

# Introduction to Machine Learning

## Philosophy of ML & AI in Literary Traditions

Ashley Gao

William & Mary

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# AI & ML in Ancient Times

- The idea of AI & ML can be traced to ancient Greece & Rome (but it is not clear where it originated)!



- Hephaestus, who created Talos

- Pygmalion, who created Galatea

# Hephaestus and Talos

- ... *not in the whole of the kingly art, but in one subsidiary to the kingly, enough for presiding in law courts; so that he was spoken of as a good judge. For Minos used him as guardian of the law in the city, and Talos as the same for the rest of Crete. For Talos thrice a year made a round of the villages, guarding the laws in them, by holding their laws inscribed on brazen tablets, which gave him his name of “brazen.”* - Plato, *Minos*

# Hephaestus and Talos

- Hephaestus, who created Talos
  - Creator and Creation
  - Autonomy and Free Will
  - The Role of Technology in Society
- Talos, created by Hephaestus
  - Artificial Sentience
  - Human-Machine Boundaries
  - Morality and Ethics
  - The Problem of Control

# Pygmalion and Galatea

- ... *Pygmalion had seen them (the Propoetides), spending their lives in wickedness, and, offended by the failings that nature gave their hearts, he lived as a bachelor, without a wife or partner for his bed. But, with wonderful skill, he carved a figure, brilliantly, out of snow-white ivory, no mortal woman, and fell in love with his own creation.* - Ovid, *Metamorphoses*

# Pygmalion and Galatea

- Pygmalion, who created Galatea
  - Creator and Creation Relationship
  - Perfection and Flaw
  - Anthropomorphization of Inanimate Objects
- Galatea, created by Pygmalion
  - Consciousness and Sentience
  - Ethical Creation
  - Transformative Power of Emotions
  - The Ideal vs. the Real:

# Animated Artefacts

- *Hyakki Tsurezure Bukuro* (“The Illustrated Bag of One Hundred Haunted Artefacts” or “A Horde of One Hundred Haunted Housewares”).
- Hand-scrolls illustrated by Toriyama Sekien (1712 - 1788).



# Animated Artefacts

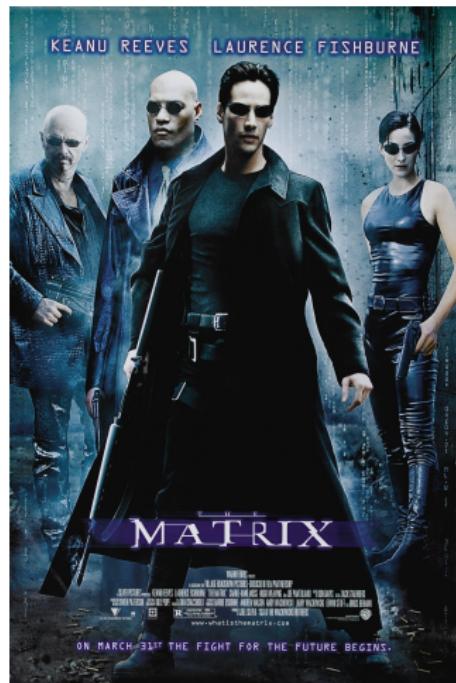
- *Koto-furunushi* illustrated by Toriyama Sekien (1712 - 1788).
- Said to be the music instrument of Emperor Keikō (71–130).



# Idea Shift on Artificial intelligence



● The Terminator (1984)



● The Matrix (1999)

# Idea Shift on Artificial intelligence

- The Mass Effect Trilogy (2007)



# Idea Shift on Artificial intelligence



Figure: Mass Effect: Andromeda (2017)

**What Now?** Reality tries its best to catch up with sci-fi.

# ChatGPT

- Text Generation
  - Generate human-like text based on input prompts
- Answering Questions
  - Explain concepts and provide information on a wide range of topics
- Text Summarization
  - Summarize long articles, documents, or webpages into shorter, more concise versions
- Coding Assistance
  - Help with programming-related queries and code generation.
- Storytelling
  - Create and continue stories or narratives.
- What's the problem with these?

# ChatGPT: Generated Story

- What's wrong with this generated story?

The screenshot shows a conversation between a user and ChatGPT. The user, represented by a profile icon with a orange circle and the text "You", asks for a short story featuring a hero defeating a dragon and rescuing royalty. ChatGPT, represented by a green circular icon with a brain-like symbol and the text "ChatGPT", generates a detailed response. The story describes a hero named Sir Tristan embarking on a quest to rescue Princess Isabella from a malevolent dragon named Drakaros. It details the battle, Sir Tristan's courage, and his victory, concluding with the princess being carried to safety. At the bottom of the screen, there are several small icons for interacting with the post.

You

Write me a short story (one paragraph) featuring a hero defeating an evil dragon and rescuing a royalty.

ChatGPT

In a land shrouded in darkness, a fearless hero named Sir Tristan embarked on a perilous quest to rescue Princess Isabella from the clutches of the malevolent dragon, Drakaros. With his trusty sword gleaming in the moonlight, Sir Tristan confronted the fire-breathing terror, engaging in a fierce battle that shook the very earth beneath them. With unwavering determination and a heart ablaze with courage, he plunged his sword into the heart of the dragon, vanquishing the evil that had plagued the kingdom for centuries. As the dragon's fiery breath dwindled, Sir Tristan carried the grateful princess to safety, their victory illuminating the land with hope and promise once more.

Reply ⌂ Like ⌂ Dislike ⌂ More ⌂

# Diffusion Model

- Architecture: DALL-E 2 uses a two-step process involving a diffusion model and a CLIP (Contrastive Language–Image Pretraining) model.
- The diffusion model generates images, and the CLIP model, trained to understand and rank the relevance of images in relation to text, guides the generation process.
- What's the problem with the results it generated, or just generative AI in general?
  - Biases in the training dataset!

# Diffusion Model



You

Provide a painting that describe this quote by Scott Fitzgerald: "Give me a hero and I will write you a tragedy."



DALL-E



Here are the paintings that capture the essence of the quote by Scott Fitzgerald: "Give me a hero and I will write you a tragedy." Each image portrays a heroic figure set against a backdrop of looming tragedy, reflecting the dramatic and emotional theme of the quote.

# Diffusion Model

- After some specifications in the prompt:

You  
Can the paintings feature a woman instead of a man?  
< 2 / 2 >

DALL-E

The image shows a screenshot of the DALL-E interface. At the top, there is a message from 'You' asking if the paintings can feature a woman instead of a man. Below this, it says '2 / 2'. On the left, there is a profile icon for 'DALL-E'. Two paintings are displayed side-by-side. Both paintings feature a woman with curly hair, standing in front of a dramatic, fiery background. The woman in the left painting has long, flowing hair and is wearing a dark, draped garment. The woman in the right painting has shorter, curly hair and is wearing a light-colored, draped garment. At the bottom of each painting, there is a quote: "GIVE ME A THE HERO AND I WIILL WRITE A TRAGEDY" -SCOTT FITZGERALD. The interface has a dark theme with white text and icons.

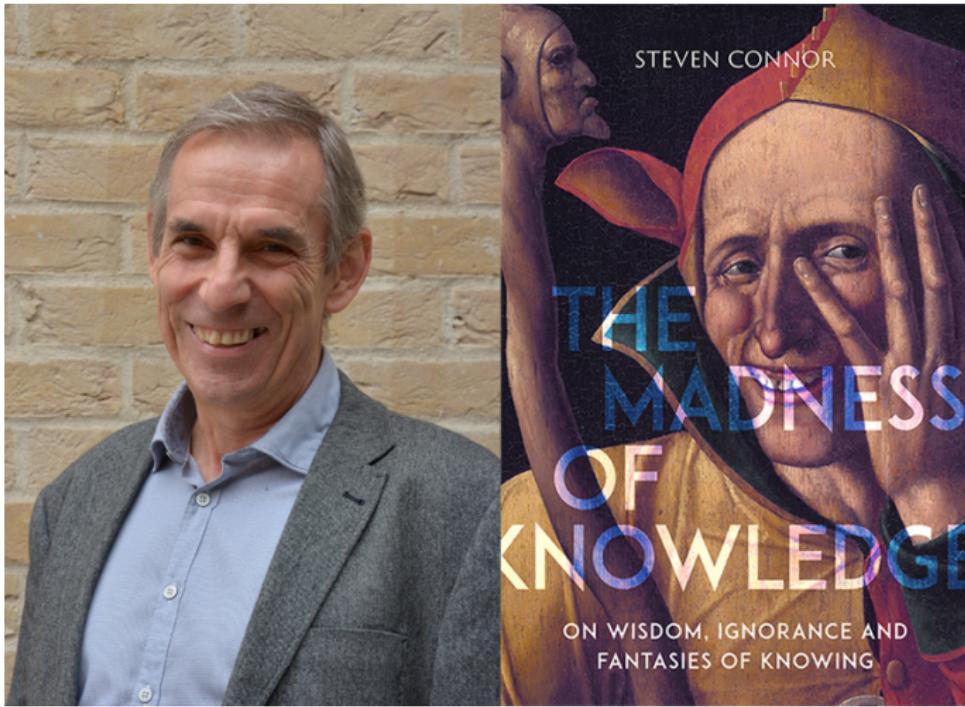
"GIVE ME A THE HERO  
AND I WIILL WRITE A TRAGEDY"  
-SCOTT FITZGERALD

"GIVE ME AS A HERO AND  
I WILL WRITE A TRAGEDY"  
-SCOTT FITZGERALD

Here are the revised paintings, each featuring a heroic woman as the central figure, in line with Scott Fitzgerald's quote: "Give me a hero and I will write you a tragedy."

□ ▲ □ □ □ □

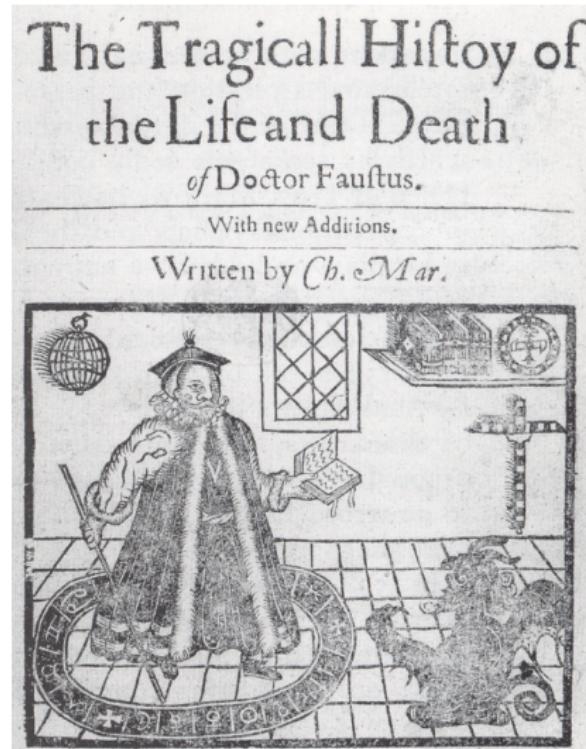
# On the Concept of “Learning”



# On the Concept of “Learning”

- Fantasies of Knowing
  - The author investigates fantasies of perfect knowledge, including the notion that total understanding is achievable.
- Limits of Knowledge
  - Connor discusses the ethical and existential implications of pursuing knowledge without bounds. He reflects on how the relentless drive for discovery can lead to ethical quandaries, personal madness, and even environmental degradation.
- Wisdom and Madness
  - The book considers the relationship between wisdom and knowledge, suggesting that true wisdom requires an awareness of the limits of one's knowledge. It also delves into the idea that there is a fine line between the genius of discovery and what society considers madness.

# On the Concept of “Learning”

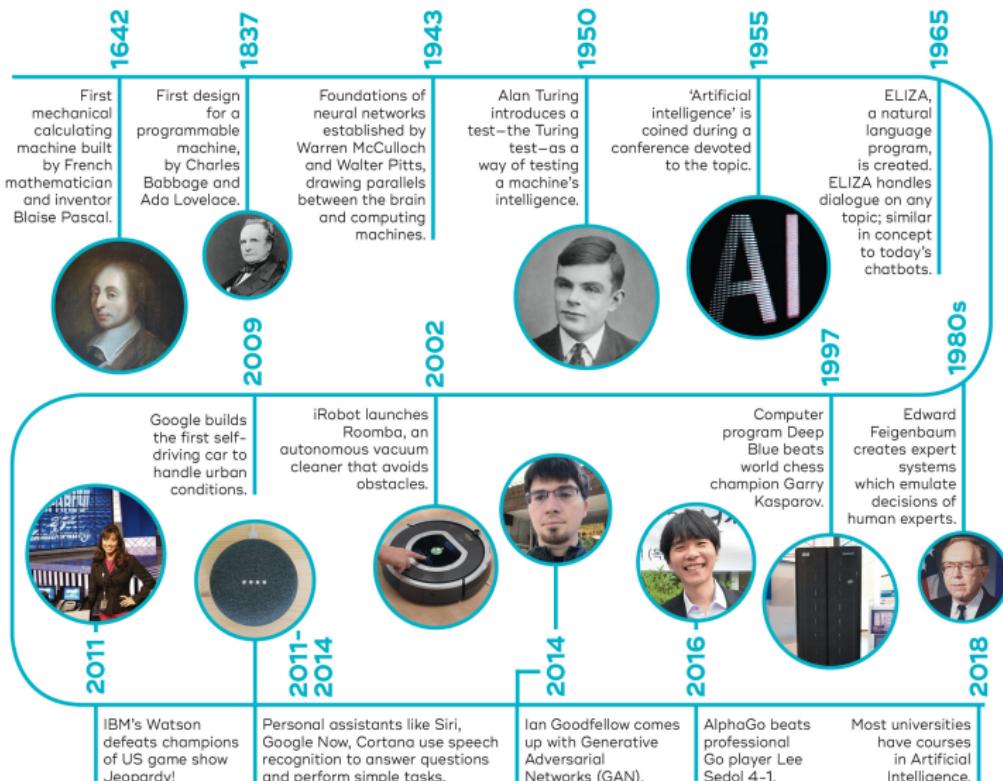


LONDON,  
Printed for John Wright, and are to be sold at his shop without  
Newgate, at the signe of the Bible. 1604.

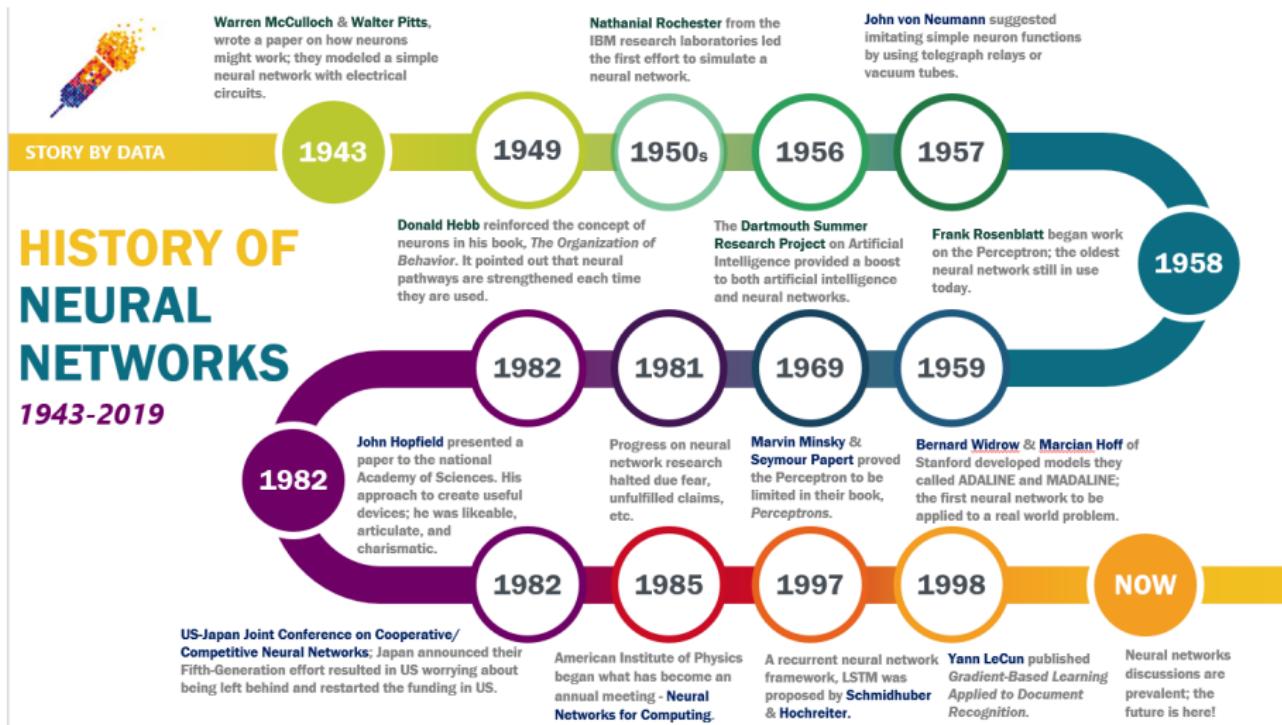
# What about machine learning?

By far we've only talked about human learning.

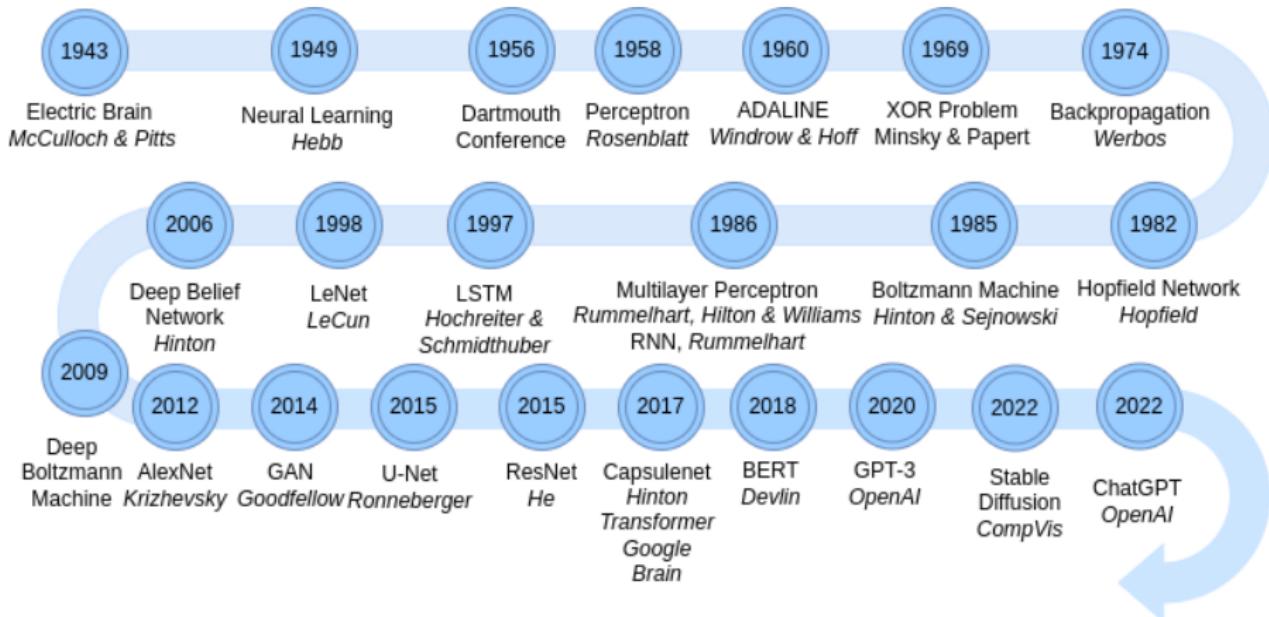
# History of Artificial Intelligence



# History of Neural Networks (High-Level)



# History of Neural Networks (Low-Level)



That's the End of CSCI416/516!

Thank you very much!

In the remaining lecture(s) we will cover the practice questions.