

Azure OpenAI

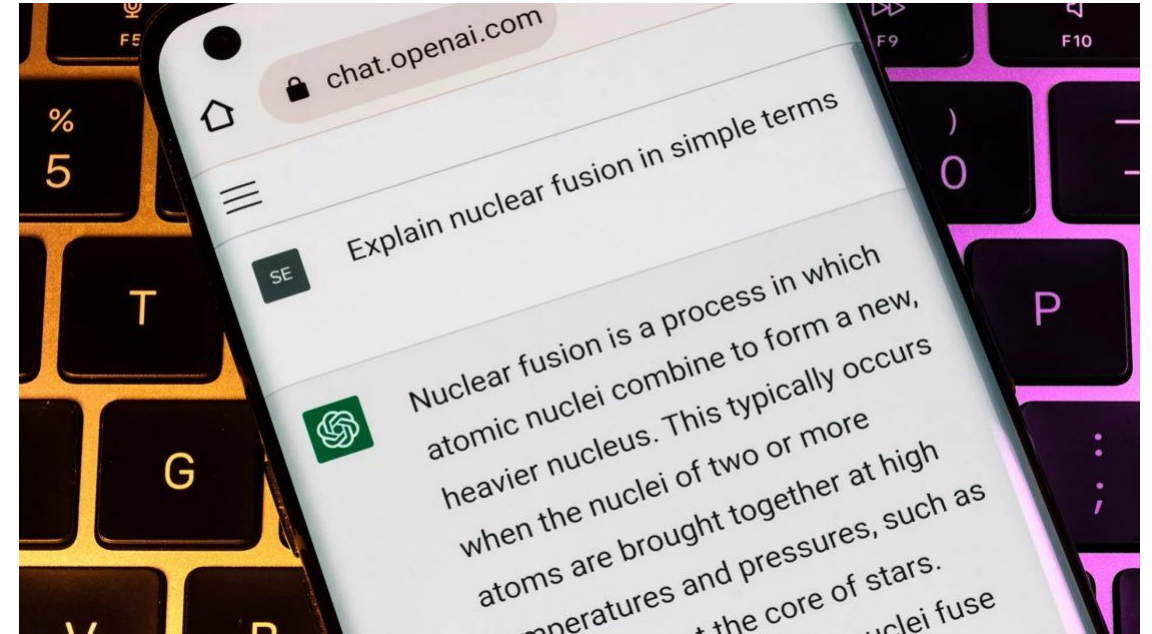
Dr. Ernesto Lee



ChatGPT

 OpenAI

what sets chat GPT apart from other chat Bots is its ability to understand context and provide relevant responses.



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Generative Pretrained Transformer (GPT)

Hello and Welcome

- **Generates responses**
- **It is pretrained by humans**
- **Transforms input to meaningful output**



OpenAI

Greg Brockman

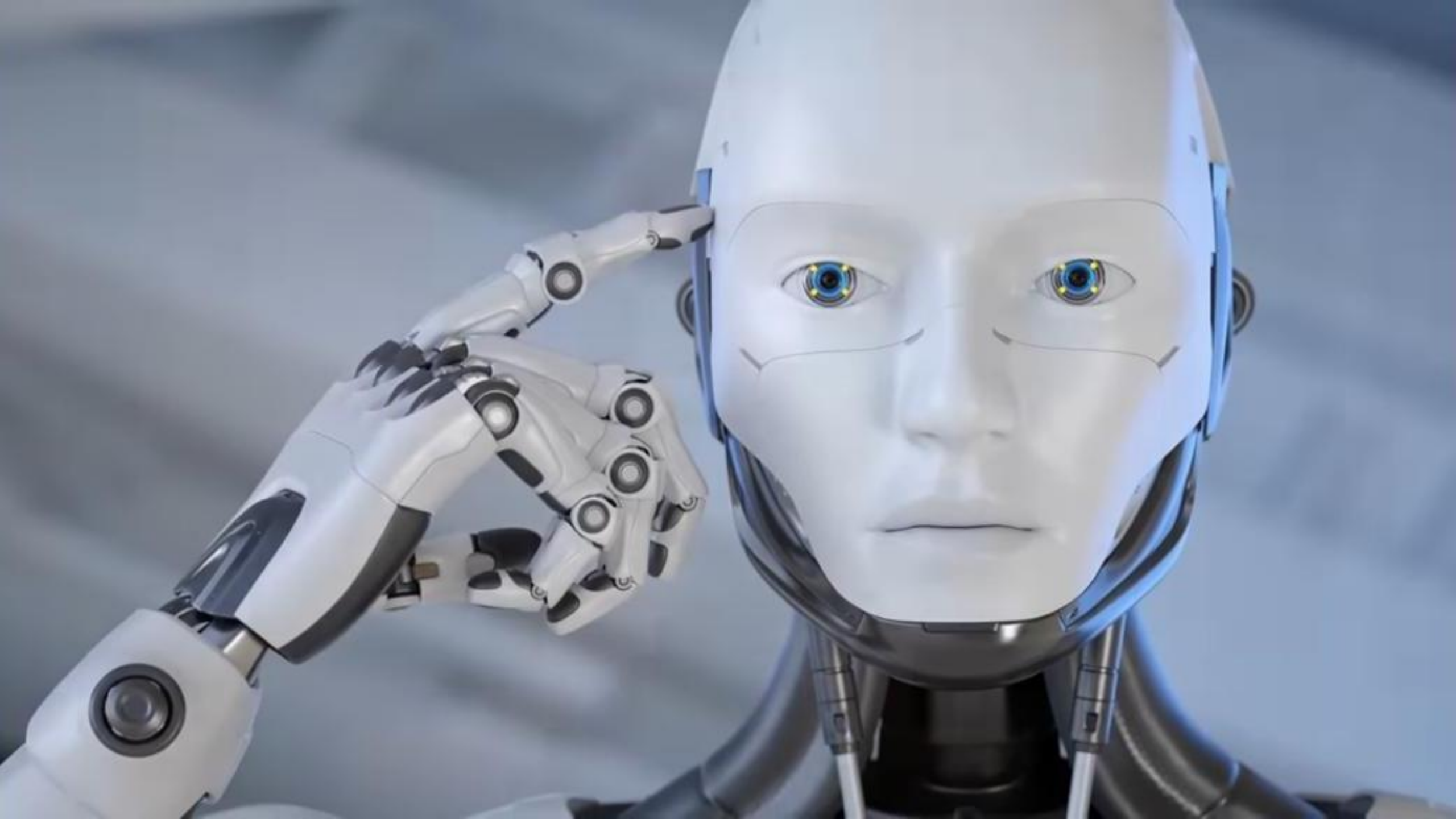
Co-founder & CTO

Ilya Sutskever

Co-founder & chief scientist

Dario Amodei

Research Director



A man in a white shirt and a lanyard is holding a blue folder and looking upwards. He is standing in front of a server rack with blue lights. The background is dark.

Supervised learning and reinforcement learning

ChatGPT



Examples

"Explain quantum computing in simple terms" →

"Got any creative ideas for a 10 year old's birthday?" →

"How do I make an HTTP request in Javascript?" →



Capabilities

Remembers what user said earlier in the conversation

Allows user to provide follow-up corrections

Trained to decline inappropriate requests



Limitations

May occasionally generate incorrect information

May occasionally produce harmful instructions or biased content

Limited knowledge of world and events after 2021

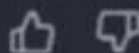
In two sentences, explain quantum mechanics in very simple terms



FI In two sentences, explain quantum mechanics in very simple terms



Quantum mechanics is a branch of physics that deals with the behavior of tiny particles like atoms and electrons. It tells us that these particles can act like both waves and particles, and can be in many different states at the same time.



How did it come up with this?

Fi In two sentences, explain quantum mechanics in very simple terms



Quantum mechanics is a branch of physics that deals with the behavior of tiny particles like atoms and electrons. It tells us that these particles can act like both waves and particles, and can

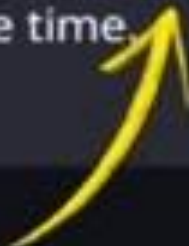
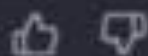


Predicts what words, phrases and sentences are most associated with the input made

FI In two sentences, explain quantum mechanics in very simple terms



Quantum mechanics is a branch of physics that deals with the behavior of tiny particles like atoms and electrons. It tells us that these particles can act like both waves and particles, and can be in many different states at the same time.



Chooses words and sentences deemed most likely to be associated with the input

FI In two sentences, explain quantum mechanics in very simple terms



Quantum mechanics is a branch of physics that deals with the behavior of tiny particles like atoms and electrons. It tells us that these particles can act like both waves and particles, and can be in many different states at the same time.



Outputs words and sentences that it predicts will best answer your question, based on its training

AI

In two sentences, explain quantum mechanics in very simple terms



Quantum mechanics is a branch of physics that deals with the behavior of tiny particles like atoms and electrons. It tells us that these particles can act like both waves and particles, and can be in many different states at the same time.

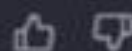


Randomizes output so that the answer is not always the same

< 2 / 2



Quantum mechanics is a branch of physics that studies the behavior of matter and energy at a very small scale, such as atoms and subatomic particles. It is characterized by phenomena such as superposition, entanglement, and wave-particle duality, which are not easily explained by classical physics.



Was this response better or worse?



Better



Worse



Same



Regenerate response



FI

In two sentences, explain quantum mechanics in very simple terms

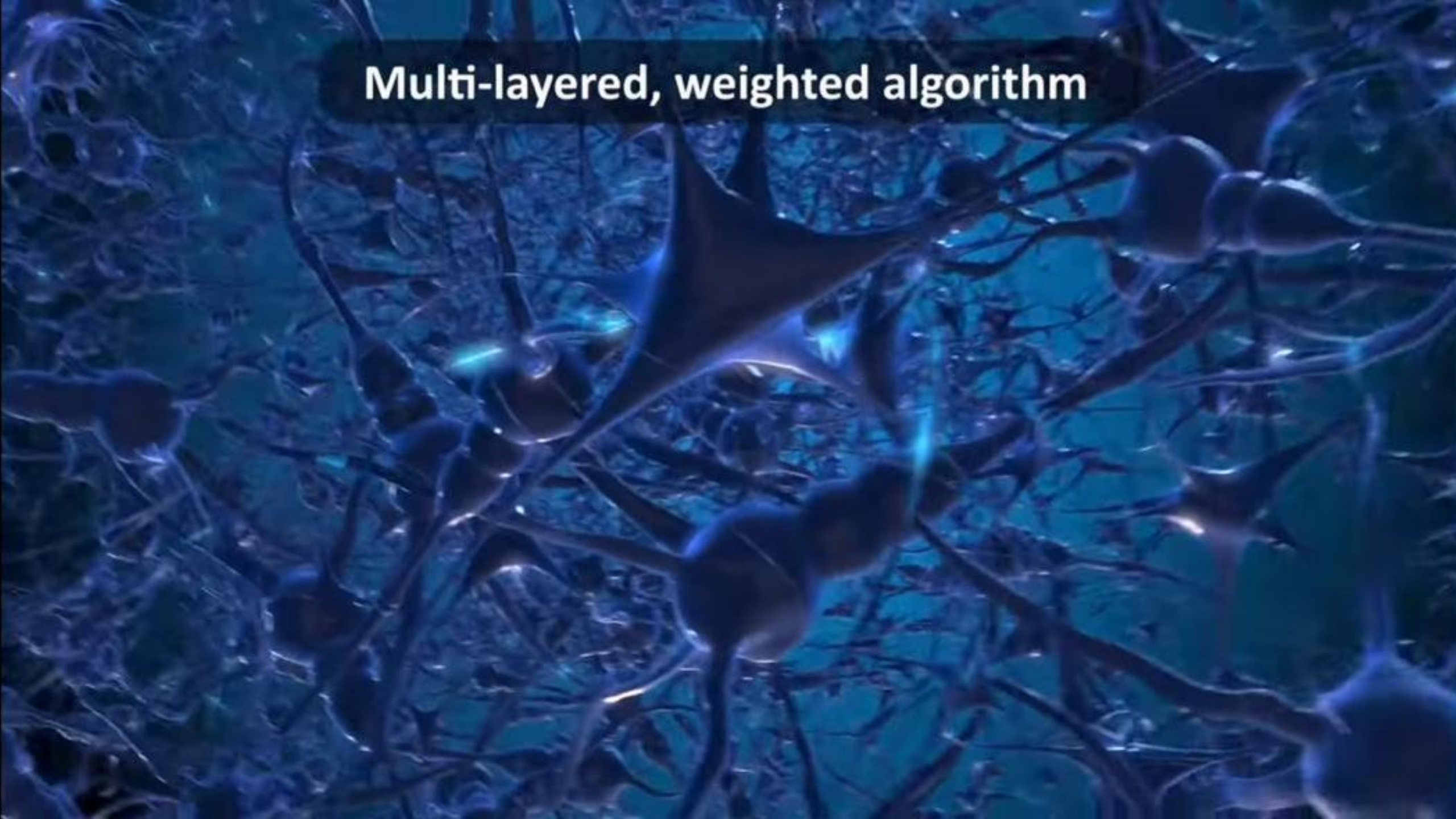


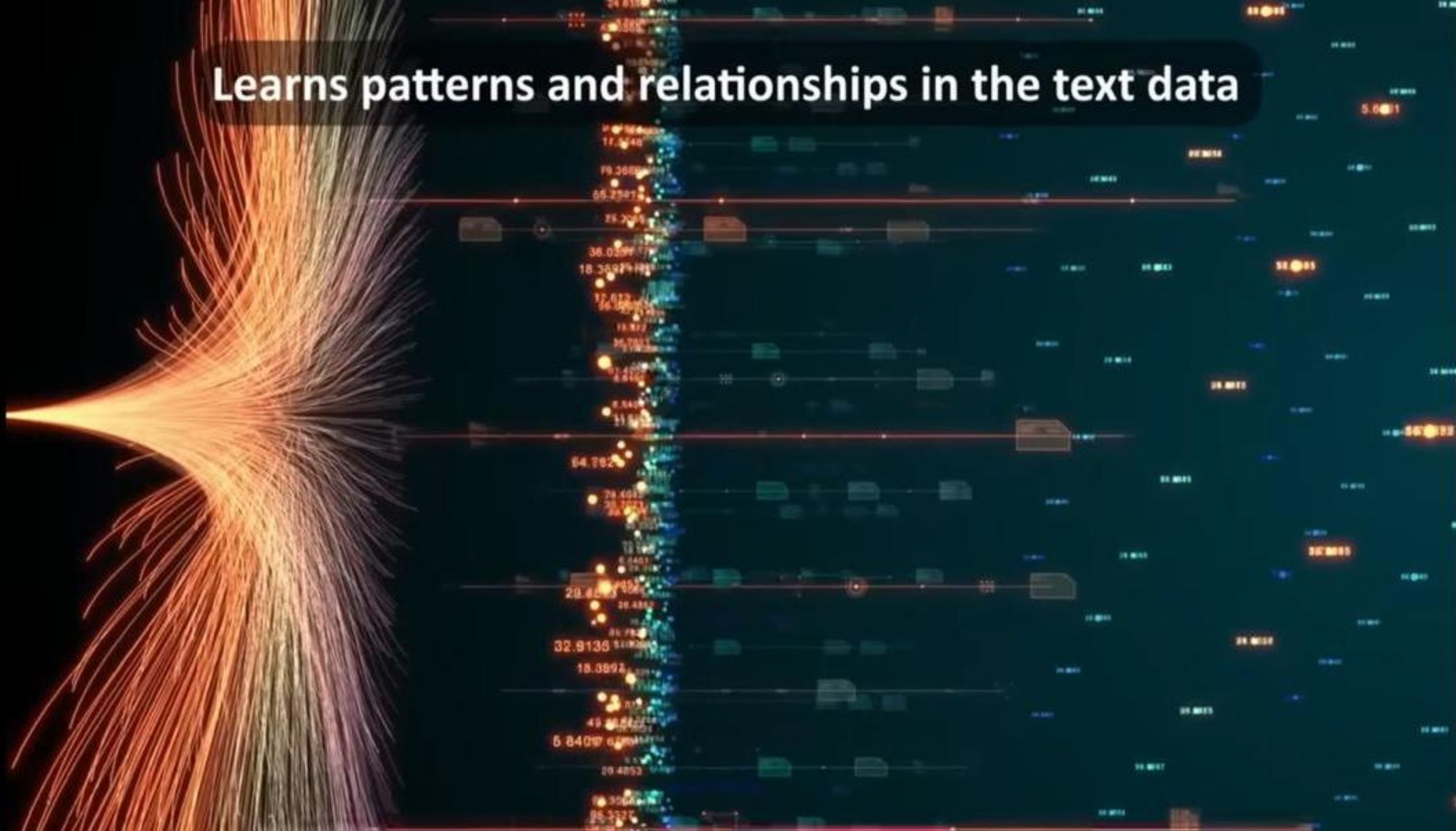
Quantum mechanics is a branch of physics that deals with the behavior of tiny particles like atoms and electrons. It tells us that these particles can act like both waves and particles, and can be in many different states at the same time.



**Determines what words would most likely
be expected after having learned how
input compares to words written on millions
of pages**

Multi-layered, weighted algorithm





Learns patterns and relationships in the text data

F1

In two sentences, explain quantum mechanics in very simple terms



Quantum mechanics is a branch of physics that deals with the behavior of tiny particles like atoms and electrons. It tells us that these particles can act like both waves and particles, and can be in many different states at the same time.



It's not like the predictive text on your phone



FI

In two sentences, explain quantum mechanics in very simple terms



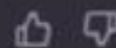
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Was this response better or worse?



Better



Worse



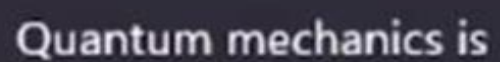
Same



Predicts words, sentences and paragraphs



Regenerate response




Quantum mechanics is

[ChatGPT Mar 14 Version](#). Free Research Preview. Our goal is to make AI systems more natural and safe to interact with. Your feedback will help.

the smallest scales, such as atoms, subatomic particles, and photons. It was developed in the early 20th century as a result of experimental observations that contradicted classical mechanics, which was the dominant physical theory at the time.

Quantum mechanics describes the behavior of particles in terms of wavefunctions, which are mathematical functions that describe the probability of finding a particle in a particular location or with a particular energy. The theory also introduces the concept of superposition, where a particle can exist in multiple states simultaneously, and the principle of uncertainty, which states that certain properties of particles, such as position and momentum, cannot be measured with absolute precision.


Quantum mechanics has many important applications, including in the development of technologies such as transistors, lasers, and nuclear power. It also plays a key role in understanding the behavior of complex systems, such as molecules and materials, and in the study of fundamental questions in physics, such as the nature of particles and the origins of the universe.

 Regenerate response

Send a message...

Quantum mechanics is

Calculates what word comes next
and what fraction of the time



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**Looks for matches in
context and meaning**

Quantum mechanics is


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Quantum mechanics is...	a	4.5%
Quantum mechanics is...	based	3.8%
Quantum mechanics is...	fundamentally	3.5%
Quantum mechanics is...	described	3.2%
Quantum mechanics is	many	0.7%

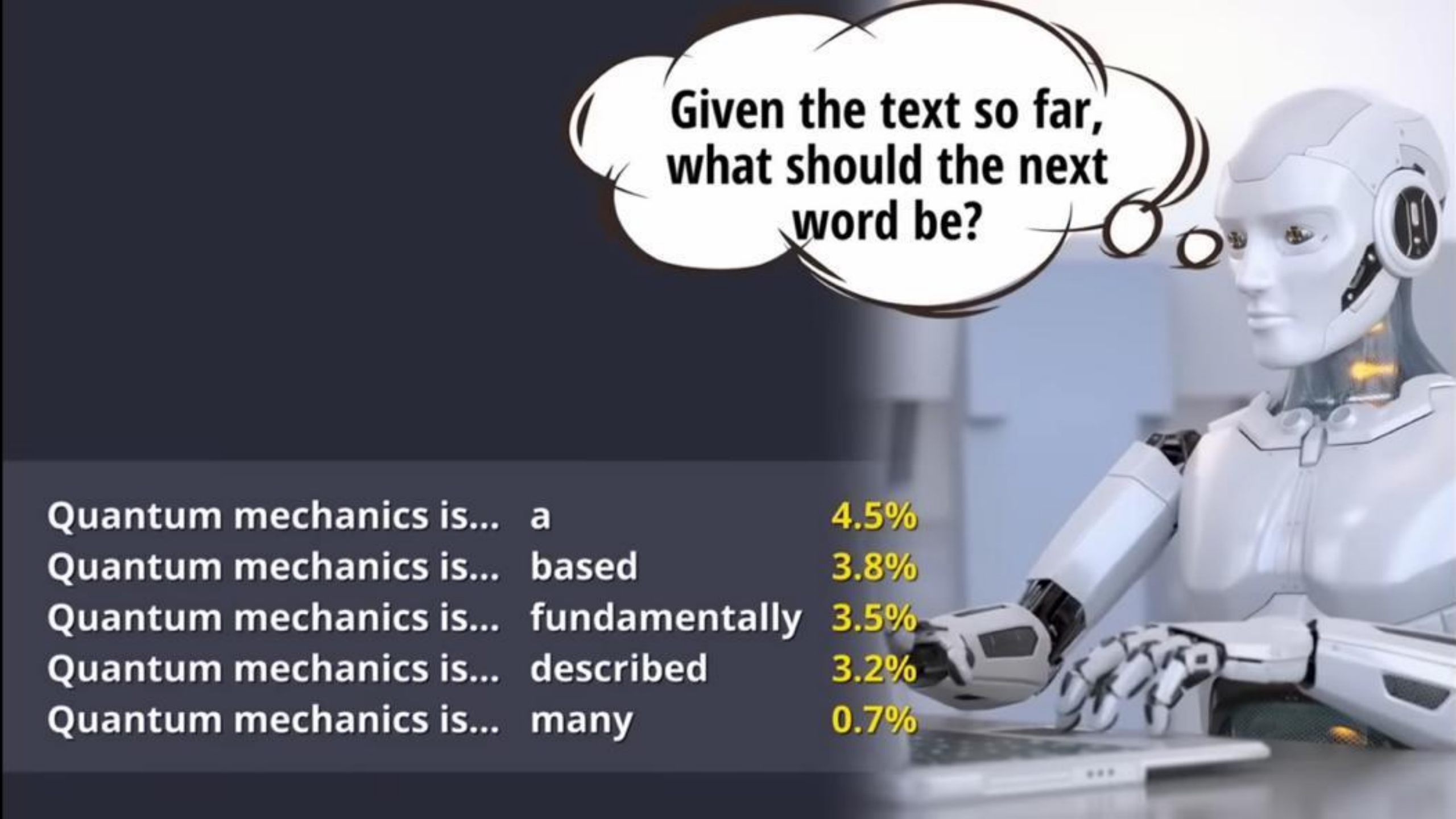
ChatGPT, Mar 14, Version 3.5 (Research) Preview. Our goal is to make AI systems more natural and safe to interact with. Your feedback will help.

Quantum mechanics is

**a
based
fundamentally
described
many**



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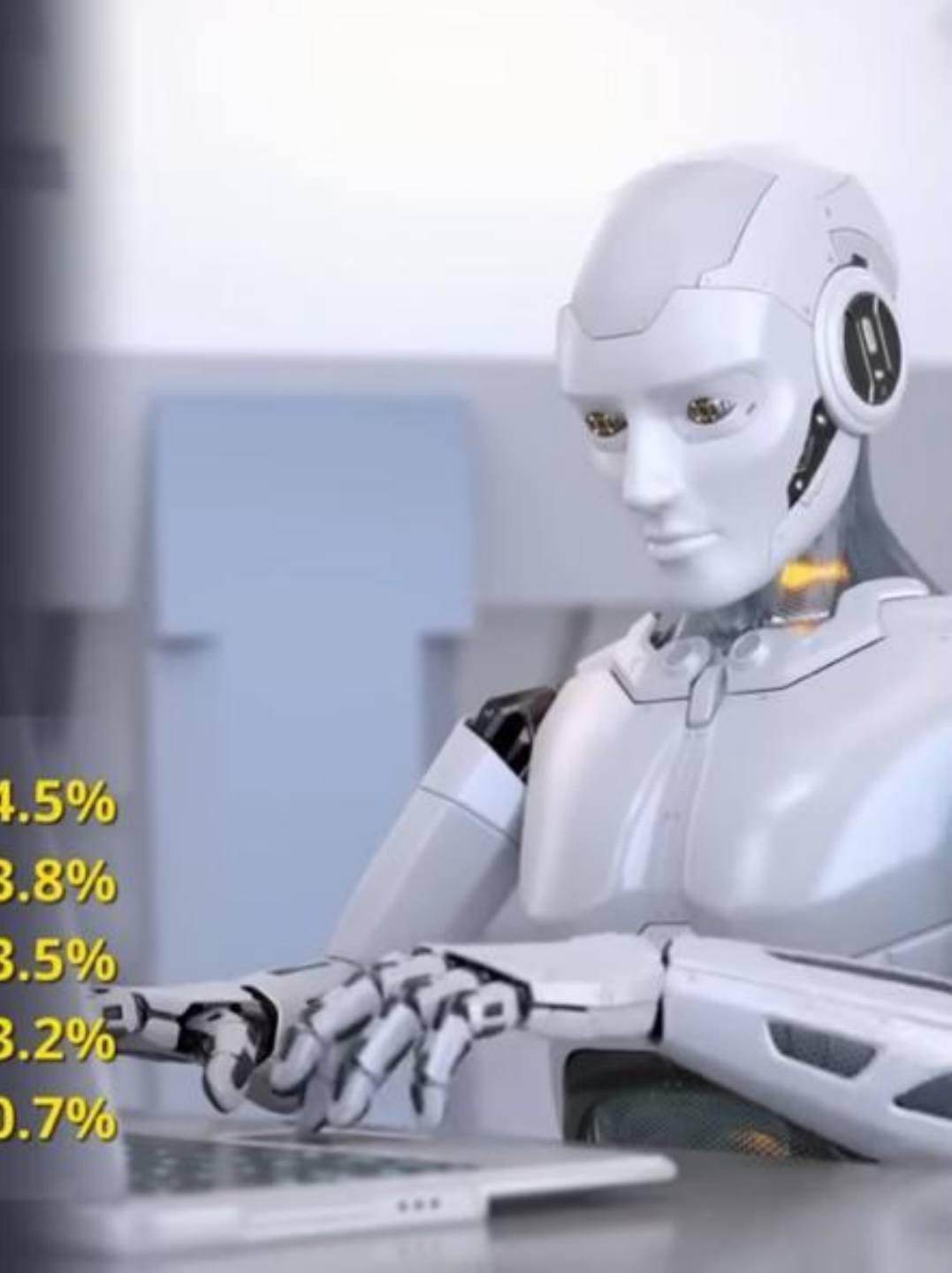


**Given the text so far,
what should the next
word be?**

Quantum mechanics is...	a	4.5%
Quantum mechanics is...	based	3.8%
Quantum mechanics is...	fundamentally	3.5%
Quantum mechanics is...	described	3.2%
Quantum mechanics is...	many	0.7%

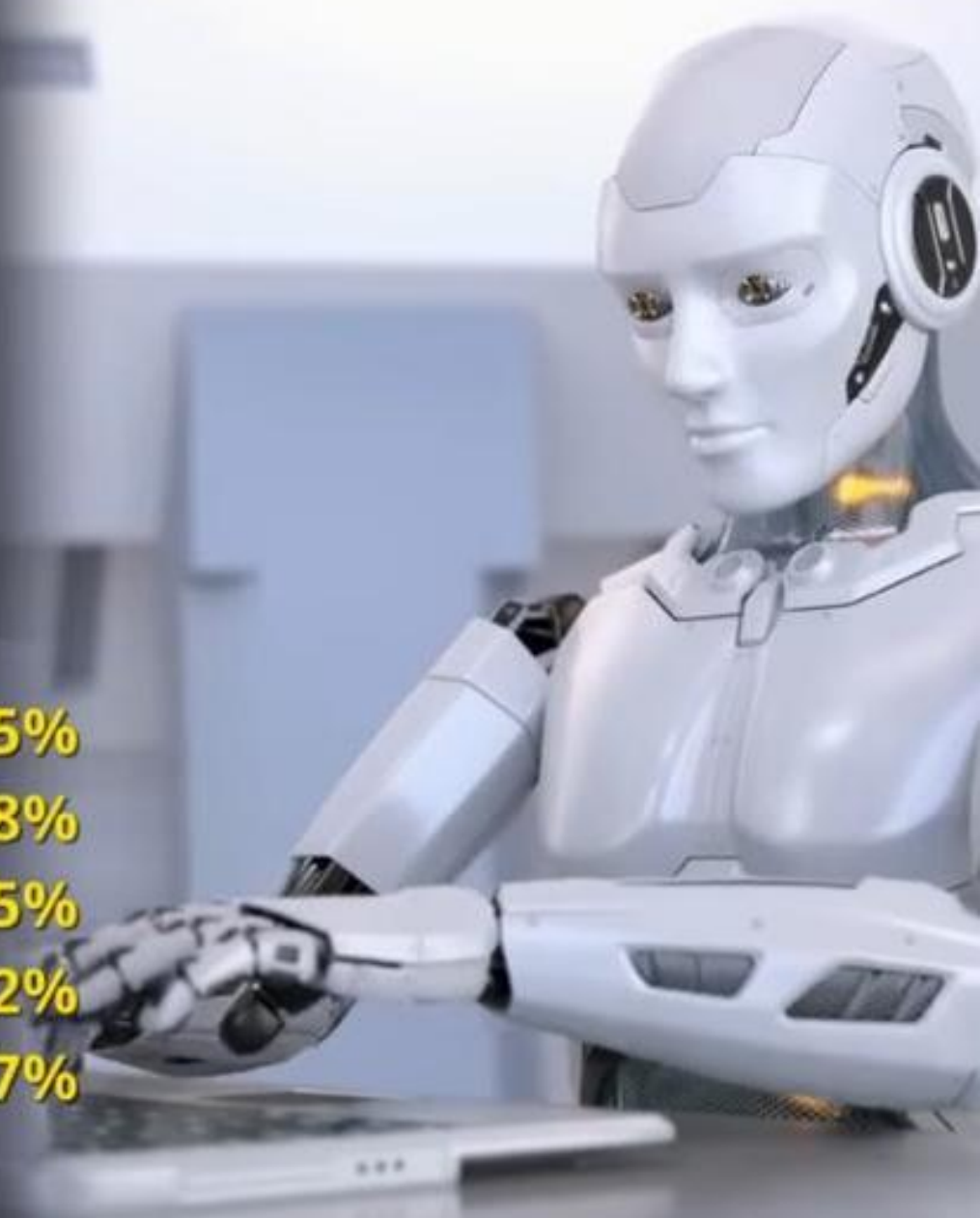
Quantum mechanics is a branch of physics that deals with the behavior of tiny particles like atoms and electrons. It tells us that these particles can act like both waves and particles, and can be in many different states at the same time.

Quantum mechanics is... a	4.5%
Quantum mechanics is... based	3.8%
Quantum mechanics is... fundamentally	3.5%
Quantum mechanics is... described	3.2%
Quantum mechanics is... many	0.7%



Quantum mechanics is a branch of physics that deals with the behavior of tiny particles like atoms and electrons. It tells us that these particles can act like both waves and particles, and can be in many different states at the same time.

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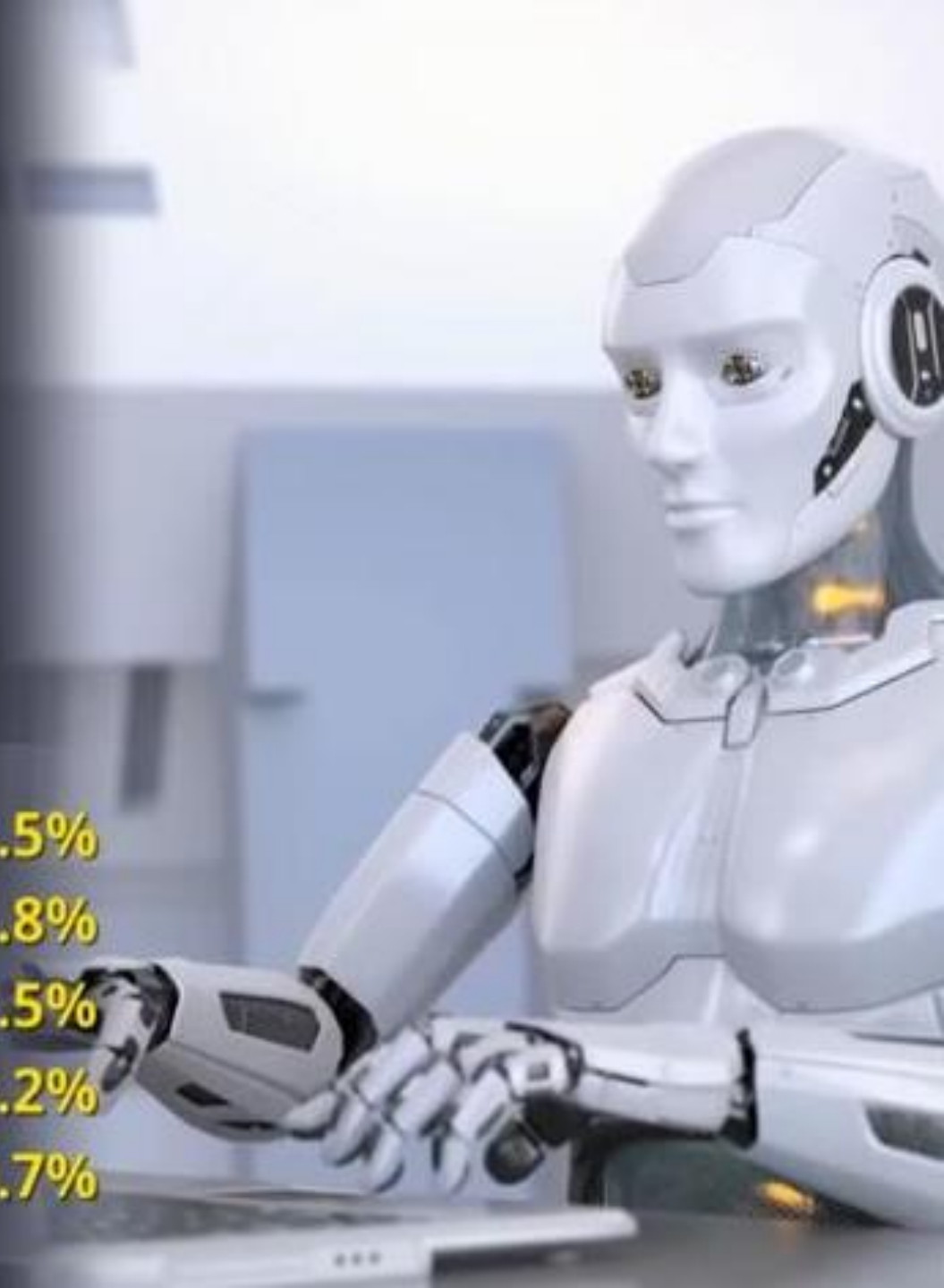
Quantum mechanics is a
Quantum mechanics is a branch
Quantum mechanics is a branch of
Quantum mechanics is a branch of physics

Quantum mechanics is...	a	4.5%
Quantum mechanics is...	based	3.8%
Quantum mechanics is...	fundamentally	3.5%
Quantum mechanics is...	described	3.2%
Quantum mechanics is...	many	0.7%



Quantum mechanics is a branch of physics that deals with the behavior of particles on a very small scale, such as atoms and subatomic particles like electrons, protons, and photons.

Quantum mechanics is... a	4.5%
Quantum mechanics is... based	3.8%
Quantum mechanics is... fundamentally	3.5%
Quantum mechanics is... described	3.2%
Quantum mechanics is... many	0.7%



Quantum mechanics is fundamentally
Quantum mechanics is fundamentally a
Quantum mechanics is fundamentally a probabilistic
Quantum mechanics is fundamentally a probabilistic theory■

Quantum mechanics is... a	4.5%
Quantum mechanics is... based	3.8%
Quantum mechanics is... fundamentally	3.5%
Quantum mechanics is... described	3.2%
Quantum mechanics is... many	0.7%



Both are correct



Quantum mechanics is fundamentally a probabilistic theory. It describes the behavior of particles and systems in terms of probabilities rather than deterministically predicting their behavior



Quantum mechanics is a branch of physics that deals with the behavior of particles on a very small scale, such as atoms and subatomic particles like electrons, protons, and photons.



Input: Quantum mechanics is

Potential output: Quantum mechanics is a

Quantum mechanics is based

Quantum mechanics is fundamentally

Quantum mechanics is described

Quantum mechanics is many

Model works at sentence and paragraph level in addition to word level

Quantum mechanics is

Quantum mechanics is a branch of physics that deals with the behavior of particles on a very small scale.

Model works at sentence and paragraph level in addition to word level

Quantum mechanics is

Quantum mechanics is fundamentally a probabilistic theory.
It describes the behavior of particles and systems in
terms of probabilities rather than deterministically
predicting their behavior

Quantum mechanics is

Quantum mechanics is a branch of physics that deals with the behavior of particles on a very small scale.

The model is choosing the best response step by step

Quantum mechanics is

Quantum mechanics is fundamentally a probabilistic theory.
It describes the behavior of particles and systems in
terms of probabilities rather than deterministically
predicting their behavior

The model is choosing the best response step by step



Explain how quantum mechanics works according to the Schrodinger Equation

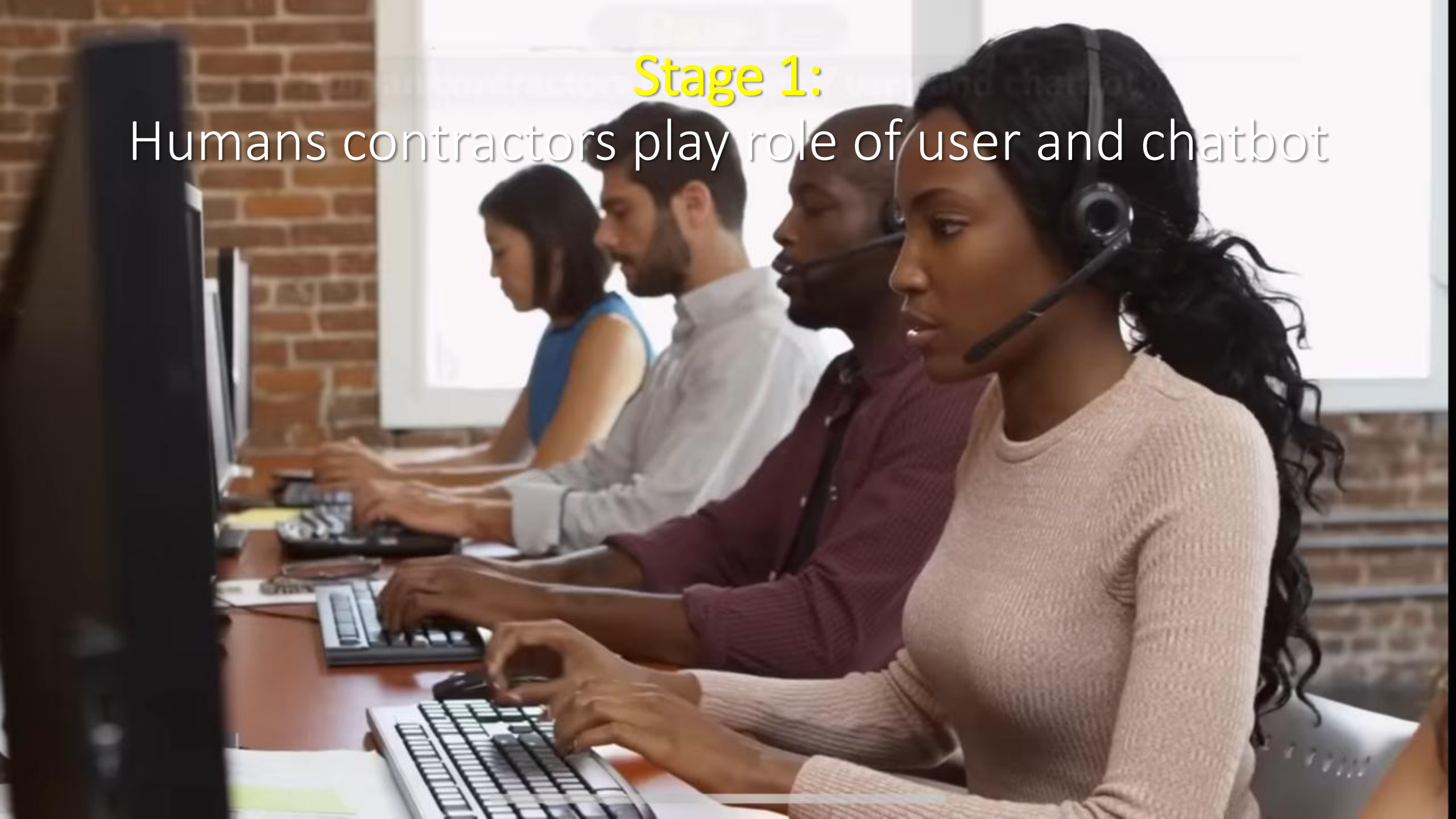
Explain how quantum mechanics works

...

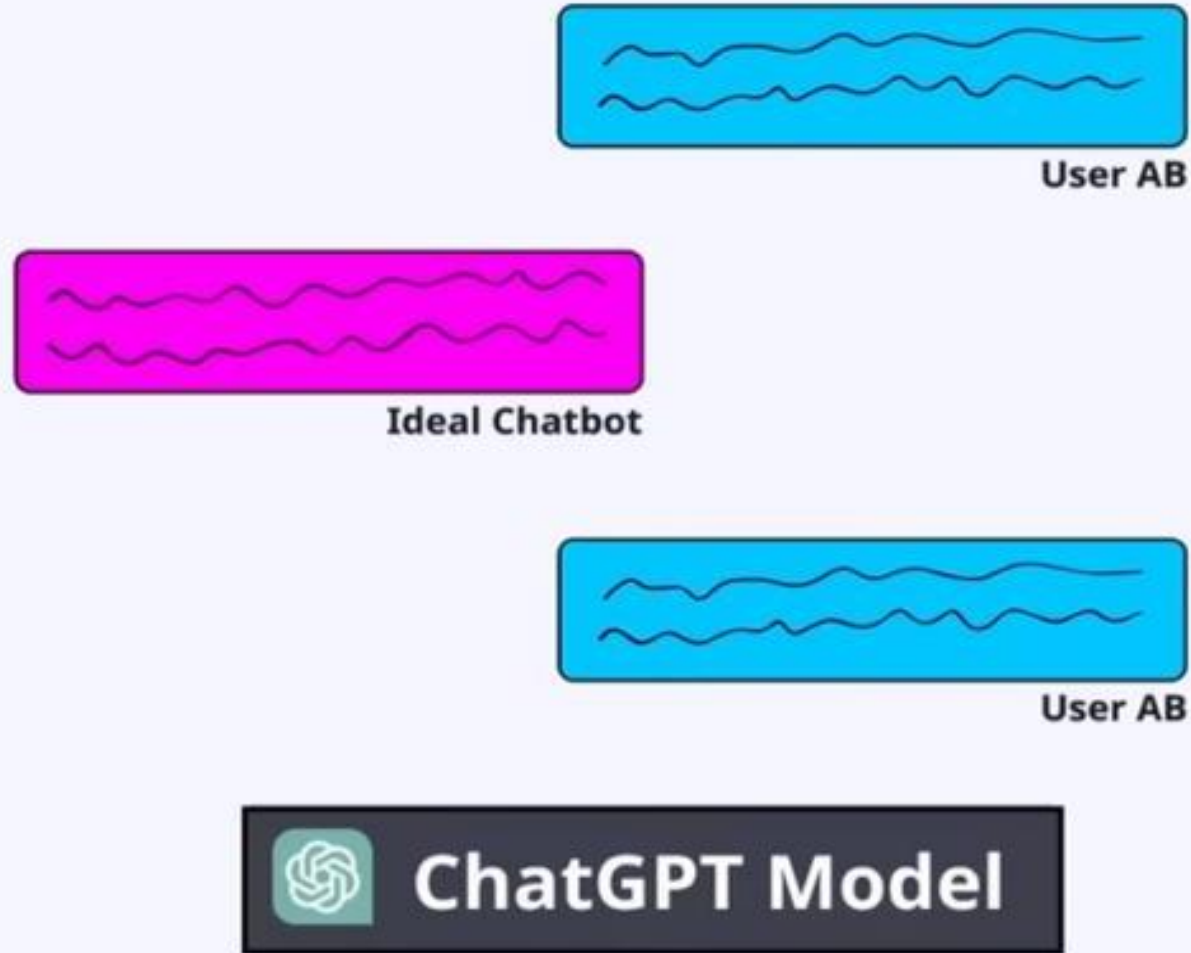
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Stage 1:

Humans contractors play role of user and chatbot



Thread history of mock conversations is entered into the model



I like cows.



M

I heard they go to college.

Cows go to college?



M

I heard that a cow went to Harvard.

What did the cow study?



M

Bovine sciences.

Do horses ever go to Harvard?



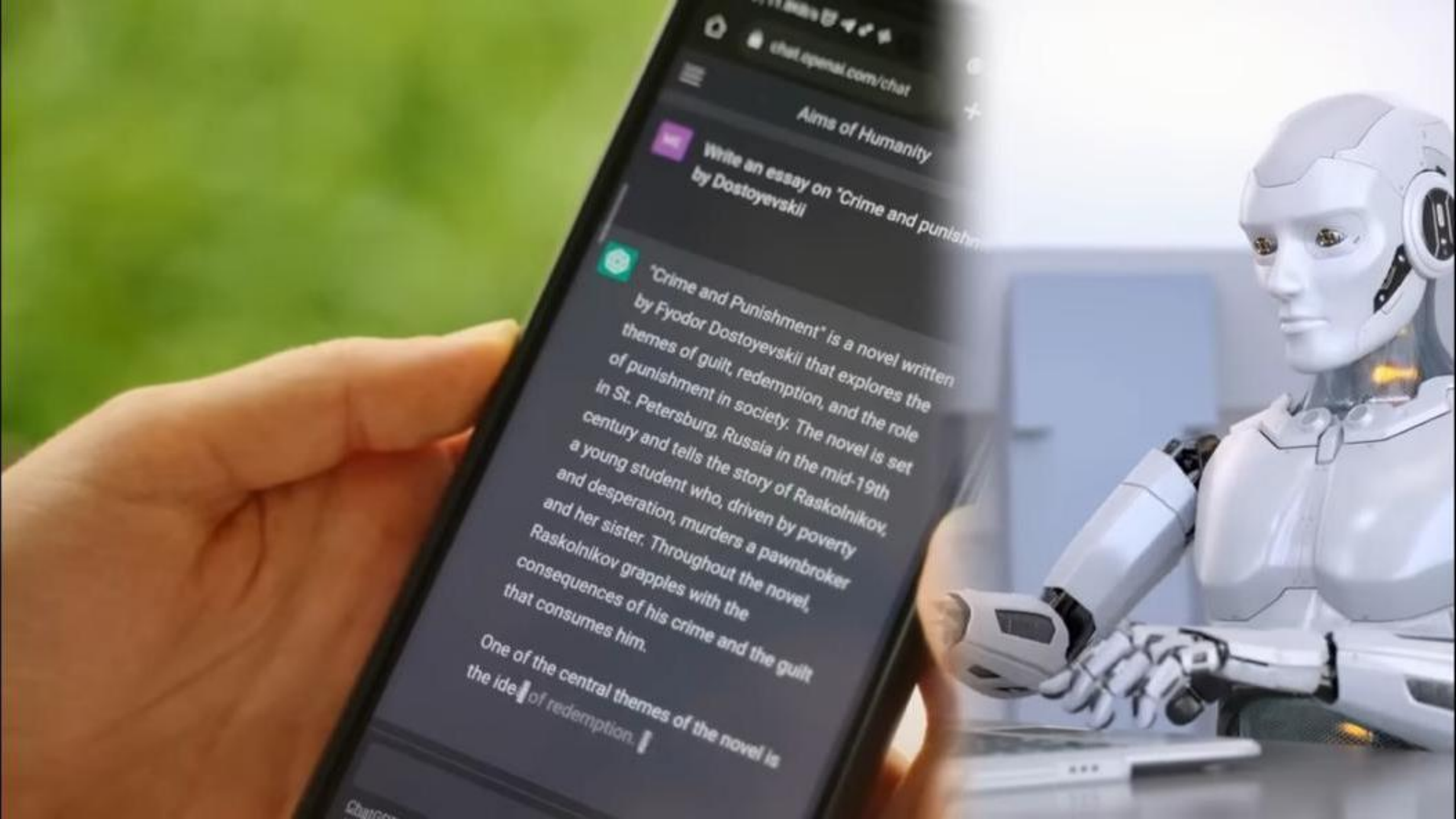
M

Horses go to Hayvard.



That's a pretty good joke, I feel like you led me into it.





chat.openai.com/chat

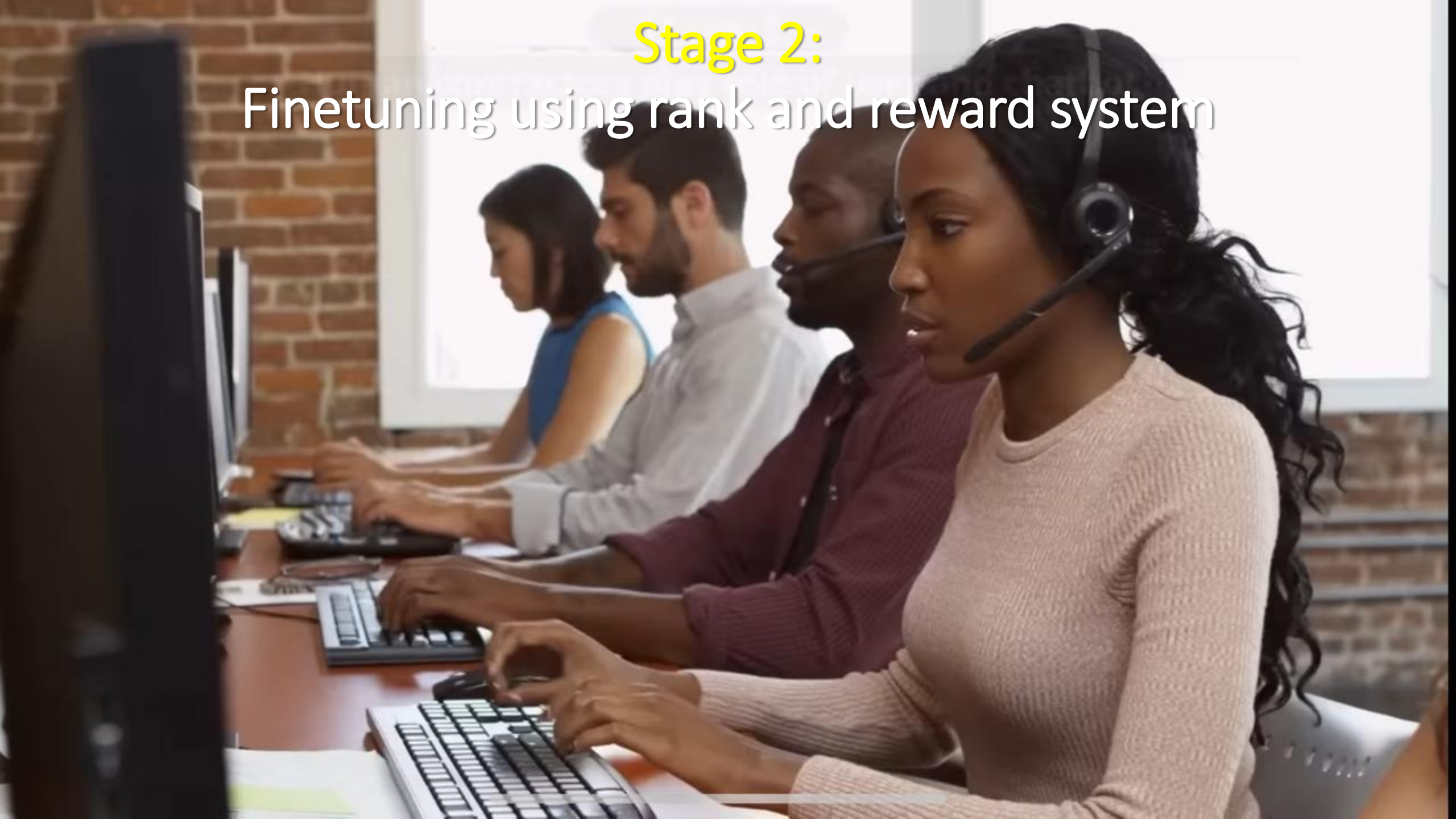
Aims of Humanity

Write an essay on "Crime and punishment" by Dostoyevskii

"Crime and Punishment" is a novel written by Fyodor Dostoyevskii that explores the themes of guilt, redemption, and the role of punishment in society. The novel is set in St. Petersburg, Russia in the mid-19th century and tells the story of Raskolnikov, a young student who, driven by poverty and desperation, murders a pawnbroker and her sister. Throughout the novel, Raskolnikov grapples with the consequences of his crime and the guilt that consumes him.

One of the central themes of the novel is the idea of redemption.

Stage 2: Finetuning using rank and reward system



Describe an atom

- A) It's the smallest part of a substance made of electrons, neutrons, and protons. **0.95**
- B) It's a basic chemical element **0.37**
- C) It's an object made of subatomic particles **0.48**
- D) It's a ticketing service **0.12**

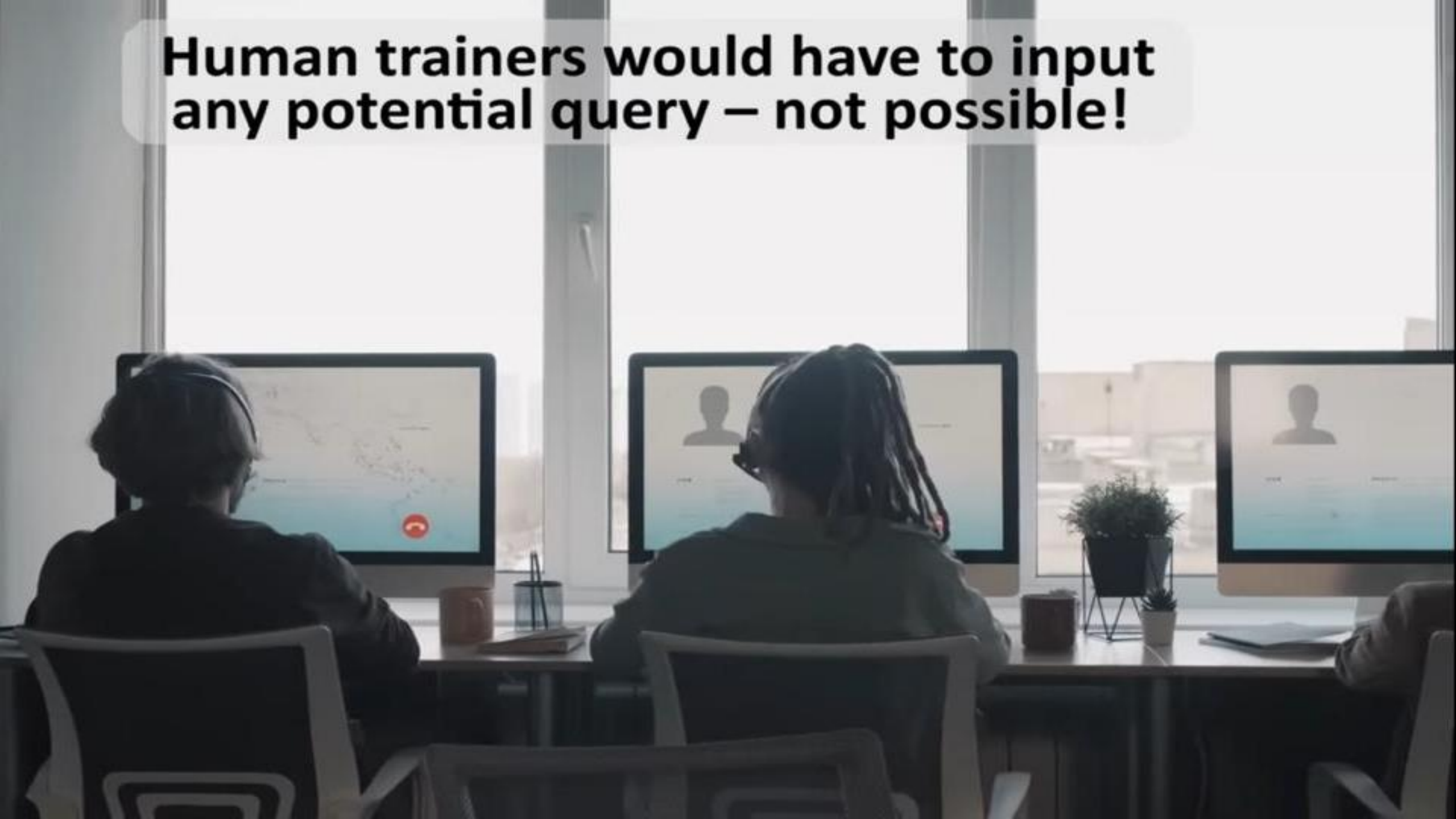
Teaches ChatGPT to evaluate
what the best output is
likely to be

A > C > B > D



ChatGPT Model

**Human trainers would have to input
any potential query – not possible!**



ChatGPT



Examples

"Explain quantum computing in simple terms" →

"Got any creative ideas for a 10 year old's birthday?" →

"How do I make an HTTP request in Javascript?" →



Capabilities

Remembers what user said earlier in the conversation

Allows user to provide follow-up corrections

Trained to decline inappropriate requests



Limitations

May occasionally generate incorrect information

May occasionally produce harmful instructions or biased content

Limited knowledge of world and events after 2021

Write a short story about bread



Stage 3: Reinforcement learning



Unsupervised learning based on the human-taught ranking system



Unsupervised learning based on the human-taught ranking system



**Unsupervised learning allows the
model to learn patterns from
much more data and many
more subjects**

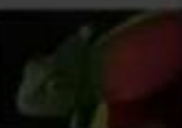
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- Consultancy
- Corporate Banking
- Credit
- Debt / Fixed Income
- Derivatives
- Equities
- FX & Money Markets

Company search
Find companies by

Bloomberg

paying bank

After a period of transition with new leadership, the bank is now looking for a new CEO to lead the bank through the challenges of the current market.

Senior Director to pay 200m in 2008/09 and 2009/10

Senior Director to pay 200m in 2008/09 and 2009/10

The bank is looking for a Senior Director to pay 200m in 2008/09 and 2009/10. The bank is looking for a Senior Director to pay 200m in 2008/09 and 2009/10. The bank is looking for a Senior Director to pay 200m in 2008/09 and 2009/10.

What Credit Downgrade? Cantor Says It Will Keep Hiring

With a new credit rating, Cantor says it will keep hiring. The bank is looking for a Senior Director to pay 200m in 2008/09 and 2009/10. The bank is looking for a Senior Director to pay 200m in 2008/09 and 2009/10. The bank is looking for a Senior Director to pay 200m in 2008/09 and 2009/10.

This way, the human training
can be scaled to much larger dataset

Select Region

Search

is related to strategy and finance, industry and financial sector. Here, for example, you will find a recruitment, pharmaceuticals, or the manu

Partners
10,000
200m

management of the research management team

Partners
10,000 range
into their retail banking group



45 terabytes of data

GET STARTED

[Introduction](#)[Quickstart](#)[Libraries](#)[Models](#)[Overview](#)[GPT-4](#)[GPT-3.5](#)[DALL·E](#)[Whisper](#)[Embeddings](#)[Moderation](#)[GPT-3](#)[Tutorials](#)[Data usage policies](#)[Usage policies](#)[Embeddings](#)

A set of models that can convert text into a numerical form

[Moderation](#)

A fine-tuned model that can detect whether text may be sensitive or unsafe

[GPT-3](#)

A set of models that can understand and generate natural language

[Codex](#) Deprecated

A set of models that can understand and generate code, including translating natural language to code

We have also published open source models including [Point-E](#), [Whisper](#), [Jukebox](#), and [CLIP](#).

Visit our [model index for researchers](#) to learn more about which models have been featured in our research papers and the differences between model series like InstructGPT and GPT-3.5.

GPT-4

Limited beta

GPT-4 is a large multimodal model (accepting text inputs and emitting text outputs today, with image inputs coming in the future) that can solve difficult problems with greater accuracy than any of our previous models, thanks to its broader general knowledge and advanced reasoning capabilities. Like `gpt-3.5-turbo`, GPT-4 is optimized for chat but works well for traditional completions tasks. Learn how to use GPT-4 in our [chat guide](#).



Each terabyte equivalent to about 83 million pages!



community. She decided to use her bread-baking skills to feed her neighbors.

Maria woke up early every day to begin baking loaves of bread. She worked tirelessly, kneading the dough and carefully watching the rising process. Her hands became covered in flour, and her apron became stained with the evidence of her hard work.

As the smell of fresh bread wafted through the village, the people's spirits lifted. They would line up outside Maria's small bakery, eager to get their hands on a warm, fresh loaf. Maria's bread became a staple of their daily diets, and soon, the village began to thrive again.

Years passed, and Maria became known ■

☐ Stop generating

Send a message...

..

We've created GPT-4, the latest milestone in OpenAI's effort in scaling up deep learning. GPT-4 is a large multimodal model (accepting image and text inputs, emitting text outputs) that, while less capable than GPT-3.5 in many real-world scenarios, exhibits human-level performance on various professional and academic benchmarks.

March 14, 2023

[Read paper ↗](#)

[View system card ↗](#)

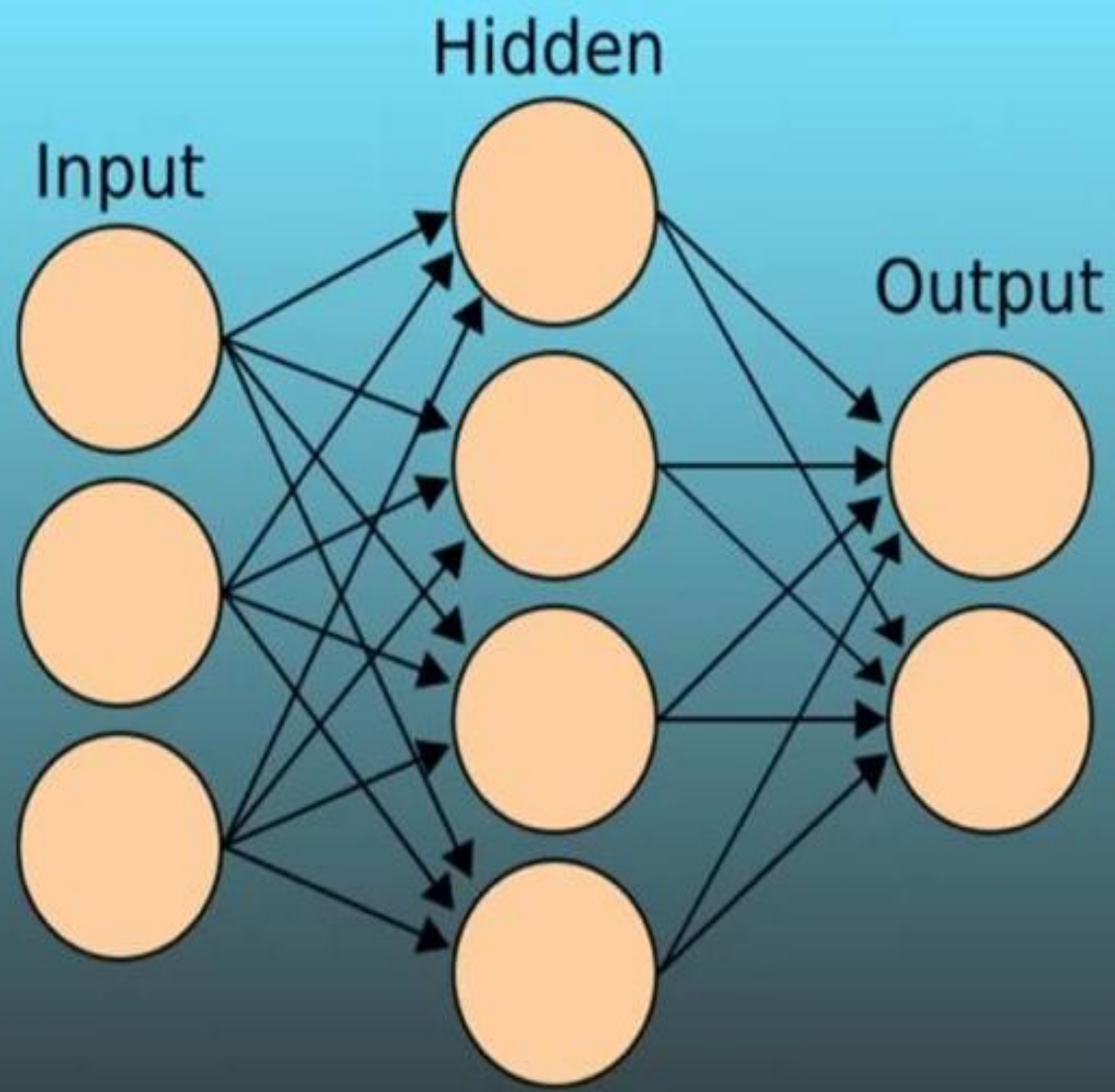
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[Language](#), [GPT-4](#), [Milestone](#), [Publication](#)



The Microsoft AI platform

Cloud-powered AI for every developer

Services

CUSTOM AI

Azure Machine Learning

PRE-BUILT AI

Cognitive Services

CONVERSATIONAL AI

Bot Framework

Infrastructure

AI ON DATA

Cosmos
DB

SQL
DB

SQL
DW

Data
Lake

Spark

DSVM

Batch
AI

ACS

Edge

AI COMPUTE

CPU, FPGA, GPU

Tools

CODING & MANAGEMENT TOOLS

VS Tools
for AI

Azure ML
Studio

Azure ML
Workbench

Others (PyCharm, Jupyter Notebooks...)

DEEP LEARNING FRAMEWORKS

3rd Party

Cognitive
Toolkit

TensorFlow

Caffe

Others (Scikit-learn, MXNet, Keras,
Chainer, Gluon...)

Azure AI

Azure Applied AI Services



Azure Cognitive
Search



Azure Form
Recognizer



Azure Bot
Service



Azure Video
Analyzer



Azure Metrics
Advisor



Azure Immersive
Reader

Azure Cognitive Services



Language



Vision



Speech



Decision



OpenAI

Azure Machine Learning



Azure Machine Learning

Filter by title

Azure OpenAI Service Documentation

Overview

What is Azure OpenAI?

Quotas and limits

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What's new

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What is Azure OpenAI Service?

Article • 09/15/2023 • 4 contributors

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[Responsible AI](#)

[How do I get access to Azure OpenAI?](#)

[Comparing Azure OpenAI and OpenAI](#)

[Key concepts](#)

[Next steps](#)

Azure OpenAI Service provides REST API access to OpenAI's powerful language models including the GPT-4, GPT-35-Turbo, and Embeddings model series. In addition, the new GPT-4 and gpt-35-turbo model series have now reached general availability. These models can be easily adapted to your specific task including but not limited to content generation, summarization, semantic search, and natural language to code translation.

Additional resources

Training

Learning path

[Develop Generative AI solutions with Azure OpenAI Service - Training](#)

Develop Generative AI solutions with Azure OpenAI Service

Certification

[Microsoft Certified: Azure AI Engineer Associate - Certifications](#)

Microsoft Azure AI engineers build, manage, and deploy AI solutions that make the most of Azure Cognitive Services and Azure services.

Documentation

[Azure OpenAI Service models](#) [Azure OpenAI](#)

OpenAI

Azure OpenAI

Azure OpenAI Pricing

Tokens

Pricing

Azure Machine Learning

Azure Machine Learning

Deploy your Azure OpenAI Environment