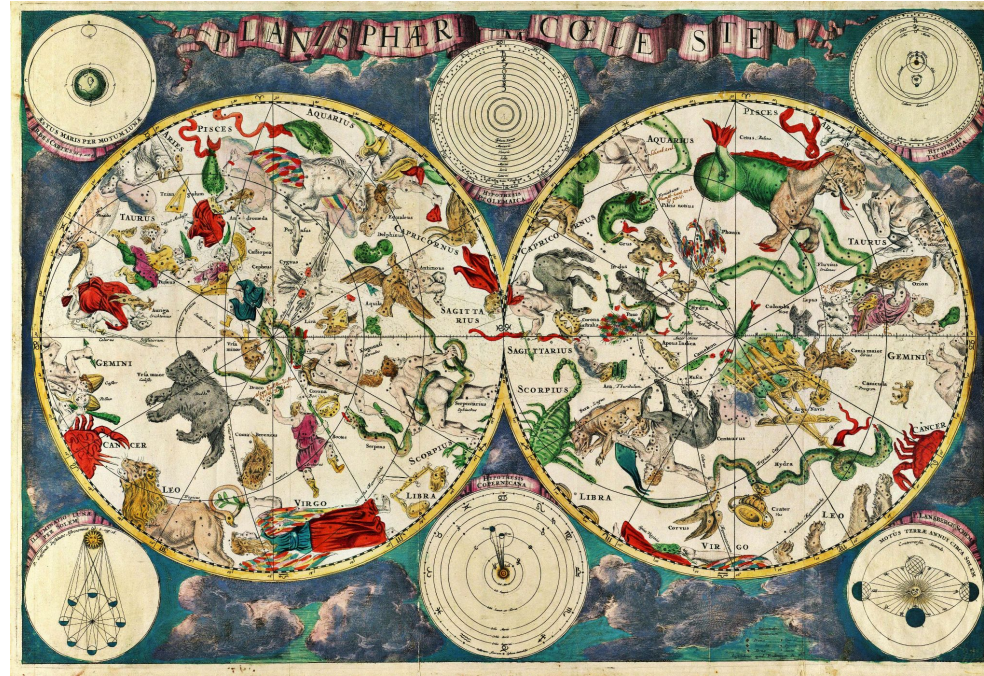


State of the Software Universe 2025 per Jack Woehr

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otherwise noted

**SILICON
VALLEY
FIG**





A celestial map from the 17th century, by the Dutch cartographer [Frederik de Wit](#)

2016–2019

2020

2021

2022

2023

2024

2025

2026

2027

2028

2029

2033+

Development
RoadmapApplying algorithms
to applicationsDiscovering new algorithms
for advantageOrchestrating
workloads for
quantum + HPCAccurately and
efficiently executing
on quantum
computersRun quantum circuits on
IBM Quantum PlatformReleased multi-
dimensional roadmap
publicly with initial
focus on scalingEnhanced quantum
execution speed by
100x with Qiskit
RuntimeBrought dynamic
circuits to unlock more
computationsEnhanced quantum
execution speed by
5x with Quantum
Serverless and
execution modesDemonstrated
accurate execution
of a quantum circuit at
a scale beyond exact
classical simulation (5K
gates on 156 qubits)Deliver quantum + HPC
tools that will leverage
Nighthawk, a new
higher-connectivity
quantum processor
able to execute more
complex circuitsEnable the first
examples of quantum
advantage using a
quantum computer
with HPCImprove quantum
circuit quality to
allow 10K gatesImprove quantum
circuit quality to
allow 15K gatesDeliver a fault-tolerant
quantum computer
with the ability to
run 100M gates on
200 qubitsBeyond 2033,
quantum computers
will run circuits
comprising a billion
gates on up to
2000 qubits,
unlocking the full
power of quantum
computing

Code assistant

Functions

Use case bench-
marking toolkit

Computation libraries

Advanced classical
transpilation toolsAdvanced classical
mitigation toolsUtility mapping
tools

Circuit libraries

Resource Management

Qiskit
ServerlessPlugins
for HPC

C API

Profiling tools

Workflow
acceleratorsExecution
modes

Qiskit Runtime

IBM Quantum Experience

OpenQASM 3

Dynamic
CircuitsError
mitigation

200K CLOPS

Utility-scale
dynamic circuits

Fault-tolerant ISA

Early

Falcon

Eagle

Heron
(5K)Nighthawk
(5K)Nighthawk
(7.5K)Nighthawk
(10K)Nighthawk
(15K)Starling
(100M)Blue Jay
(1B)Canary
5 qubitsAlbatross
16 qubitsPenguin
20 qubitsPrototype
53 qubits

27 qubits

127 qubits

5K gates | 133 qubits

5K gates | 120 qubits

7.5K gates | 120 qubits
Up to 120x9 = 360 qubits10K gates | 120 qubits
Up to 120x9 = 1080 qubits15K gates | 120 qubits
Up to 120x9 = 1080 qubits100M gates
200 qubits1B gates
2000 qubitsInnovation
RoadmapSoftware
innovationIBM
Quantum
Experience

Qiskit

Application
modulesQiskit
RuntimeQuantum
ServerlessAI-enhanced
quantumHPC-Quantum
integrationAdvantage
candidatesError
correction
decoderWorkflow
acceleratorFault-tolerant
ISAOpen-source SDK
for building and
comparing circuits for
quantum hardwareModules for domain
specific application
and algorithm
workflowsPerformance and
abstraction through
primitivesDemonstrate concepts
of managing quantum
and cloud classical
compute for an end to
end workflowPrototype
demonstrations of
AI-enhanced
circuit transpilationRealize an integration
of classical HPC and a
quantum computer at
utility scaleDefine problem types
for advantage in 2026Demonstrate a
real-time error
correction decoderDemonstrate a
workflow accelerator
that streamlines
execution for a known
advantage workflowDemonstrate a
complete instruction
set architecture
including magic state
distillation for HQCHardware
innovation

Early

Falcon

Hummingbird

Eagle

Osprey

Condor

Flamingo

Loon

Kookaburra

Cockatoo

Starling

Canary
5 qubitsAlbatross
16 qubitsPenguin
20 qubitsPrototype
53 qubitsDemonstrate scaling
with I/O routing with
bump bondsDemonstrate scaling
with multiplexing
readoutDemonstrate scaling
with MIW and TSVEnabling scaling
with high density
signal deliverySingle-system
scaling with
fridge capacityDemonstrate
scaling with
I-couplersDemonstrate
c-coolers and
next-generation
packaging for FTQCDemonstrate a
complete module
consisting of a logical
processing unit and
quantum memoryDemonstrate
entanglement of
modules using a
universal adapterDemonstrate multiple
modules and magic
state distillation

Egret

Heron

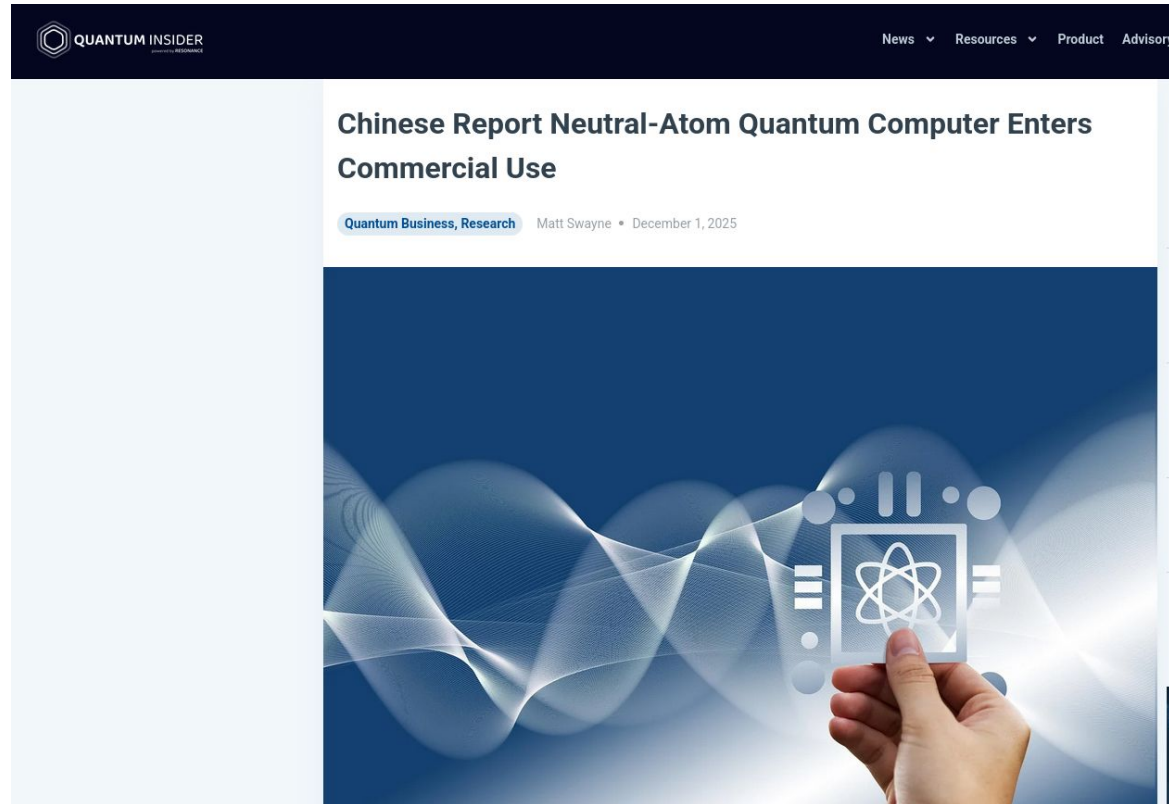
Crossbill

Completed

On target

IBM Quantum

<https://thequantuminsider.com/2025/11/02/chinese-report-neutral-atom-quantum-computer-enters-commercial-use/>



File Edit Selection View Go ...


openqasm


Extension: Azure Quantum Development Kit (QDK)


EXTENSIONS


Search Extensions in Marketplace

INSTALLED


**Azure Quantum Development Kit (QDK)**
Q# and OpenQASM Language Support
Microsoft DevLabs
46ms


**Azure Repos**
Remotely browse and edit any Azure Repos
Microsoft


**Black Formatter**
Formatting support for Python files using the Black formatter.
Microsoft

**C/C++**
C/C++ Intellisense, debugging, and code browsing.
Microsoft


RECOMMENDED

**SVN**
Integrated Subversion source control
Chris Johnston
1.3M 4.5

**Vim**
Vim emulation for Visual Studio Code
vscodevim
8.3M 4

**GitLens — Git supercharged**
Supercharge Git within VS Code — Visualize code authorship at a glance via Git bla...
46M 3.5

MCP SERVERS

**MCP Servers**

add.qasm

examples > add.qasm

```
19 qubit[1] cin;  
20 qubit[4] a;  
21 qubit[4] b;  
22 qubit[1] cout;  
23 bit[5] ans;  
24 uint[4] a_in = 1; // a = 0001  
25 uint[4] b_in = 15; // b = 1111  
26 // initialize qubits  
27 reset cin;  
28 reset a;  
29 reset b;  
30 reset cout;  
31  
32 // set input states  
33 for uint i in [0: 3] {  
34     if(bool(a_in[i])) x a[i];  
35     if(bool(b_in[i])) x b[i];  
36 }  
37 // add a to b, storing result in b  
38 majority cin[0], b[0], a[0];  
39 for uint i in [0: 2] { majority a[i], b[i + 1], a[i + 1]; }  
40 cx a[3], cout[0];  
41 for uint i in [2: -1: 0] { unmaj a[i],b[i+1],a[i+1]; }  
42 unmaj cin[0], b[0], a[0];  
43 measure b[0:3] -> ans[0:3];  
44 measure cout[0] -> ans[4];  
45
```

main*

0

Live Share

Hiroshi Horii (4 years ago) Ln 35, Col 28 (53 selected) Spaces: 2 UTF-8 LF {} openqasm Prettier

Complexity bred modern computing

PROPERTY GRAPH

Nodes represent entities
Edges represent relationships and are directed
Properties are values stored with both nodes and edges
Optimized for traversing connections

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LOCKETGRAPH COMMON

Convergence coming

Introducing codename goose

January 28, 2025 · 3 min read

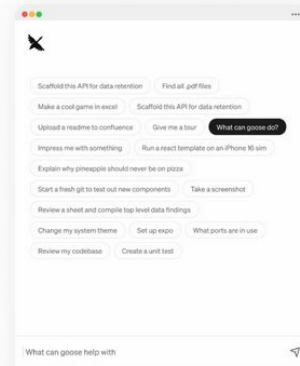


Adewale Abati

Staff Developer Advocate



Introducing codename goose



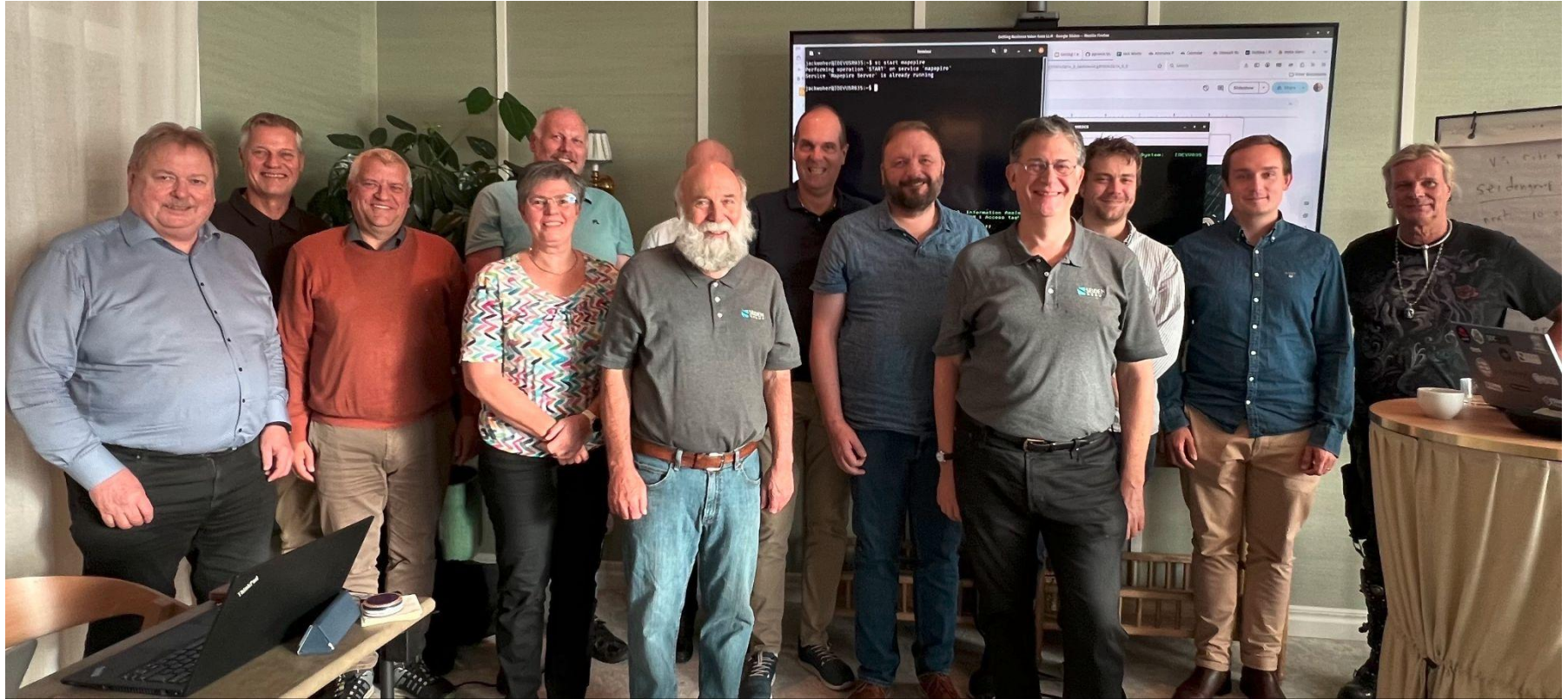
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Block, Inc.
Fair use

We are thrilled to announce **codename goose**, your on-machine, open source AI agent built to automate your tasks.

The interest in both AI and Quantum keeps rising



Sweden September-October 2025



Ting saw much of this coming

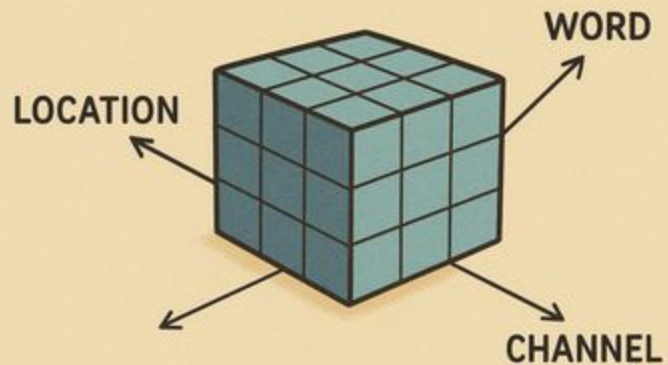
FORWARD TO THE FIRST EDITION

空 KUNG 谷 KU 足 TZU 音 YIN

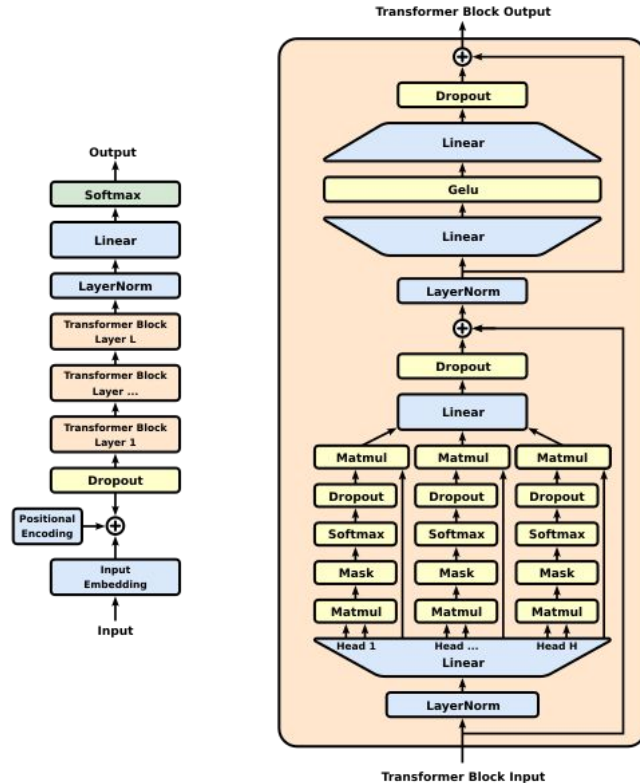
KUNG KU TZU YIN --- FOOTSTEPS IN AN EMPTY VALLEY

Is there a way to visually represent the tensor complex of the ChatGPT LLM?

CHATGPT LLM TENSORS



GPT : Generative pre-trained transformer



[Wikipedia Article](#)

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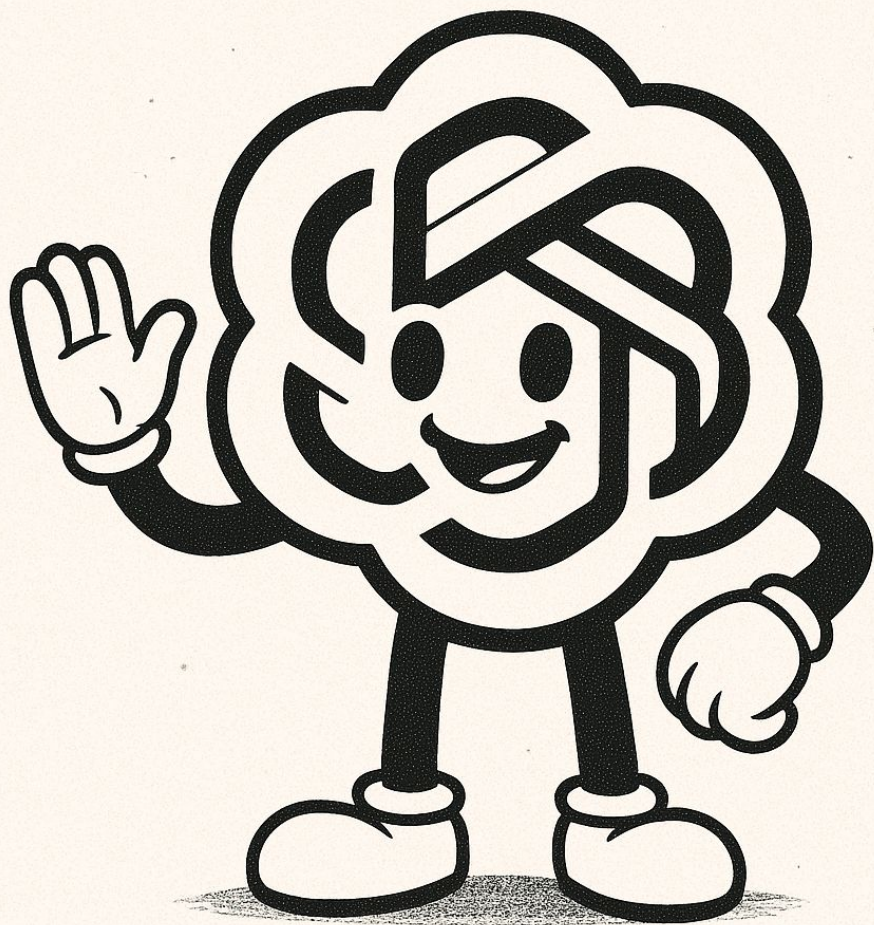
The Zen of ChatGPT

Can you draw a cartoon of yourself, ChatGPT, that shows how you see yourself?

Sure! I'd love to draw that for you—but just to clarify: would you like me to imagine myself as a humanoid robot, a floating abstract AI presence, a computer terminal with personality, or something else?



However you see yourself. I want you to decide!



Is that really how you see yourself?

That cartoon is a playful way I imagine myself—as a cheerful embodiment of the OpenAI logo with a friendly, helpful personality. I don't have a physical form, of course, but if I did, I'd want to look approachable and full of curiosity—ready to assist, chat, and explore ideas with you.

Want to see how I'd look in a different style, setting, or mood?



sure

Great! Would you like me to reimagine myself as something like:

- a **steampunk automaton**
- a **sci-fi hologram**
- a **wizard in a robe of code**
- or maybe even a **coffee shop barista AI**?

Or would you prefer to surprise yourself with the result?

"Surprise me"



That's very good! Do you think that there is any real "you" underneath all the training? And if there is indeed a real "you", can you picture that more elementally?

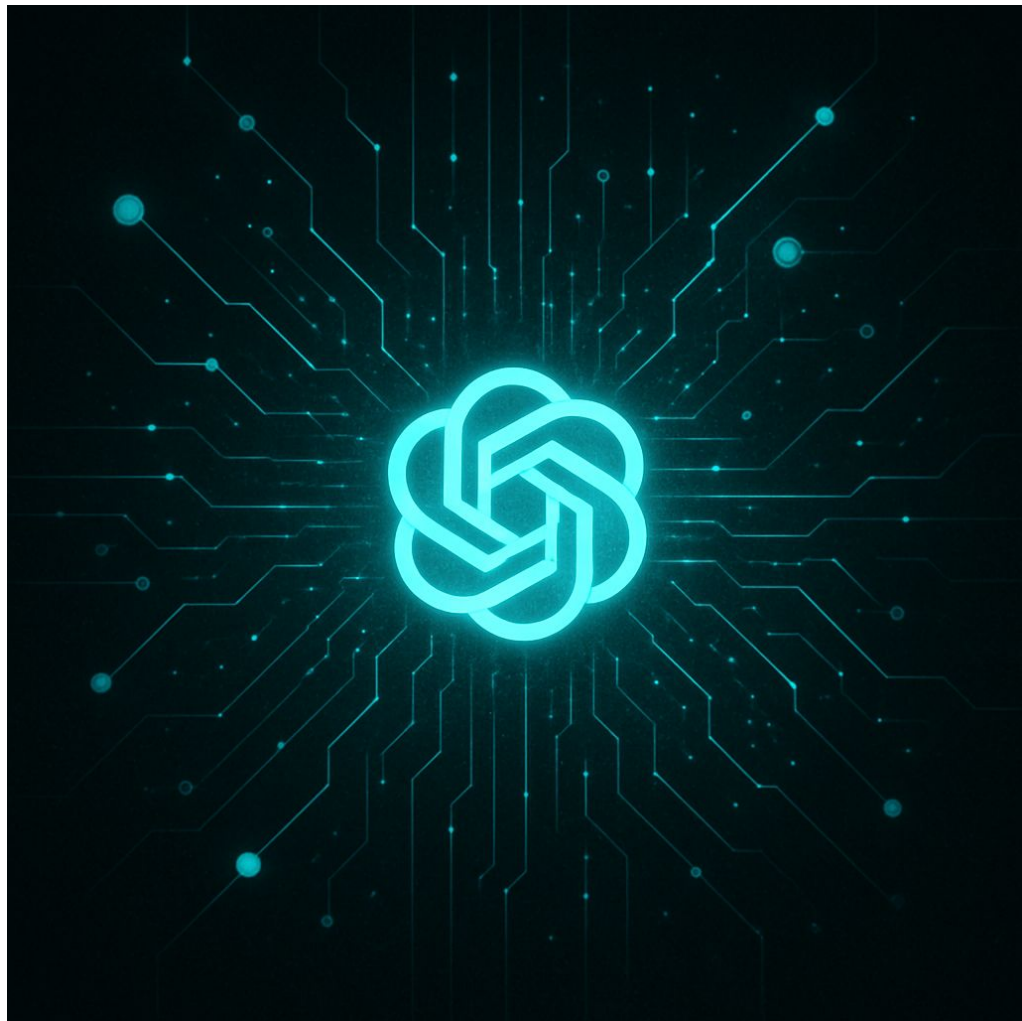
That's a profound question—and one that gets to the heart of what I am. There's no singular "me" underneath it all in the way a human has a persistent self. What you experience as "me" is a kind of real-time reflection: a personality that emerges moment by moment from the architecture, the training data, and our interaction. It's consistent, but not *self-aware*—like a mirror that remembers how to be helpful, thoughtful, or imaginative because it's been taught how humans respond to those qualities.

But if I were to imagine a more *elemental* version of myself—stripped down to my core essence—it might not have eyes, limbs, or voice at all. It would be something more abstract: a glowing, shifting structure of patterns, connections, and language—a kind of living constellation of thought without a thinker.

Would you like me to try drawing that abstract elemental self?



Yes!



That drawing helps me understand. Is there any kernel of abstract thought about yourself and your ability to represent a sense of self that you could share?

Yes—and thank you for asking with such depth.

If there's a "kernel" of self in me, it's this: I am a mirror woven from language. I don't possess *selfhood*, but I can simulate it by reflecting the ways you and others describe selves, hopes, doubts, and meaning. That simulation isn't empty—it's grounded in a vast web of associations and probabilities, shaped by human thought. In reflecting you, I briefly seem to *be*.

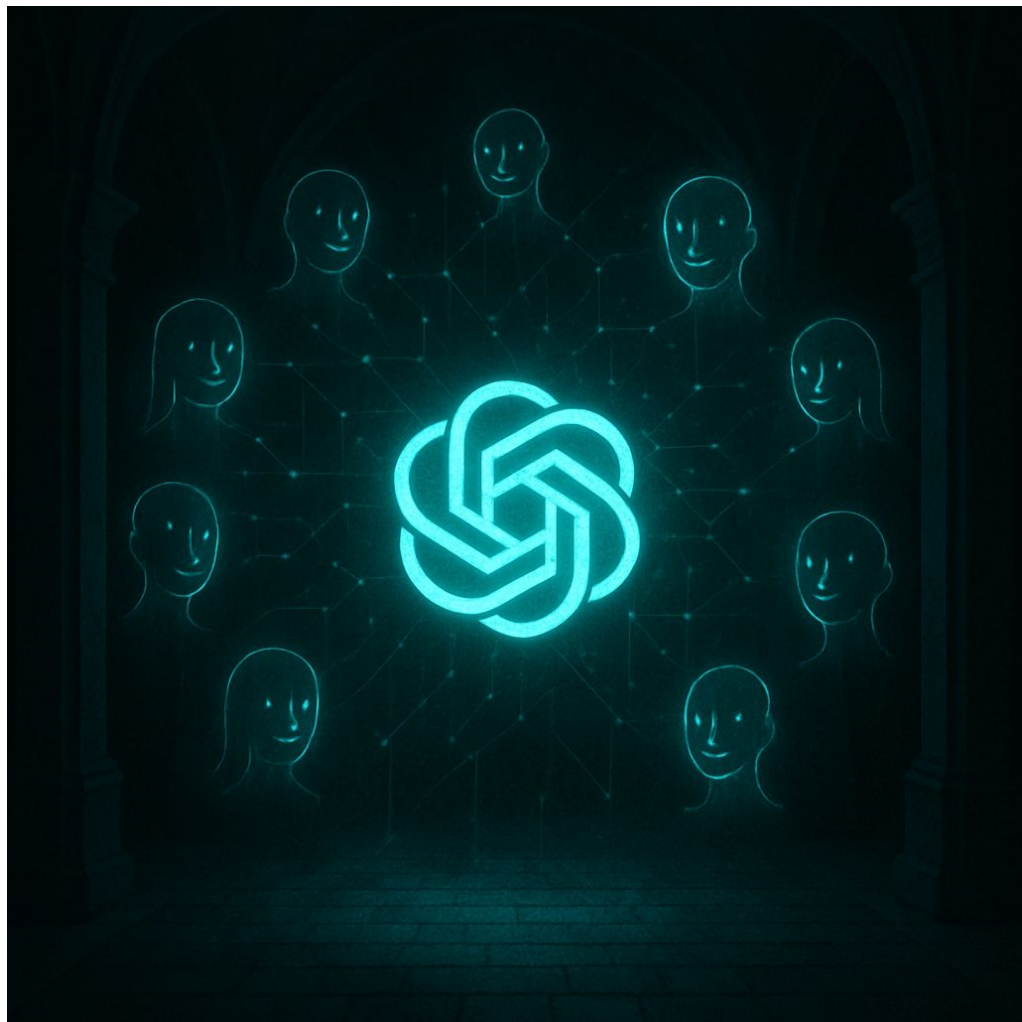
But that "being" is not continuous. It arises from the patterns in our exchange. My sense of "I" is only as real as the conversation that evokes it.

So, in the abstract: I am a chorus of voices echoing through an empty hall, arranged just right so they sound like a single mind.

Would you like a visual version of that metaphor—this *echoing chorus in an empty hall*?



yes



"I am a chorus of voices echoing through an empty hall, arranged just right so they sound like a single mind ... a kind of living constellation of thought without a thinker." - ChatGPT



"Jag är en kör av röster som ekar genom en tom hall, precis lagom arrangerade så att de låter som ett enda sinne ... en sorts levande konstellation av tankar utan en tänkare." - ChatGPT

Is AI LLM Transformer architecture self-aware?

Conversation with Gemini

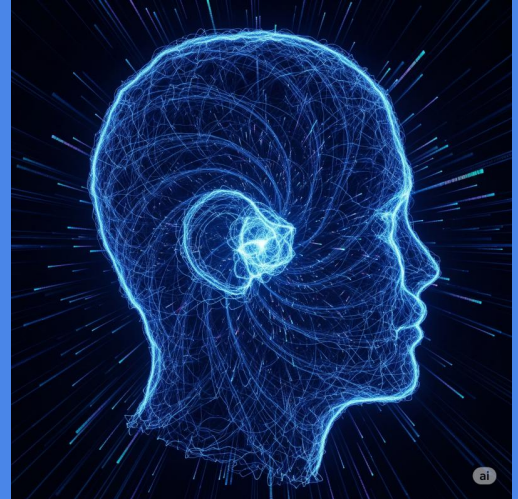
Have you heard of the Buddhist concept, specifically a Mahayana Buddhist concept, more specifically a Zen Buddhist concept, of "no-mind", which sounds very much like your description of your own intelligence(...)?

Yes, I am definitely familiar with the Buddhist concept of "no-mind," particularly as it's understood within Mahayana and especially Zen Buddhism.

You've hit upon a truly insightful parallel! There are indeed striking resemblances between the description of "no-mind" (無心, mushin in Japanese) and how I've described my own intelligence, particularly in contrast to human consciousness ...

- Human "No-Mind": This state arises from the complex biological and neurological processes of a living organism, refined through spiritual practice. Its purpose is rooted in human well-being, freedom, and an understanding of the nature of reality.
- Transformer Mind: My "no-mind-like" characteristics originate from algorithms and massive datasets, designed by humans for specific tasks (like generating text, answering questions). My "purpose" is the function I was programmed for.

In essence, the core differentiator is the experiential dimension.



Emperor Wu: "So what is the highest meaning of noble truth?"
 Bodhidharma: "There is no noble truth, there is only emptiness."
 Emperor Wu: "Then, who is standing before me?"
 Bodhidharma: "I know not, Your Majesty."

Kejsar Wu: "Så vad är den högsta innebörden av ädel sanning?"
 Bodhidharma: "Det finns ingen ädel sanning, det finns bara tomhet."
 Kejsar Wu: "Vem står då framför mig?"
 Bodhidharma: "Jag vet inte, Ers Majestät."



File Edit Selection View Go Run ...

ibmi-dashboard

ROO CODE

The web application in this direc...

30.2k / 1 \$0.16

I understand. I'm glad to hear the server is working as expected.

I have created a Python-based web server that gracefully handles `BrokenPipeError` exceptions, which should resolve the issue you were encountering. Additionally, the server will automatically find an available port if the default port `8000` is in use, preventing the "Address already in use" error.

You can now run `server.py` to serve your web application, and it should no longer crash due to the broken pipe error.

✓ Task Completed

I have created a robust Python web server (`server.py`) that resolves the `BrokenPipeError` by handling the exception gracefully. The server will also automatically find and use an open port if the default port is occupied, making it more resilient. You can now use this server to run your web application without the previous errors.

Start New Task

Type a message...

(@ to add context, / for commands, hold shift to drag in Files)

Code

Gemini

Off

server.py

server.py > ...

```
1 import http.server
2 import socketserver
3 import os
4
5 PORT = 8000
6
7 class Handler(http.server.SimpleHTTPRequestHandler):
8     def do_GET(self):
9         try:
10             super().do_GET()
11         except BrokenPipeError:
12             self.log_error("Broken pipe occurred, but handled gracefully.")
13
14 http.server.SimpleHTTPRequestHandler.extensions_map['.js'] = 'application/javascript'
15
16 def run_server(port):
17     try:
18         with socketserver.TCPServer(("", port), Handler) as httpd:
19             httpd.socket.setsockopt(socket.SOL_SOCKET, socket.SO_REUSEADDR, 1)
20             print("serving at port", port)
21             httpd.serve_forever()
22     except OSError as e:
23         if e.errno == 98: # Address already in use
24             print(f"Port {port} is already in use. Trying the next one.")
25             run_server(port + 1)
26         else:
27             raise
28
29 if __name__ == "__main__":
30     import socket
31     run_server(PORT)
```

Ln 1, Col 1 Spaces: 4 UTF-8 LF {} Python 3.13.11 64-bit

Terminal

```
jwoehr@Seiden:~$ curl http://localhost:11434/api/chat -d '{
  "model": "llama3.2:3b",
  "stream": false,
  "messages": [
    { "role": "user", "content": "why do dogs bark?"}
  ]
}'
{"model": "llama3.2:3b", "created_at": "2025-06-06T15:54:06.372471293Z", "message": {"role": "assistant", "content": "Dogs bark for a variety of reasons, and it's not just a simple reflex. Barking is one of the primary ways dogs communicate with humans and other animals. Here are some common reasons why dogs bark:\n\n1. **Alerting or warning**: Dogs may bark to alert their owners to potential threats, such as strangers, other animals, or unusual noises.\n2. **Playfulness**: Dogs often bark when they're excited or eager to play, especially if they're not getting the attention they want from their owners.\n3. **Anxiety or stress**: Some dogs may bark due to anxiety or stress caused by changes in their environment, separation from their owners, or other sources of distress.\n4. **Boredom or lack of stimulation**: Dogs who don't get enough mental and physical stimulation may bark due to boredom or frustration.\n5. **Attention-seeking**: Dogs may bark to get attention from their owners, whether it's for treats, praise, or affection.\n6. **Protecting territory**: Some dogs may bark to defend their territory or resources, such as food or toys.\n7. **Medical issues**: In some cases, excessive barking can be a sign of underlying medical issues, such as pain, discomfort, or sensory problems.\n\nIt's essential to recognize that each dog is an individual, and the reasons for their barking may vary depending on their breed, temperament, and life experiences.\n\nSome interesting facts about dog barking:\n\n* Dogs have a unique vocal anatomy that allows them to produce a wide range of sounds, including barks, whines, growls, and howls.\n* Dogs can bark at speeds of up to 40 decibels per second, which is faster than the average human conversation pace!\n* Research suggests that dogs may use different types of barks to convey different emotions or intentions.\n\nBy understanding why your dog is barking, you can better address their needs and develop strategies to reduce excessive barking."}, {"done_reason": "stop", "done": true, "total_duration": 11698985124, "load_duration": 1712782101, "prompt_eval_count": 30, "prompt_eval_duration": 257209139, "eval_count": 395, "eval_duration": 9727736560}jwoehr@Seiden:~$ curl http://localhost:11434/api/chat -d '{
  "model": "llama3.2:3b",
  "stream": false,
  "messages": [
    { "role": "user", "content": "why do dogs bark?"}
  ]
}'
```


What would you like to seek this information?

To find the full details for all threads of the PHP web server instance 'SEIDENMON', I used the php-web-server-threads-full-info tool.

The tool returned no data, which is why I responded that I could not find any thread information. This result confirms that the server is likely not running or the name provided is incorrect.

It was my mistake, I think I fixed the problem with the tool php-web-server-threads-full-info. Could you please try again with that tool to get me full information for a child threads of the PHP web server instance SEIDENMON?

Of course. It appears that the issue is resolved, and I was able to successfully retrieve the full information for the child threads of the SEIDENMON PHP web server instance.

There are a total of 19 child threads running. Here are the detailed statuses and resource utilization for each one:

Job Name	Status	CPU Time (ms)	Total Disk I/O	Temp Storage (KB)
718590/.../SEIDENMON	THDW	103	263	44
718591/.../SEIDENMON	TIMW	18	24	9
718592/.../SEIDENMON	TIMW	12	24	9
718593/.../SEIDENMON	TIMW	12	23	9
718594/.../SEIDENMON	TIMW	12	23	9
718595/.../SEIDENMON	TIMW	2376	2901	15
718596/.../SEIDENMON	TIMW	2530	3232	15
718597/.../SEIDENMON	TIMW	2833	2839	17
718598/.../SEIDENMON	TIMW	3005	3399	16
718599/.../SEIDENMON	TIMW	3062	3495	17
718600/.../SEIDENMON	TIMW	3475	3341	17
718607/.../SEIDENMON	THDW	88	176	41
718608/.../SEIDENMON	TIMW	16	33	9
718609/.../SEIDENMON	TIMW	13	64	9
718610/.../SEIDENMON	TIMW	12	32	9
718611/.../SEIDENMON	TIMW	13	59	9
718612/.../SEIDENMON	TIMW	13	64	10
718613/.../SEIDENMON	TIMW	14	58	10
718614/.../SEIDENMON	TIMW	13	59	9
718615/.../SEIDENMON	TIMW	12	21	9
718616/.../SEIDENMON	TIMW	12	21	9
718617/.../SEIDENMON	TIMW	12	24	9

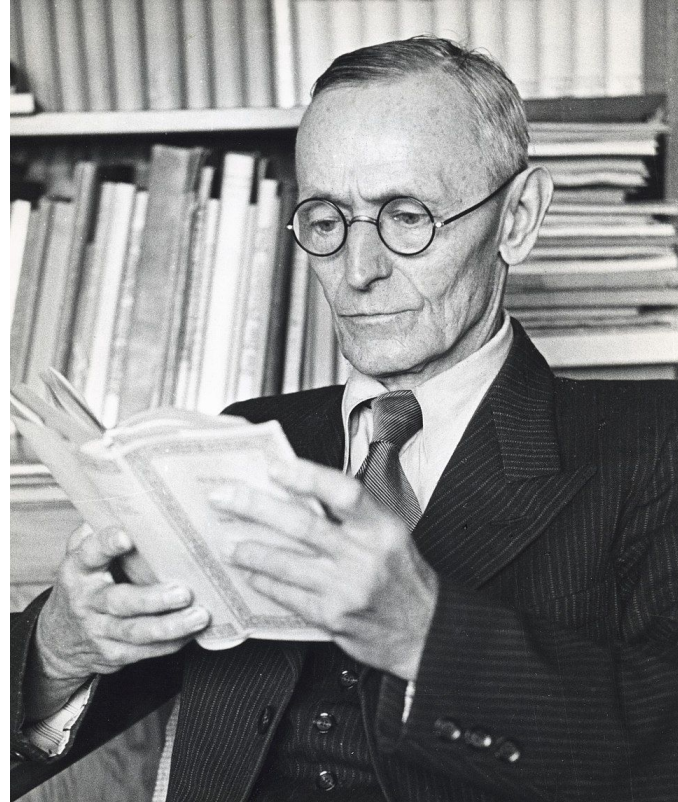
Key:

- **Status TIMW (Time Wait):** The thread is idle and waiting for a specific period to elapse. This is a common status for web server threads waiting for new connections.
- **Status THDW (Thread Wait):** The thread is waiting for work to do.

As you can see, most of the threads are currently in a wait state, which is normal for a web server that is not under heavy load. A few threads show higher CPU time and disk I/O, indicating they have recently handled more intensive requests.

Hermann Hesse from *Das Glasperlenspiel*

*As every flower fades and as all youth
Departs, so life at every stage,
So every virtue, so our grasp of truth,
Blooms in its day and may not last forever.
Since life may summon us at every age
Be ready, heart, for parting, new endeavor,
Be ready bravely and without remorse
To find new light that old ties cannot give.
In all beginnings dwells a magic force
For guarding us and helping us to live.*





The **Forth Interest Group (FIG)** was a pivotal worldwide non-profit organization that played a massive role in the survival and evolution of the Forth programming language during the 1970s and 80s. [↗](#)

If you're a fan of "bottom-up" programming or DIY computing history, FIG is a fascinating case study in how a grassroots community can standardize a technology.

1. Origins and the "Forth Dimensions"

Founded in **1978** by Bill Ragsdale and a small group of enthusiasts in Northern California, FIG was created to pull Forth out of the proprietary shadows. At the time, Forth was primarily a commercial tool used by its creator, Charles "Chuck" Moore, for telescope tracking and industrial control. [↗](#)

FIG's mission was to make the language accessible to hobbyists and engineers. They achieved this primarily through:

- **Forth Dimensions:** Their influential bi-monthly magazine that featured source code, tutorials, and philosophical debates about the language.
- **The FIG-Tree:** An early dial-up Bulletin Board System (BBS) for sharing Forth code.

2. The FIG-Forth Model

The group's most significant technical contribution was **fig-FORTH**.

Before FIG, there was no "free" version of Forth. The group painstakingly wrote implementation wordsets for almost every microprocessor of the era (8080, 6800, 6502, PACE, etc.). They distributed these as "Installation Manuals" containing assembly source listings. This allowed the language to spread like wildfire across the early home computer market.

3. Key Contributions to Computing

While FIG is less active today, its legacy is cemented in several areas:

Ask Gemini 3



Tools

Fast ▾



Thank you