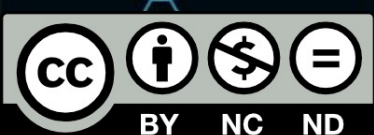# The State of AI and Questions We All Should Be Asking

Kiri L. Wagstaff

Fellow, Association for the Advancement of Artificial Intelligence (AAAI)

NASA Jet Propulsion Laboratory (2003-2022); Oregon State Univ. (2019+)

OSU AI Week, April 28, 2025

Dr. Kiri Wagstaff

- Computer Science, AI, Machine Learning (Ph.D.)
  - Geology (M.S.), Library and Information Science (MLIS)

- NASA Jet Propulsion Laboratory
  - Machine learning for space exploration
  - Mars rover operations (Opportunity rover)

- Oregon State University
  ("Machine Learning Challenges in the Real World")

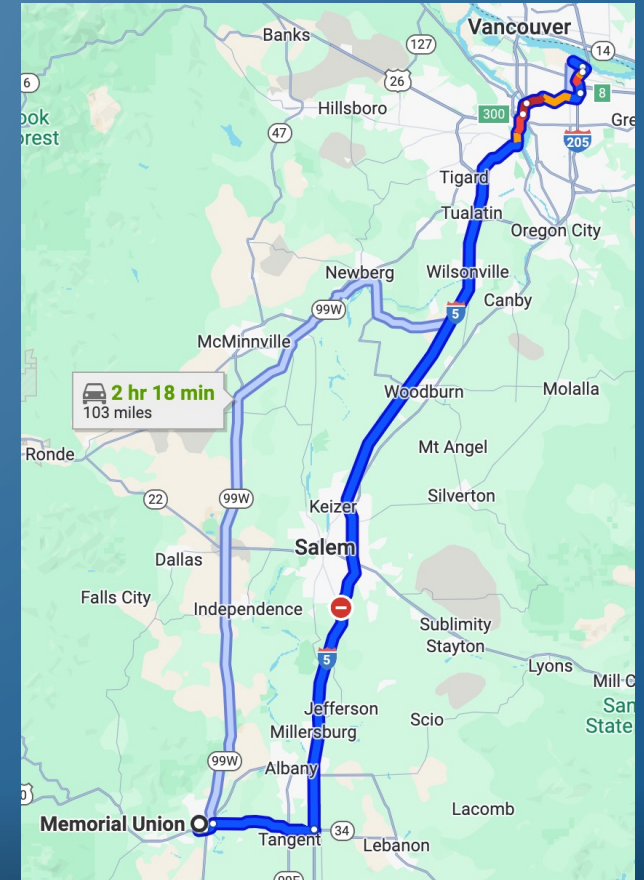- Artificial Intelligence Advisor for Senator Mark Kelly
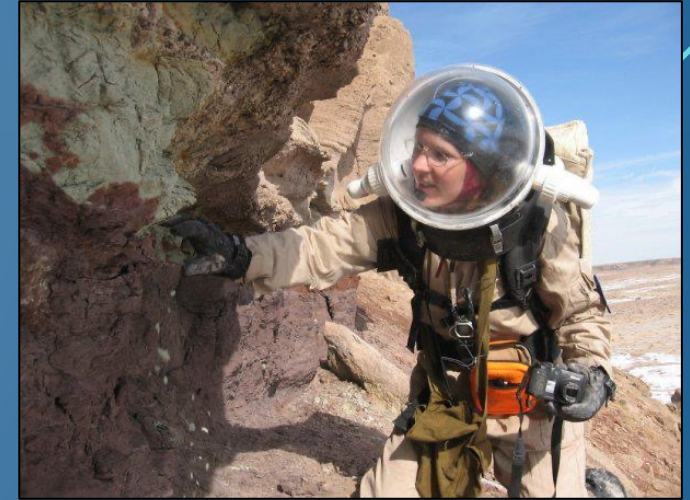
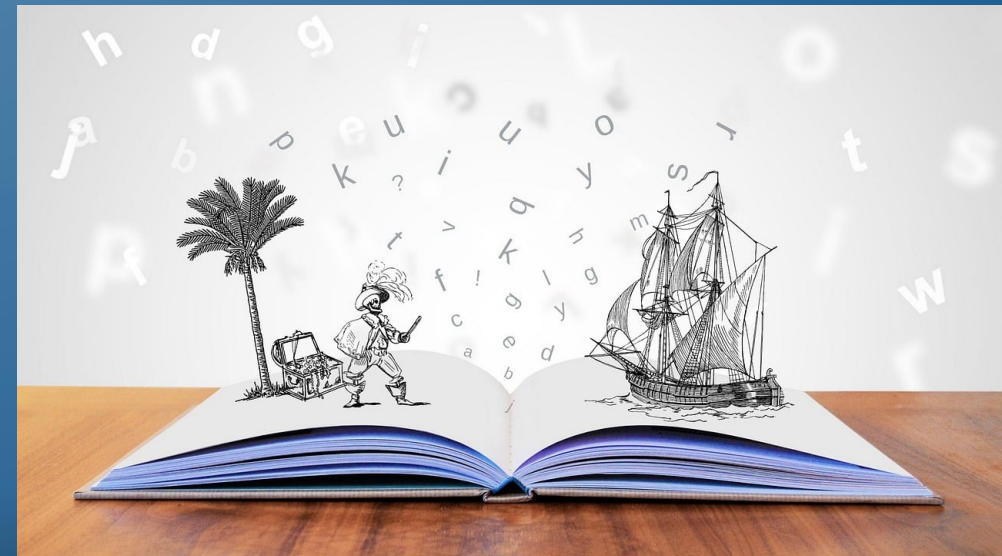Mars Desert Research Station

U.S. Congress

Do you use AI?

- Unlock your smartphone with face or fingerprint

- Ask a question of Siri, Alexa, Google Assistant…

- Dictate a message or note
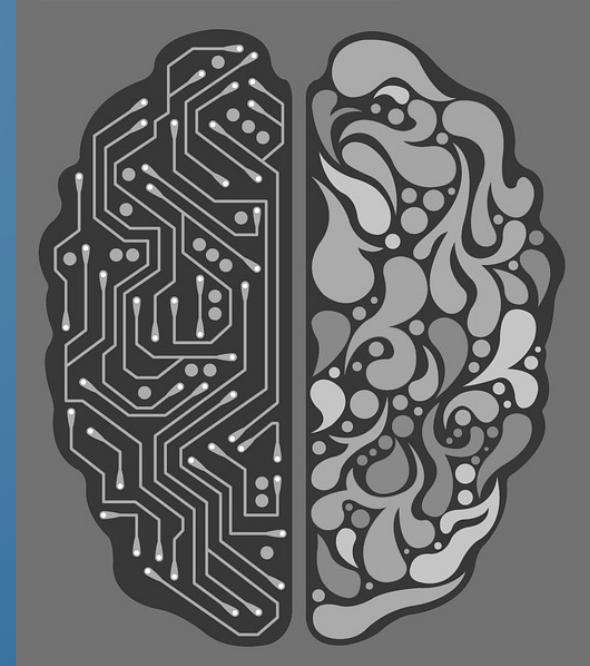
- Get driving directions

Do you use AI?

- Play a game with an AI opponent

- Translate text into a different language

- Get book, movie, product recommendations

What is AI?

- There is no widely agreed-on definition

- "Artificial intelligence (AI) is technology that enables computers and machines to simulate human learning, comprehension, problem solving, decision making, creativity and autonomy." – IBM
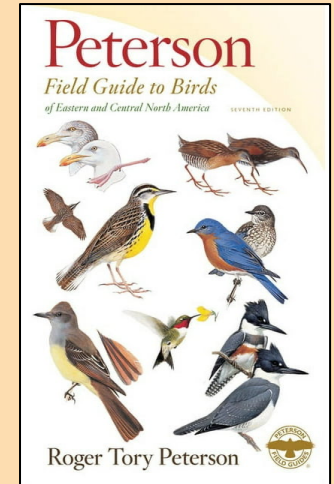
Artificial Intelligence

Optimize

- Generate driving directions using a <u>map</u>

Predict

- Identify birds (or mushrooms) using <u>guidebooks</u>
  - Check beak shape, crest, coloring

# Artificial Intelligence

Optimize

- Generate driving directions using a <u>map</u>
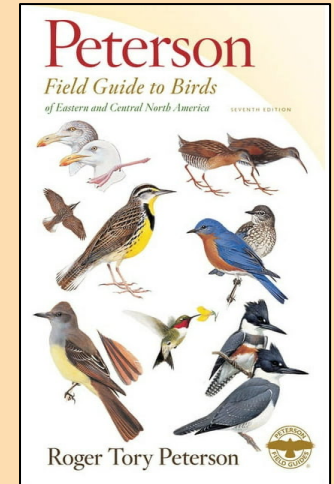
Predict

- Identify birds (or mushrooms) using <u>guidebooks</u>
  - Check beak shape, crest, coloring

Peterson
Field Guide to Birds
of Eastern and Central North America
SEVENTH EDITION

Roger Tory Peterson

Machine learning

Optimize predictions using <u>data</u>

- Generate driving directions using <u>current traffic</u>
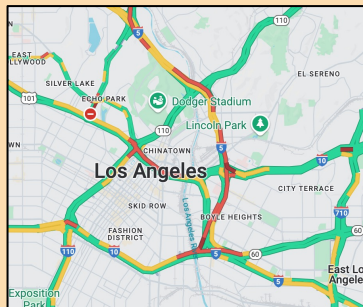

- Identify birds using <u>example images</u>

Kingfisher

Heron

AI or machine learning?

- Atris – a Tetris-like game with AI players
  - Hand-written scoring functions that guide AI search
  - AI players playing against each other (static)

- AlphaGo – an AI model that plays Go
  - Machine-learned scoring function that guides AI search
  - Trained on 30M moves,
    then played against itself to improve further (dynamic)
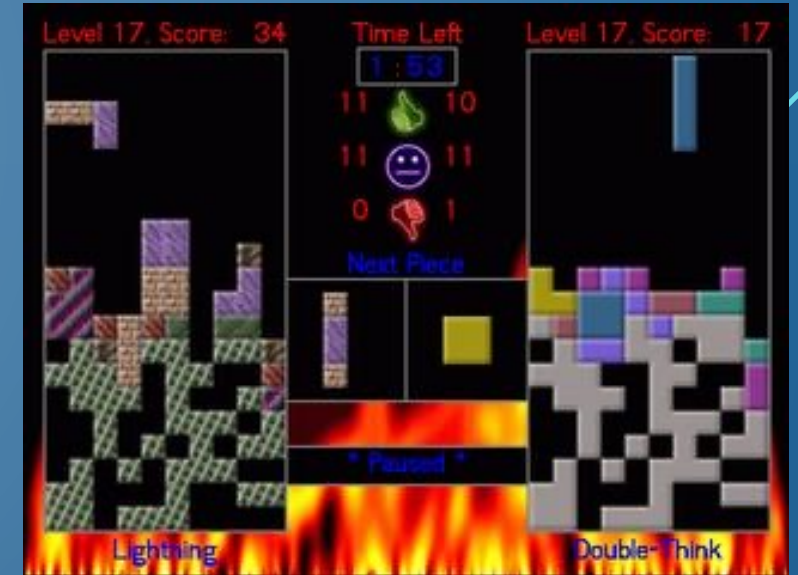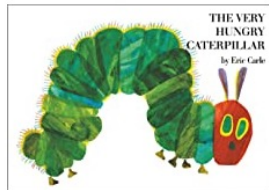
Machine learning: learn patterns in data

Learning
algorithm

Data

Learned model
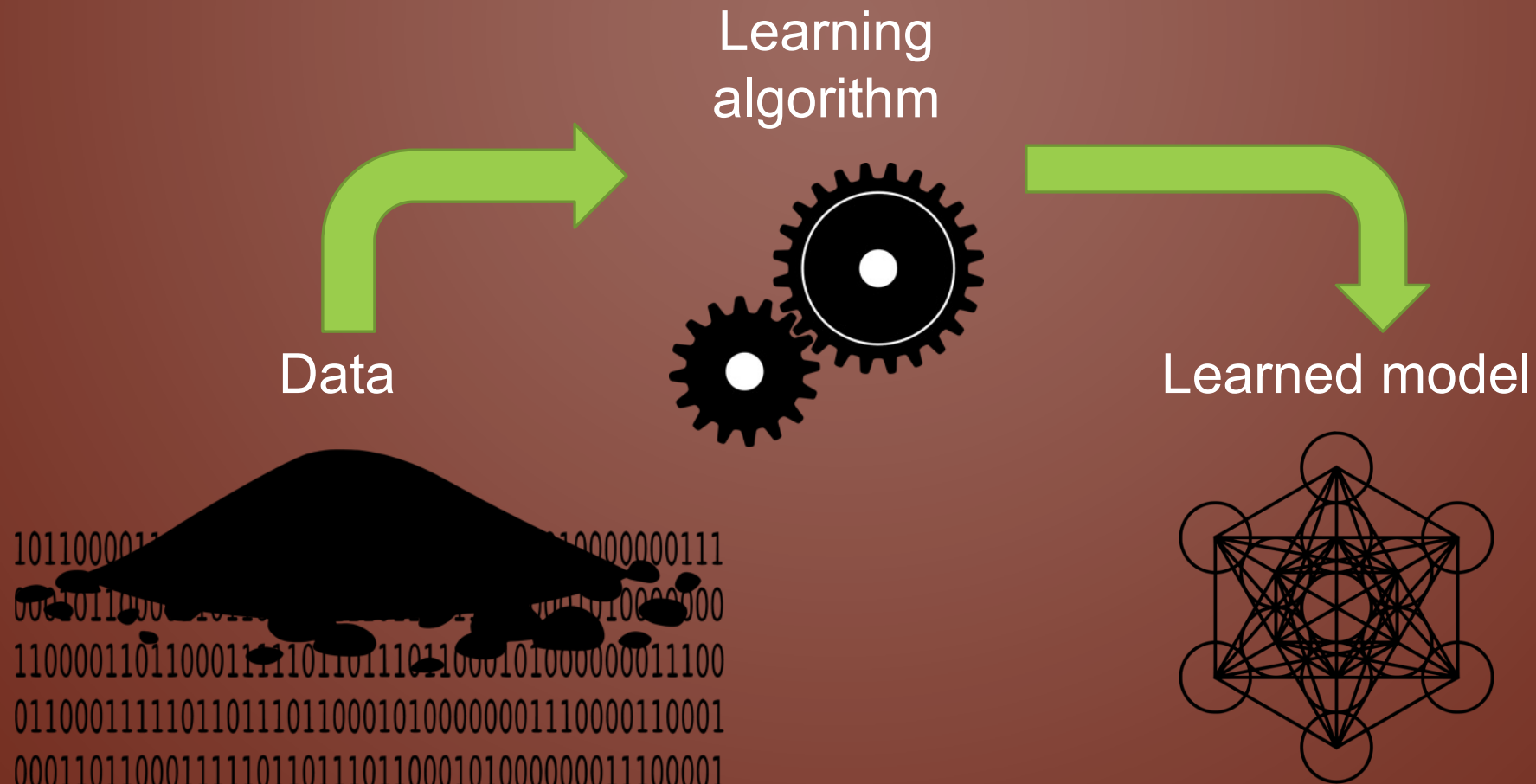
… to enable application to new data

Kiri L. Wagstaff

April 28, 2025

Where does the data come from?

Shopping recommendations
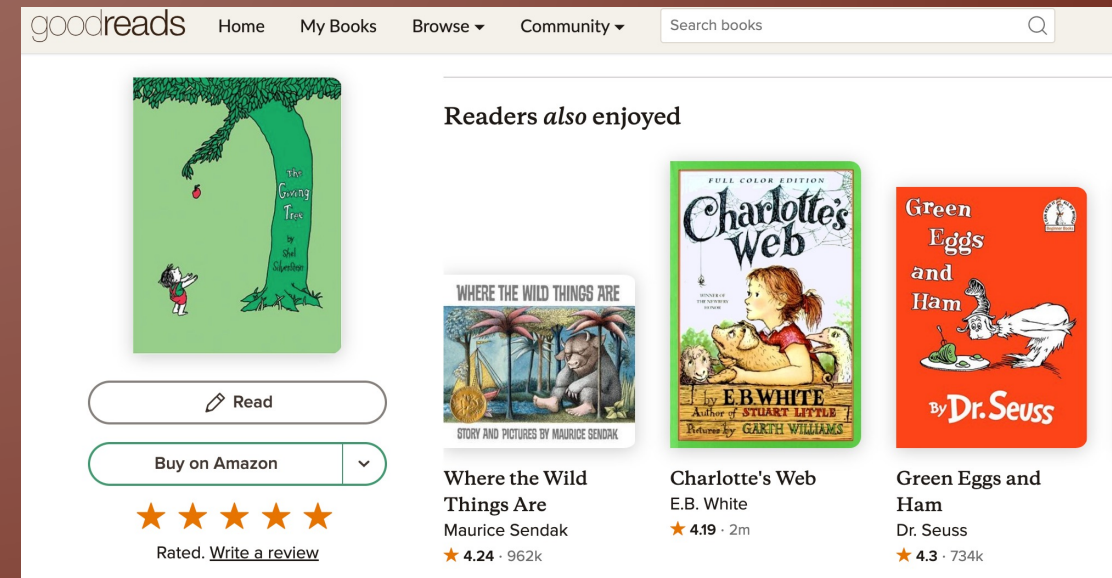
Every purchase informs the model

Personalized book, movie, etc. recommendations

Every rating informs the model

We all use (and help train) machine learning models

What is generative AI?

- "Generative" because it generates new data (text, image, music, etc.)
  - Learn probabilities from previous data and create new outputs

- "Large language model" = Generative model learned from (a lot of) text
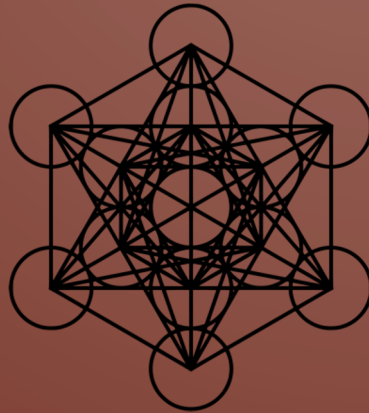
Fill in the blank

"The cat sat on the _____."

Possibly: mat, hat, chair…
Unlikely: xylophone, dream, golf…

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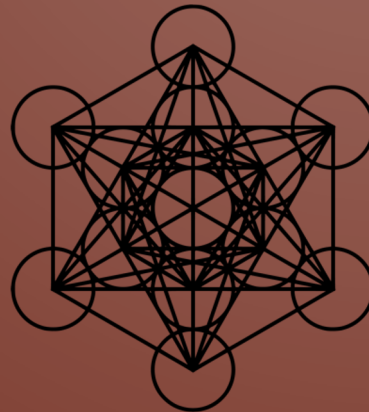
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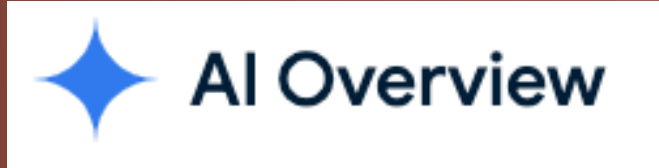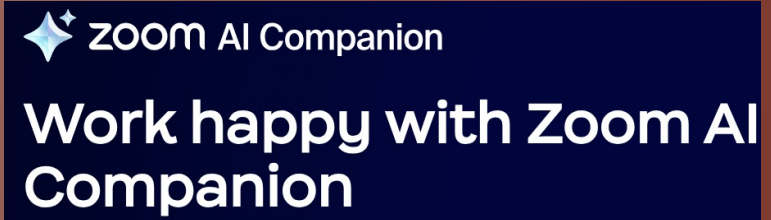Possibly: mat, hat, chair…
Unlikely: xylophone, dream, golf…

- Generative AI does not have real-world experience

- Generative AI does not reason, analyze, deduce (or think)

- Generative AI is not sentient

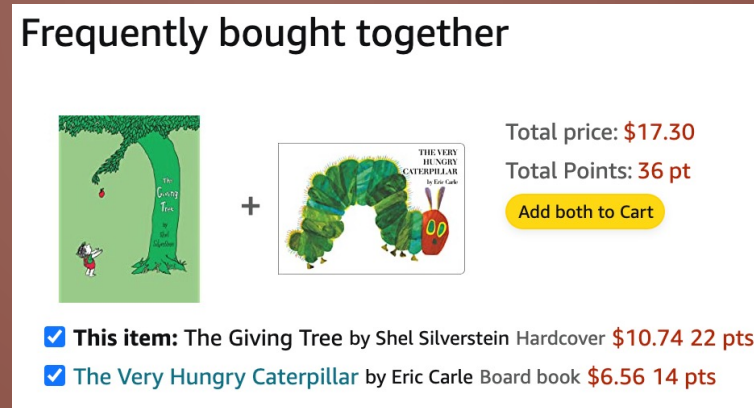# Spotting AI (and ML) - Obvious

Google search

Replika

Spotting AI (and ML) – Not obvious

Email spam filtering

Amazon shopping
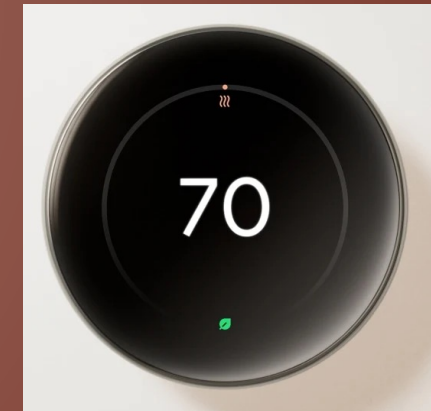
Nest thermostat
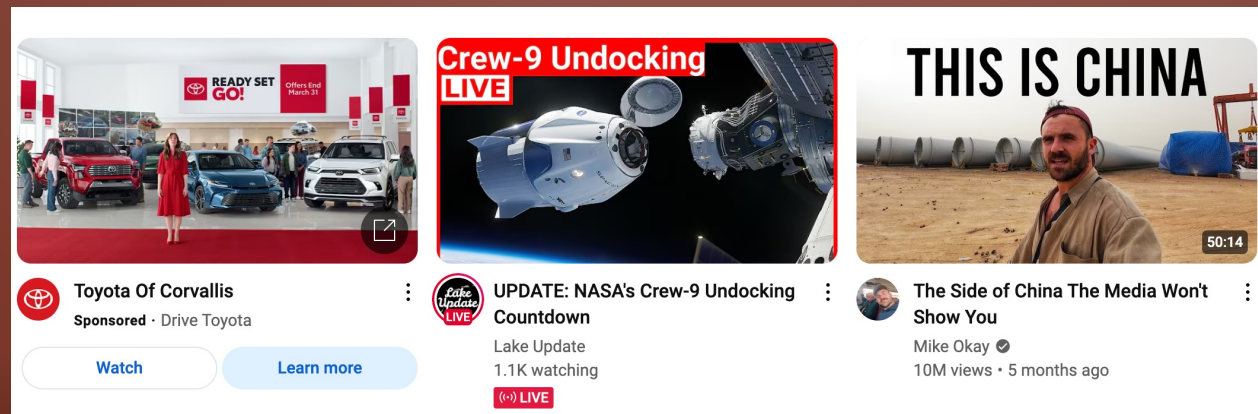
YouTube recommended videos

Where should generative AI be used?

Air Canada Has to Honor a Refund Policy Its Chatbot Made Up

The airline tried to argue that it shouldn't be liable for anything its chatbot says.

Wired, February 2024

PayPal

Jun 19, 2024 9:59 AM

Hi Kiri!

I'm your PayPal Assistant and always here to help. I'm still in beta testing, so talking to you helps me learn.

I noticed that your recent transaction for 23.64 USD was declined. Can I help you get more information?

Finance demands facts, not creativity

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April 28, 2025

Maslow's Law of the Instrument (1966)

If the only tool you have is a hammer,
it is tempting to treat everything as a nail.

How can we make it better?

1. Government action –
   legislation, regulation, enforcement

2. Developer decisions about
   design and user guidance

3. User / consumer education
   and empowerment
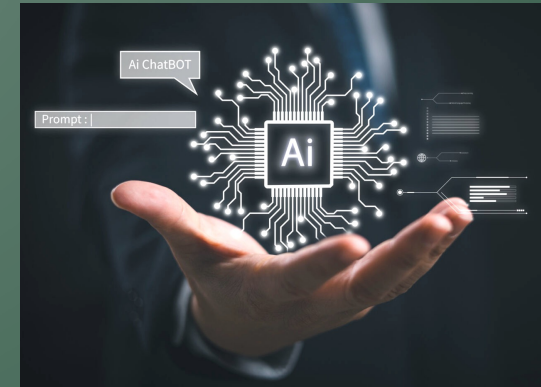
1. Government action

How can we balance
the drive for innovation
with meaningful protection?

Data privacy

- The U.S. lacks federal data privacy legislation, but many states have created their own laws

- Oregon (July 1, 2024): right to access, correct, copy, delete your personal data

1. Government action

How can we balance
the drive for innovation
with meaningful protection?

Deepfakes and deception

- Oregon SB 1571 (March 2024): requires disclosure of AI-generated content in campaign materials

- Oregon Unlawful Trade Practices Act (1971): illegal to use AI for deception, misrepresent AI system capabilities, fail to disclose AI product defects, etc.

- Take It Down Act (passed by U.S. Senate): illegal to post non-consensual intimate images, including digital forgeries, and users can request removal

2. Developer decisions

How to set realistic user expectations?
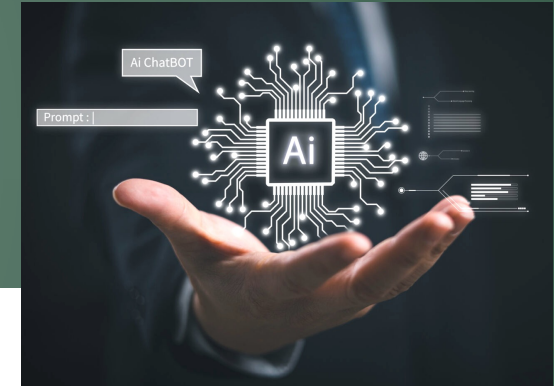
What can I help with?

Message ChatGPT

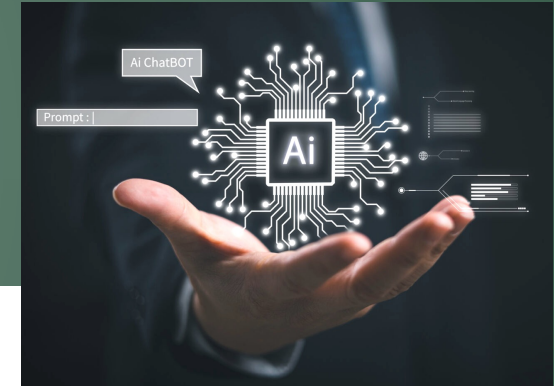| Factual	Creative	Factual	Creative	Factual
📄 Summarize text	✏️ Help me write	▶️ Code	💡 Make a plan	🎓 Get advice	More

By messaging ChatGPT, you agree to our <u>Terms</u> and have read our <u>Privacy Policy</u>.

chat.openai.com

What if...

What can I help with?

Message ChatGPT

I'm good at…

- Help me write
- Chat with me
- Help me brainstorm

I can start, but check the details…

- Code
- Make a plan
- Summarize text
- Make a recipe

Try an expert for…

- Get advice
- Diagnose my pain

3. User education and empowerment

How can users make informed decisions?

What questions should you consider before using an AI product?

1. What was it trained on?
   When can I trust it?

2. What data will it collect about me?
   (What am I sharing with it?)
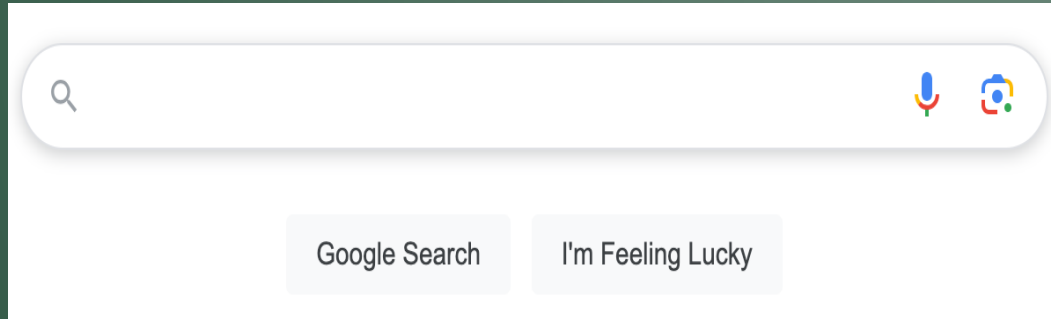
3. How will my data be used?

Example: Do you want a car insurance discount for allowing the company to track you?

3. User education and empowerment

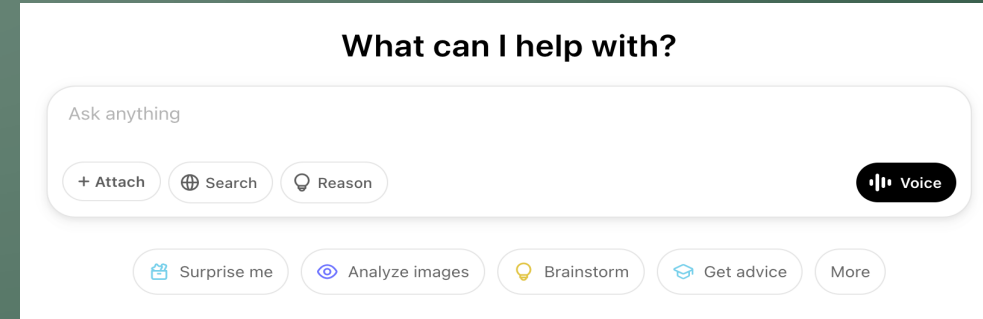These tools look almost the same, but they aren't!

How can users make informed decisions?

Google Search   I'm Feeling Lucky

What can I help with?

Ask anything

+ Attach   ⊕ Search   ♀ Reason   Voice

Surprise me   Analyze images   Brainstorm   Get advice   More

Search engine - finds real matches   Generative AI (chatbot) - generates new content

Detective   Artist

Choose your tool to fit the task

3. Consumers LEARN AI Act (2024)

Consumer Literacy and Empowerment to Advance Responsible Navigation of Artificial Intelligence Act

How can users make informed decisions?

National strategy


Multilingual public campaign

Specific use cases

- Personal finance
- Healthcare recommendations
- Communication
- Creative works
- Business management

- AI capabilities and limitations

- Where AI is or can be used in daily life

- Best practices: data privacy, legal considerations, evading deception

Summary – The State of AI

- AI technology simulates human intellectual activities
  - Much of AI is powered by machine learning – trained on data
  - Generative AI creates new content based on patterns in previous data

- Generative AI systems cannot assess truth, only plausibility, of content
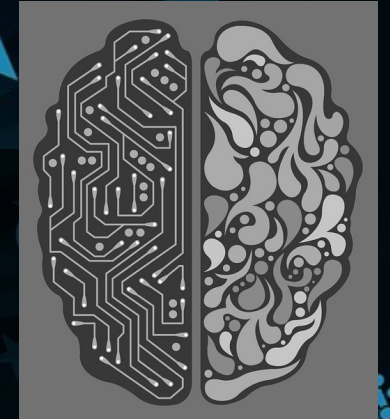
1. U.S. legislation and regulation (so far) has been mostly quiet on AI

2. AI companies can do a better job of communicating strengths and limitations

3. You can make informed decisions about when and how to you use AI

or
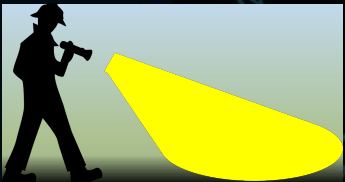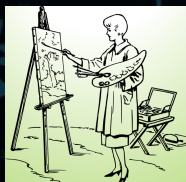
Thank you!

Contact: wkiri@wkiri.com

Kiri L. Wagstaff

April 28, 2025