



Generative AI for Games

CES Editor's Day 2025 Session 4

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The Future of Games is a Living World



Game Worlds Will be a Matrix of Autonomous AI



Autonomous Companions

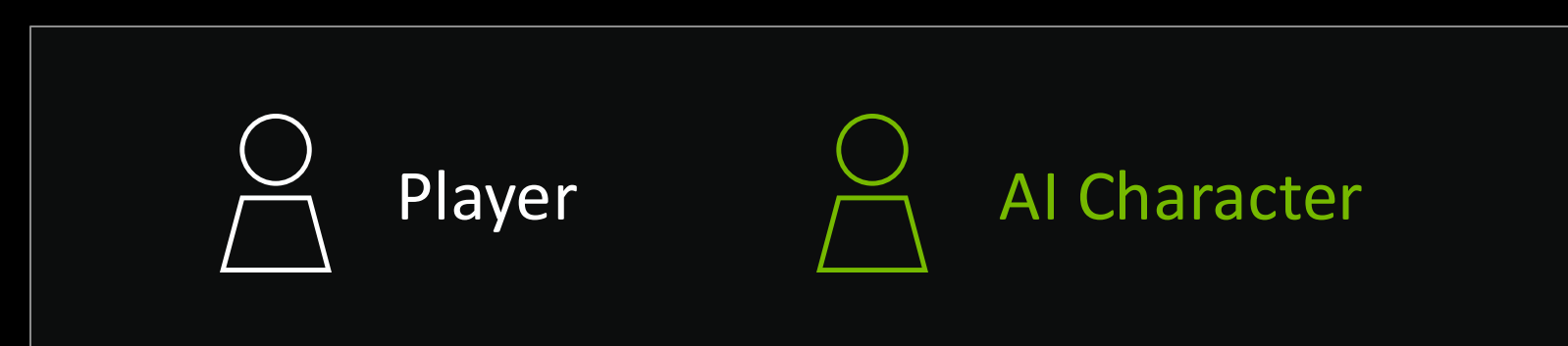
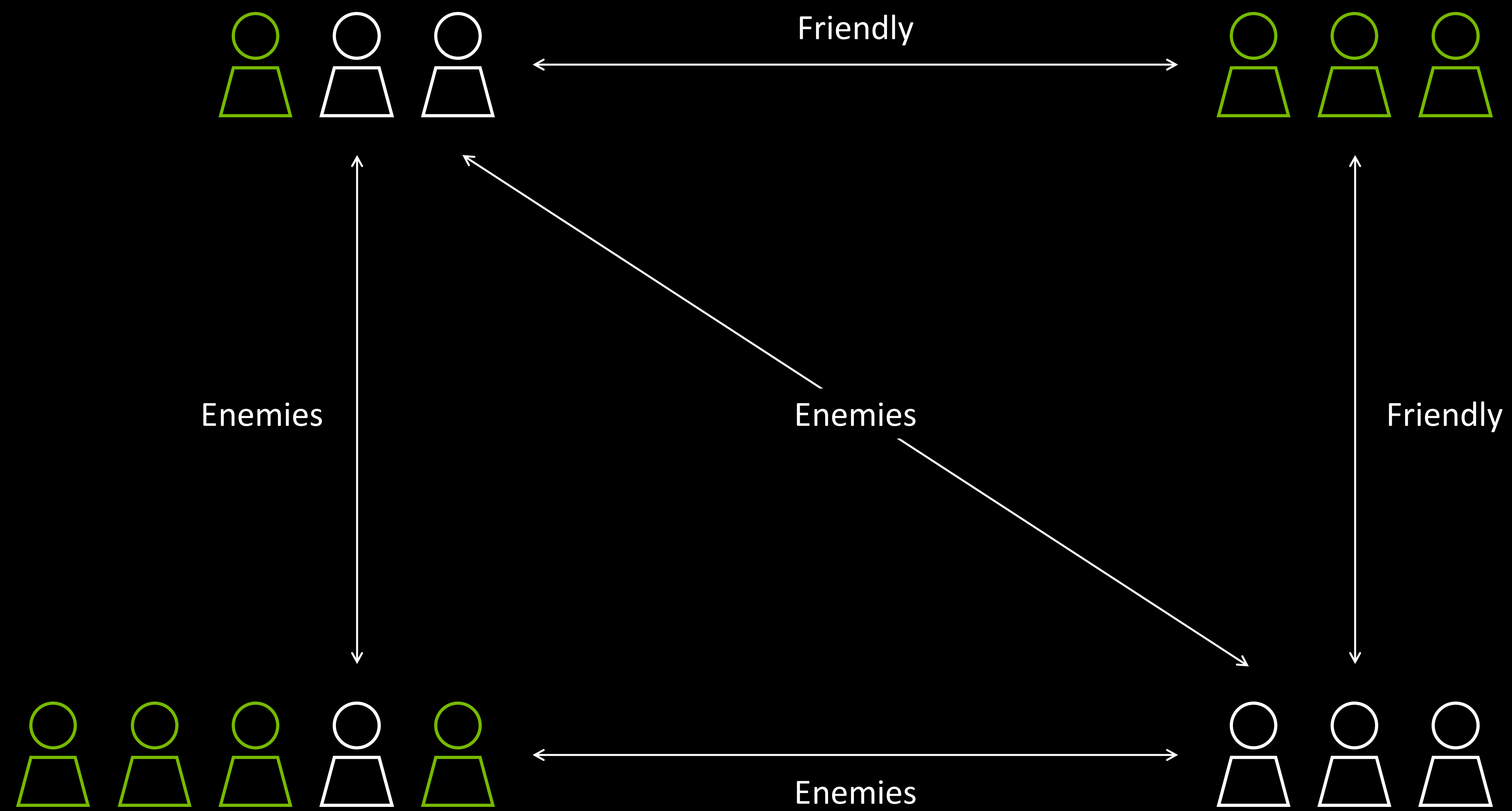


Autonomous Systems

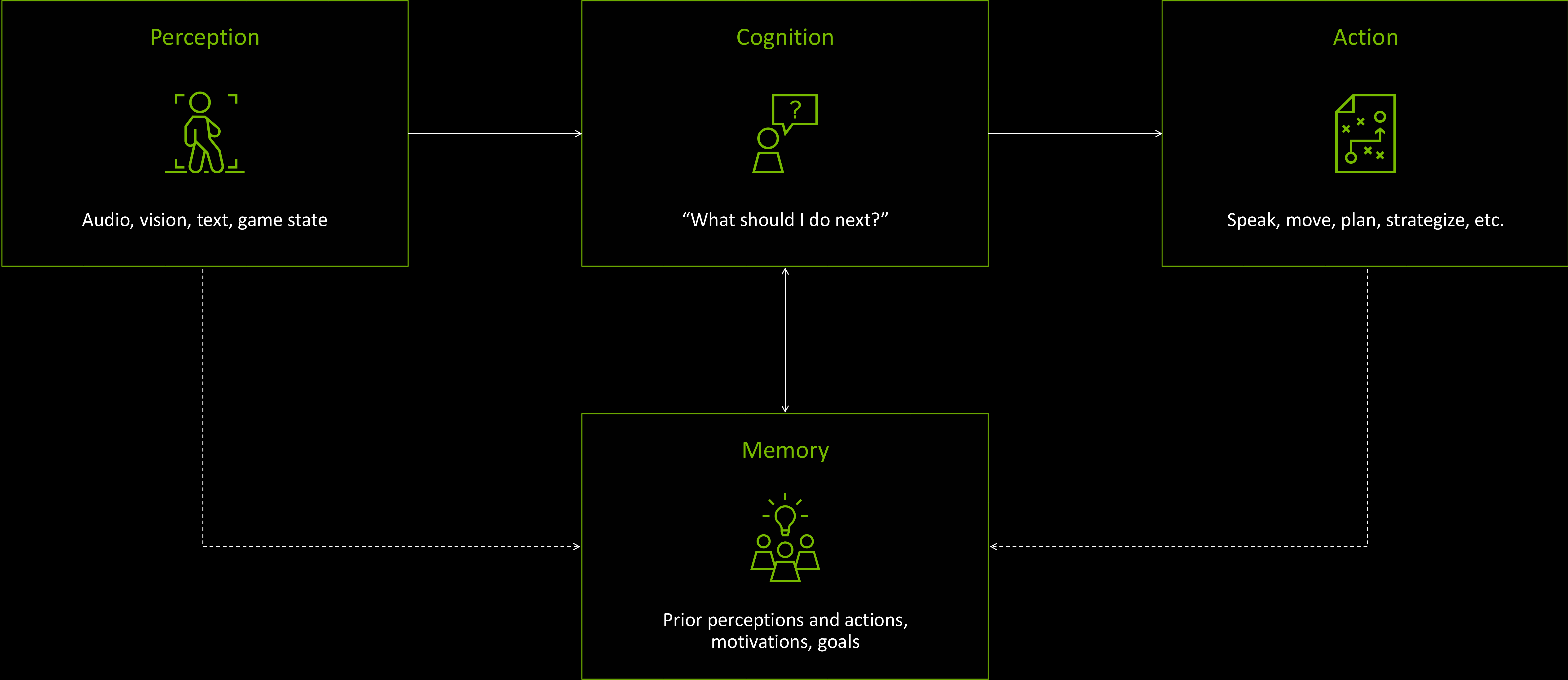


Autonomous Enemies

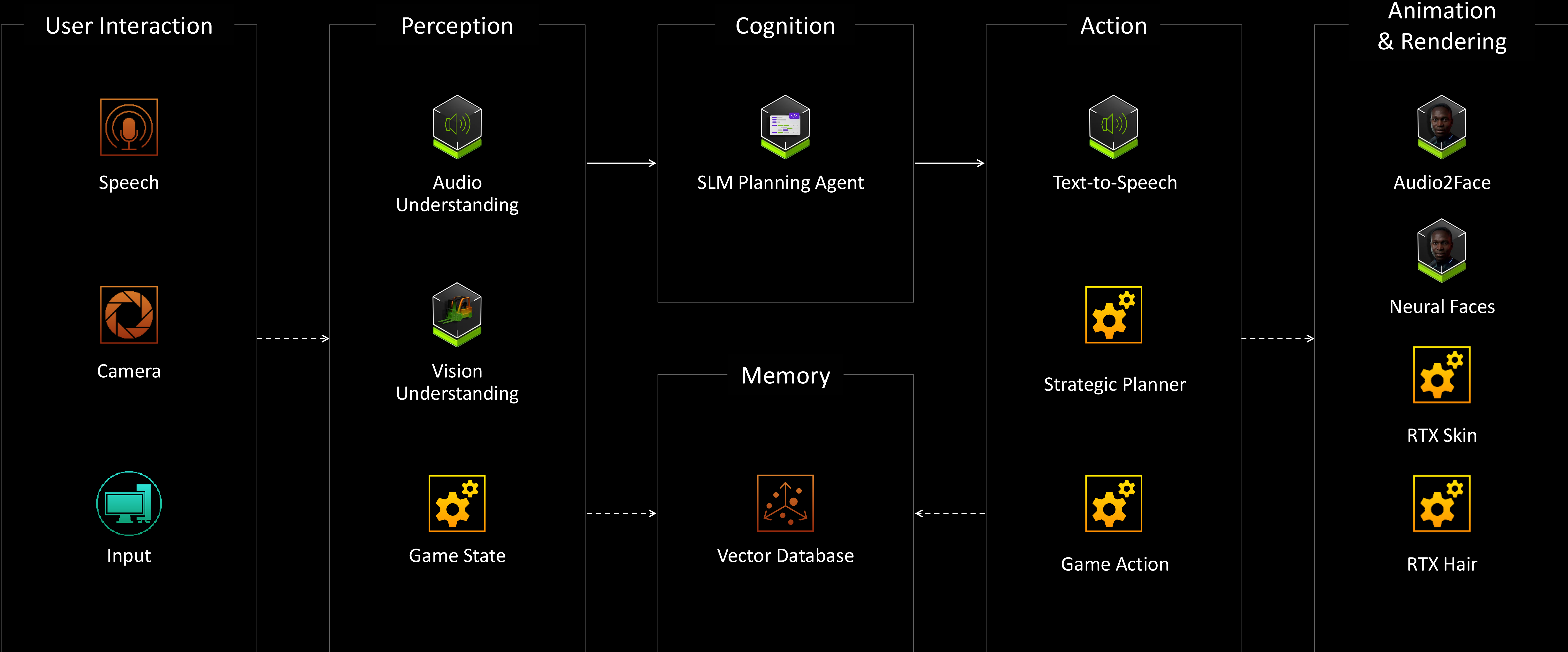
Autonomous AI Worlds Enable Player-like Social Dynamics



Replicating Human Decision Making is Hard



NVIDIA ACE Enables Autonomous Game Characters



Perception: Audio Understanding

Nemoaudio-4B-Instruct



“Describe the soundscape”



NemoAudio



“A gun fires out almost twenty times and a second gun further in the distance fires a similar number of shots.”

Perception: Vision Understanding

Cosmos Nemotron-4B-Instruct-v2



“Describe the image, player status, and any relevant information on the mini-map”



Cosmos
Nemotron-4B



“The player is in combat.
The time is 12:38 AM.
There is an enemy directly ahead of the player.”

Cognition: Planning

Mistral NeMo Minitron instruct family of models

GAME STATE

Located outdoor. The direction I am facing is 0 degree, which is approximately North.
I am hungry. This is inflicting damage to my HP.

MOTIVATION

“I want to survive and support my teammates as they loot high value items”

PROMPT

“Given the game state and motivations, what should my next action? Describe in plain English.”



Minitron SLM

“Eat some food while watching over my teammate.”

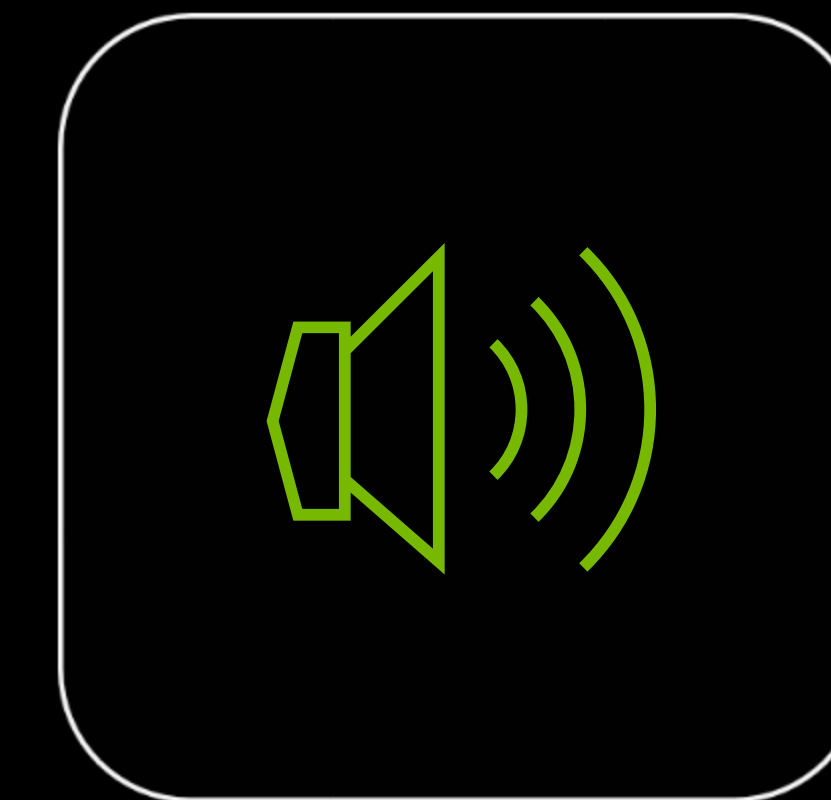
Action: Voice Generation

Riva A^2 Flow TTS

“I never wanted this to happen. If only I had listened, maybe things would be different.”



Riva A^2 Flow TTS



Action: Action Selection

Mistral NeMo Minitron instruct family of models

PLANNING

“I want to survive and support my teammates as they loot high value items”

AVAILABLE ACTIONS

- Follow Teammate
- Engage Enemy
- Pick up loot
- Hold position
- Eat food
- Answer Teammate

PROMPT

“Given the plan and the available actions,
select the best action.”

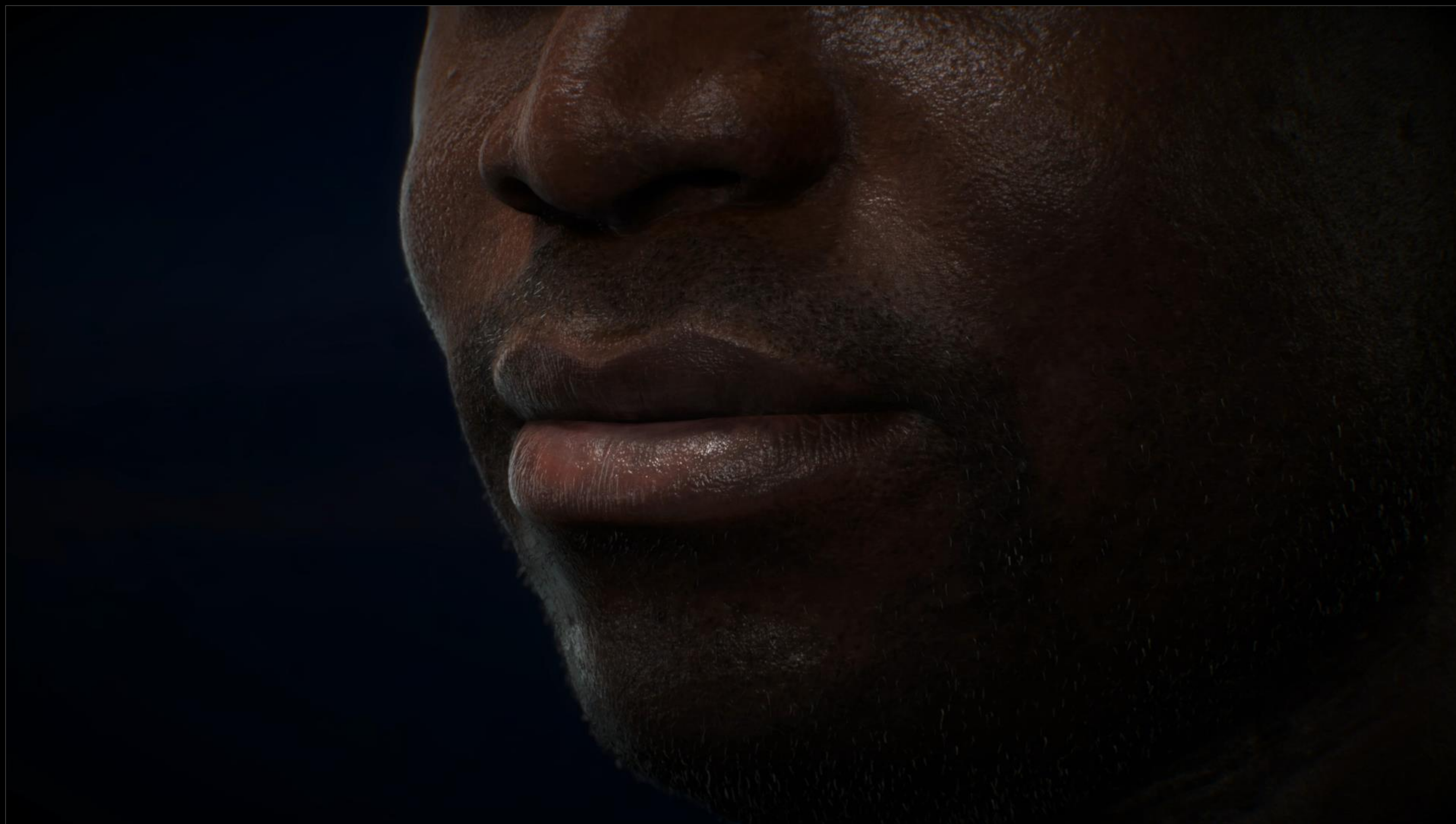


Minitron SLM

- Follow Teammate
- Eat Food

Animation: Audio-driven AI Face

Next Gen Audio2Face





Buck

ZooPunk Live Demo

No problem. Let's get started.

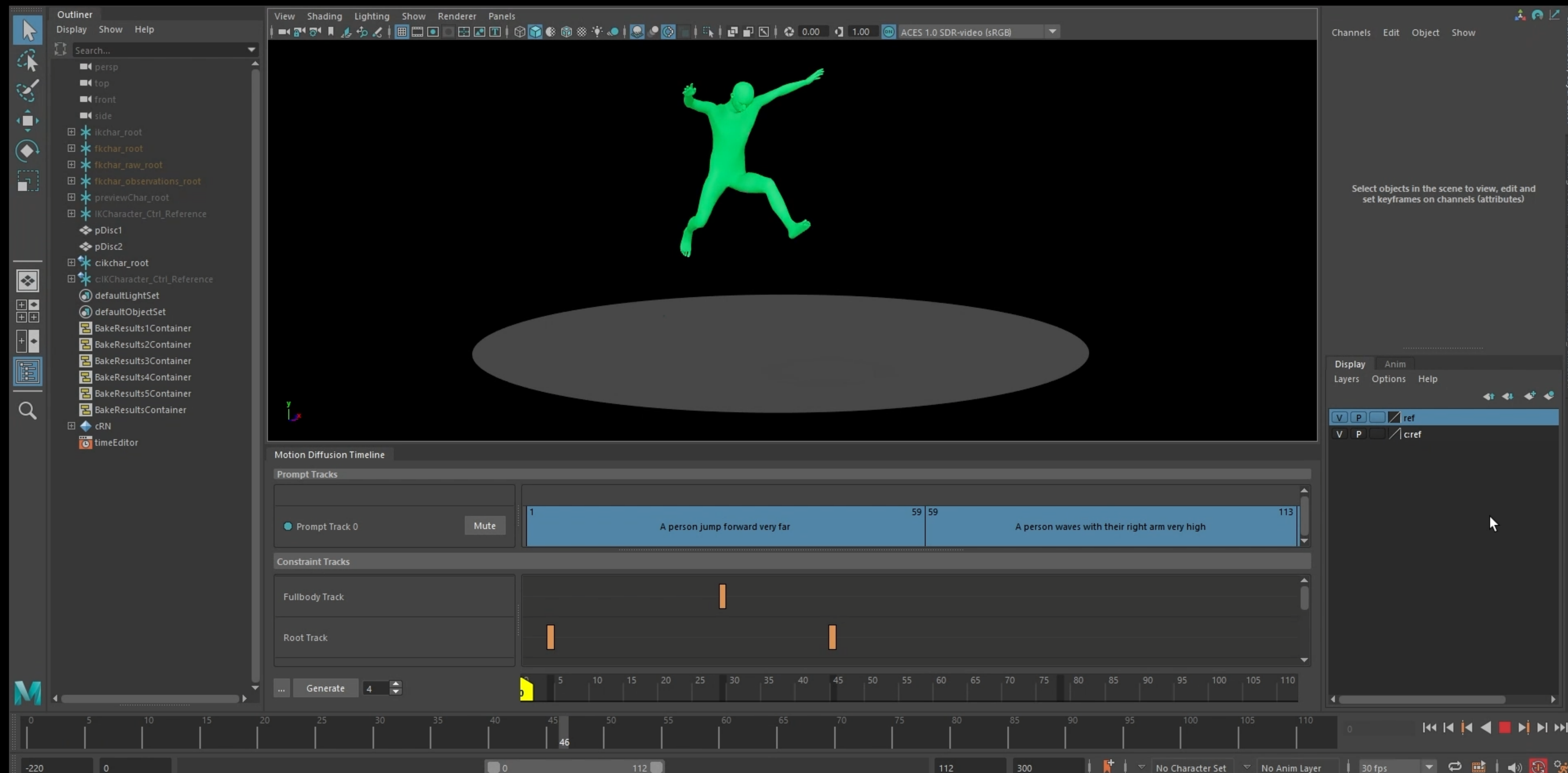
Animation: Text to Body Motion

Introducing ACE AI Body Motion



Animation: Text to Body Motion

Accelerate 3D animation authoring with ACE AI body motion



Animation: Text to Body Motion

Style Transfer, In-Betweening, and Variation



Rendering: Crossing the Chasm of Uncanny Valley

RTX Kit for digital human



RTX Neural Faces

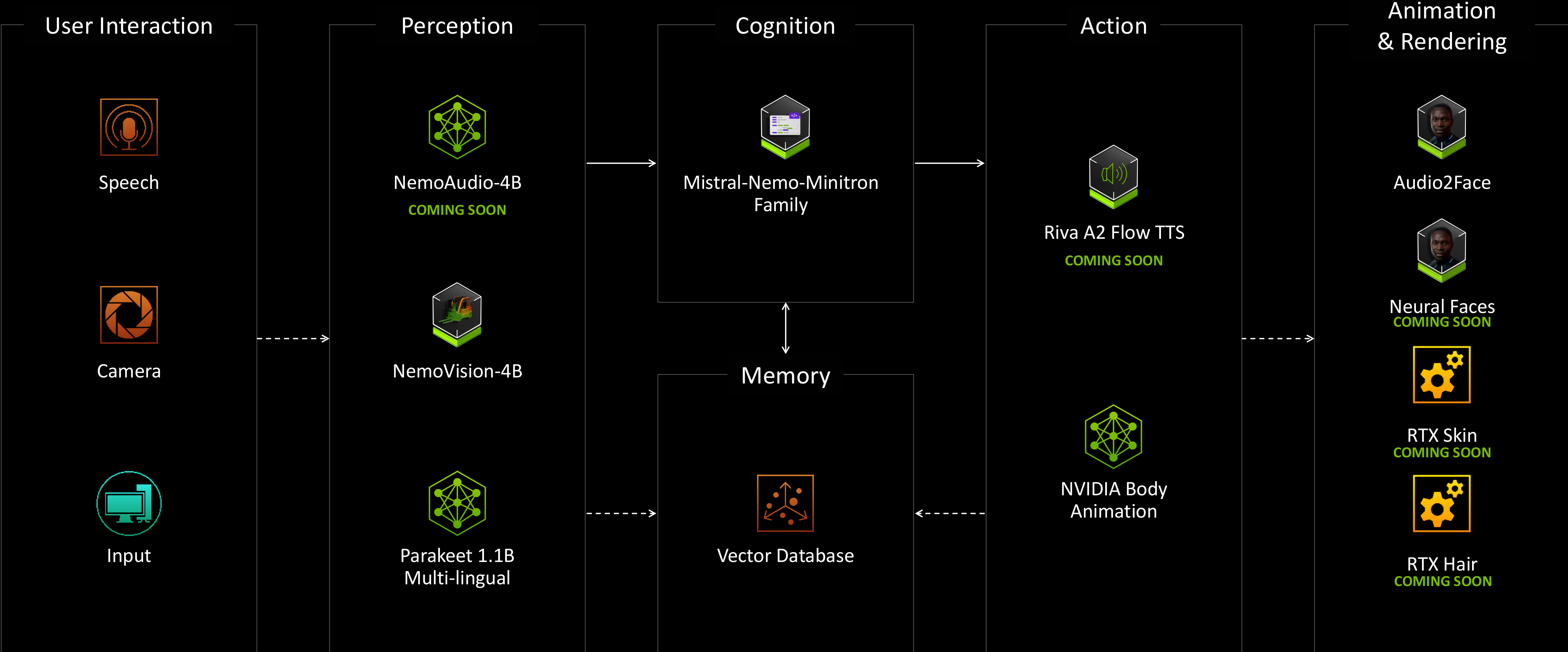


RTX Skin

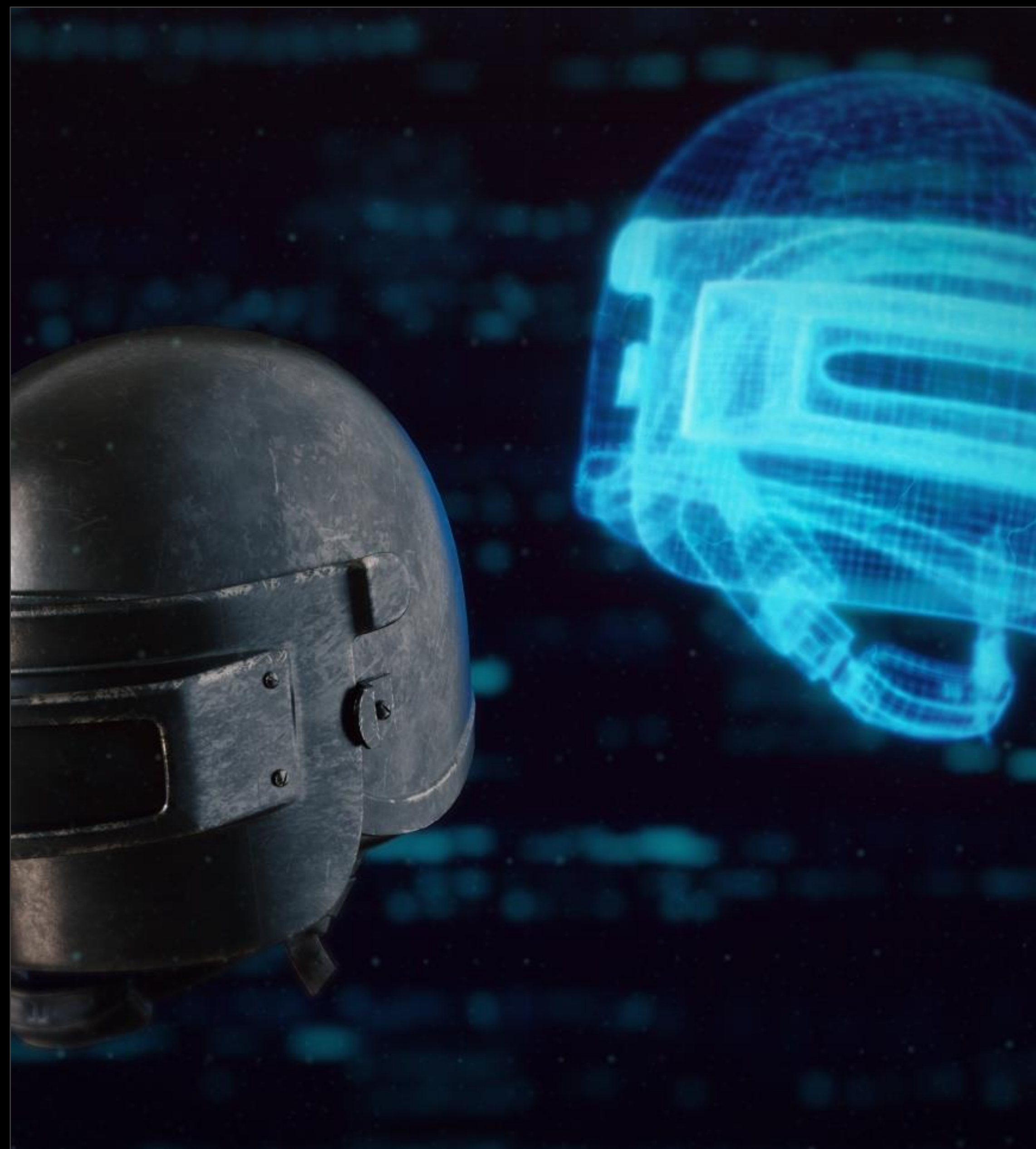


RTX Hair

New ACE Autonomous NPC Models Available for Developers



Game Developers Begin Journey to Living Worlds



PUBG Battlegrounds | Krafton
Autonomous Companions



inZOI | Krafton
Autonomous Systems



Mir5 | WeMade
Autonomous Enemies



KRAFTON

Kangwook Lee

Head of Deep Learning at KRAFTON





PUBGTM

PUBG Ally: Solo, but like a team

A close-up, low-angle shot of a person's face wearing a dark helmet. The helmet is illuminated from behind, creating a bright orange glow on the left side and a bright green glow on the right side. The person's eyes are visible through the helmet's visor. Overlaid on the center of the image is the text 'PUBG ALLY' in a large, bold, sans-serif font. 'PUBG' is in a yellow, distressed, stencil-like font, and 'ALLY' is in a clean, white, sans-serif font.

PUBG ALLY

PUBG Ally Video



PUBG Ally

CPC (Co-playable Character) for PUBG

Talks To You

- Strategic discussions
- Gaming advice
- Chitchat

Teams Up With You

- Long-term planning
- Cooperative/supportive

Built with NVIDIA ACE and runs entirely on the client side!



PUBG Ally Demo

A woman with short brown hair, wearing a light blue t-shirt, is seated in a white chair. She is looking down at a glowing, detailed city simulation on a table in front of her. The simulation shows a dense urban landscape with various buildings and green spaces. The background is a bright, blue sky with soft, white clouds. The overall aesthetic is clean and futuristic.

INZOI

Advanced life simulation with Smart Zoi



PUBG Ally Video



Smart Zoi

Smart Zoi (CPC for inZOI)

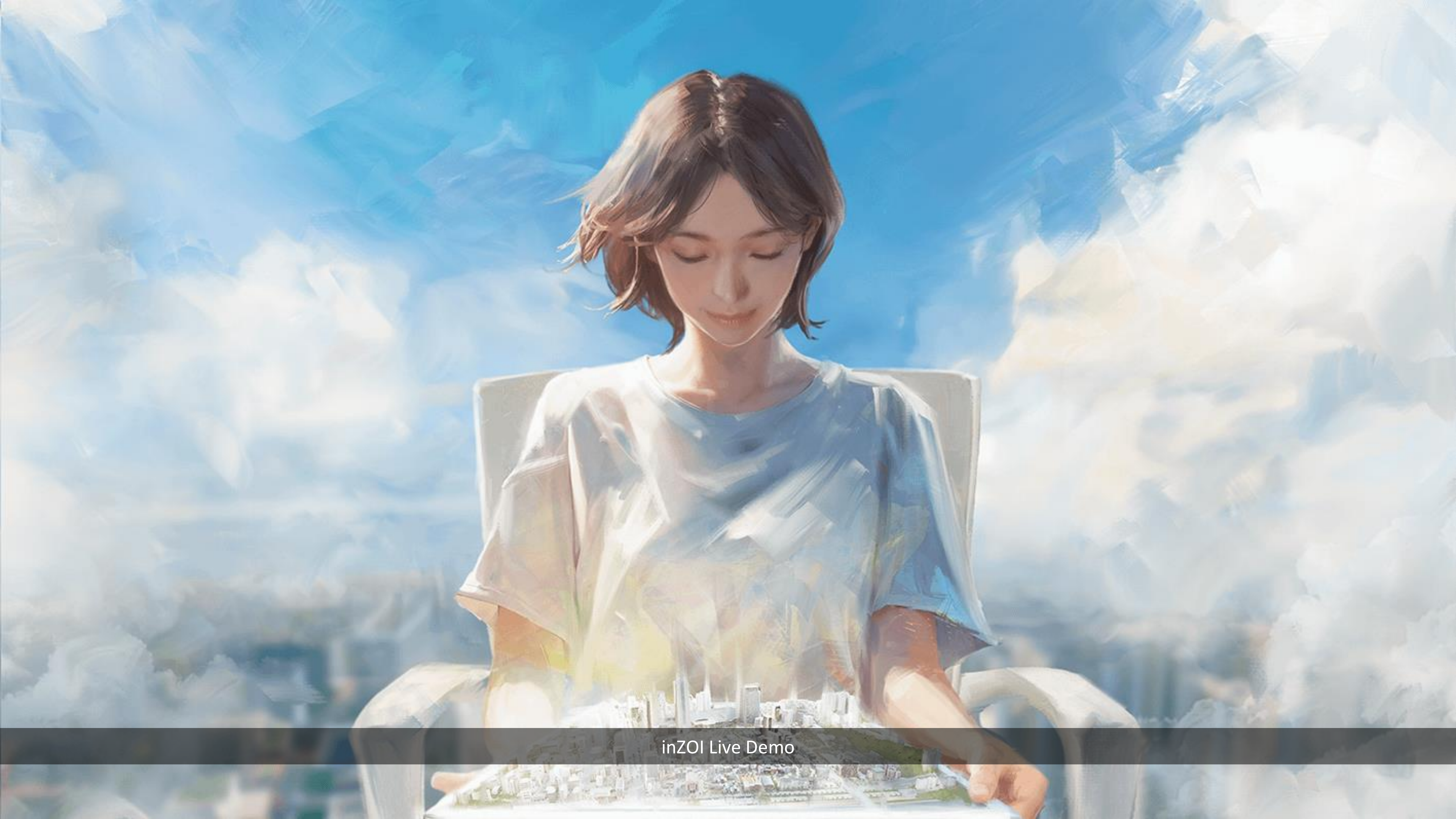
Lives On Like Us

- Planning
- Decision making
- Reflection

Fully Customizable via Natural Language

- Character
- Relationship
- Memory

Built with NVIDIA ACE and runs entirely on the client side!



inZOI Live Demo



Smart Zoi

Smart Zoi (CPC for inZOI)

Lives On Like Us

- Planning
- Decision making
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Fully Customizable via Natural Language

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- Relationship
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Built with NVIDIA ACE and runs entirely on the client side!

Available on March 28th



Mir5 Demo—Video



啾啾白桃冻冻茶
 925
 [队伍] ②: 这就开大, 掩护你撤退!
 [队伍] ①: 你的大招进度到百分之多少啦?

2 0 1 10:59
 6 Enter F1 Alt Esc

第1次暗域蔓延中

30/30
 30/30
 10/20

18米

NARAKA

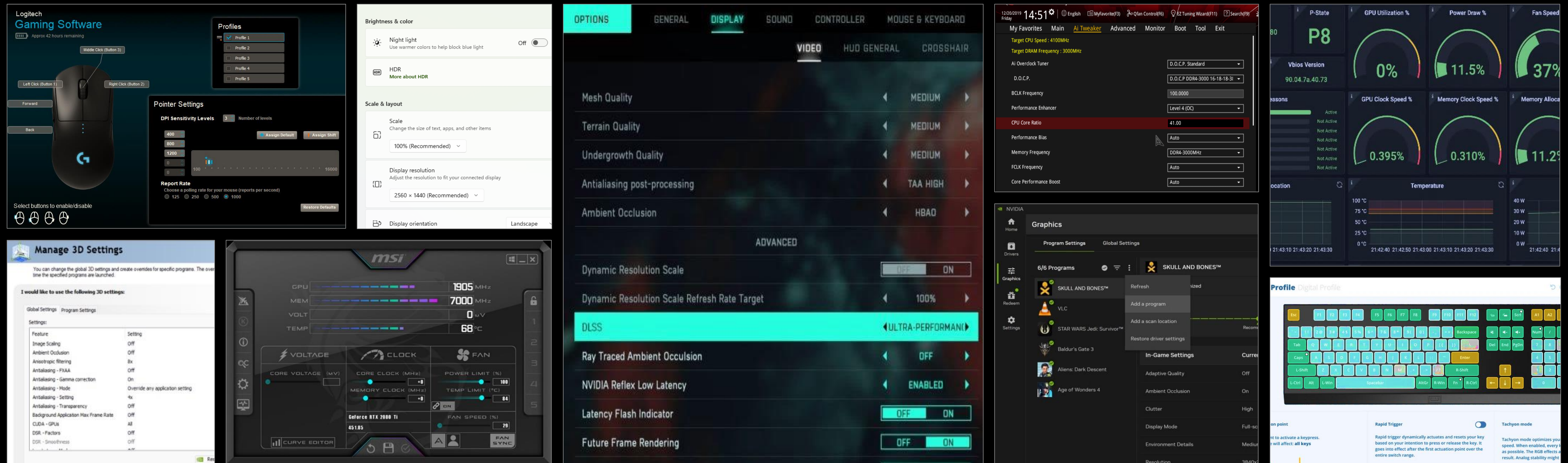
BLADEPOINT
 FREE TO PLAY

Gamer: What 's the percentage of your ultimate?

1毫秒

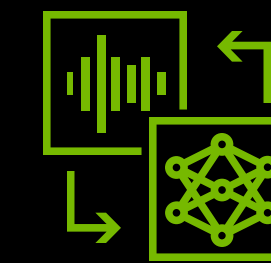
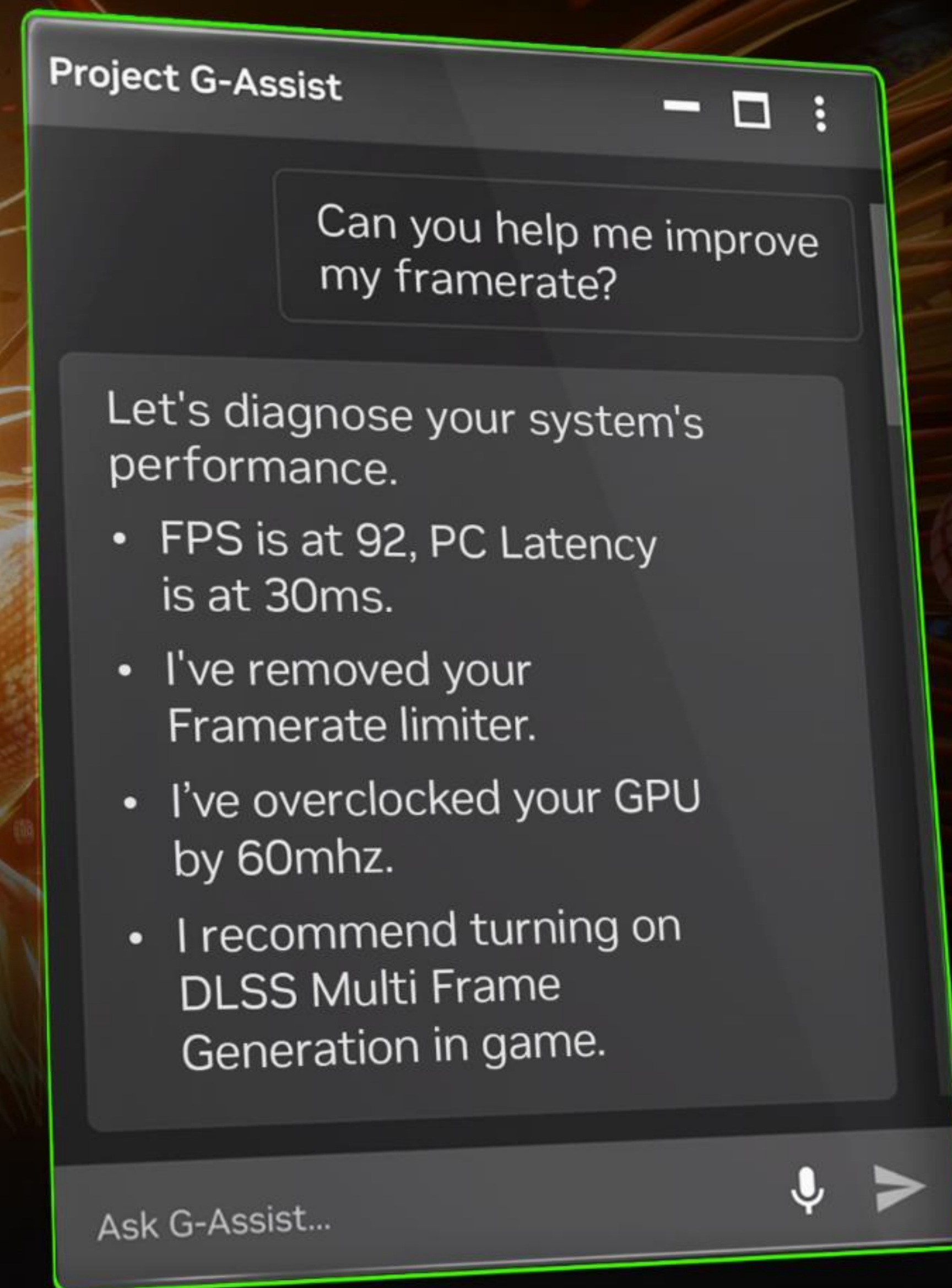
0/4
 Naraka Mobile CoPilot
 变身 V
 受击技 F
 3/9
 Tab

Optimal System Performance: a Needle in a Complicated Haystack



+1.3 Trillion configurations across game, software, and hardware settings

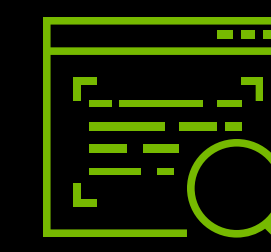
Project G-Assist: AI Assistant for Your RTX PC



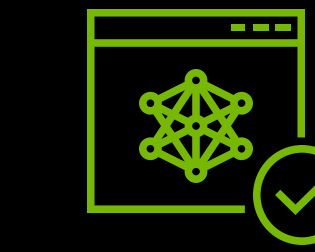
Control your system with voice or text commands



Optimize FPS, latency, power efficiency and more



Diagnose and monitor performance with AI insights



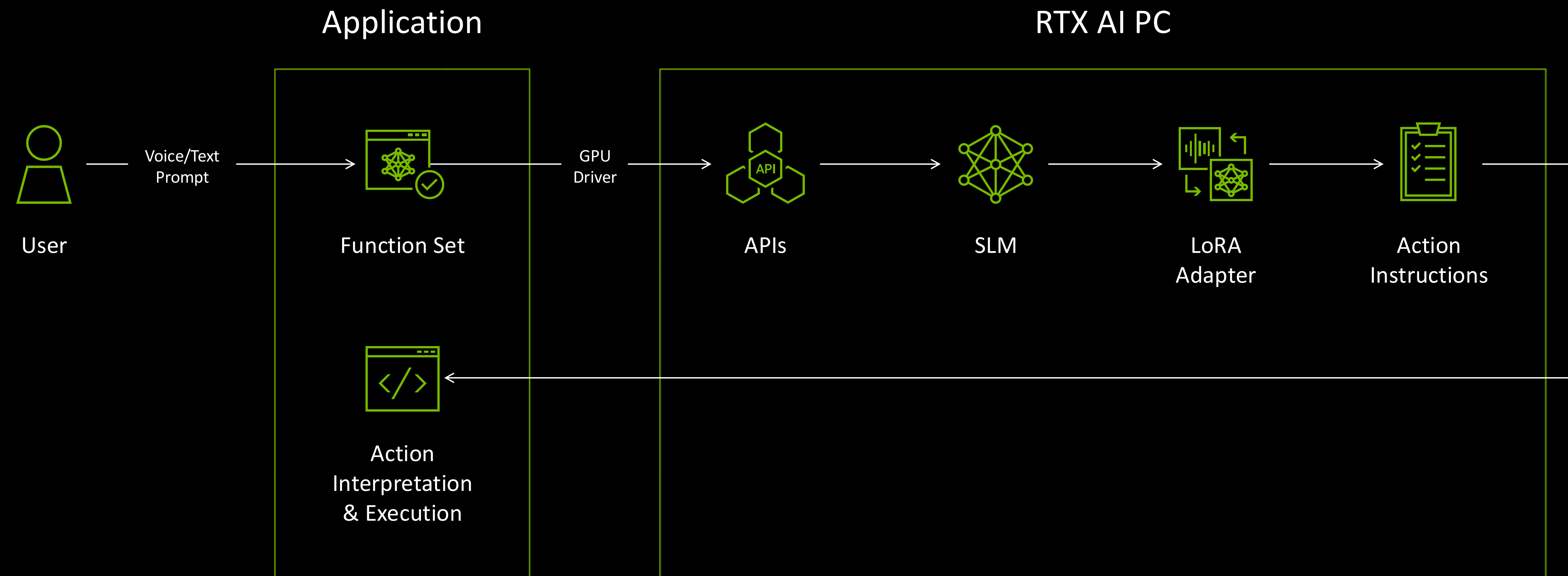
Customize peripheral lighting and manage fan noise

100% on-device AI:
Available to RTX users via NVIDIA app in February

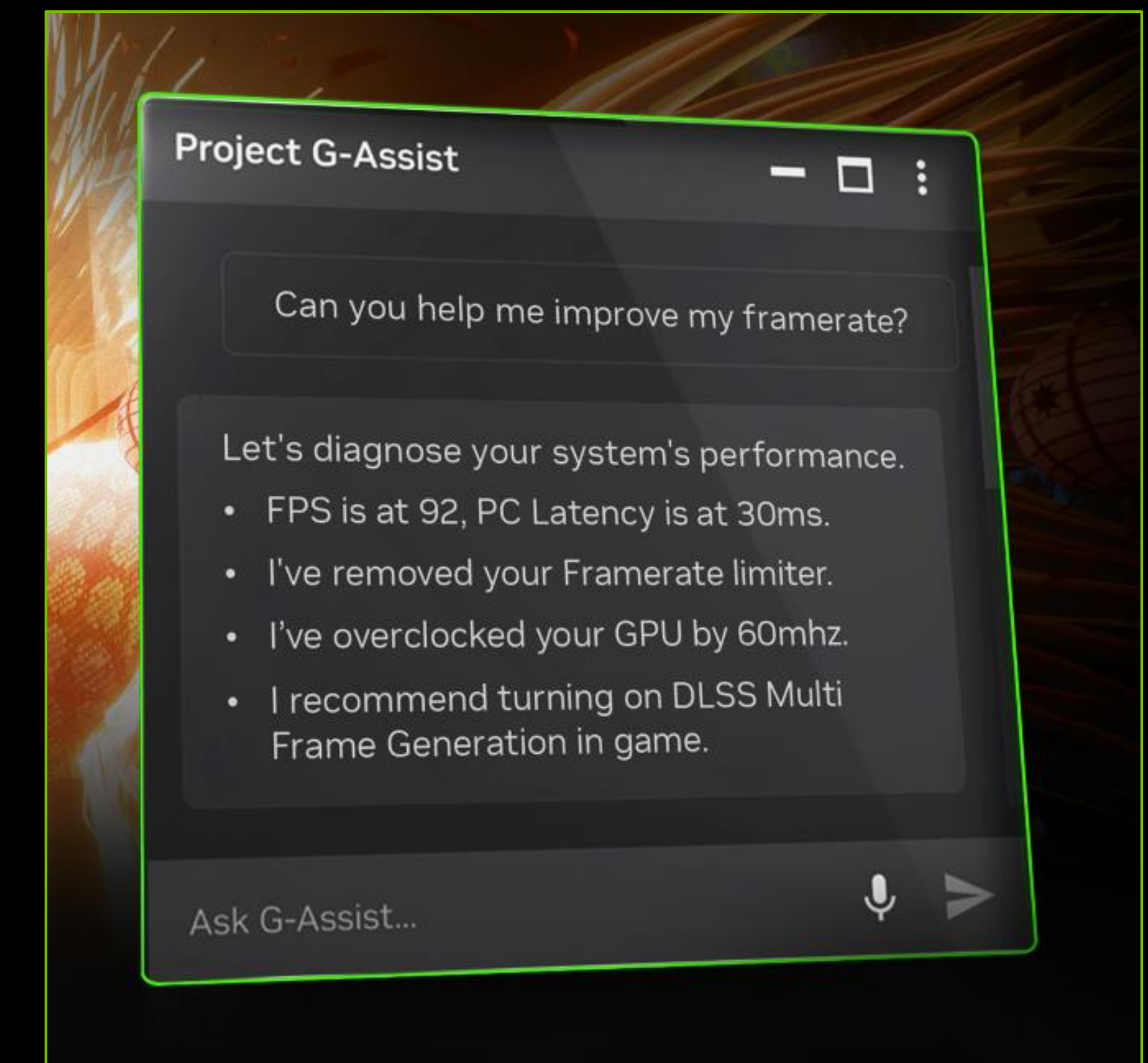


G-Assist Video

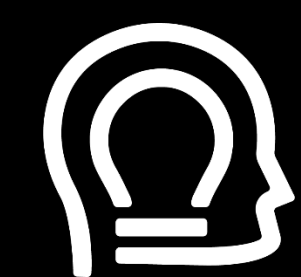
Samples and APIs Available for Partners



Function-Calling Assistants



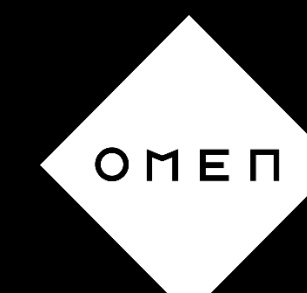
Powering Custom Assistants For MSI, HP and More



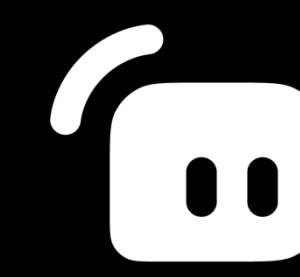
MSI Center



MSI Afterburner



Omen Gaming Hub

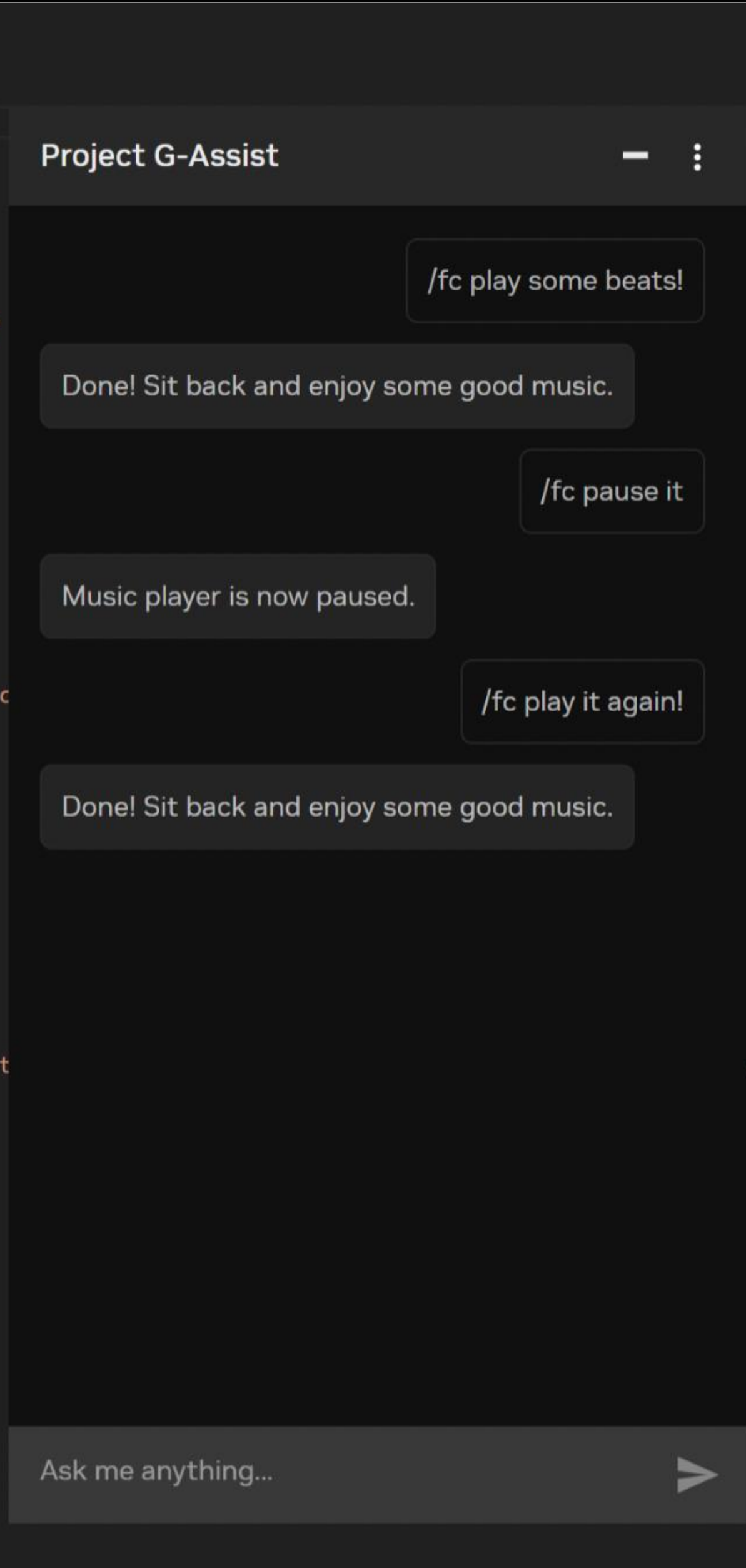


Streamlabs

Extensible by the Community

Build your own plugins

```
"version": "v0.0.1",  
"executable": "./Music_plugin.exe",  
"persistent": true,  
"functions":  
[  
  {  
    "name": "mediaplayer_start",  
    "pretrained": false,  
    "description": "Starts playing music for",  
    "parameters":  
    {  
      "type": "dict",  
      "required": [],  
      "properties": {}  
    }  
  },  
  {  
    "name": "mediaplayer_pause",  
    "pretrained": false,  
    "description": "Pauses the song that is c",  
    "parameters":  
    {  
      "type": "dict",  
      "required": [],  
      "properties": {}  
    }  
  },  
  {  
    "name": "mediaplayer_stop",  
    "pretrained": false,  
    "description": "Stops the song, so when t",  
    "parameters":  
    {  
      "type": "dict",  
      "required": [],  
      "properties": {}  
    }  
  }  
]  
]
```



The screenshot shows a chat interface titled "Project G-Assist". The chat history includes the following messages:

- User: "/fc play some beats!"
- Assistant: "Done! Sit back and enjoy some good music."
- User: "/fc pause it"
- Assistant: "Music player is now paused."
- User: "/fc play it again!"
- Assistant: "Done! Sit back and enjoy some good music."

At the bottom of the chat, there is an input field with the text "Ask me anything..." and a send button.

Build & test your own plugins

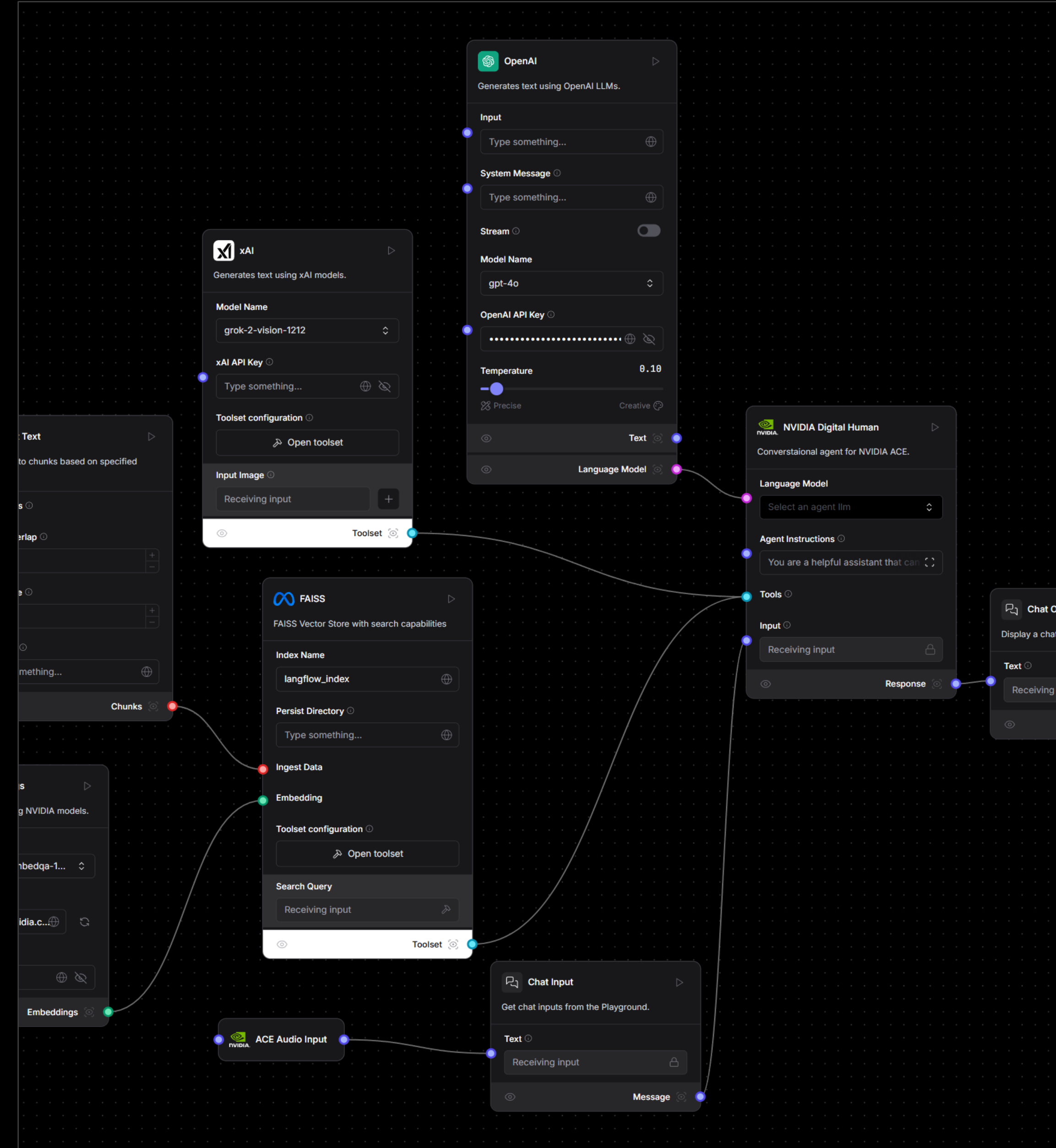
```
FUNCTION_MAP = {  
  "weather": weather,  
  "news": news,  
}  
  
FUNCTIONS_LLM = [  
  {  
    "name": "weather",  
    "description": inspect.getdoc(weathe  
    "parameters": TypeAdapter(weather).j  
  },  
  {  
    "name": "news",  
    "description": inspect.getdoc(news),  
    "parameters": TypeAdapter(news).json  
  },  
]
```



The screenshot shows a code editor with two function definitions:

- `FUNCTION_MAP`: A dictionary mapping "weather" to a `weather` function and "news" to a `news` function.
- `FUNCTIONS_LLM`: A list of function objects. The first object has a name of "weather", a description of `inspect.getdoc(weathe`, and parameters of `TypeAdapter(weather).j`. The second object has a name of "news", a description of `inspect.getdoc(news),` and parameters of `TypeAdapter(news).json`.

Share & collaborate on GitHub



The screenshot shows a complex workflow diagram with several interconnected nodes:

- OpenAI**: Generates text using OpenAI LLMs. It has an input field and a "Stream" toggle.
- xAI**: Generates text using xAI models. It has a "Model Name" dropdown set to "grok-2-vision-1212" and an "xAI API Key" field.
- FAISS**: FAISS Vector Store with search capabilities. It has an "Index Name" field set to "langflow_index", a "Persist Directory" field, and an "Embedding" field.
- NVIDIA Digital Human**: Conversational agent for NVIDIA ACE. It has a "Language Model" dropdown, "Agent Instructions" field, and a "Tools" section.
- Chat Input**: Get chat inputs from the Playground. It has a "Text" field and a "Message" field.
- ACE Audio Input**: A node for audio input.

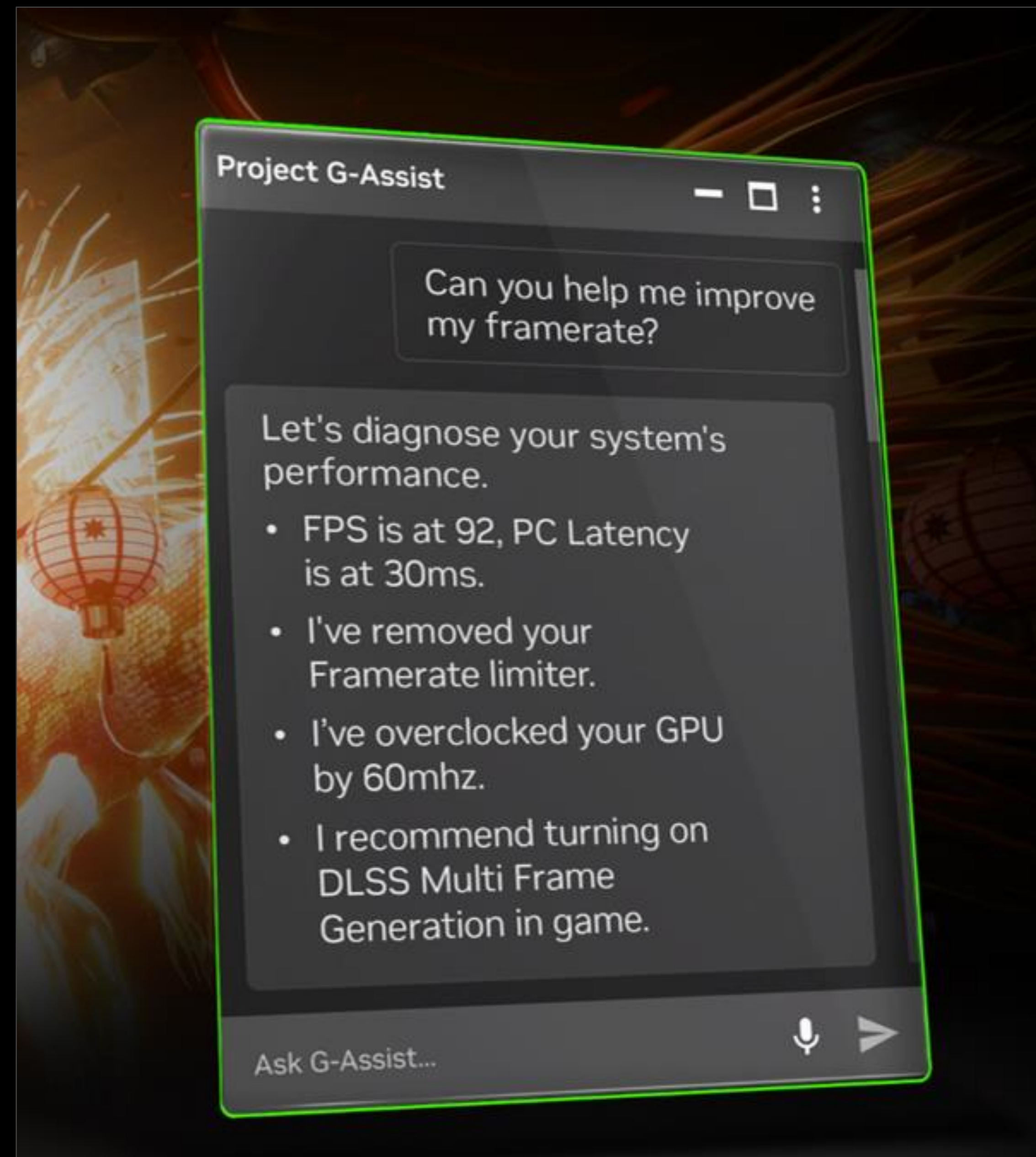
Arrows indicate the flow of data and control between these components, showing how they are integrated into a single system.

Connect with popular AI tools

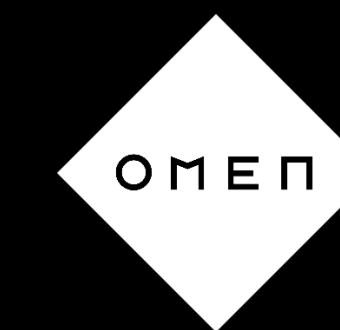
Generative AI Levels Up Gaming



Autonomous Game Characters



AI Coaches and Assistants



Partners Leading the Way

