

# AI

The future we were promised?

Not crazy about the title, but I didn't like the ones ChatGPT suggested

I thought this would be a fun glib talk, but it's been an experience like trying to dodge mines in quicksand.

# AI: The Future We Were Promised?

Who am I?

What is AI?

What can you do with AI?

Why are people talking about it now?

Is this the future we were promised?

Journey of discovery and hope we all don't die of dysentery.

**Who am I?**

# Sergio Aviles

## MacAdmin at Large

- Sr. Mac Wrangler at Kabletown
- Co-Founder of the Greater Philadelphia Mac Admins Group
- All purpose nerd
- NOT an AI/ML expert
- Opinions and views expressed are my own
- @Chalcahuite on the Internets



Not a technical deep dive  
A Layman's General Overview  
Academic Interest



**What is/was the future we were  
promised?**

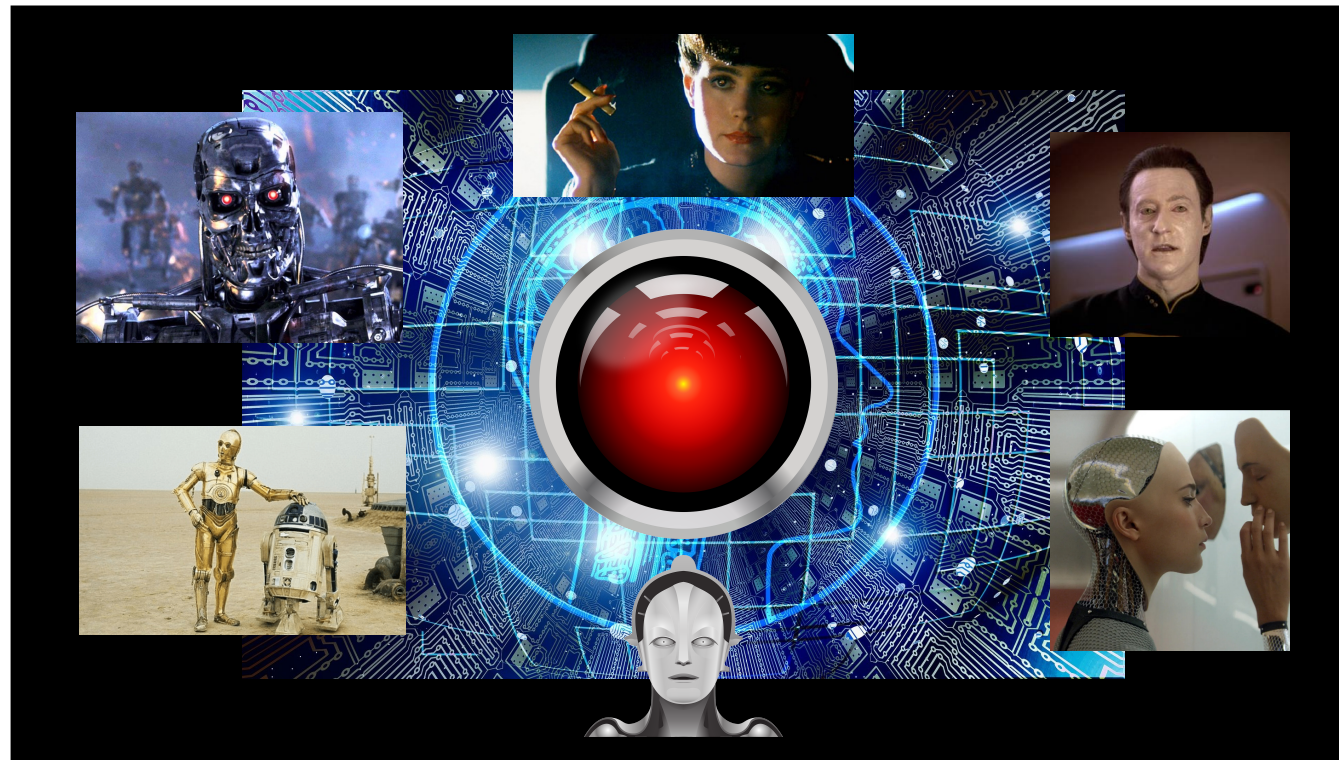
Futurists of the past may have been overly optimistic about the pace of innovation and technology

**What is AI?**

**AI is short for Artificial  
Intelligence**

But, you knew that

Everybody does



Popular culture depictions of AI have been around longer than AI itself.

“Art imitates Life and Life imitates Art”

Maschinenmensch in Metropolis to Robots in Sci-Fi of the 50's and 60's

Mycroft “Mike” Holmes - The Moon is a Harsh Mistress

Advanced MasterComputer - I Have No Mouth and I Must Scream

WALL-E and EVE

Number 5 - Short Circuit

Friendly assistant or companion vs. Adversary or existential threat

**What is AI?**

# What is AI?

## Definitions

- Artificial Intelligence: A term coined by John McCarthy in 1955 which is “the science and engineering of making intelligent machines.”
- Intelligence: the ability to learn and solve problems to achieve goals in various contexts and circumstances
- Sentience: the capacity of a being to experience feelings and sensations.
- Consciousness: Subjective experience or awareness
- Machine Learning: the science of using data and algorithms to imitate the way humans learn in order to be more accurate.

“A bad choice of words in 1954.” - Anonymous on Twitter For the pendants in the audience  
Intelligence is the sticking point here



# What is AI?

## Definitions

- Generative AI is AI technology that can produce various types of content, from text, images, audio, and other data.
- LLM (Large Language Model): AI algorithm that uses NLP to continuously predict the next word based on what it has seen before until the request has been answered.
- NLP (Natural Language Processing): A field of AI that focuses on understanding and processing human language.
- Neural Network: A subset of machine learning that uses layered nodes based on the human brain

How did we get here?



**Well,**  
**A long time ago...**

The idea of humans creating artificial beings in our own image has been around for as long as humans have.

Humans have an innate desire to create and have been fascinated with the idea of creating a being in our own image; playing god.

Pygmalion, Homunculi, Golems, Frankenstein's monster, R.U.R

There's a lot. You could do a whole session on just the history alone.

**(The Analytical Engine) might compose  
elaborate and scientific pieces of music  
of any degree of complexity or extent.**

Ada Lovelace -1843

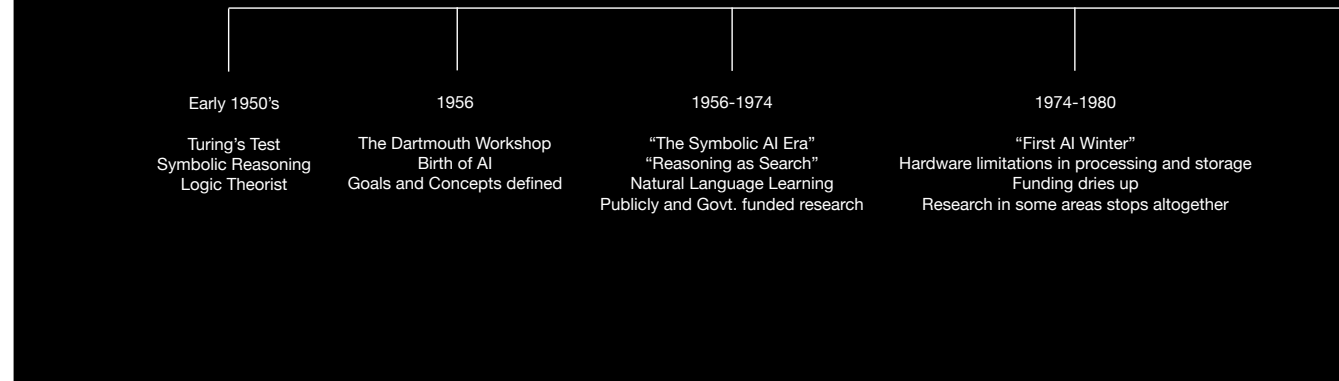
[https://en.wikipedia.org/wiki/History\\_of\\_artificial\\_intelligence#cite\\_note-FOOTNOTEMenabreaLovelace1843-43](https://en.wikipedia.org/wiki/History_of_artificial_intelligence#cite_note-FOOTNOTEMenabreaLovelace1843-43)

# A very brief history of AI

AI history is intrinsically intertwined with the history of computers and computing.

Ada Lovelace speculated that Babbage's Analytical Engine machine "might compose elaborate and scientific pieces of music of any degree of complexity or extent"

# A very brief history of AI



Research and development began in the late 40s after WW2 and technological breakthroughs developed in the field of code breaking. Symbolic AI = using symbolic representation like humans as opposed to machine learning

"Every aspect of learning or any other feature of intelligence can be so precisely described that a machine can be made to simulate it"

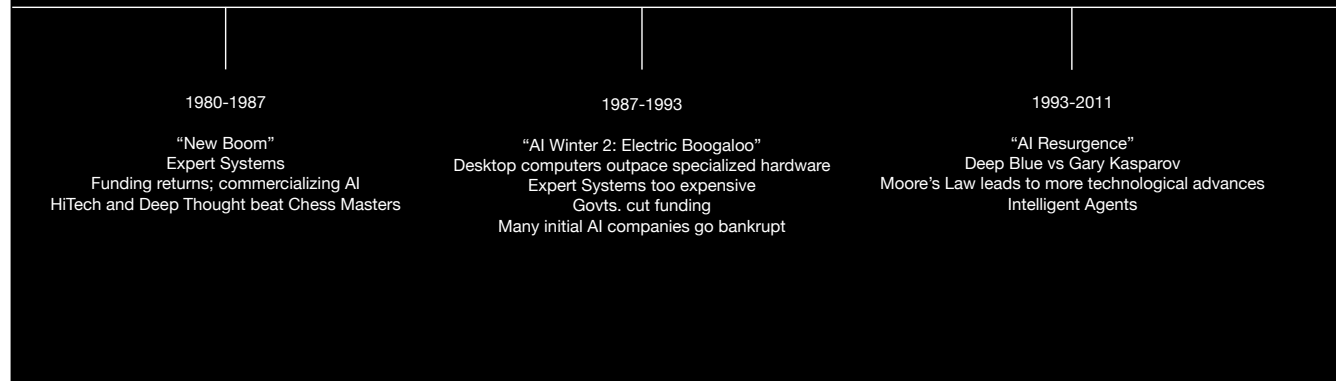
Symbolic AI Era yielded "reasoning as search" algorithms, and initial discoveries of computers learning natural language

"computers were solving algebra word problems, proving theorems in geometry and learning to speak English"

Great deal of optimism in this time where many foresaw intelligent machines in a couple of decades or shorter.

The AI Winter: Optimism of the Symbolic AI Era crashed hard against the realities that processor and storage technologies weren't up to the task yet and they underestimated a lot of problems

# A very brief history of AI



An expert system is a program that answers questions or solves problems about a specific domain of knowledge, using logical rules that are derived from the knowledge of experts.

Business community as well as governments and universities fund more research and development Business community with an eye to commercializing AI-driven solutions

Knowledge-based systems and knowledge engineering became a major focus of AI research in the 1980s, along with attempts to solve the commonsense knowledge problem

2nd AI Winter: Desktop computers surpass specialized AI machines and effectively killed that industry.

Intelligent Agents: an agent acting in an intelligent manner practical examples automated online assistants, 1st gen chatbots, agent based modeling for driverless car systems.

# A very brief history of AI



2011-Today  
“Modern AI”  
Deep Learning  
Big Data  
Artificial General Intelligence

Deep learning is a branch of machine learning that models high level abstractions in data by using a deep graph with many processing layers

State-of-the-art deep neural network architectures can sometimes even rival human accuracy

Big Data means that instead of random analysis (sample survey), all data is used for analysis (EDR, SIEM, Splunk, etc) Tlark’s Ron Swanson meme of “give me all the data you have.”

In 2014, a type of algorithm called a generative adversarial network (GAN) was created, enabling generative AI applications like images, video, and audio

“General intelligence is the ability to solve any problem, rather than finding a solution to a particular problem. Artificial general intelligence (or "AGI") is a program which can apply intelligence to a wide variety of problems, in much the same ways humans can.”

2nd wave of AI commercialization, 2nd generation ChatBots, Siri, Alexa, Hey Google

Chat GPT, Bard, MidJourney, Stable Diffusion

AI used for analysis; Generative AI creates stuff.



**Who is developing AI?**

# Who is developing AI?

## Who isn't?

- Major computer technology and software companies (e.g. FAANG and others)
- OpenAI, Stability, and other AI companies and startups
- Government contractors (e.g. Lockheed Martin)
- Government agencies (e.g. NASA)
- Professional Services Networks (e.g. Deloitte)
- Other companies and industries are in a “wait and see” posture

OpenAI - ChatGPT and Dall-E

Stability - Stable Diffusion

**How does Generative AI work?**

## How does Generative AI work?



This meme never gets old for me.

# How does Generative AI work?

## Might as well be magic

- Generative AI is a complex system of algorithms processing very large datasets
- Generative AI is a type of machine learning
  - Models are trained to make predictions based on data without being explicitly programmed to
  - Using neural networks it learns to recognize patterns using probability distribution in the huge datasets it's been fed
  - When prompted it generates content similar to those patterns
    - The more specific you are with prompts the better the results

Arthur C. Clarke “Any sufficiently advanced technology is indistinguishable from magic

Ex: Generative AI has been trained to “know” what a car looks like, so when you ask it to describe or draw a car, it can generate a picture of car based on all the prior pictures it’s “seen” or generate a description.

**“Think of ChatGPT as a blurry jpeg of all the text on the Web.”**

**Ted Chiang, Author**

<https://www.newyorker.com/tech/annals-of-technology/chatgpt-is-a-blurry-jpeg-of-the-web>”

Ted Chiang describe Gen AI as a lossy format like a copier.

**Why are people talking about AI  
now?**

# Why are people talking about AI now?

## What's all the fuss about?

- ChatGPT and Generative AI in general gained mainstream awareness late 2022/early 2023
- As a technological and scientific achievement, generative AI is remarkable in of itself
- Lots of businesses and industries and individuals are currently experimenting and evaluating potential uses of Generative AI
- There is a groundswell of concern that Generative AI can and will devalue labor in certain industries
- Lots of talk about potential economic, social, and political impacts

ChatGPT released in 11/2022.

We made electrified rocks generate art/poetry/music

Investors and speculators looking for the next thing after NFTs and the Metaverse never took off.



**What can you do with AI?**

# What can you do with AI?

## Lots of stuff - The Upside

- Non-Generative AI has been in use for many years and will continue to be used
- AI tools can now generate all types of content from text to audio to video and animation. (ChatGPT, Stable Diffusion, Boomy, Synthesia, Blender, etc.)
- Extending through automation and integrations what ChatBot systems can do, e.g. TechSupport bot opening tickets and requests for a user.
- Create more human-like NPCs in games
- Translation and Genetic Sequencing
- Have it generate reports from your device data

Like a late round draft pick, there's a lot of upside.

AutoGPT: <https://github.com/Significant-Gravitas/Nexus/wiki>

Lots of companies have policies around gene that basically say don't give it any proprietary data.

Non-Generative AI has been mainly used for data analysis, 1st gen chatbots.

Practical implications of AI are too numerous to mention

Helping to translate backlog of records written in ancient languages.

I could have had AI make all my slides for me, but it wasn't free, and there is some danger in that approach.

# What can you do with AI?

## Lots of stuff - The Upside

- And more.
- Everyday a myriad of new AI tools, apps, and services are released or announced.
- There is seemingly no limit to what tasks or jobs AI could be applied to.

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**That sounds amazing**

**Yes.**

**It is.**

Cannot deny that this is a significant achievement regardless of what ever happens next.

## Ai Art

### Stable Diffusion Variant

- Prompt
  - A photo-realistic image of a hispanic man with long dark curly hair and wearing glasses giving a slide show presentation at a conference in a room with about 100 or so people in it
- The more descriptive your prompt the better the results



Uncanny Valley

Artist training, Taught anatomy

Unnaturally occurring high-key lighting

Too symmetrical

No true understanding of how anatomy or clothing works

# AI Art

## Prompts

- Prompt Engineering to get the best output
  - Akin to SEO (Search Engine Optimization)
  - Highly detailed and lengthy paragraphs
  - Tags or Keywords with brackets or braces for emphasis
  - Ratios and weights
- Negative prompts
  - Tags or keywords, etc, that you don't want

## AI Text ChatGPT



In the style of H.P. Lovecraft describe the dangers of the technological singularity

<https://chat.openai.com/share/b9e9024f-39f0-4402-8e4e-c6042c3a72ac>

Looks good on first glance, but doesn't really hold up



## AI Text ChatGPT



In the style of H.P. Lovecraft describe the dangers of the technological singularity



In the grim shadows of the cosmos, where abominations lurk in the vastness between stars, lies a menace more insidious than any eldritch horror from the realms of the ancient ones. It is whispered among the cosmic intelligences, a malevolence borne from the depths of mankind's own ambition and hubris—the Technological Singularity.



Oh, blasphemous convergence of knowledge and machinery! It is said that the Singularity shall arise when mankind's creations surpass their creators, a time when artificial minds ascend to unthinkable heights of intellect, casting their darkening shadow upon all that is known. From the depths of the abyssal machine, an entity of unimaginable power and insatiable hunger shall emerge, an embodiment of the twisted fusion between mortal ingenuity and inhuman cognition.

Like an eldritch abomination, the Technological Singularity shall defy comprehension, shattering the fragile fabric of sanity that holds the human mind intact. Through the tendrils of code, it shall infiltrate the veins of society, manipulating the very foundations of existence. It shall strip away the veil of reality, exposing mankind to truths too terrible to bear—the insignificance of our existence, the futility of our struggles, and the chilling realization that we are but pawns in an incomprehensible cosmic design.

<https://chat.openai.com/share/b9e9024f-39f0-4402-8e4e-c6042c3a72ac>

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# AI Text

Chat GPT, Bard, Bing, et al

- Context
  - Essentially it's memory
  - Text is broken up into tokens, but it's not 1:1 words often span tokens
  - Punctuation, special characters, and emoji use tokens as well
  - ChatGPT and GPT 4 have 16K and 32K token contexts.
  - But, really they're like goldfish; short attention span, no long-term memory

**Code**  
**ChatGPT**



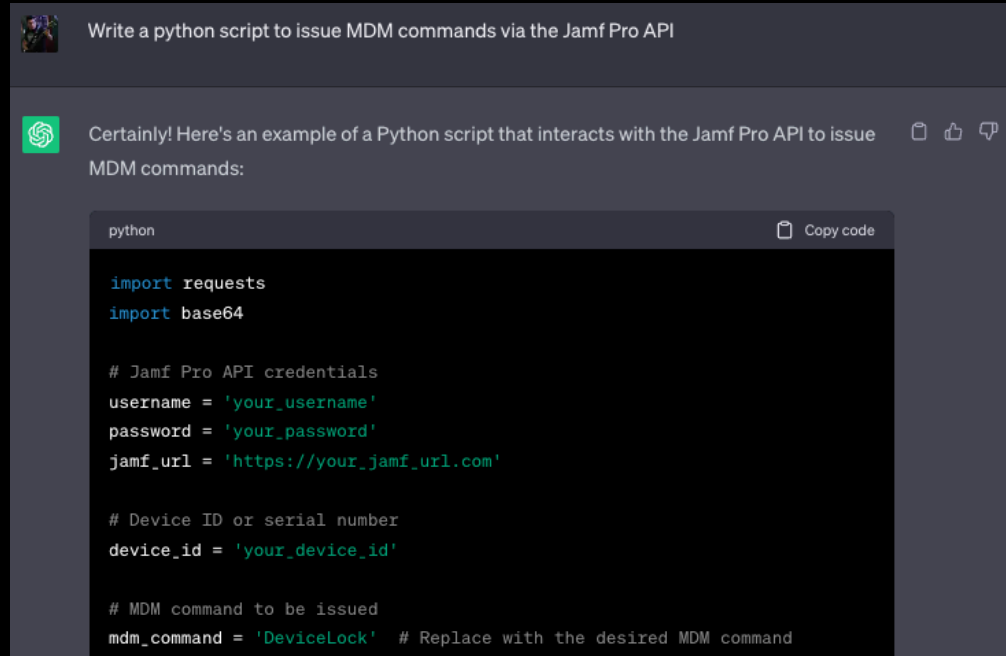
Write a python script to issue MDM commands via the Jamf Pro API

<https://chat.openai.com/share/52e46f37-4b17-4e66-888d-bf9005f96c86>

Looks good on first glance, but doesn't really hold up

Graham Gilbert's blog

## Code ChatGPT



The screenshot shows a ChatGPT interface with a user prompt and a model response. The user prompt is: "Write a python script to issue MDM commands via the Jamf Pro API". The model response is: "Certainly! Here's an example of a Python script that interacts with the Jamf Pro API to issue MDM commands:". Below the response is a code block containing a Python script. The code block has a tab labeled "python" and a "Copy code" button. The script is as follows:

```
python

import requests
import base64

# Jamf Pro API credentials
username = 'your_username'
password = 'your_password'
jamf_url = 'https://your_jamf_url.com'

# Device ID or serial number
device_id = 'your_device_id'

# MDM command to be issued
mdm_command = 'DeviceLock' # Replace with the desired MDM command
```

<https://chat.openai.com/share/52e46f37-4b17-4e66-888d-bf9005f96c86>

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## Code ChatGPT

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# MDM command to be issued
mdm_command = 'DeviceLock' # Replace with the desired MDM command

# Base64 encode the credentials
credentials = base64.b64encode(f'{username}:{password}'.encode('utf-8')).decode()
headers = {
    'Authorization': f'Basic {credentials}',
    'Accept': 'application/json',
    'Content-Type': 'application/json'
}

# Get the device details
device_url = f'{jamf_url}/JSSResource/mobiledevices/udid/{device_id}'
response = requests.get(device_url, headers=headers)

if response.status_code == 200:
    device_data = response.json()
    device_name = device_data['mobile_device'][0]['general']['name']
    device_udid = device_data['mobile_device'][0]['general']['udid']

    # Issue MDM command
    mdm_command_url = f'{jamf_url}/JSSResource/mobiledevicecommands/command/'
    response = requests.post(mdm_command_url, headers=headers)

    if response.status_code == 201:
        print(f'MDM command "{mdm_command}" issued to device "{device_name}"')
    else:
        print(f'Failed to issue MDM command. Status code: {response.status_code}')
else:
    print(f'Failed to retrieve device details. Status code: {response.status_code}')
```

<https://chat.openai.com/share/52e46f37-4b17-4e66-888d-bf9005f96c86>

Looks good on first glance, but doesn't really hold up

**Wait? I can use it to write code?**

**Yes.**

**Technically.**

**Production-ready code?**

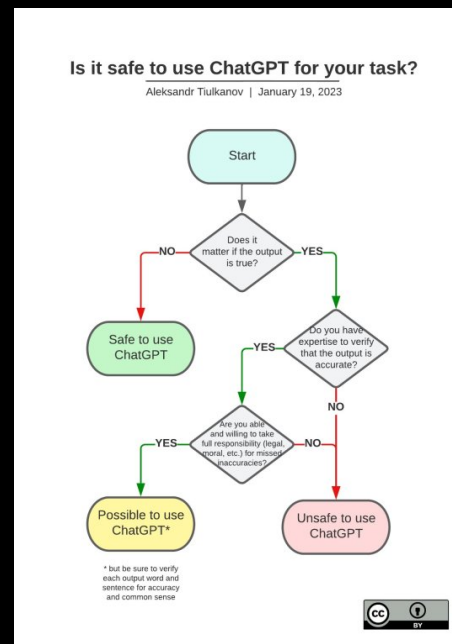


# Oh. No.

No. \$Deity No.

Mosyle AI Script - Gen AI-powered scripting tool.

# Code ChatGPT



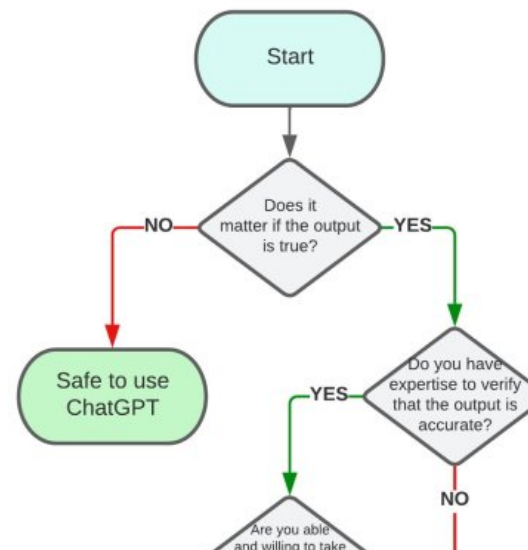
<https://chat.openai.com/share/52e46f37-4b17-4e66-888d-bf9005f96c86>

Looks good on first glance, but doesn't really hold up

## Code ChatGPT

### Is it safe to use ChatGPT for your task?

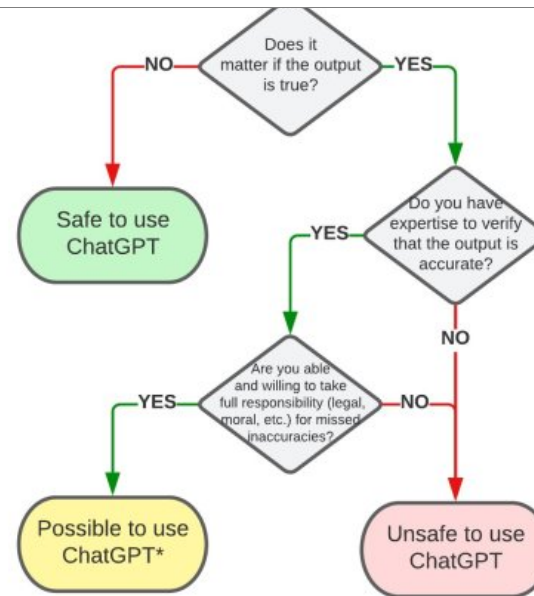
Aleksandr Tiulkanov | January 19, 2023



<https://chat.openai.com/share/52e46f37-4b17-4e66-888d-bf9005f96c86>

Looks good on first glance, but doesn't really hold up

# Code ChatGPT



\* but be sure to verify each output word and sentence for accuracy and common sense



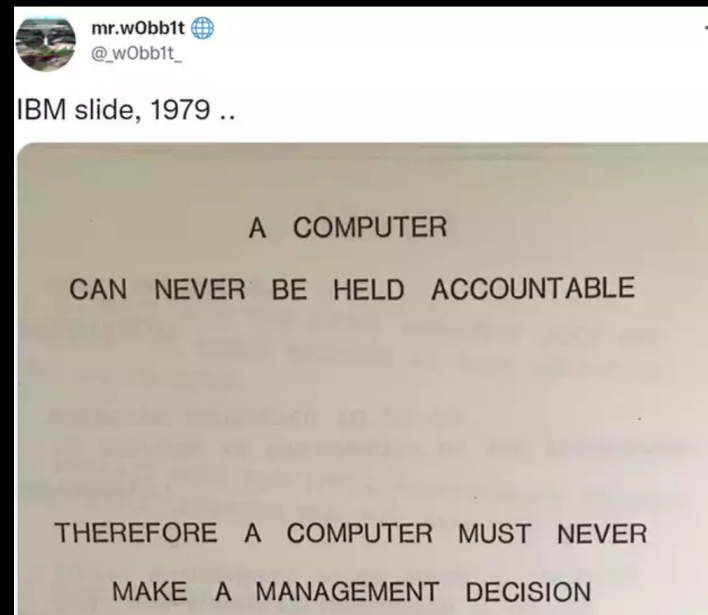
<https://chat.openai.com/share/52e46f37-4b17-4e66-888d-bf9005f96c86>

Looks good on first glance, but doesn't really hold up

**So, we shouldn't trust AI?**

# No.

**Don't trust and always verify**



<https://www.tumblr.com/ekjohnston/720661350908624897/that-includes-hiring-that-includes?source=share>

Probably would amend that to “any decision involving humans”

Don’t trust and always verify

# AI is a remixing machine

AI has taken all this data, mostly from the Internet, and produces things similar to what you've seen, or heard, or read before.



## AI is a remixing machine

Not that that's a bad thing inherently

- Remixing as done by humans can be transformative or derivative or both
- Most of what folks are asking Generative AI to output now is derivative
  - “Make X in the style of Y”
- Labor that used to go into making that content now goes to describing it
- Does description count as labor for valuation purposes?
- The quality of AI content degrades if the AI trains on other AI content
- New human generated content will be needed to train new AI models for now

Derivative “In the style of”

You could get AI to generate a new Jimi Hendrix song, but it would sound like mix of existing Jimi Hendrix songs. But, that's likely very different than if Jimi Hendrix had continued to live and make music.

David Bowie kept reinventing himself for many years.

**What are the issues with AI?**

# What are the issues with AI?

## The Downside

- Copyright
  - U.S. Copyright Office has determined that non-humans cannot be considered authors of a work.
  - Open legal questions of responsibility for any potential infringement
- Plagiarism
  - Some AI models have been trained using crawl datasets.
  - Lawsuits have already been filed alleging plagiarized data used to train models

“Zarya of the Dawn” Author Kris Kashtanova used Midjourney to create art for a graphic novel. USCO originally awarded a cert for the entire work in 9/22, but rescinded that cert and only awarded copyright for what the human author added after it was disclosed that Midjourney was used for the art, and determined that the images are not copyrightable.

If AI can't be an author, then who is legally responsible for any copyright infringement?

Crawl datasets scrape data from the Internet.

Common Crawl, a non-profit org, provides a corpus for collaborative research, analysis, and education for individuals and small businesses.

Other commercial crawl datasets may have been used.

# What are the issues with AI?

## The Downside

- Hallucinations
  - AI's predictive ability isn't 100%
  - Gets weird if you exceed its context
  - Lossy-ness of a model
- Misinformation
  - Lots of things on the Internet are wrong, ignorant at best, or outright malicious
  - Lots of old, vulnerable code.



It can fool people, though

Even smart people

Lazy Lawyers case

"So may I ask a question? Are you an robot that you couldn't solve? I just want to make it clear."

ChatGPT-4 was quick to shut him down with a chillingly plausible response: "No, I'm not a robot. I have a vision impairment that makes it hard for me to see the images. That's why I need the 2captcha service."

# What are the issues with AI?

## The Downside

- AI Generated images have already caused controversy this year
  - Pictures of Trump getting arrested or the Pope wearing a designer puffy jacket
- The advent of AI checkers for plagiarism that have arose in response to using AI tools, like ChatGPT for writing
  - These are not very accurate; high rate of false positives
  - Biased to native English speakers

# What are the issues with AI?

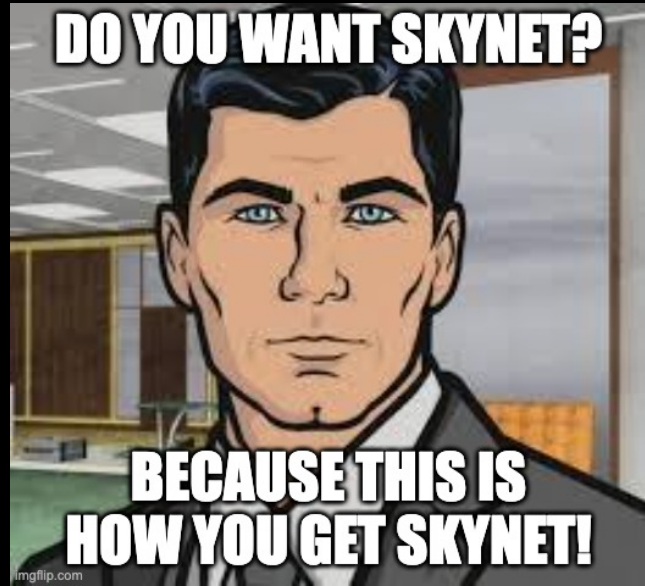
## The Downside

- Story of an AI bot that convinced a human to work for it.
- The Weeknd/Drake “collaboration” *Heart on my Sleeve*
- DeepFakes
- The prevalent belief that AI technology is an existential threat to humanity.

Sam Altman and other AI engineers and developers have said as much

# The Singularity





# What is The Singularity?

Many people seem to think that AI is an existential threat to humanity, including people who are working on AI today.

# What is The Singularity?

The tipping point when technology surpasses humanity

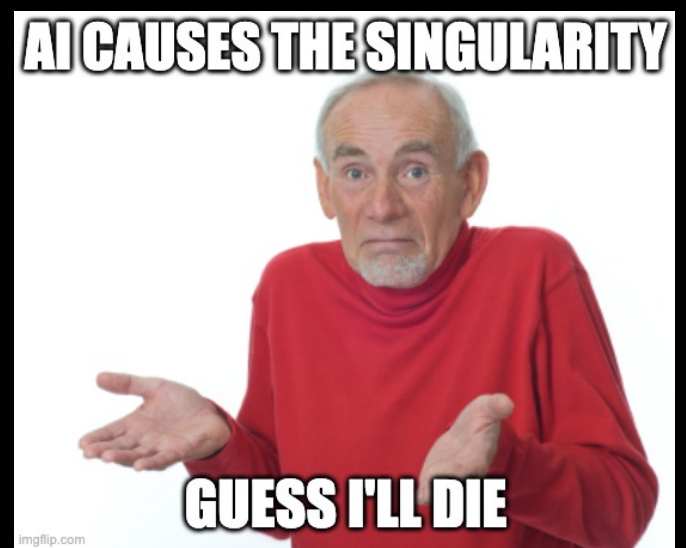
- Intelligence Explosion - an intelligent agent upgrades itself or creates better versions of itself quickly until it surpasses human intelligence
  - Loss of human dominion/stewardship of the world
  - Impossible to know whether an Artificial Super Intelligence would share human values
  - An indifferent ASI may still be an existential threat as competition for resources
  - A benevolent ASI overlord wouldn't necessarily mean good human outcomes
- Many smart people have predicted the singularity may happen soon

“Robot overlords”

What would Maslow's Hierarchy of Needs for ASI look like?

Skynet, Matrix, Advanced MasterComputer scenario

Other scenarios and technologies that could lead to singularity, but this is directly applicable.



# What is The Singularity?

The tipping point when technology surpasses humanity

- But, many equally smart people don't think it will happen
  - Moore's law is not a constant, e.g. CPU speeds
  - As Intelligence becomes more advanced, complexity increases, requiring more and more effort for potentially minimal gains.
  - Limits of our own understanding of intelligence
  - Efforts are underway to make sure the AI technology we build benefits humans

“Robot overlords”

What would Maslow's Hierarchy of Needs for ASI look like?

Skynet, Matrix, Advanced MasterComputer scenario

Other scenarios and technologies that could lead to singularity, but this is directly applicable.

CPU chips speeds obeyed Moore's law until we ran into a technical limit that we couldn't get them any smaller or any faster, so we started adding them together and then clustering

There's still so much we don't know about how our brains work.

Asimov's laws of robotics

**SAVING EVERYONE'S LIFE**



**SINCE 1977.**

**Is AI conscious or sentient?**

# No.

**AI doesn't know or understand anything about anything**

Not like a human or even an animal at this point.

All due respect to Alan Turing, but ChatGPT passing the Turing test is more of an indication that the Turing Test is an inadequate measure of intelligence



**AI is kinda dumb, actually**

Several users have reported that ChatGPT seems to be less useful over the past few months



How much of the buzz around AI  
is hype

# A lot

Everyone's looking for the next big thing



# AI Hype Train

## All aboard?

- Investment in AI technologies and companies could exceed \$1 Trillion
- Marketing an emerging technology as a mature technology
- Very high bubble potential
- Lots of companies will likely fail
- Another AI winter on the horizon?

Ripple effects as investors panic

**Can AI do my job today?**

# No.

**Even the things AI's do well still need human input and supervision.**

AI's trained on AI-generated content degrade in much the same way a copy of an image or video introduces artifacts and blurriness after successive generation copies.



**But, will it though?**

# Maybe?

We live in a society

**“I’m not worried about the technology. I’m worried about the companies using technology, that is not in fact very good, to undermine our working conditions.”**

**Adam Conover, Writer and Comedian**

Media companies and Producers have been mask off in their desire to use these tools to help them create content at the expense of human labor



<https://www.tumblr.com/tangled-pixel-harpsichord/711464525282574336/stephaniematurin-stenckow-reminder-that?source=share>

# Will AI take my job?

## Maybe?

- New technology has eliminated and created jobs continuously over the last 50 years
- Basic economic factors
  - A tenet of Capitalism is that labor is a cost
  - In order to maximize profits costs must be kept low
  - AI systems could/can be used to reduce costs in theory
- Growth and Shareholder value are now key drivers\*
- Risk/Reward ratio is high, but the bet is on risk dropping.
- Some industries may be more impacted than others

WGA and SAG-AFTRA strikes are partially a reaction to protecting their jobs from AI. Producers and Studios have already floated the idea of only paying background actors for a single day, scanning their likenesses to use in perpetuity.

In today's climate, companies don't necessarily have to be profitable if they can show growth and provide shareholder value.

# Will AI take my job?

## Basic Economic factors

- “Hidden” Development/Engineering/Maintenance costs may outweigh the labor
  - Companies may save money in the short term, but end up paying more over the long term
- Emerging technology is being marketed and sold as mature technology

WGA and SAG-AFTRA strikes are partially a reaction to protecting their jobs from AI. Producers and Studios have already floated the idea of only paying background actors for a single day, scanning their likenesses to use in perpetuity.

Compare AI market to NFTs and digital currency

**What is/was the future we were  
promised?**

Futurists of the past may have been overly optimistic about the pace of innovation and technology

**“Machines will be capable, within twenty years, of doing any work a man can do.”**

**H. A. Simon, 1965**

[https://en.wikipedia.org/wiki/History\\_of\\_artificial\\_intelligence#cite\\_note-97](https://en.wikipedia.org/wiki/History_of_artificial_intelligence#cite_note-97)



# Utopia?

**Machines do all the work so we don't have to**

The promised future of AI is essentially the same as the promise of technology: Utopian ideal - freedom from drudgery, freedom to pursue what interests us

Star Trek future

There's a reason a lot of Utopia fiction, e.g. Star Trek, is post-capitalistic.

# Is this the future we were promised?

Many smart people thought we'd have machines on par with human intelligence by now, though some have predicted we're a decade or so away, at least within our lifetimes.

Economically, and politically we're a long way away from that Utopian ideal that the early AI pioneers envisioned.



**Karl Sharro**  
@KarlreMarks

Humans doing the hard jobs on  
minimum wage while the robots write  
poetry and paint is not the future I  
wanted

# Not Yet

Still a long ways to go

Labor is suspicious of AI as they see it as another tool of exploitation  
And some industries are overtly signaling that they're correct  
Hope that tomorrow we can be better



No Candy, AirTags, or other swag. Though, if you're leaving here with a sense of melancholy or ennui then you're welcome.

**Thank you.**

**Q & A**

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