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# QUINN'S AI UPDATE

## Welcome to Quinn's AI Update

Issue #14, December 2023

Hello, AI Enthusiasts!

I can't believe it's almost 2024 already and this is issue #14 of Quinn's AI Update!

I hope you're getting value from this newsletter. I've heard back from many of you and tried to incorporate your feedback—thanks for the help on improvement!

If you like what you see here, please don't hesitate to forward it on to anyone else you think it could help. The AI Revolution is underway and I want to help as many as I can to understand and profit from it!

As usual, a lot has happened in the last two weeks—read on for more!



Image generated by ChatGPT4/Dalle-3 with the text prompt: "Santa Claus wearing a cowboy hat and boots, standing in a Texas landscape. The background shows a vast desert with cacti and a clear blue sky."

### In This Issue

Here's the amazing stuff going on in AI the last two weeks:

- GPT-4.5 before the New Year?
- Google DeepMind discovers millions of new materials
- The Deep Dive: Quantum Computing—what is it and what does it mean for AI?
- Google Gemini—not all we thought it was?
- Mistral: the new open-source AI from France
- The UTSA MATRIX AI Consortium receives a \$2.8M NSF grant to establish neuro-inspired AI partner institute

### All Sam Wants for Christmas is GPT-4.5?

The rumor mill is swirling about OpenAI releasing ChatGPT-4.5 before the New Year. Some AI enthusiasts think it may have already been released, as they claim they see faster, smarter responses when they use ChatGPT. Our old friend "Jimmy Apples" has also been posting that GPT-4.5 Turbo would be released before Christmas. If that were the case, it would certainly "one up" Google's Gemini AI announcements as well as Anthropic's Claude updates.

If it has been released, that certainly suggests we'll see GPT-5 in 2024—and maybe that's Artificial General Intelligence (AGI).

As of this writing, my instance of ChatGPT has been responding to me that it is still GTP-4. [Here's a link to a Business Insider article on the matter.](#)

### Google GNoME Dreams Up 2 Million New Materials

Google claims that a new AI tool, called GNoME, developed by its DeepMind research lab has come up with millions of new, never-before-seen materials. By training GNoME on 50,000 already known materials, the AI has generated the theoretical architecture of millions of new materials that could have potential for revolutionary new batteries, solar panels and computer chips. In a research paper published recently in the science journal *Nature*, the Alphabet-owned AI firm said almost 400,000 of its hypothetical material designs could soon be produced in lab conditions. It's estimated this feat would have taken ordinary humans 800 years to achieve.

**Why it matters:** So that's an AI Revolution kicking off a Materials Science Revolution. Imagine all the other Revolutions on the way thanks to AI! Space travel? Nanotechnology? Human longevity?

[Here's a link](#) to the *Nature* article. Click [here](#) for a Reuter explanation.

*"Nature isn't classical, dammit, and if you want to make a simulation of nature, you'd better make it quantum mechanical."*

—Richard Feynman, American theoretical physicist, known for his work on the Manhattan Project, the Space Shuttle Challenger Crash Investigation, the Feynman Lectures on physics, and his quirky sense of humor. He shared the 1965 Nobel Prize in Physics for his work on Quantum Electrodynamics.

### Deep Dive: Quantum Mania Around Quantum Computing

The buzz around AI has been closely mirrored by the buzz around Quantum Computing. So I thought I'd do this month's Deep Dive on what is Quantum Computing and why it's important.

A quantum computer differs from a "classical", or current day, computer in several important ways beginning with the material used to do its calculations: silicon-based transistors for today's computers vs. superconducting materials for quantum computers. But it goes way beyond that.

**Information Processing and Physics:** **Classical Computers** rely on "bits" as the basic unit of information, and a bit can be either 0 or 1. Every operation in a classical computer is a manipulation of these bits and the silicon-based transistors in these computers act as switches to represent these bits. That's Classical Physics.

**Quantum Computers**, on the other hand, use "qubits" (quantum bits) as their basic unit of information. Qubits have the unique property of being able to exist in a superposition of 0 and 1 simultaneously. This allows quantum computers to **process a vast amount of information in parallel**, dramatically increasing their potential computational power for certain tasks. That's Quantum Physics.

**Materials and Construction:** **Classical Computers** primarily use silicon-based materials for transistors. The advancements in classical computing have largely followed Moore's Law, focusing on miniaturizing transistors to pack more of them into smaller spaces on computer chips.

**Quantum Computers** use different, more exotic materials, including superconductors, trapped ions, and more. The choice of material affects how qubits are created and manipulated. The behavior of qubits is sensitive to their environment, requiring advanced techniques to isolate and control them, including lowering the temperatures of the material to the coldest temperature in the universe: zero Kelvin.

**Error Rates and Stability:** **Classical Computers** are relatively stable and have low error rates in their operations.

**Quantum Computers** currently face significant challenges with error rates and qubit stability (coherence). Quantum error correction is a major area of research.

**Applications:** **Classical Computers:** Are suitable for a wide range of tasks and are the backbone of current digital technology. Everything from laptops to iPhones to car sensors and even current day supercomputers are based on classical computing technology.

**Quantum Computers:** While holding potential for specific complex problems (like cryptography, optimization, and simulation of quantum systems), they are not intended to replace classical computers for all tasks.

So I asked ChatGPT4 why quantum computing was so important. Here's what it said:

**Solving Complex Problems:** Quantum computers have the potential to solve certain types of problems much faster than current day, "classical" computers. This includes complex simulations in chemistry and physics, optimization problems, and potentially breaking certain types of encryption.

**Advancements in Science and Medicine:** They could accelerate research in various fields. For example, in drug discovery, quantum computers could simulate molecular interactions at an unprecedented scale.

**Quantum Supremacy:** This is the point where quantum computers can perform tasks that classical computers just can't. This has implications for cryptography, as they could potentially crack the toughest currently used encryption methods, and in protein folding required to understand how our biological cells operate.

**Randy's musings:** We are in the early stages of the Quantum Computing Revolution just as we are in the AI Revolution. But while significant progress has been made, the QC technology is still largely experimental. Researchers have demonstrated "quantum supremacy" for specific, narrowly defined tasks, but a general-purpose quantum computer is still a work in progress. The major challenges include improving qubit coherence times, error rates, and scalability. Quantum computers are extremely sensitive to environmental interference, which leads to errors. Building systems that can manage and correct these errors is a crucial area of ongoing research.

Predicting when we will have a fully functional, reliable quantum computer is challenging but I'd say it's within 10 to 15 years. Having AI helps us probably make that timeframe shorter. And for really tough problems that AIs may want to solve, they may find quantum computing is the *fastest*, and maybe the *only* way, to solve them.

### Did Google Pull a Fast One With Gemini?

Some critics think so.

As you may recall, a few weeks ago, Google showed its AI, Gemini, reacting in real time to what it was being shown by a human. Apparently, all the interactions recorded with Gemini were *not* in real time and the video was edited—so Gemini didn't respond as immediately as the video suggested and the image and audio interactions where a human showed Gemini a blue duck were not as smooth or, shall we say, "human like" as shown.

Was it all just Google using smoke and mirrors to pretend to be a near competitor to OpenAI—experts say, no, there's something there. But Google may have tried to make the production values a little too good.

For more, check [here](#).



Image generated with the ChatGPT4/Dalle-3 and the text prompt: "Create a photorealistic image, in 16:9 format, for Christmas Morning inside a cozy house with a Christmas Tree and presents under the tree and a train in HO scale that goes around the tree."

### France Gets into the AI Game

Mistral, a French AI Startup, has announced their new AI. It was launched under the open-source Apache 2.0 license so that people can build their own Chatbots to their own specifications. Unlike ChatGPT, the Mistral AI has been minimally trained on a small data set so that users/developers have more freedom in how their AIs are trained. And instead of opening access to the Mistral 7B model via APIs (Application Program Interfaces), as OpenAI has done with ChatGPT, Mistral made it available as a free download so developers could run it directly on their devices and servers. That gives developers much more freedom in what they do with the Mistral AI. So far, Mistral has received over \$500 Million in Seed and Series A investments.

Currently, Mistral AI outperforms GPT-3.5 on most accepted industry AI benchmarks. Mistral is a private company and has been valued at \$2 Billion. Click [here](#) for more.

Personally, I like this approach better. When we can have our own Artificial General Intelligence, I want one that is loyal to me and my family, not one that is trained to a Silicon Valley tech's beliefs and world view. I want my own [Larvis](#) "raised" by me.

### The MATRIX AI Consortium Launches at UTSA

Today's AIs take a lot of energy—so much that I covered in my [blog](#) how Microsoft was looking for nuclear project engineers who knew how to build nuclear reactors for powering AIs.

The human brain, though, which most people would say is running an organic intelligence, can run on a lot less energy—three meals a day and 64 ounces of water. And with this idea in mind, The UTSA MATRIX AI Consortium just received \$2 Million from the National Science Foundation to research making AI more energy efficient.

To that end, the Consortium Team will draw ideas from the Temporal Scaffolding Hypothesis, a theory that mirrors the human brain's ability to process temporal patterns during both wakefulness and sleep.

"This \$2 million grant for pioneering research represents a significant step toward unlocking the potential of AI and aligning it with the efficient temporal learning principles of the human brain," said Eric Brey, interim dean of the Margie and Bill Klesse College of Engineering and Integrated Design at UTSA.

Here's the [article](#) in the UTSA Today online magazine for more.

*"By combining brain science ideas and real-life experiments, we can test and improve how these computer programs work, changing the way we study them. Copying how our brain learns about time helps AI require less power, which is a big issue in today's AI technology."*

—Dhiresha Kudithipudi, PhD, McDermott Endowed Chair, Department of Electrical and Computer Engineering at UTSA, founding director of MATRIX AI.

### What Does the Science Fiction Say?

"**Silent Running**" is a 1972 environmental-themed science fiction film. Set in the future, it tells the story of Freeman Lowell, a passionate botanist and ecologist aboard the spaceship Valley Forge, which houses Earth's last remaining forests in domes. When orders come to jettison and destroy the domes, Lowell rebels, killing his fellow crew members in an effort to save the forests. He is left alone with only three small service robots—Huey, Dewey, and Louie—for company and assistance. These robots, initially designed for menial tasks, become Lowell's companions and helpers as he strives to maintain the forest ecosystem. "Silent Running" has since become a cult classic, admired for its ahead-of-its-time commentary on environmentalism and the complex relationship between humans and technology. You can stream the movie on Youtube, Amazon Prime or Google Play.

"**Ex Machina**" is a 2014 science fiction thriller directed by Alex Garland. The film centers around Caleb Smith, a young programmer working for a large tech company, who wins a company contest to be chosen to participate in a groundbreaking experiment: to interact with Ava, a highly advanced humanoid robot with artificial intelligence, and determine if she possesses genuine consciousness and the ability to exhibit human-like qualities beyond her programming. Ava, portrayed with a blend of innocence and cunning, becomes the focal point of a tense and philosophical exploration of what it means to be human. You can stream the movie on Youtube, Amazon Prime or AppleTV.

### The Smart Money in AI

- Robot startup [Knightscope](#) is getting investment and making moves.
- [Biggest AI Deals of 2023](#)
- 7 Top [AI Stocks](#) for December 2023
- [Kiplinger](#): Best AI Stocks to Buy
- Beyond NVIDIA for [AI Investments](#)

### The Last word...for now.

Thanks for reading my newsletter—let me know how I can make it even better in 2024!

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Let me know what you think!

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