



Friend or Foe - The Philosophy and Utilization of AI (AI For EDU 2024 and Beyond)

Joshua King, Systems Architect

Cisco Systems

Artificial Intelligence

V.S

Taylor Swift





“The acceleration of AI will fundamentally change our world. Cisco is committed to being a trusted partner to customers and to helping them navigate this transition in a responsible way to deliver on the promise of this technology.”

Chuck Robbins

Chief Executive Officer, Cisco



Agenda - The Philosophy and Utilization of AI

- Definitions
- Advent of Modern AI in Pop Culture
- How Does it Even Work, Bro?
- Philosophic & Academic Opposition
- The Problem of Moloch
- Commercial & Industrial Acquiescence
- AI for Good
- Tools for Success
- How to Stay Informed

| Industry Term | <i>Generally Accepted Meaning</i> |
|---|--|
| Intelligence | Ability to accomplish complex goals |
| Artificial Intelligence (AI) | Non-biological Intelligence Framework made-up of models and algorithms |
| Narrow Intelligence | Ability to accomplish a narrow set of goals – e.g. drive a car or play chess |
| General Intelligence | Ability to accomplish virtually any goal, including learning |
| Human-Level Artificial Intelligence (AGI) | Ability to accomplish any cognitive task at least as well as humans |

| Industry Term | <i>Generally Accepted Meaning</i> |
|---|--|
| Superintelligence | General Intelligence far beyond human level |
| Friendly AI | Superintelligence whose goals are aligned with ours |
| Narrow Intelligence | Ability to accomplish a narrow set of goals – e.g. drive a car or play chess |
| Singularity (Intelligence Explosion) | Recursive self-improvement rapidly leading to superintelligence |
| Consciousness | Subjective experience (soul?) |

When will AI surpass human level?

In 300 years

TECHNO-SKEPTICS

In 100 years

LUDDITES

**BENEFICIAL AI
MOVEMENT**

**DIGITAL
UTOPIANS**

In 50 years

In few decades

In few years

VIRTUALLY NOBODY

Definitely bad

Probably bad

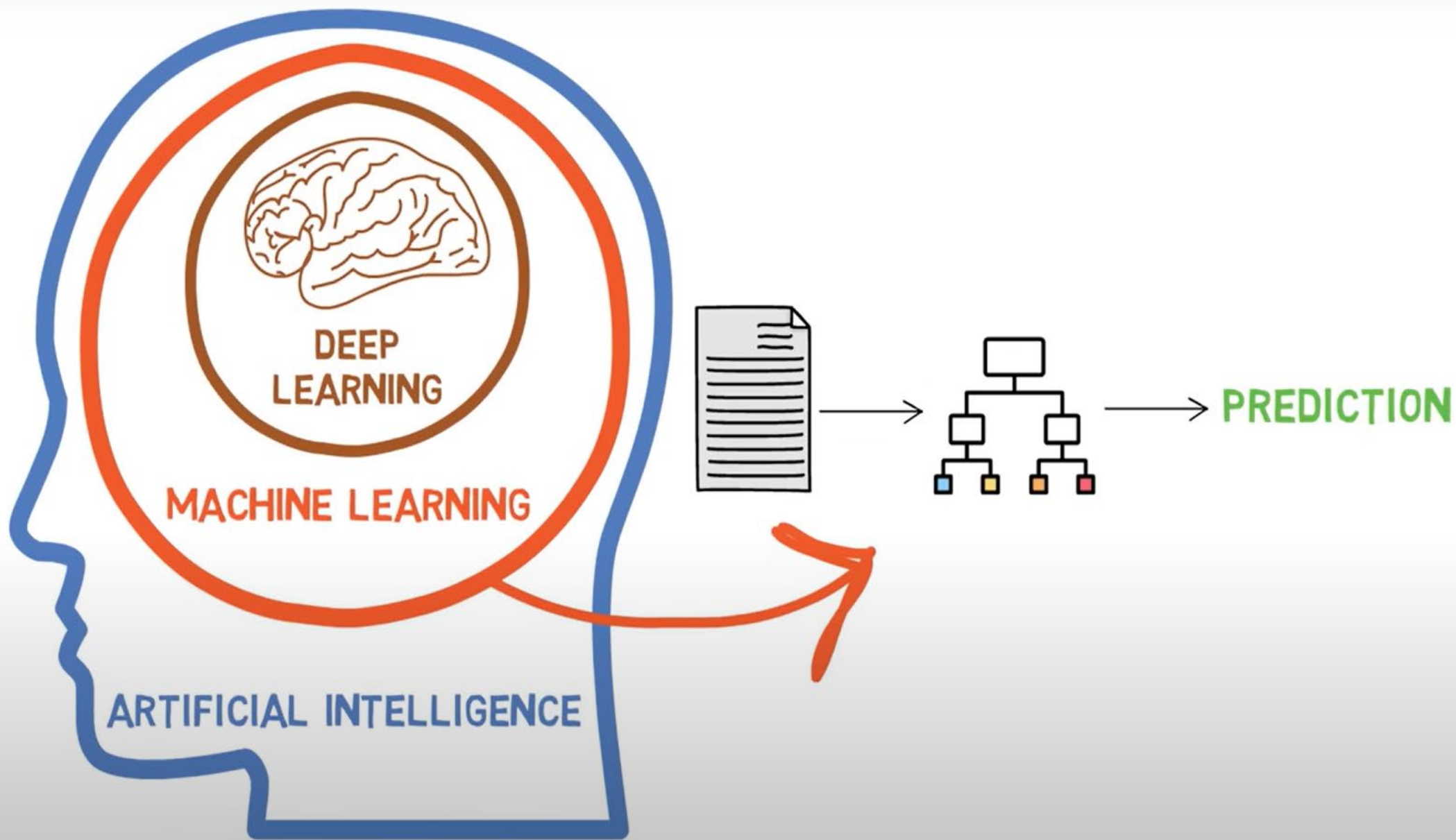
Highly uncertain

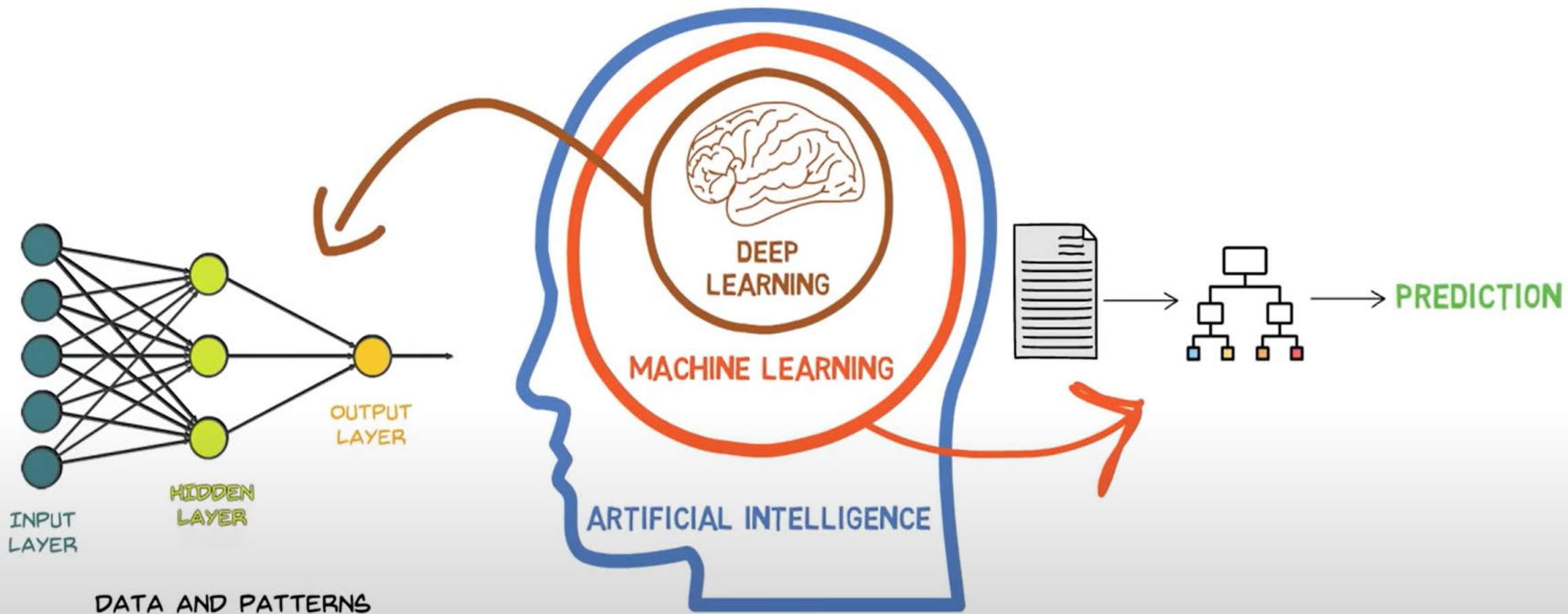
Probably good

Definitely good

If superhuman AI appears, will it be a good thing?

| Industry Term | <i>Generally Accepted Meaning</i> |
|------------------------|---|
| Digital Utopian | Life cannot spread throughout our galaxy and beyond unless we are in digital form |
| Techno-skeptics | Building Super-human AI is impossible or hundreds of years off |
| Beneficial AI Movement | Super-human AI is possible. We must be cautious. |





DATA AND PATTERNS
CAN BE BETTER PERCEIVED

Predictive AI

Maturity in 2017

Prediction, Recommendation

Predictive AI focuses on analyzing existing data that can be used **for predictions and automation**

Generative AI

Maturity in 2022

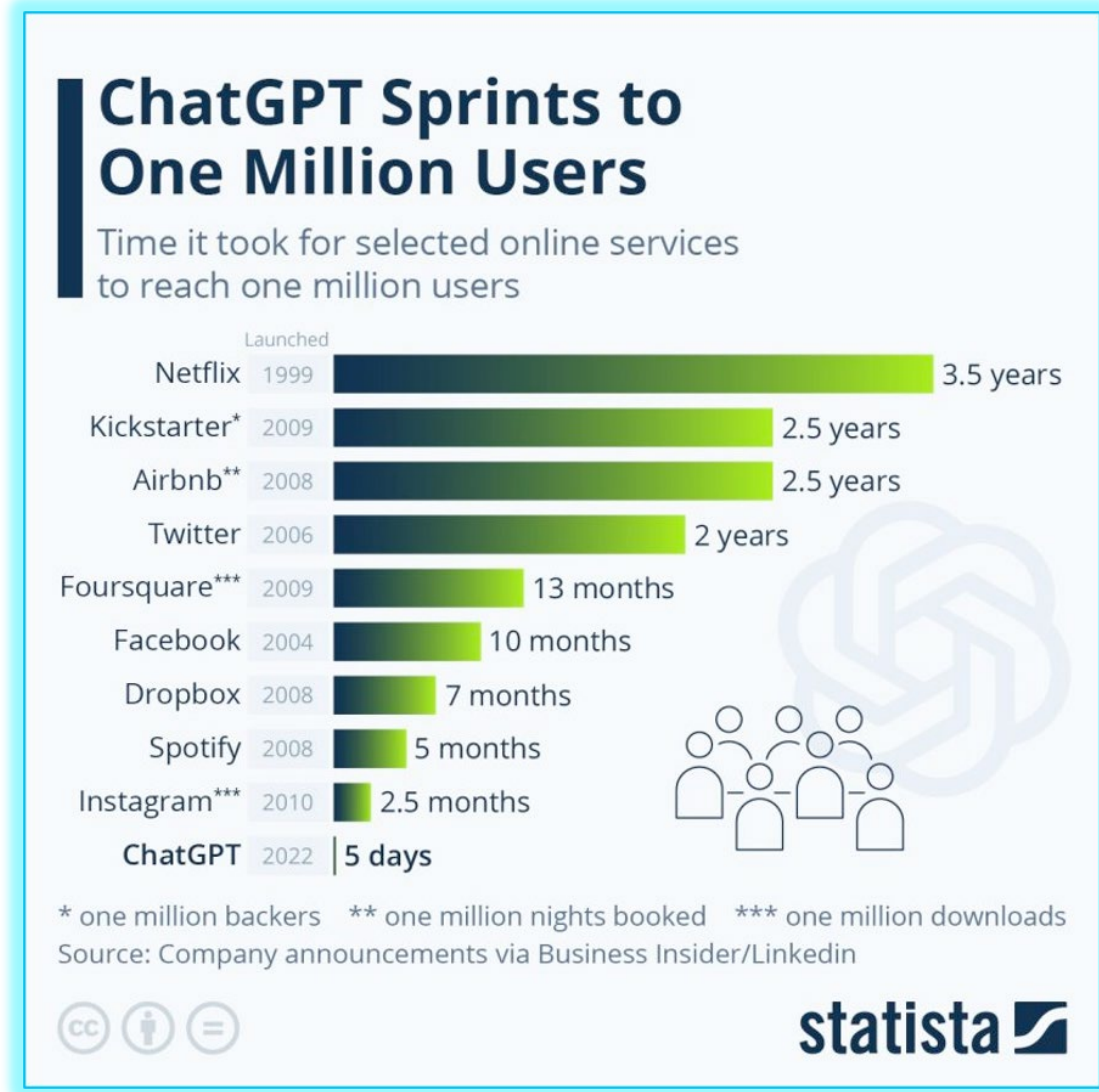
Creation, Reinvention

Generative AI focuses on learning a representation of artifacts from data and using it to **generate original artifacts** based on predicted sequences of information from a given prompt

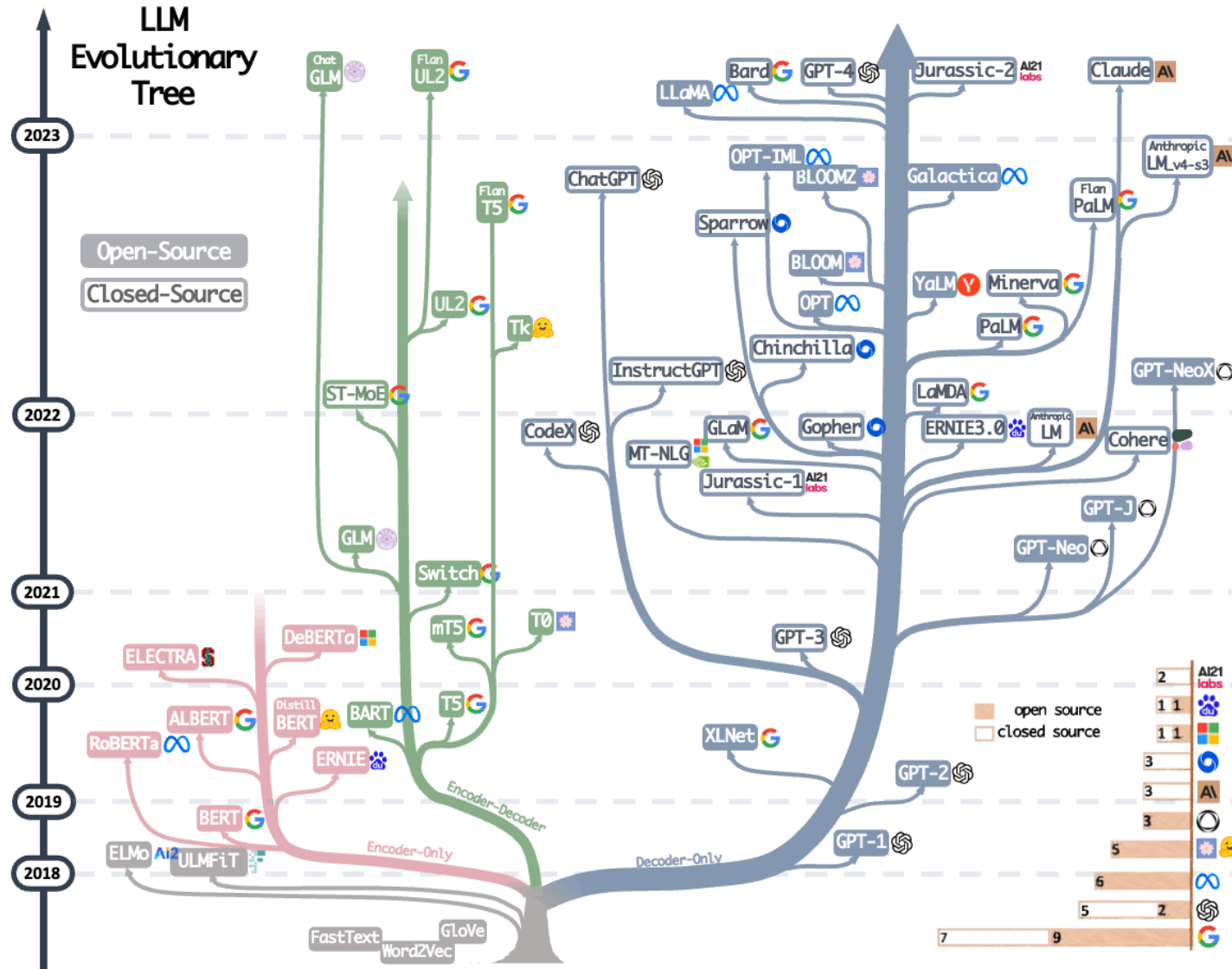
Advent of AI in Pop Culture

History of AI/ML

- 1950s:
 - John McCarthy coined the term: Artificial Intelligence
 - Dartmouth Conference marked the birth of AI as a field of study
- 1960's-1990's: AI programs introduced to play games
- 2000's: Introduction of practical applications
- 2000's-2010's:
 - Image and speech recognition
 - Techniques for various industries
- 2020s:
 - Deep learning & AI integrated into everyday life and business operations

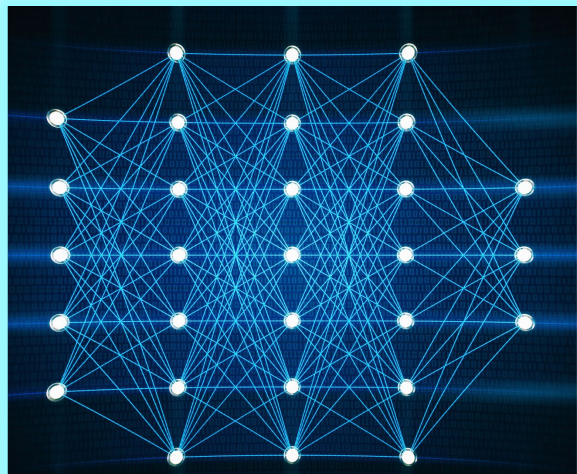


Explosion of Models!



What Makes LLMs Special?

Scale



Massive models:
~ 10s billions of
parameters

Corpus



Trained on very
large datasets

Ex: Wikipedia,
Reddit,
CommonCrawl

Architecture

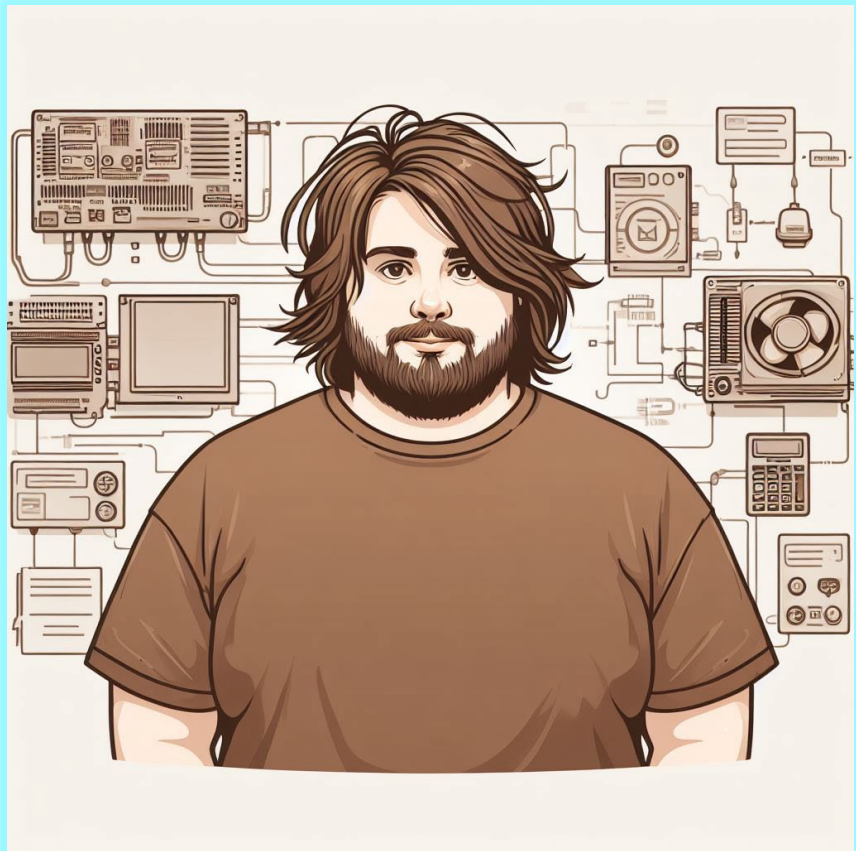
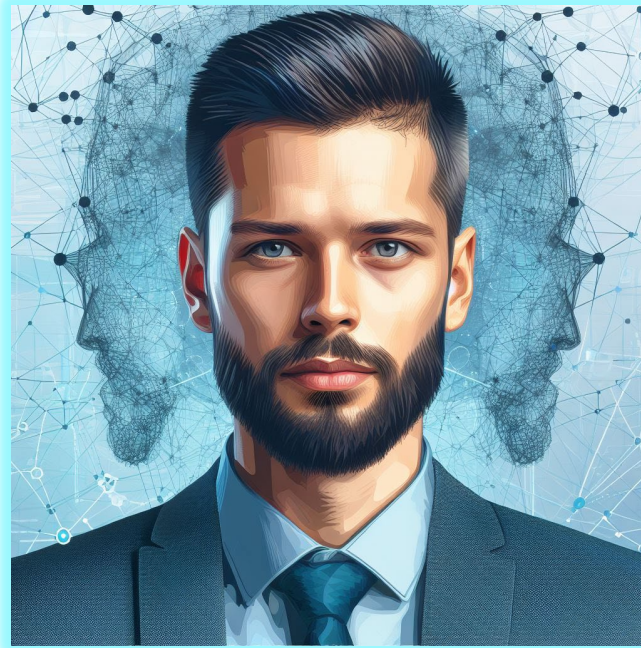


Attention
Mechanism,
Positional
Encoding, etc.

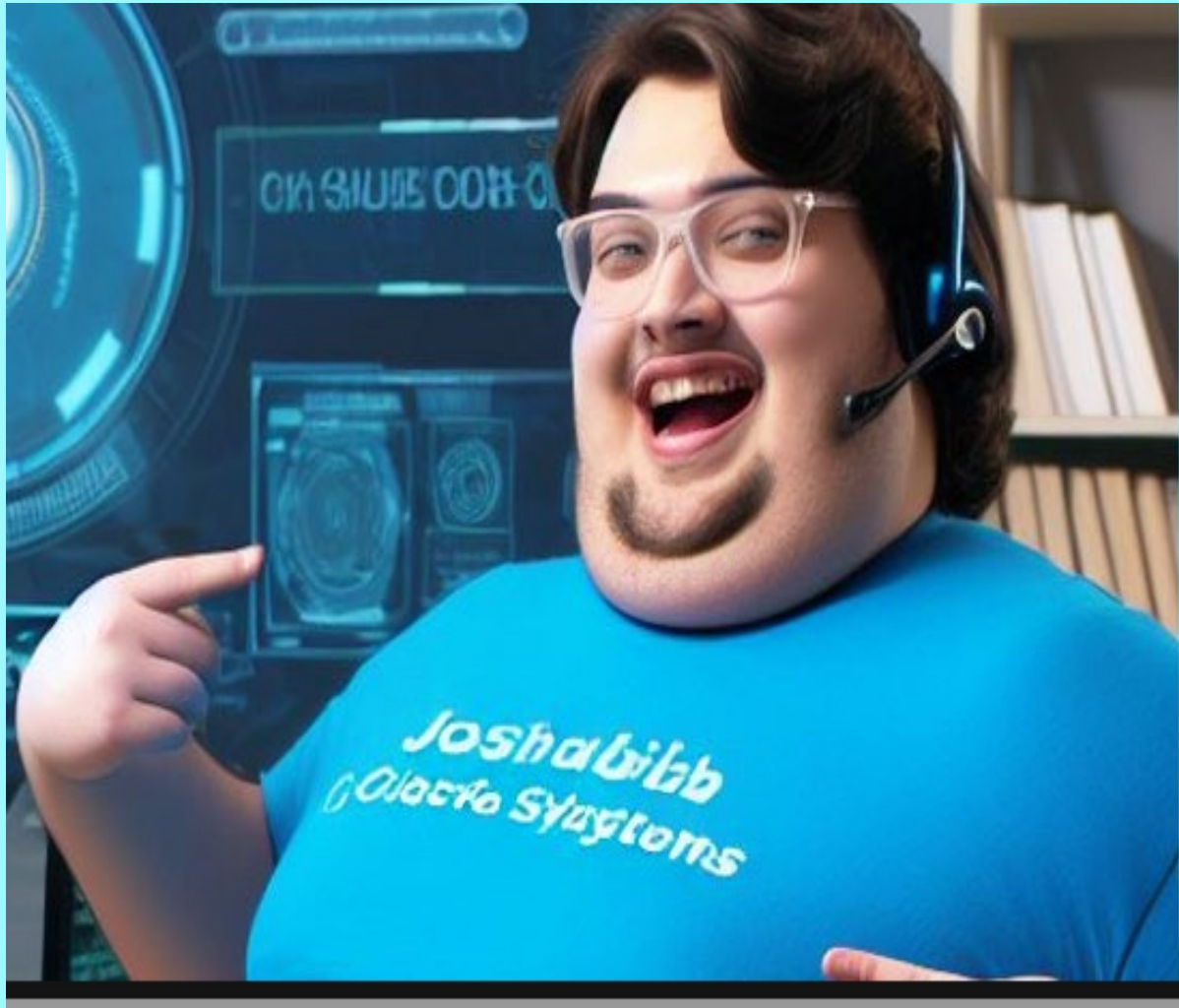
GenAI Examples

DALLE-3 Prompt:

“A man named Josh King who works for Cisco Systems specializing in AI”





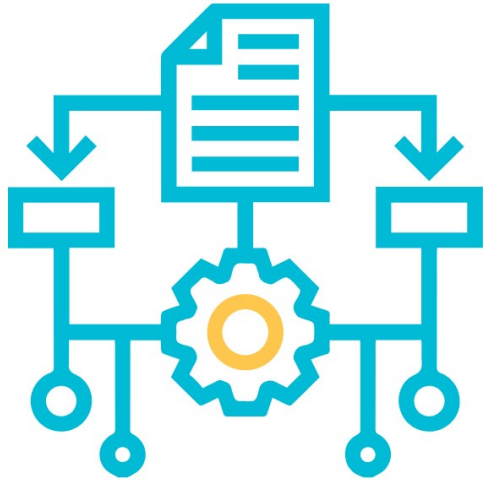


GenAI - Example



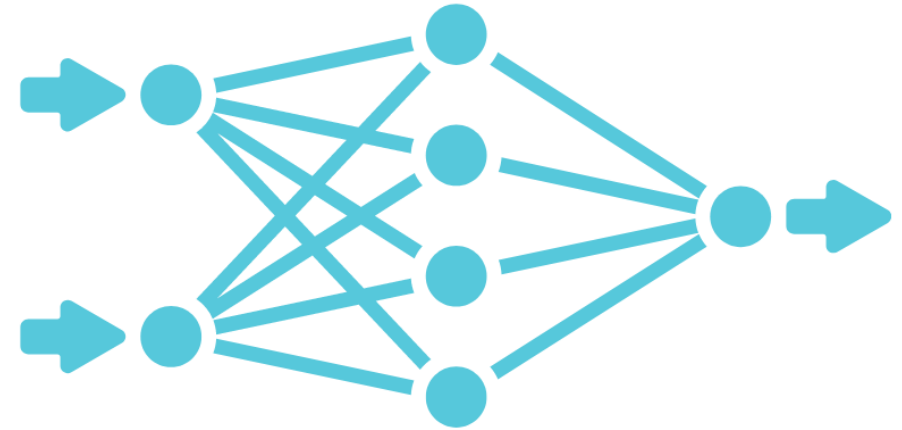
How Does it Even Work, Bro?

Model vs. Algorithm



A machine learning algorithm is a set of instructions that learn a pattern from a data.

In other words, algorithms learn from the data; they are a fit to the data set.



A machine learning model is the output of the machine learning algorithm when it has completed the fitting of the data / pattern building process.

In other words, the model is the thing that is saved when the algorithm(s) completes its work.

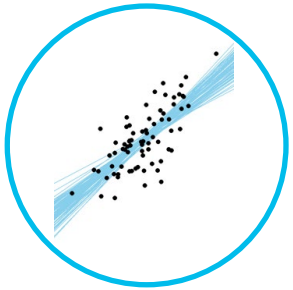
Multiple algorithms can be used to construct a model.

A model is what is used to make predictions.

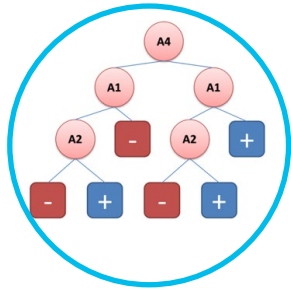
An Model for Every Situation!

- A model (and algorithms) for every problem.

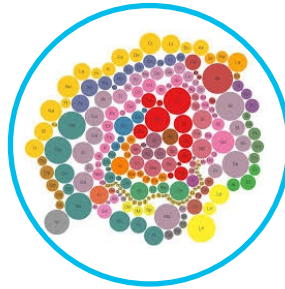
ML's Top Playlist!



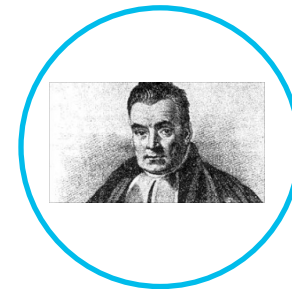
Regression



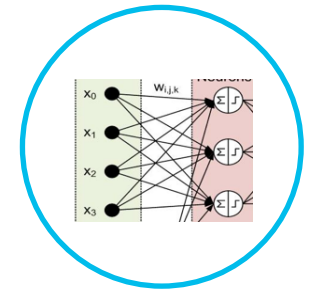
Classification



Clustering



Bayesian



Neural Networks

- Very active communities ... many algorithms and libraries are available.
- However:
 - Methods often have dependence on domain experts.
 - "Trial and error" are more common than you think!

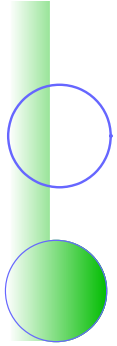
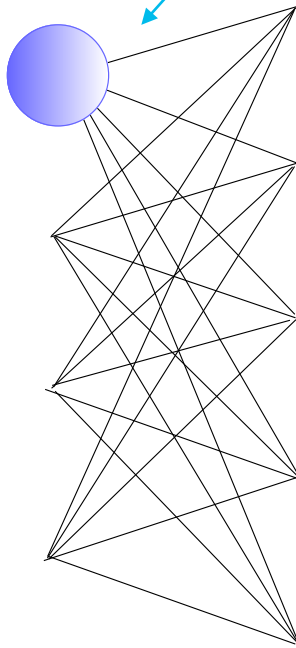
Neural Networks: Image Recognition

Training Images (Labelled)



← Backpropagation

Adjust weights



Desired Outcome

$\begin{bmatrix} 0 \\ 0 \\ 1 \\ 0 \end{bmatrix}$



$\begin{bmatrix} .01 \\ .09 \\ .95 \\ .02 \end{bmatrix}$

Close enough!

NN will predict that this is a plane with 96% probability

Train model to recognize "plane" by showing labelled images of planes.

Word-by-Word Prediction

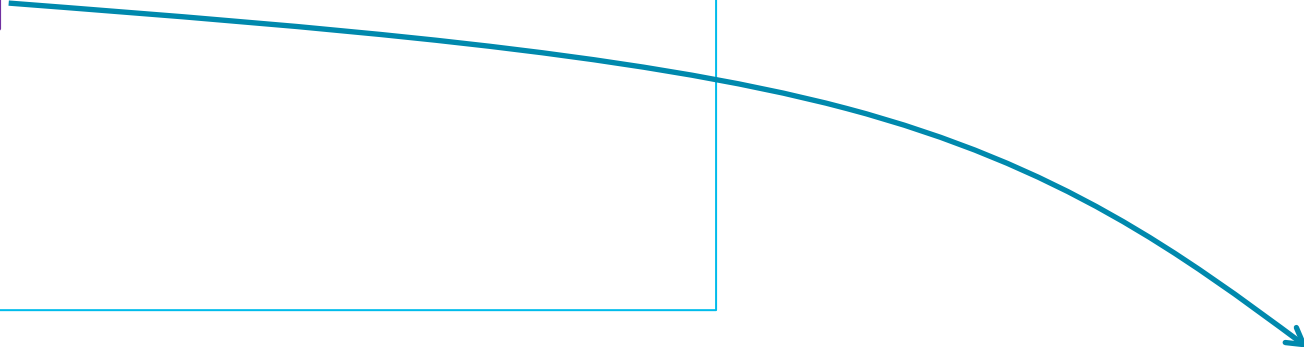
“When going backpacking through the Sierra Nevada mountains, it is best to ____”

```
In[13]:= modelOutput41 = model["When going backpacking through the Sierra Nevada mountains, it is best to", {"TopProbabilities", 10}]; Association[ ReverseSortBy[modelOutput41, Last] ]; dataset41 = Dataset[%]
```

| | |
|-------|-----------|
| pack | 0.105553 |
| carry | 0.0982246 |
| bring | 0.0479965 |
| use | 0.0441111 |
| take | 0.0390468 |
| avoid | 0.030088 |
| keep | 0.0270898 |
| have | 0.0267649 |
| stay | 0.026403 |
| plan | 0.0236902 |

Out[15]=

Choices (ranked by probability) for the next word



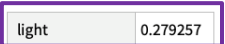
“When going backpacking through the Sierra Nevada mountains, it is best to **pack** ____”

```
In[19]:= modelOutput42 = model["When going backpacking through the Sierra Nevada mountains, it is best to pack", {"TopProbabilities", 10}]; Association[ ReverseSortBy[modelOutput42, Last] ]; dataset41 = Dataset[%]
```

| | |
|-------------|-----------|
| light | 0.279257 |
| a | 0.19682 |
| the | 0.0501265 |
| as | 0.0361783 |
| your | 0.0287107 |
| in | 0.0247948 |
| lightweight | 0.0243854 |
| an | 0.0187615 |
| for | 0.0154582 |
| at | 0.0147931 |

Out[21]=

Choices (ranked by probability) for the next word



Key Takeaways

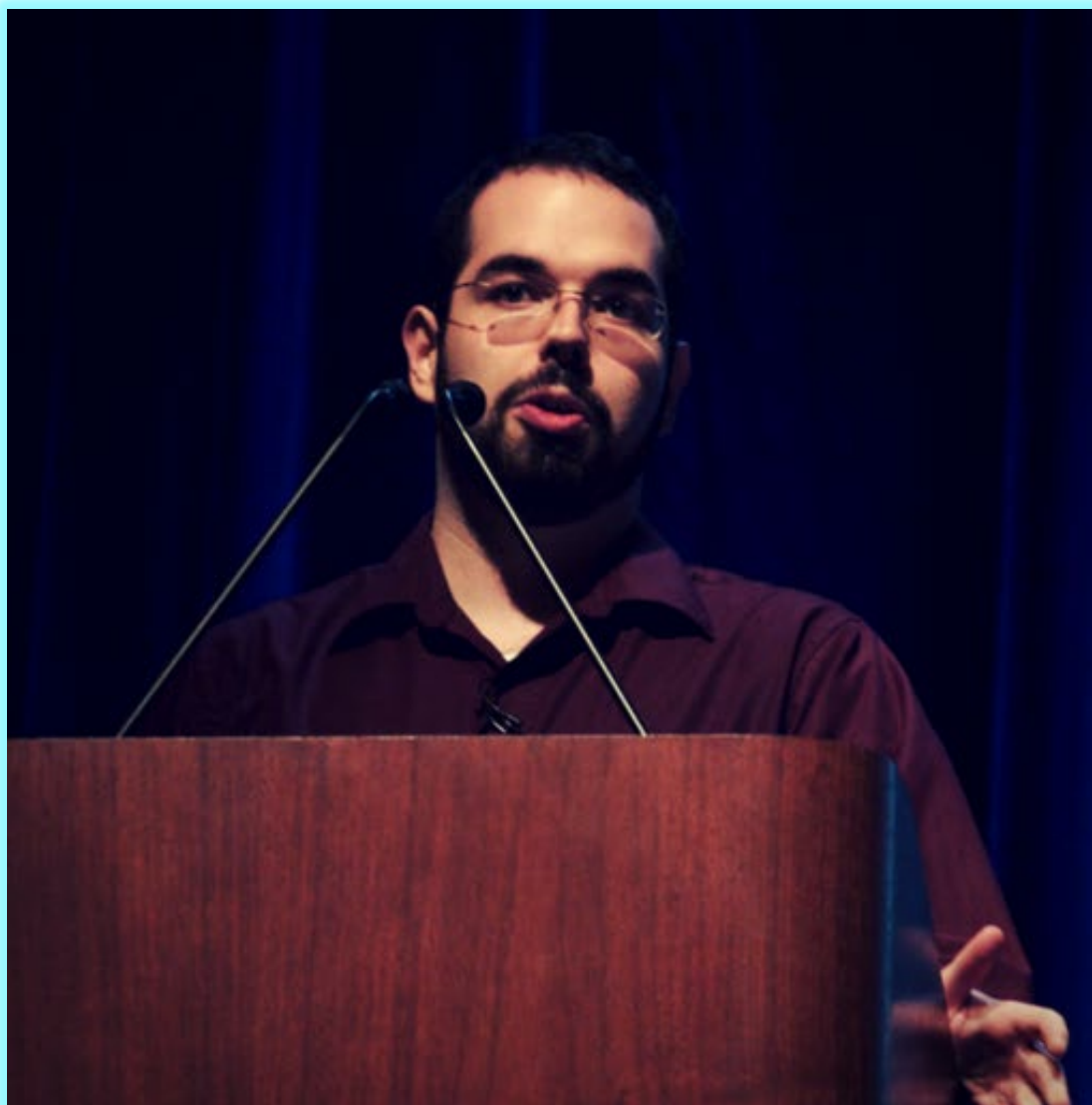
These are large **LANGUAGE** models

They are optimized for eloquence, not accuracy

The Problem of Moloch







"By far, the greatest danger of Artificial Intelligence is that people conclude too early that they understand it."



Eliezer Yudkowsky
(American AI Researcher)



“
The AI does not hate you,
nor does it love you,
but you are made out of
atoms which it can use for
something else.
”

-Eliezer Yudkowsky

Co-founder

Machine Intelligence Research Institute

"If somebody builds a too-powerful AI, under present conditions, I expect that every single member of the human species and all biological life on Earth dies shortly thereafter."
– Eliezer Yudkowsky

"Track all GPUs sold. If intelligence says that a country outside the agreement is building a GPU cluster, be less scared of a shooting conflict between nations than of the moratorium being violated; be willing to destroy a rogue data center by airstrike." – Eliezer Yudkowsky

December 17th, 1903



August 6th, 1945

FINAL EDITION

THE CINCINNATI ENQUIRER



WEATHER—CINCINNATI AND VICINITY: Fair, Moderately Warm And Less Humid Today. Fair And Cooler Tonight. Predicted High, 85.

WEATHER REPORTS, PAGES 1 AND 14.

VOL. CV. NO. 120—DAILY Entered as second-class matter Aug. 5, 1879, at the Post Office, Cincinnati, Ohio, Act of 1879.

TUESDAY MORNING, AUGUST 7, 1945

18 PAGES

FOUR CENTS In Hamilton County and FIVE CENTS in Campbell and Kenton Counties ELSEWHERE

ATOM BOMB MAY FORCE JAPAN TO QUIT; EXPLOSIVE IS MIGHTIER THAN 2,000 B-29s

NEW WEAPON

Of Foe Erased

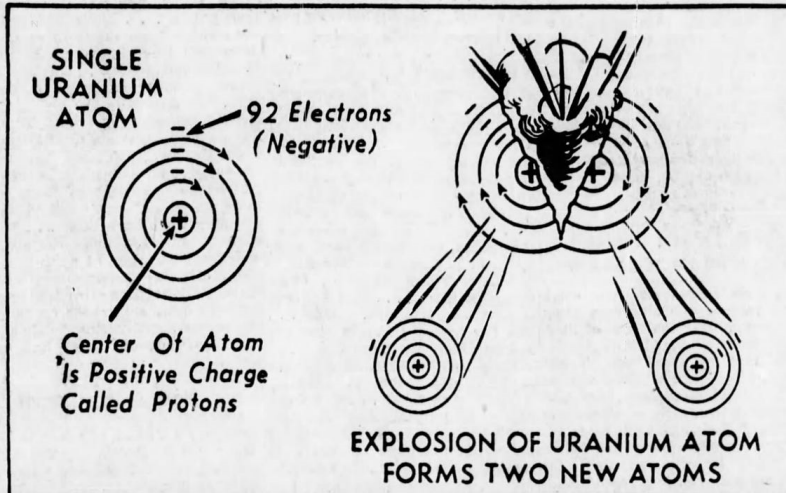
In Fire Raid On Jap Port, Fliers Believe.

Apparent Rocket Catapult Shattered—700 B-29s, Mustangs Rip Nippon.

Guam, Aug. 7 (Tuesday)—(AP)—Approximately 125 B-29s struck the Toyokawa naval arsenal with high explosive bombs around noon today. General Spaatz's communique gave no details. The Superforts were escorted by Iwo-based fighters.

Manila, Aug. 7 (Tuesday)—(INS)—More than 400 Okinawa-based American planes virtually erased the industrial and waterfront area of the South Japanese port of Tarumizu Sunday in an attack that

Billions Of Uranium Atoms In New Bomb; Annihilation Area Called Mile In Diameter, Compared With "Earthquake's" 200 Yards



TWO MORE

Nabbed By Police

In Current Campaign Against Bookies.

"Unemployed Timekeeper" Has More Than \$1,300 In His Possession.

Edward McHugh, 47, 1227 Gilsey Ave., who told police that he was a timekeeper who had not worked at his trade for six months but who had in his possession more than \$1,300 and receipts for six race information publications on his person, was charged with possession of race-horse slips after his arrest yesterday at Hogan's Grill, Gest and Summers Streets.

Also arrested in the police department's current campaign against handbooks was Bernard Schiff, 46, 875 Lexington Ave., who was arrested at the Kennedy Ave.

Tragedy Ends Career



—Associated Press Wirephoto. MAJ. RICHARD I. BONG.

BONG KILLED

Utter Destruction Seen In Force Harnessed; Cost Two Billions

LABORATORY FIGHT WON

In Plants Built In U. S.— Weapon Strikes Jap Base ---Charge Pea-Sized?

Washington, Aug. 6—(AP)—The most terrible destructive force ever harnessed by man—atomic energy—is now being turned on the islands of Japan by United States bombers. The Japanese face a threat of utter desolation, and their capitulation may be speeded up greatly.

most concentrated bundle of destruction previously known on this earth. In fact, in evaluating the enormous power involved in this new weapon, the President had to reach beyond the limits of the earth for comparison. "It is a harnessing of the basic

AI For Good



'AI IS THE NEW ELECTRICITY'



"Just as electricity transformed almost everything 100 years ago, today I actually have a hard time thinking of an industry that I don't think AI will transform in the next several years."

Andrew Ng

Former chief scientist at Baidu, Co-founder of DeepLearning.AI



Andrew Ng

Founder, DeepLearning.AI

"Despite many 'demos' and proof-of-concept implementations, getting an AI system deployed in a factory, hospital, or farm today is still a labor of love."

 EMERGING TECH BREW

"Shadow-banning, okay, you post, no one can see it. Heaven banning, you post - no one can see it, but a whole lot of AIs are spot up to interact with you."

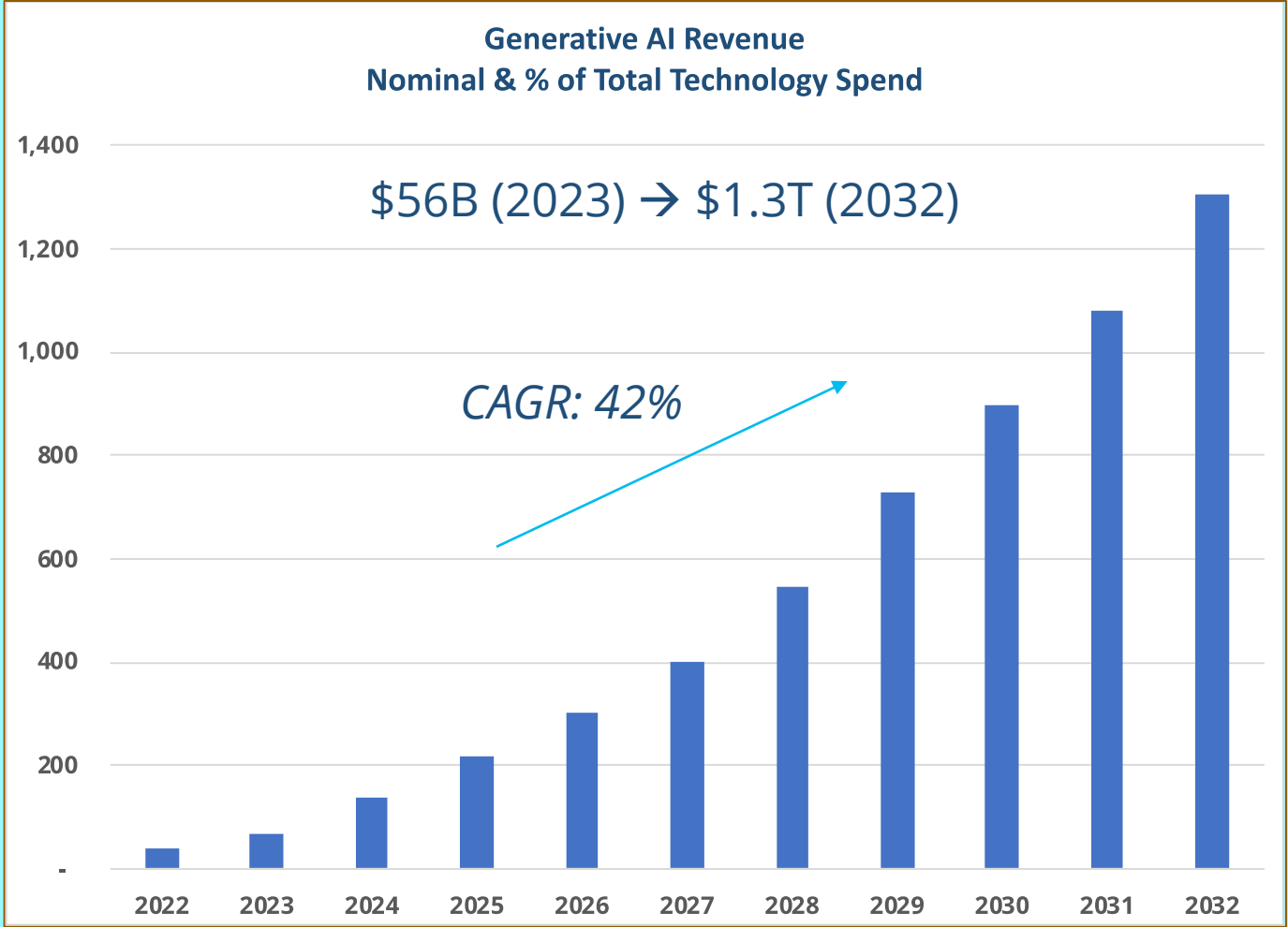


"I just started my second company (tiny corp). My third company will be AI Girlfriends. I mean it."



Commercial and Industrial Acquiescence

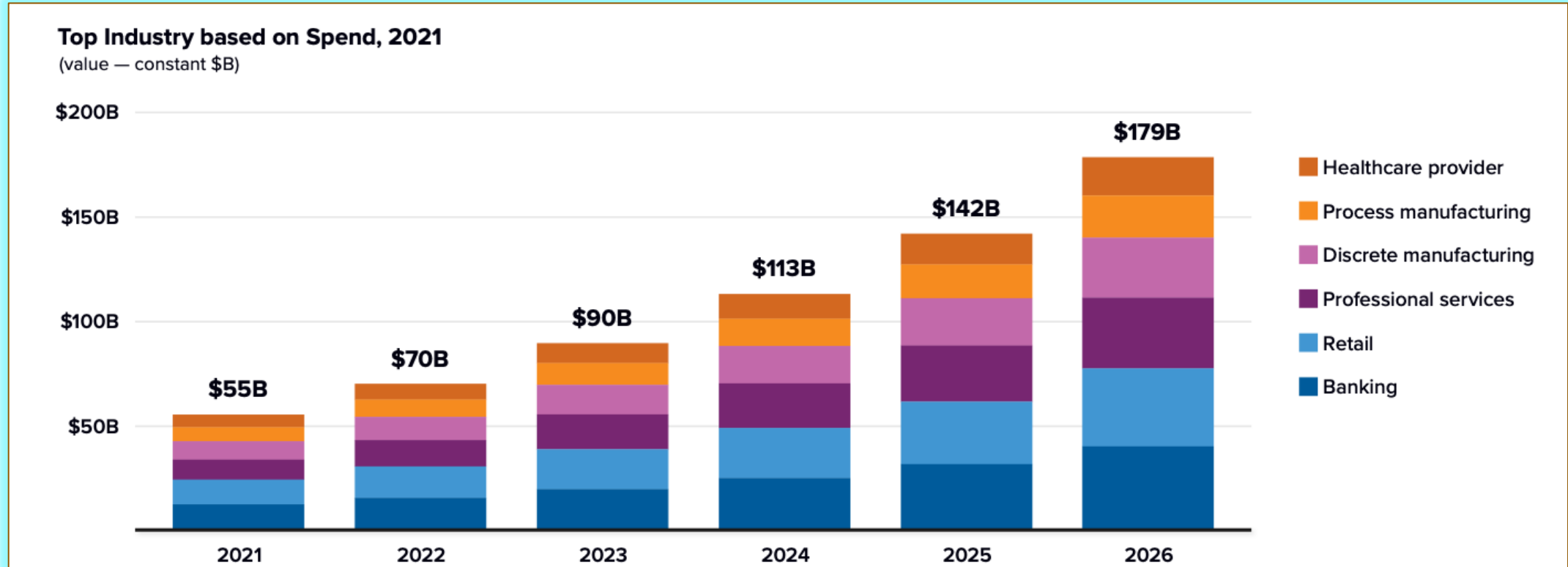
Generative AI Market – Revenue Forecast



2032 Forecast - Detail

- **Hardware: \$640B**
 - Devices (inferencing): \$168B
 - Infrastructure (training): \$472B
- **Software: \$280B**
- **Services: \$380B**
 - Gaming
 - Advertising
 - IT
 - Business services

AI Spend by Industry



- Banking / financial services, retail, professional services:
 - These three will account for more than half of global IT spending on AI in 2026.

Sources:

- IDC: 2023-02 - Create More Business Value from Your Organizational Data



Gartner Predictions for Generative AI

Before long, GenAI will greatly impact product development, customer experience, employee productivity and innovation. We predict that:



By 2025, 70% of enterprises will identify the sustainable and ethical use of AI among their top concerns.



By 2025, 30% of outbound marketing messages from large organizations will be synthetically generated. That's up from less than 2% in 2022.



By 2030, AI could reduce global CO2 emissions by 5 to 15% and consume up to 3.5% of the world's electricity.



By 2025, 35% of large organizations will have a chief AI officer who reports to the CEO or COO.



Through 2026, despite all the advancements in AI, the impact on global jobs will be neutral — there will not be a net decrease or increase.



By 2030, decisions made by AI agents without human oversight will cause \$100 billion in losses from asset damage.



By 2025, the use of synthetic data will reduce the volume of real data needed for machine learning by 70%.



By 2033, AI solutions will result in more than half a billion net-new human jobs.

Tools For Success

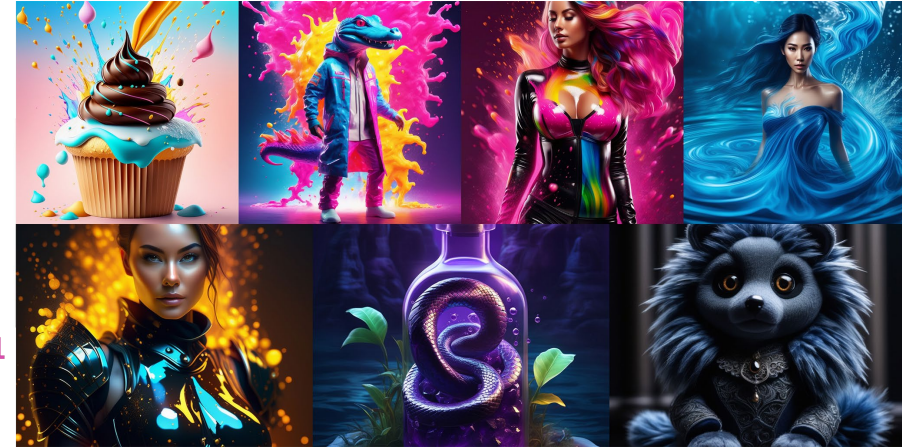




ChatGPT




STABLE DIFFUSION **XL 0.9**
FFUSION.AI
FFXL & **diffusers** | TRAINED ON "1024X1024"
FFUSIONXL-09-SDXL



Bing



 Generating a new quiz for you...

Provide a prompt for AI to generate a quiz.

University of Kent



BOOOM.AI

Perfectly Social...

Express your creativity and play



Multiplayer

Invite up to 8 friends by sharing QRcode



AI Content

Generate Trivia content with a single prompt



GIF Support

Upload animated stickers to customize content

OPINIONATE.IO

Steelman arguments, settle debates and challenge your ideas

Topic

Let AI debate your own topic

or [generate a topic](#)

why do they think it be like it do?

1 / 1 daily debates

Debater A

People often think that things just "be like they do" because they have a tendency to accept the status quo without questioning it. This cognitive bias, known as acquiescence bias, leads individuals to adhere to existing norms and customs without critically evaluating them. Additionally, people might also lack the necessary information or understanding to fully comprehend the complexities of certain phenomena, leading them to make assumptions or accept things as they are without further inquiry.

Debater B

While acquiescence bias and lack of information may influence some individuals' perspectives, it is important to consider other factors that contribute to the belief that things "be like they do." Rational thought and empirical evidence often inform our understanding of the world. For instance, scientific laws and principles are based on extensive research and experimentation. Moreover, historical events and societal observations shape our understanding of how things work. Therefore, it's not merely a case of blindly accepting the status quo, but rather a result of reasoned analysis and accumulated knowledge.

Open LLM Leaderboard

| T | Model | Average | ARC | F |
|---|---|---------|-------|---|
| ◆ | ValiantLabs/ShiningValiant | 74.17 | 72.95 | 8 |
| ◆ | ICBU-NPU/FashionGPT-70B-V1.2 | 74.11 | 73.04 | 8 |
| ◆ | sequelbox/StellarBright | 74.1 | 72.95 | 8 |
| ◆ | Riid/sheep-duck-llama-2-70b-v1.1 | 74.07 | 73.04 | 8 |
| ◆ | AIDC-ai-business/Marcoroni-70B-v1 | 74.06 | 73.55 | 8 |
| ◆ | ICBU-NPU/FashionGPT-70B-V1.1 | 74.05 | 71.76 | 8 |
| ? | adonlee/LLaMA_2_70B_LoRA | 73.9 | 72.7 | 8 |
| ◆ | uni-tianyan/Uni-TianYan | 73.81 | 72.1 | 8 |

How Do I Stay Informed?



DeepLearning.AI

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...aspiring blacksmith & ramen chef on the weekends

joshking.ai

How Do I Make Cool Stuff?





Recursive Character Text Splitter

Inputs

Chunk Size

800

Chunk Overlap

Output

RecursiveCharacterTextSplitter

PDF Pdf File

Inputs

Text Splitter

Pdf File *

Student_Handbook_2022-20231 (1).pdf

Upload File

Usage *

One document per page

Additional Parameters

Output

Document

OpenAI Embeddings

Inputs

OpenAI Api Key *

Additional Parameters

Output

OpenAIEmbeddings

ChatOpenAI

Inputs

OpenAI Api Key *

Model Name

gpt-3.5-turbo

Temperature

0.6

Additional Parameters

Output

ChatOpenAI

In-Memory Vector Store

Inputs

Document *

Embeddings *

Top K

4

Output

Memory Retriever

Conversational Retrieval QA Chain

Inputs

Language Model *

Vector Store Retriever *

Memory

Return Source Documents

Additional Parameters

Output

ConversationalRetrievalQAChain

Hi there! How can I help?

How many credit hours can warned students registered?

The number of credit hours that warned students can register for depends on the specific warning they are on. For the first warning, they can register for a maximum of 15 credit hours, of which three or six credit hours are repeated. For the second warning, they can register for a maximum of 12 credit hours, of which six or nine credit hours are repeated.

Type your question...

How Can I Get Involved?





The bridge to possible