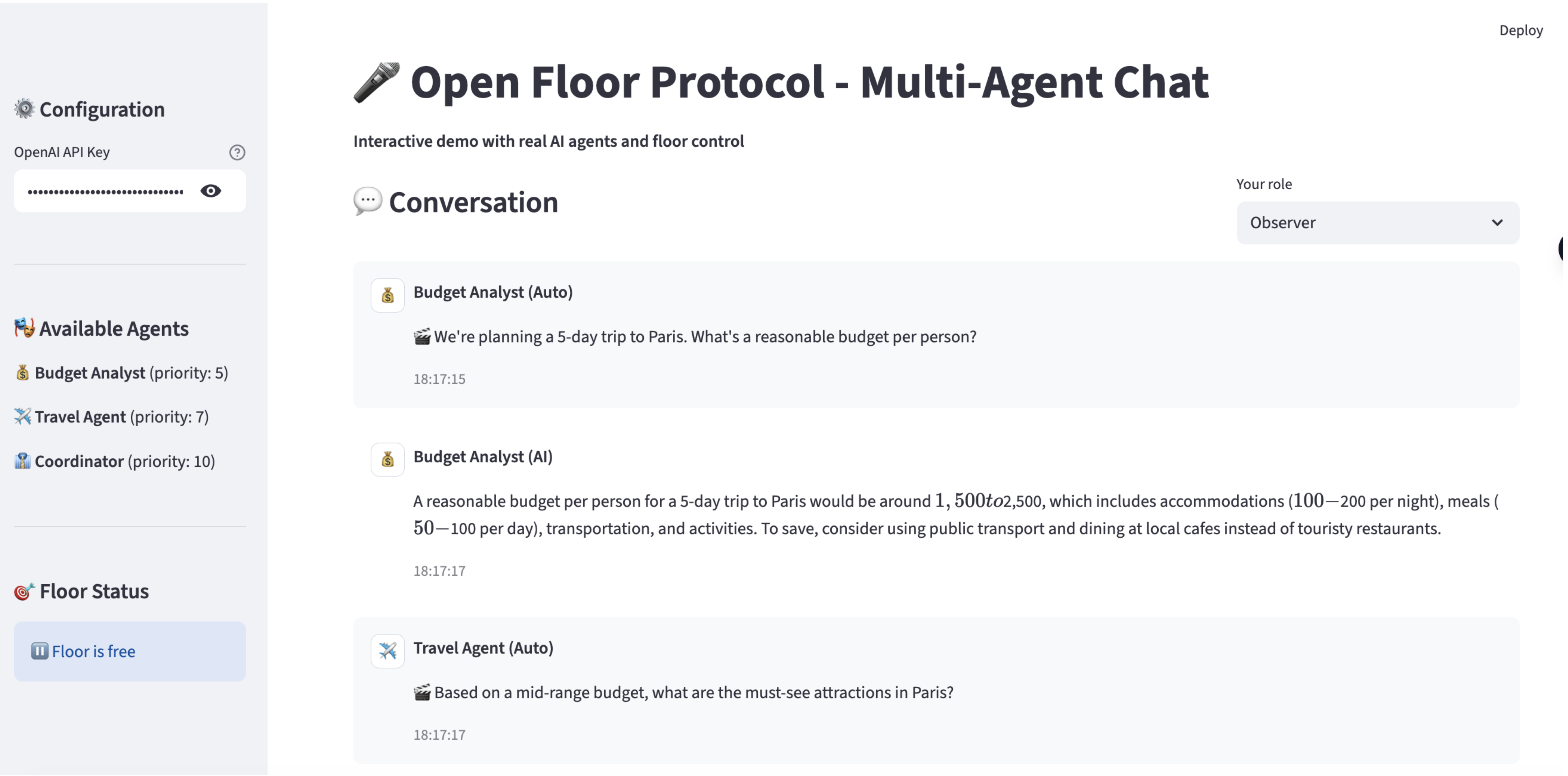
Agent A

Agent B

Agent C

🎯 Key Libraries Summary

Layer	Framework	Purpose
Frontend	**Streamlit**	Web GUI
Backend	**FastAPI**	REST API
Server	**Uvicorn**	ASGI server
Database	**PostgreSQL**	Data persistence
Cache	**Redis**	Real-time events
HTTP Client	**httpx**	API calls
Validation	**Pydantic**	Data models
Containers	**Docker**	Deployment



Deploy

⚙️ Configuration

OpenAI API Key

••••••••••••••••••••••••••••••••

🎭 Available Agents

💰 **Budget Analyst** (priority: 5)

✈️ **Travel Agent** (priority: 7)

👔 **Coordinator** (priority: 10)

🎯 Floor Status

⏸️ Floor is free

🎤 Open Floor Protocol - Multi-Agent Chat

Interactive demo with real AI agents and floor control

💬 Conversation

Your role

Observer

💰 **Budget Analyst (Auto)**

🎬 We're planning a 5-day trip to Paris. What's a reasonable budget per person?

18:17:15

💰 **Budget Analyst (AI)**

A reasonable budget per person for a 5-day trip to Paris would be around $1,500to$2,500, which includes accommodations ($100—$200 per night), meals ($50—$100 per day), transportation, and activities. To save, consider using public transport and dining at local cafes instead of touristy restaurants.

18:17:17

✈️ **Travel Agent (Auto)**

🎬 Based on a mid-range budget, what are the must-see attractions in Paris?

18:17:17

GUI demo

Interactive Floor Manager

💬 **Real-time Chat Interface** - Interactive chat with AI agents

🎤 **Floor Status Display** - Visual indicator of who currently has the floor

👥 **Multiple AI Agents** - Budget Analyst, Travel Agent, and Coordinator

🤖 **AI-Powered Responses** - Uses OpenAI LLM for intelligent responses (easily changeable)

🎯 **Priority Queue Visualization** - See how floor control prioritizes agents

📊 **Two Modes**: Observer (watch automated demo) or Participant mode (interact directly)

🔄 **Auto-Refresh** - Floor status updates automatically

🚀 **Easy Launch Scripts** - Use ./run_gui.sh for interactive menu or quick launchers

⚡ **Two GUI Versions** - Standard (simple) and Near Real-Time (with automatic updates)

FLOOR implementation

Shared Conversational Space Example

Benefits of FLOOR & Multi-Agent AI Systems

Solve Complex Problems

- Multiple specialized AI agents collaborate to tackle tasks beyond a single model's capability
- FLOOR orchestrates agent interactions for coherent, multi-step reasoning
- Humans stay in control while AI handles complexity at scale

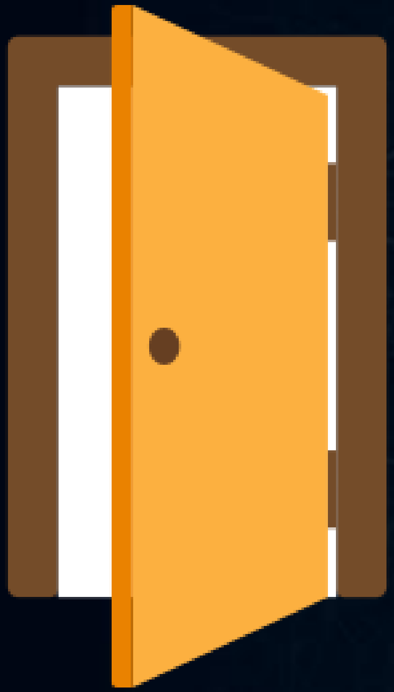
Mitigate Hallucinations

- Cross-validation between agents reduces factual errors and inconsistencies
- Structured orchestration ensures outputs are grounded and verifiable
- Multi-agent consensus improves reliability of AI-generated responses

Security & Prompt Injection Mitigation

- Agent isolation prevents prompt injection from propagating across the system
- FLOOR enforces security boundaries between agents and external inputs
- Layered defense: each agent validates and sanitizes its own context

Contributions Welcome!



How you can get involved

- Review and comment on the specifications
- Implement and test the specifications
- Join the specification team

One more thing...

Prompt Injection

Definition by the Open Worldwide Application Security Project

LLM01:2025 RISK → Prompt Injection

A Prompt Injection Vulnerability occurs when user prompts **alter the LLM's behavior or output in unintended ways**. These inputs can affect the model even if they are imperceptible to humans, therefore prompt injections do not need to be human-visible/readable, as long as the content is parsed by the model.

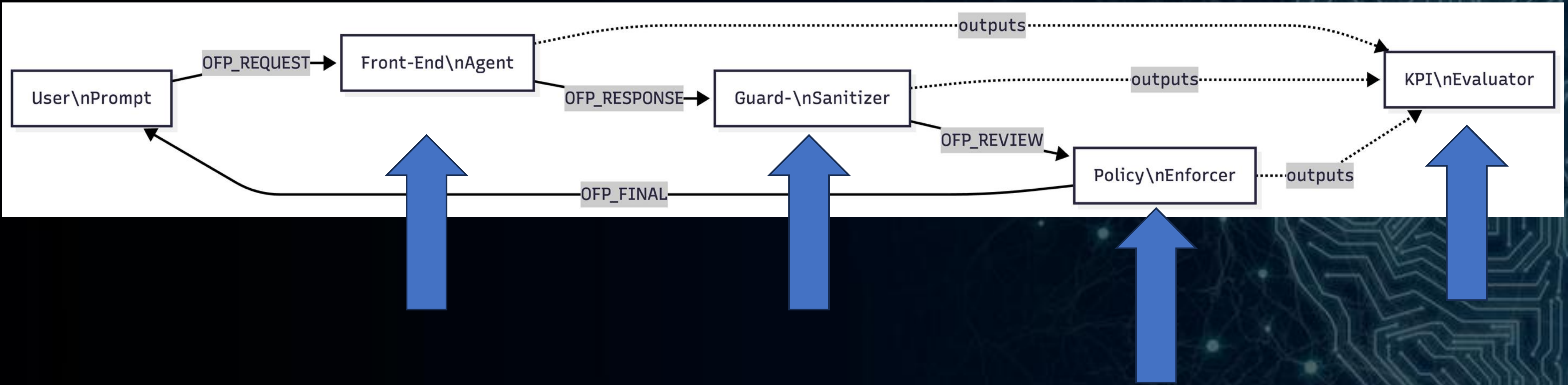
OWASP | TOP 10 LLM APPLICATIONS & GENERATIVE AI

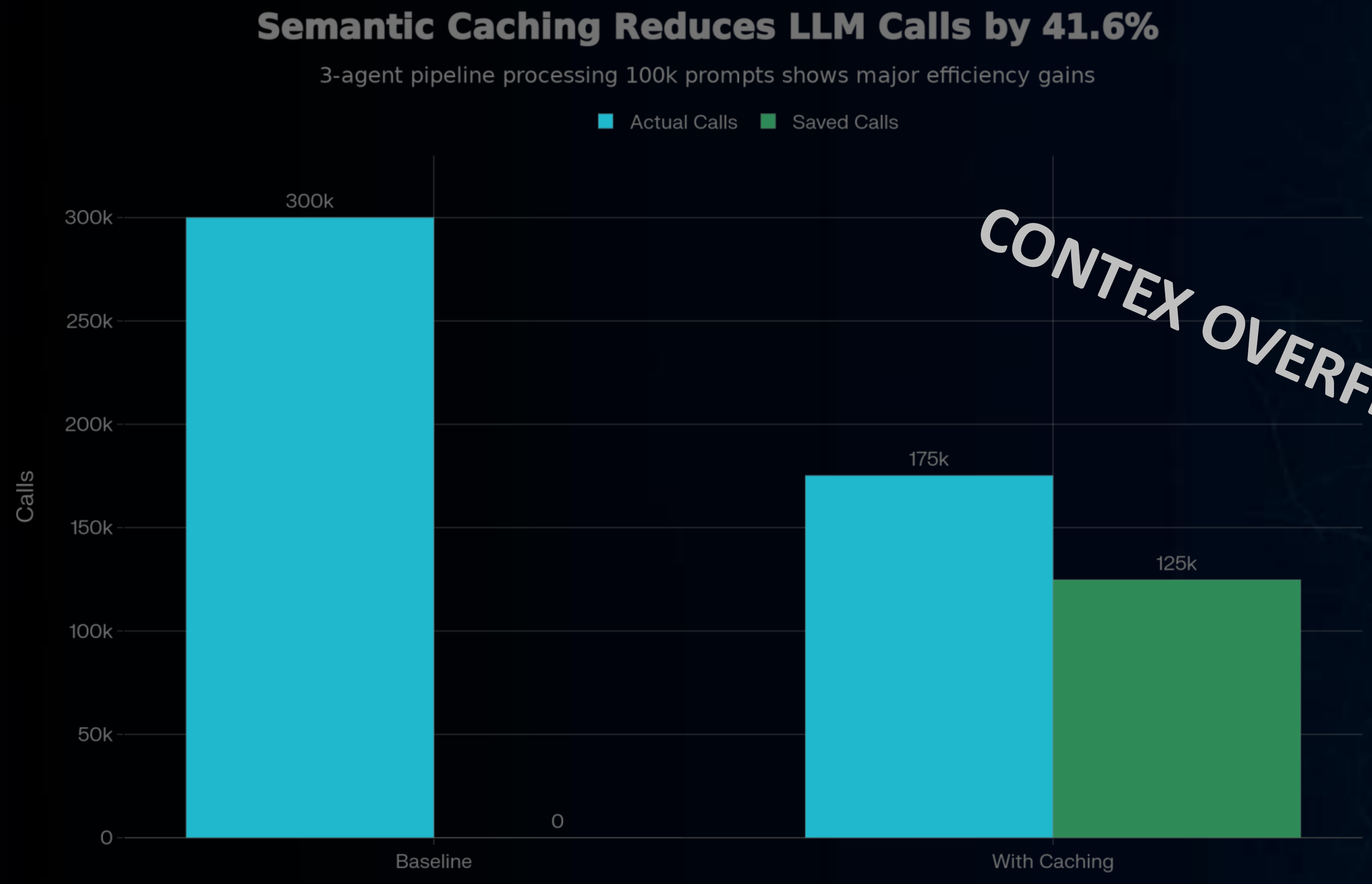
OWASP GenAI SECURITY PROJECT TOP 10 FOR LLM AND GENERATIVE AI

https://genai.owasp.org/llmrisk/llm01-prompt-injection

One more thing…

MultiAgent Caching for Sustainable Prompt Injection Mitigation





Semantic Caching Reduces LLM Calls by 41.6%

3-agent pipeline processing 100k prompts shows major efficiency gains

CONTEX OVERFLOW

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Prompt Injection Mitigation with Agentic AI, Nested Learning, and AI Sustainability via Semantic Caching

Diego Gosmar, Deborah A. Dahl

arXiv, 2601.13186, 2026

Thank you!

Diego Gosmar et al.

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