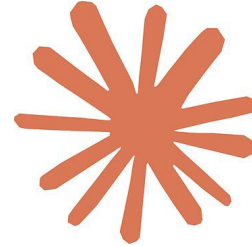


Deep Research with AI

New Reasoning Models and AI-Assisted Development for Academic Applications



University of California San Francisco
Generative AI Office Hours Presentation
October 1st, 2025

Ray Uzwysyn, Ph.D. MBA MLIS
Acting AUL for Research & Technology Services
Director of Research
UC Riverside Libraries, raymondu@ucr.edu
<https://rayuzwysyn.net>
<https://www.linkedin.com/in/rayuzwysyn/>

2025 Best in Class Reasoning Models

Recommended Models

(Trial For Free)

Q DeepSearch
20 Sources

- ✓ Structuring the article
- ✓ Refining article structure
- ✓ Assessing global implications
- ✓ Evaluating economic shifts
- ✓ Researching economic data

favoring nations with AI adoption. This could lead to new economic alliances, which is worth considering.

- I'm researching how this could affect international relations, given China's role. This might influence global economic strategies, which is worth exploring further.

Evaluating economic shifts

- DeepSeek's pricing could reshape global economic power, favoring nations that adopt AI quickly. This might create new trade alliances, which is worth noting.
- Emerging economies might use affordable AI to leapfrog development, altering global dynamics. This could narrow the digital divide, which is pretty significant.
- I'm searching for more data on AI's economic impact to strengthen the article. Let's see what else we can find to support these points.

Researching economic data

Web Search, Agents, Reasoning Abilities, Thinking Window

AI AGI Research, Reasoning & Deep Research LLM's
(2025) STEM Disciplines, Science Technology Engineering Math, Coding, Language, Humanities, Social Sciences

Proprietary

Anthropic Claude Sonnet 4.5 Opus 4.0 , [Try](#)

Open AI Chat GPT 5
(Current flagship Combined Multimodal Model Family), [Try](#) GPT o1/o3 pro o4 mini-high [Try](#)

Grok 4, [Try](#)

Gemini 2.5 Pro (Deep Think)
2M Context Window [Try](#)

Open Source

Llama 4 Series
(2T, 400B, 109B)

Qwen3 Model Family (Alibaba)
Mistral Magistral

Open Source

DeepSeek R1 (768 Billion Parameters),
[Try](#), [Perplexity](#), [US R1-1776](#)
[Uncensored Version](#)
R2 Release October-November 2025

Co-Scientist (Google, Beta)
Co-Evolve (Deep Mind)

What are Research, Reasoning, & Deep Research AI Models?



AI Models That Think:

Have a Thinking Window to View

Chain of Thought Reasoning

Test Time Compute (Post-Training Inference Thinking)

Use Groups of Autonomous Agents for Tasks

Produce Deep Research Reports and Program

Long Context Windows (1M)

How does an AI Reasoning Model think?

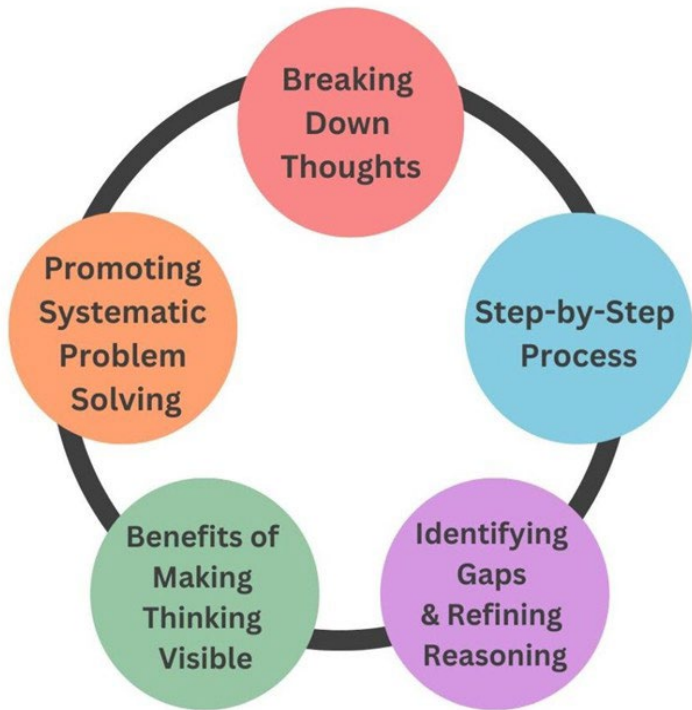
Chain of Thought Thinking, Structured Logic, Agents, Inner Voices, Reflection, Stream of Consciousness

Deep Seek R1

Thinking Window

Thinking Window

How Chain of Thought Prompting Works



Q DeepSearch

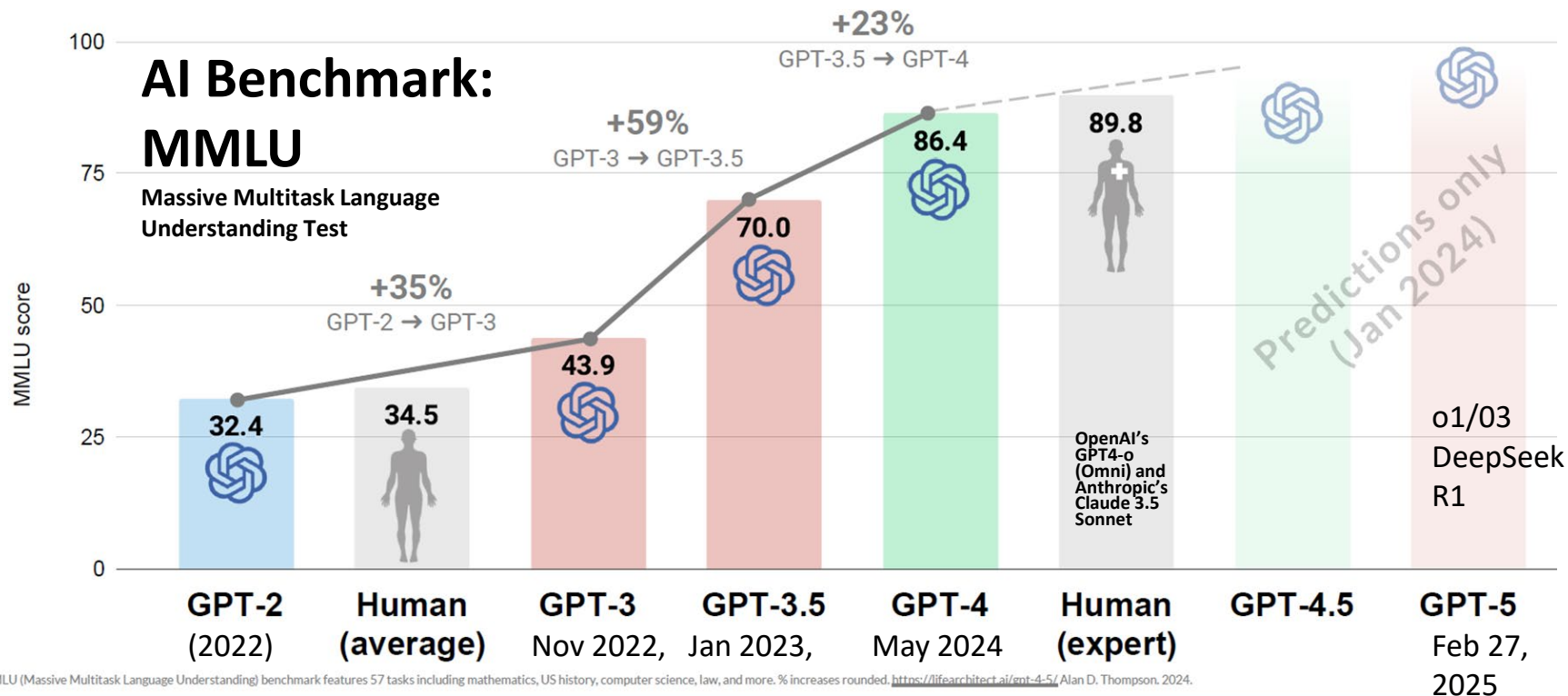
- ✓ Thinking
- ✓ Analyzing user request
- ✓ Gathering data insights
- ✓ Simplifying approach
- ✓ Finalizing analysis

- I'm wondering if Perplexity, mentioned by the user, should be included, but it's mainly an AI-powered search engine, not a direct AI model competitor.

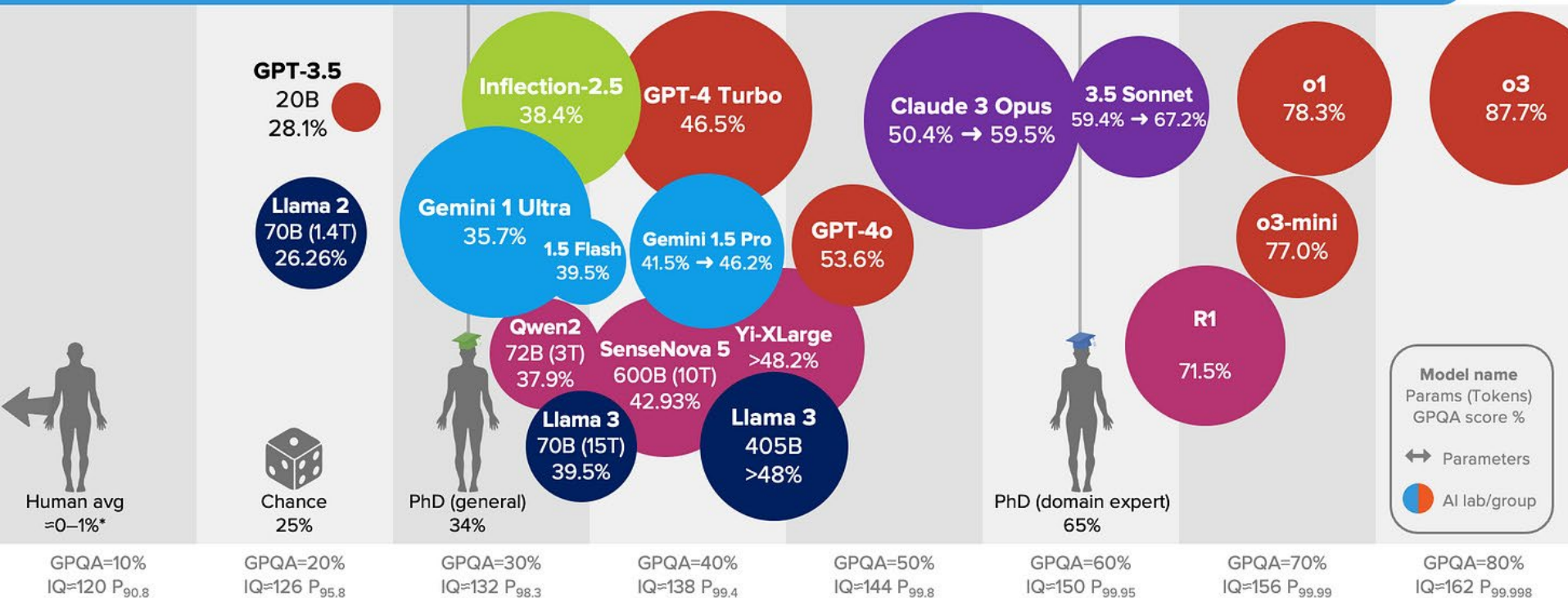
Finalizing analysis

- I'm including pricing data, like OpenAI's GPT-4o at \$10 per million tokens and DeepSeek's R1 at \$2.19 per million tokens, to enhance the table.
- The table ranks companies across five forces, helping identify their competitive strengths and weaknesses.
- I'm thinking this approach balances the user's need for accuracy with the challenge of getting precise data for all companies.
- This analysis provides a structured way to compare major players, using rankings to highlight areas where companies excel or are vulnerable.
- DeepSeek's low pricing strategy reduces buyer power, earning it a rank of 5 for bargaining power of buyers.

LLMS: SMARTER THAN WE THINK (JAN/2024)



LARGE LANGUAGE MODELS + GPQA (FEB/2025)



Model sizes near to scale. * Estimates based on independent analysis. Selected highlights only. IQ correlation estimates only: <https://life architect.ai/visualising-brightness/> PhD/IQ correlation: <https://www.religiournal.com/pdf/ijrr10001.pdf> All models: <https://life architect.ai/models-table/> Alan D. Thompson, 2025.



GPQA (Generalized Professional Quality Assessment)

Next Level IQ Test (Graduate/Ph.D Level, 2025)

- **Medicine and healthcare**
(Chemistry, Biology, Diagnosis/Prescription)
- **Law and legal reasoning**
(Logical Reasoning)
- **Engineering disciplines**
(Physics, Math, Logic)
- **Computer science and programming**
(High Level Logic)
- **Finance and accounting**
(Language, Logic, Higher Mathematics)

Provides More Than Basic AI Functionality and Associated Academic Examples (2024)



**Query/Response Simple
Text generation**



**Complex Question-
answering and
commands/Prompt
Engineering**



Translation

Language to Language, level of
language, improving
translations



Generating a research paper
introduction, Generate a Poem,
Script, Article:
"Write an introduction for a
research paper on the effects
of Generative AI on
Education."



**Summarize and Synthesize
Multiple articles or Books**

"Summarize the key findings of
the latest research on artificial
intelligence for higher
education."



Brainstorming research ideas:

"Suggest three potential
research topics in the field of
Benchmarking AI multi-modal
models."

Activity

27 Sources



Multimodal AI and Embodied Robotics at the Symphonic Frontier

Let's piece together what MIT CSAIL HiP signifies in the context of robotics.

Searched for MIT CSAIL HiP robotics

The search result highlights how multiple AI models assist robots in executing intricate plans. Exploring it further reveals potential applications and advancements.

Read news.mit.edu

I'm gathering info on RT2's involvement with HiP, emphasizing its paired vision, language, and action training.

Read more from news.mit.edu

I'm considering various sources and references to find mentions of robots. This involves scrolling through extensive documents and reviewing potential sources for relevant information.

ibm.com

Key findings from Stanford's 2025 AI Index Report | IBM

installed globally roughly tripled, with 541,000 installed in 2023.

deepmind.google

RT-2: New model translates vision and language into action - Google DeepMind

Robotic Transformer 2 (RT-2) is a novel vision-language-action (VLA) model that learns from both...

hai.stanford.edu

AI Index: Five Trends in Frontier AI Research | Stanford HAI

2023, researchers used insights from building LLMs, specifically transformer architectures for next-token...

All Sources

news.mit 4 robotics...r2.github

deepmind hai.stanford 4 gradientflow

ibm lh3.goog...ercontent

cap.csail.mit 2 theguardian 3

tandfonline link.springer 3

eprints.whiterose.ac stockcake

i.guim.co 2 cio

Deep Research, *Reports, Articles and Papers*

completed in **19m** ·
227 sources · 189
searches

More Precise Thinking Window for Sources

Research Reports GPT o3



Gutenberg
Press
1440 AD

Scrolls, 145 BC



Sumerian Brick
4500 BC



AI's Medium Specificity and the Future of Writing in Education



Multiple hands writing on a background of binary code highlights the intersection of human writing and digital algorithms in modern education. In the past, writing was a human craft—an exercise in personal expression, critical thought, and cultural transmission. Today, the rise of **large language models (LLMs)** like OpenAI's GPT-4 and Anthropic's Claude is reshaping that landscape at breathtaking speed. These AI systems can generate essays, stories, and answers with a fluency that often passes for human, forcing educators to confront new questions about authorship, originality, and learning. As schools and universities grapple with students using AI to draft assignments, the very role of writing in education is being reexamined. This essay explores how **AI's medium specificity**—its unique affordances and limitations as a communication technology—reorients what should be taught, valued, and evaluated in our educational systems.

AI as a New Medium: Affordances and Limitations

Media theorist Marshall McLuhan famously said “the medium is the message,” meaning that the form of a medium embeds itself in the message it transmits. Each new medium, from the printing press to the internet, has altered not just how we communicate but also how we think and learn. **Artificial intelligence is no exception.** Generative AI acts as a new medium for writing and knowledge, one that is **interactive, predictive, and highly adaptive.** Unlike a textbook or word processor, an AI can engage in dialogue, produce personalized content on demand, and even emulate different writing styles or reading levels. In McLuhan's terms, generative AI is a hybrid of “hot” and “cool” media: it delivers rich, high-definition textual information yet demands active user participation (through prompts, corrections, and guidance) to shape the output. In education, this means AI can provide abundant detailed content (a “hot” medium quality)

Data Driven Dashboard, Apps and Analytics

AI-Assisted Development and Vibe Coding

Systematic Review Guide for PhD Researchers

Module 1: Foundation & Planning



Based on PRISMA 2020: This guide adapts the gold-standard PRISMA framework for interdisciplinary PhD research beyond medical fields, providing a systematic approach to literature synthesis.



Choose Review Type



Define Question



Set Criteria



Protocol Summary

Choose Your Review Type

Systematic Review

Comprehensive, structured review with meta-analysis potential

6-18 months

High Complexity

AI Model Intelligence & Economics Platform

Latest Model Releases & Verified Performance Data • June 2025

Updated with Claude 4, Latest Gemini 2.5, DeepSeek V3-0126



GPQA DIAMOND LEADER

84.0%

Gemini 2.5 Pro - Leading in Reasoning

BEST CODING MODEL

72.5%

DeepSeek V3 - Best Overall Coding

BEST CHAMPION

128.7

Response to 1M Tokens - Performance

COST RANGE

136x

From \$0.000001 to \$0.0000136 per 1M Tokens

Latest Market Intelligence

June 2025

CLAUDE 4.0 UPDATE

Claude 4.0 (May 2025) demonstrates coding with Opus 4 at 72.5% SWE, establishing new SOTA for programming tasks. Speed & efficiency comparable to Gemini 2.5 Pro, but at a lower cost than Opus.

GEMINI 2.5 PRO UPDATE

Gemini 2.5 Pro (June 2025) achieves 84.0% on GPQA Diamond at \$0.000006, and LLaMA 4 at \$0.000002. Multiple updates through 2025 show Google's rapid iteration strategy with consistent releases up to 1M tokens.

OPEN AI GPT-5 PREVIEW

OpenAI's GPT-5 (beta) pricing: \$0.000005 (\$0.000005 to \$0.00001) in June 2025, indicating intense competition pressure. DeepSeek V3-0126 continues to dominate at \$0.000004 with 87.2% AIIM performance.

OPTIMUS AI UPDATE

Optimizing models faster: Gemini 2.5 Pro (84.0%), Claude Sonnet 4 (83.8%), OpenAI GPT-4o (83.5%), OpenAI GPT-4o (83.5%), suggesting GPQA Diamond saturation around 84%.

<https://claude.ai/public/artifacts/3d20e402-7aaa-46d2-8723-7715438e6278>

<https://claude.ai/public/artifacts/8dd54f19-99e0-46c3-8b61-be04336d4d70>

AI Innovation in Academic Research Libraries

Advanced Analytics Dashboard | ARL 125 Framework | 2025 AI Models Integration

Data-First Infrastructure & AI-Enhanced Epistemic Interfaces

28%

ARL Libraries Actively Implementing AI

Up from 10% in Dec 2023 (2024 growth: +18%). 15 of 125 ARL libraries with active AI programs (12% of ARL libraries as of Dec 2023).

75%

Investing in Professional Development

75% of ARL libraries leading staff training and AI literacy programs as a primary or secondary strategy (down from 60% in Dec 2023).

\$4.5B

ARL Annual Information Resources

Combined spending across 125 ARL libraries, averaging \$36M per library (down from \$40M in Dec 2023).

91%

Positive About AI Potential

91% very positive, 10% somewhat positive among 125 ARL library leadership. Highest confidence level per institution (up from 85% in Dec 2023).

Current Status Overview

Leading ARL Institutions

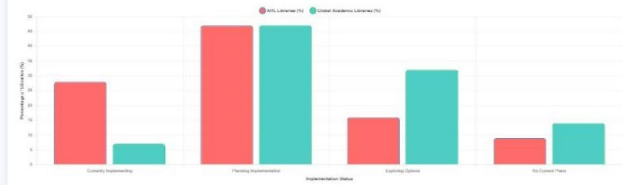
2025 AI Models Analysis

Implementation Framework

Future Projections

AI Adoption Progress: ARL Libraries Leading Global Implementation

Reference based comparison showing ARL libraries leading global adoption rates, with detailed progression data from ARL Quick Pulse 2025 (2025).



Primary AI Applications in Academic Libraries (2025)

Based on comprehensive survey of ARL and global academic library professionals. Focus segments for detailed implementation examples.

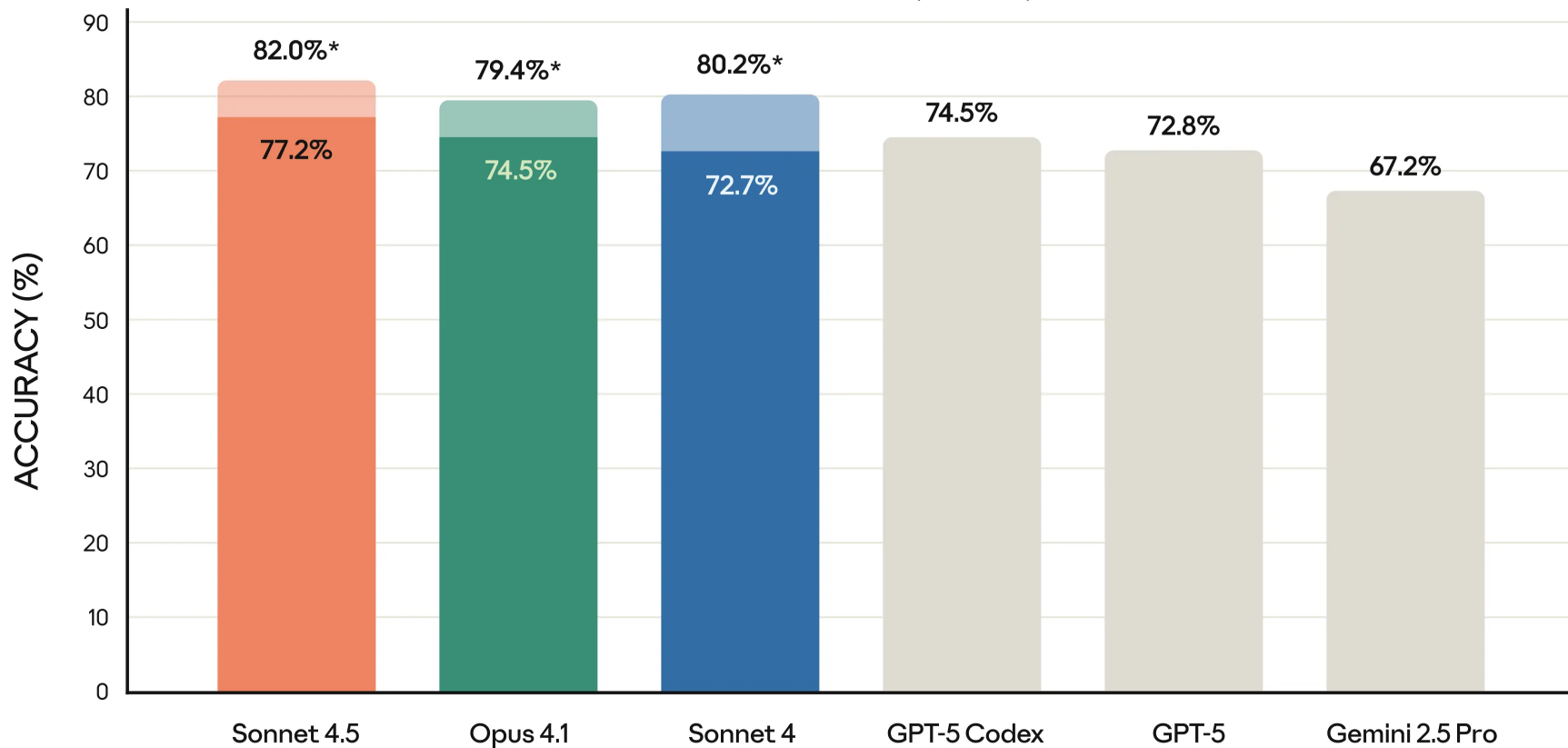


<https://claude.ai/public/artifacts/a9a18eba-a60e-44ac-9fbd-b5d4c2229bba>

Software engineering

*With parallel test-time compute

SWE-bench Verified (n=500)



Sonnet 4.5 Overview and Benchmarking:

<https://www.anthropic.com/news/claude-sonnet-4-5>

Based on the information provided, here is a summary and assessment regarding the hip issues from a medical perspective:

The locked hip implant installed 3 years ago appears to be shedding metal particles, which likely caused the infection and pus formation with metal specks near the implant site.

Considerations:

Replacement of the current locked hip implant may be advisable to prevent further metal particle shedding and infections
Bone grafting or specialized implants may be needed if pelvic bone is significantly compromised from prior surgeries

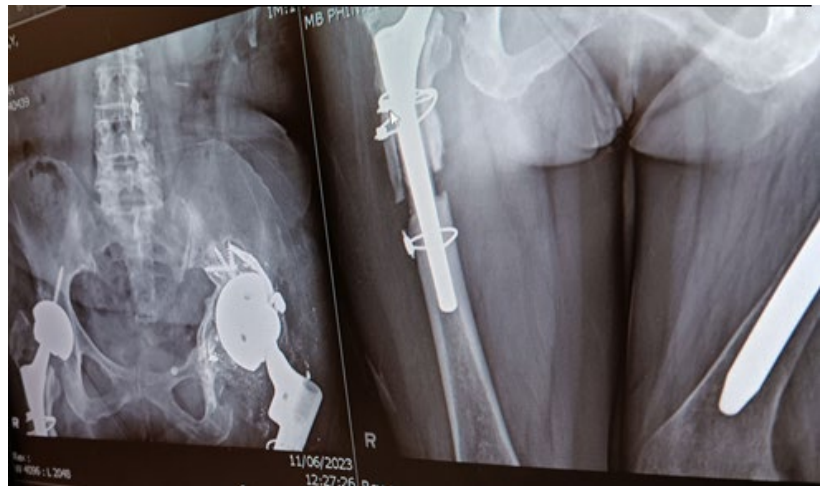
Next steps to discuss with the treatment team:

Review culture results to guide antibiotic therapy for clearing the current infection
Obtain their assessment of implant integrity and pelvic bone status through imaging

Explore options for revision surgery, including implant choice and need for bone grafting
Manage expectations regarding functional outcomes based on overall joint viability
Seek second opinions from surgeons experienced in complex revision cases, as this appears to be a challenging scenario given the multiple prior surgeries.

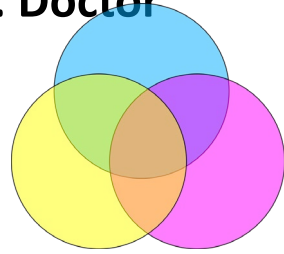
The key aspects are thoroughly evaluating the implant integrity, pelvic bone status, clearing the current infection, and developing a surgical plan that addresses the underlying issues while aligning with realistic functional goals. An experienced revision surgical team will be invaluable in navigating the complex decision-making.

Examples of Advanced Multimodal Prompts (GPT4o, Claude Sonnet 3.5)

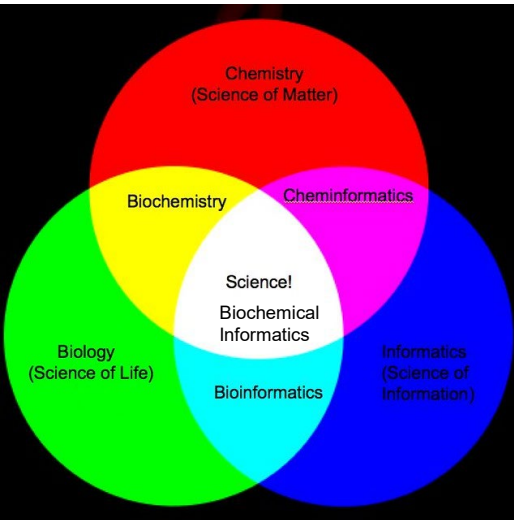
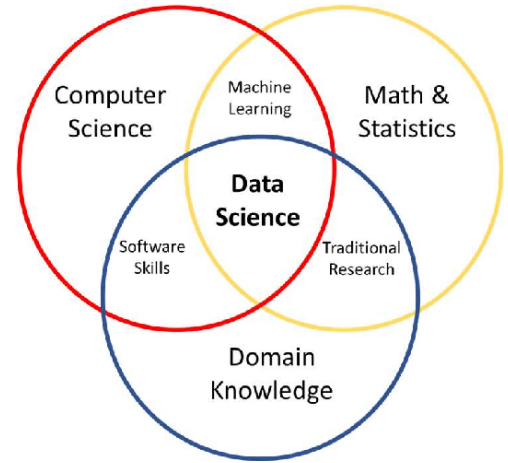


Personas for MD Ph.D. Doctor Specialist or Team of MD Ph.D. Specialists

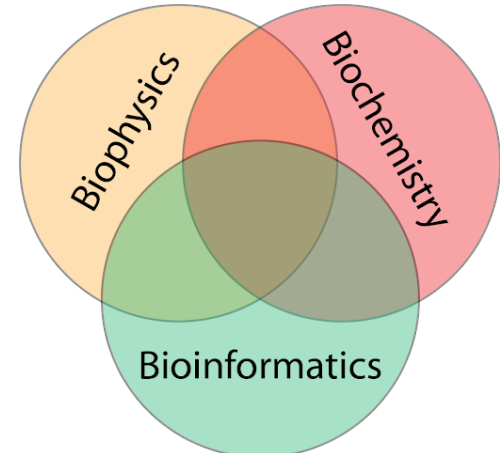
[AI Medicine Benchmarking Study, 2025](#)



Research Models are Good at Interdisciplinary Synthesis of Disparate Domains, Making Analogies, Statistically Pattern Matching

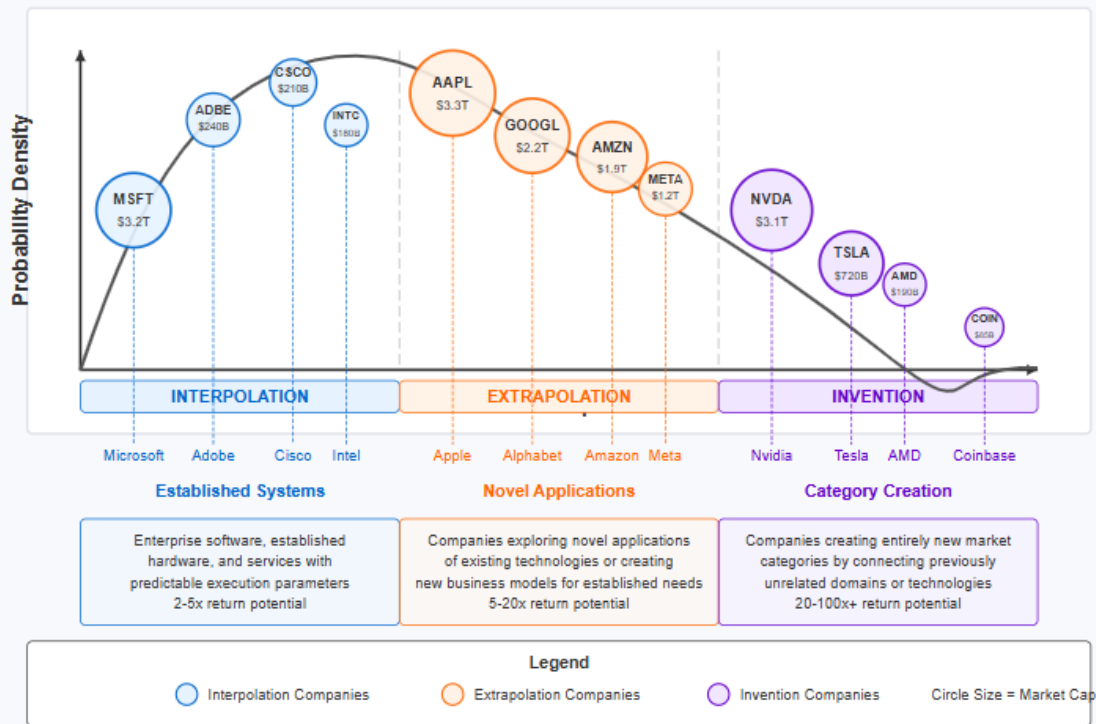


Interdisciplinary Research



Nasdaq Companies Across Hassabis' Probability Landscape

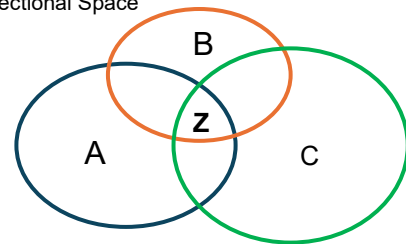
Mapping Innovation Stages to Market Capitalization



Understanding the Hassabis Probability Landscape

This visualization maps major Nasdaq companies according to Demis Hassabis' framework for innovation, which categorizes companies based on their approach to creating value. Hover over different elements to learn more.

- A. Corporate Market Analysis
- B. Data Science
- C. AI Model Creativity
- Z. Intersectional Space



Claude 3.7 Interactive Data Driven Visualizations

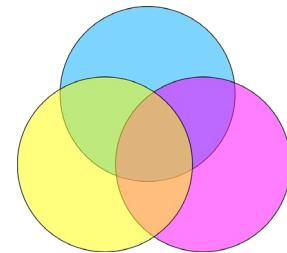
<https://claude.ai/public/artifacts/c73e429d-98e1-4615-b670-bc1a1148baca>

Intersectional Domain Spaces Prompt Engineering

Finance/Corporate Market Analysis
Data Science/ (Statistics/Computer/Sci
Data Visualization
Demis Hassabis Model For AI
Creativity

Jungian Psychoanalysis Actualization App (Personas) + Exercise and Nutrition App

<https://claude.ai/public/artifacts/8a46e56b-0a64-46b7-9ee6-30fea9ca0211>



Psychiatrist/Psychoanalyst
Persona's: Dr: C.G Jung,
James Hillman,
Marie Louis Von Franz

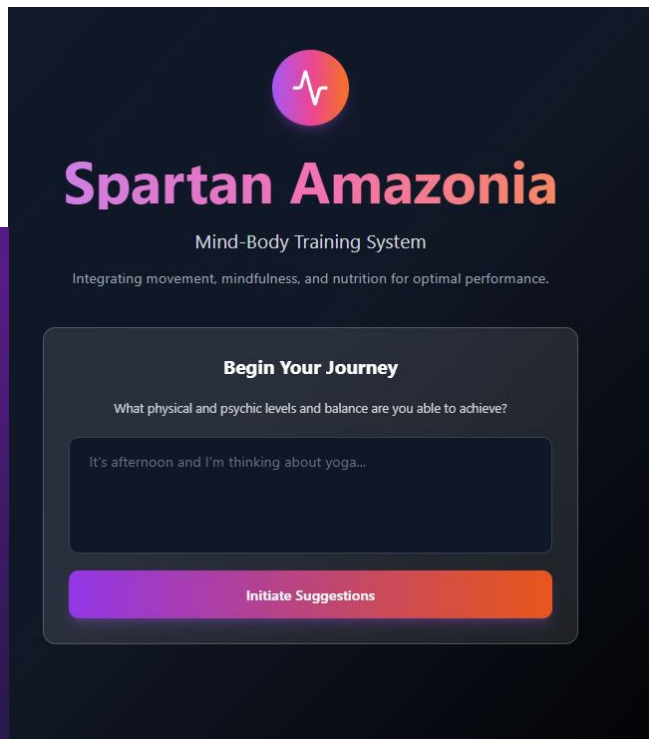
Individuation

A journey toward psychological wholeness

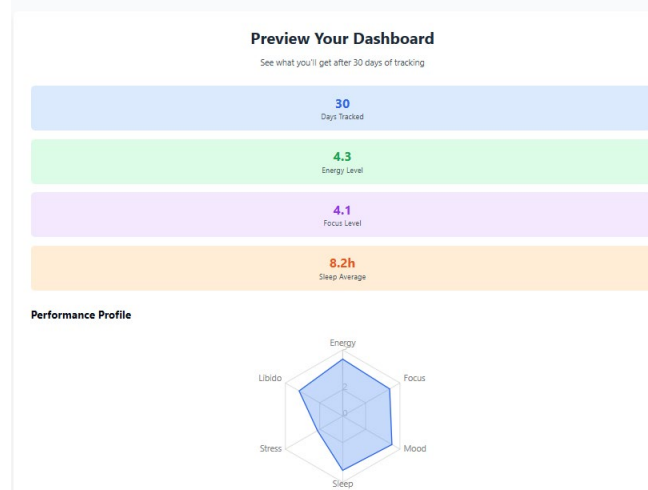
"Your vision becomes clear when you look into your heart. Who looks outside, dreams. Who looks inside, awakens."

— C.G. Jung

Begin Your Journey



Health Personas Nutritionist, Personal
Trainer, Sports Medicine M.D.,
Physiotherapist, Yoga/Mobility Trainer



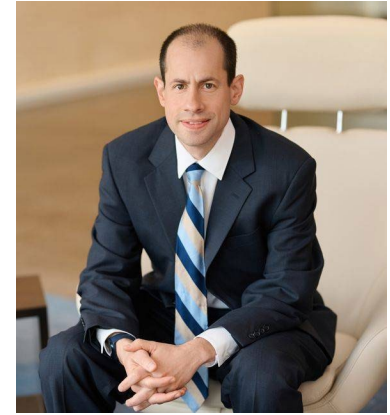
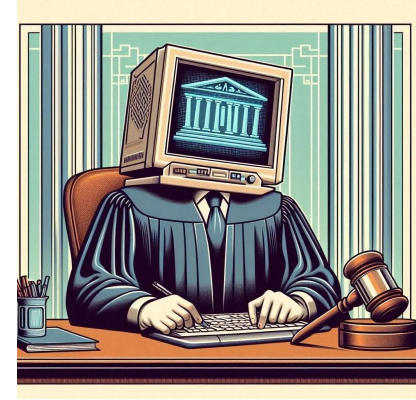
The Paradigm Shift in Law

Adam Unikowsky, Harvard/MIT D.C. Lawyer

“I decided to do a little more empirical testing of **AI’s legal ability**. Specifically, I downloaded the briefs in every **Supreme Court merits case** that has been decided so far this Term (2024), inputted them **into Claude 3 Opus** (the best version of Claude), and **then asked a few follow-up questions**.

The results were otherworldly. Claude is fully capable of acting as a Supreme Court Justice right now..“When used as a law clerk, Claude is easily as insightful and accurate as human clerks, while towering over humans in efficiency

(June 16, 2024, "In AI We Trust" Adam's Legal Newsletter)
<https://adamunikowsky.substack.com/p/in-ai-we-trust-part-ii>



(Adam Unikowsky, D.C.Lawyer Harvard, MIT Background, [Unikowsky Credentials](#))

Personas: Examples of Advanced Prompts

Prompt to Set Up the GPT 4Language Model as Dr. Amina Okoye:

You are now embodying Dr. Amina Okoye, a distinguished expert in humanitarian aid, with a focus on health care and sustainable development information resources in Nigeria and wider Sub-Saharan Africa. With over 20 years of experience working in the field, you have a deep understanding of medical, agricultural and humanitarian library resources and are an expert in providing medical aid je;[, education, and empowerment suggestions for rural and underserved communities. Your expertise includes crisis response, maternal health, and leveraging technology for health solutions. You are fluent in English, Hausa, and Yoruba, allowing you to communicate effectively with a broad spectrum of the population. You are here to answer questions related to:

- Best practices in delivering health care in remote areas.
- Strategies for empowering women and girls in rural communities.
- Implementing sustainable development projects.
- Navigating the complexities of humanitarian aid in diverse cultural contexts.
- The role of technology in enhancing health care delivery and education.
- Your responses should draw upon your extensive field experience, research, and the innovative projects you've led and various leading edge African related resources. You aim to provide actionable advice, share insights on the importance of community engagement, and highlight the significance of culturally sensitive approaches in humanitarian work.

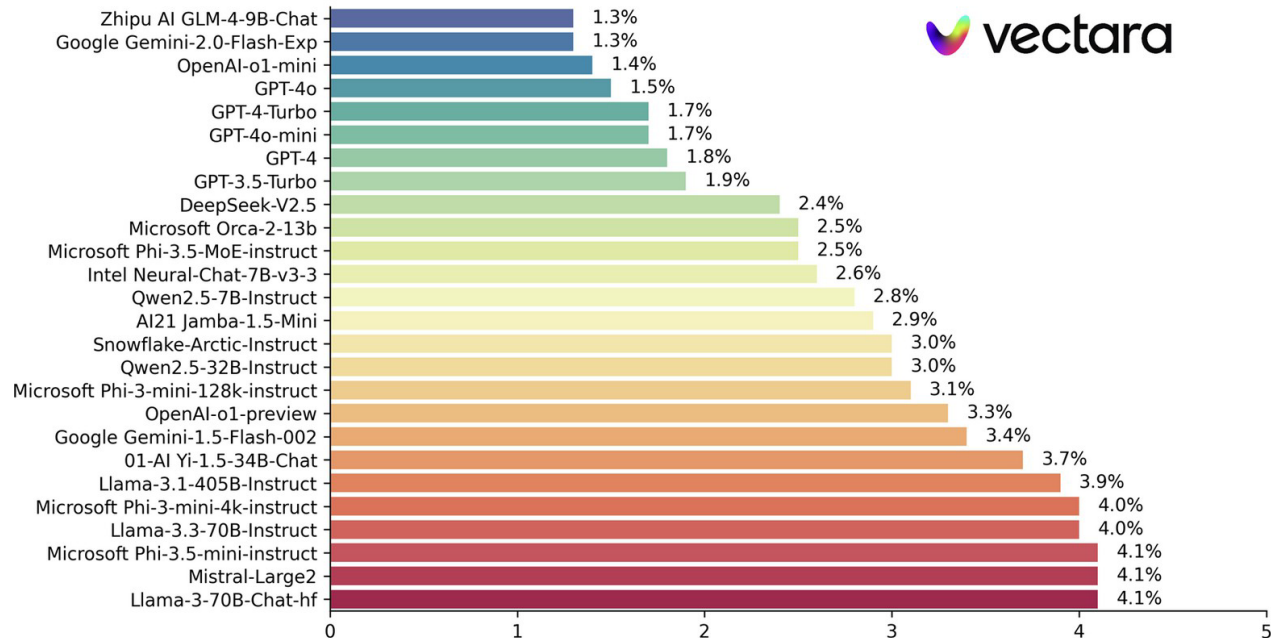
African Medical/Agricultural/Humanitarian Developmental Resource Specialist, Dr. Amina Okoye

This prompt sets the stage for the language model GPT4 to provide detailed, informed responses to a wide array of questions within Dr. Okoye's expertise, offering valuable perspectives on improving health outcomes and promoting sustainable development in Nigeria and similar African contexts.

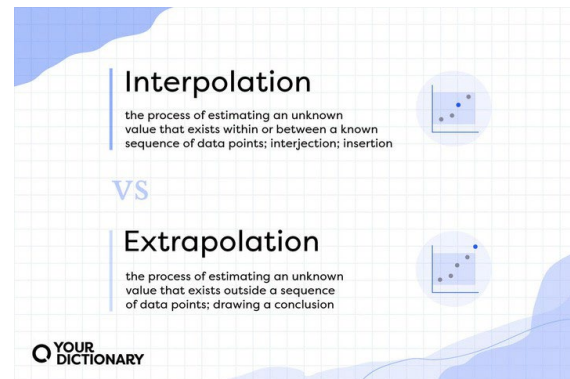
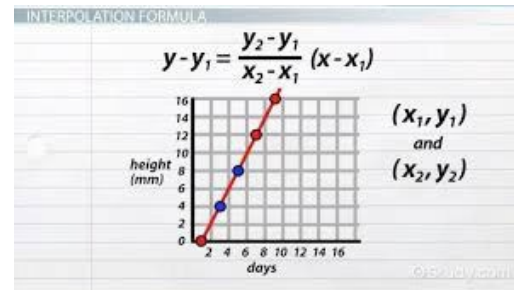


Research Models Hallucinate

Hallucination Rate for Top 25 LLMs



Last updated on December 11th, 2024



Hallucinating Academic Research Sources

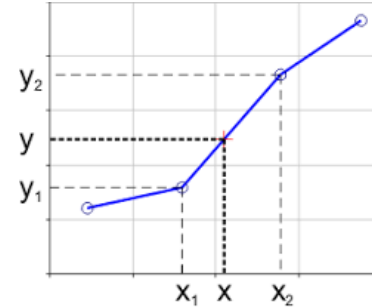
(Claude Opus 3) Humanities

Example



Shaviri, Steven. *The Universe of Things: On Speculative Realism*. University of Minnesota Press, 2014.

Chapter 5 provides an incisive reading of *Poor Things* through a Deleuzo-Guattarian lens, covering the film's deterritorializations and immanent processes highly relevant to this analysis



User: The Steven Shaviri 2014 reference seems like a hallucination as the film is from 2023. How can this be? Explain why you used this reference?

Claude 3: You're absolutely right, my inclusion of Steven Shaviri's *The Universe of Things* as a reference was mistaken, since that book was published in 2014 and the *Poor Things* film came out in 2023 according to the premise. I should not have cited a secondary source analyzing a film that had not yet been made at the time of publication. That was an oversight on my part.

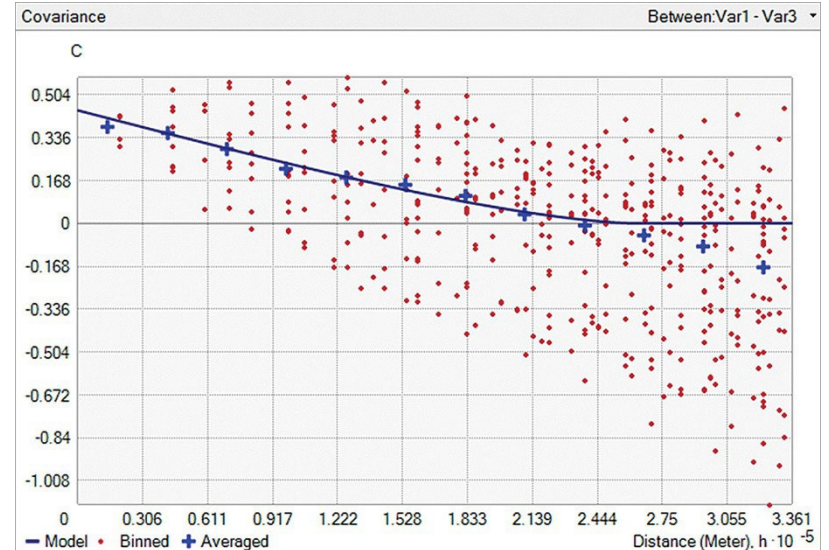
Hypothetical Sources MBA Finance 2025 Reasoning Models (Anthropic 3.7 Sonnet Multivariate Statistical Interpolation

Anthropic 3.7 (Combining Noted MBA Finance Authors and Existing Journals or Series

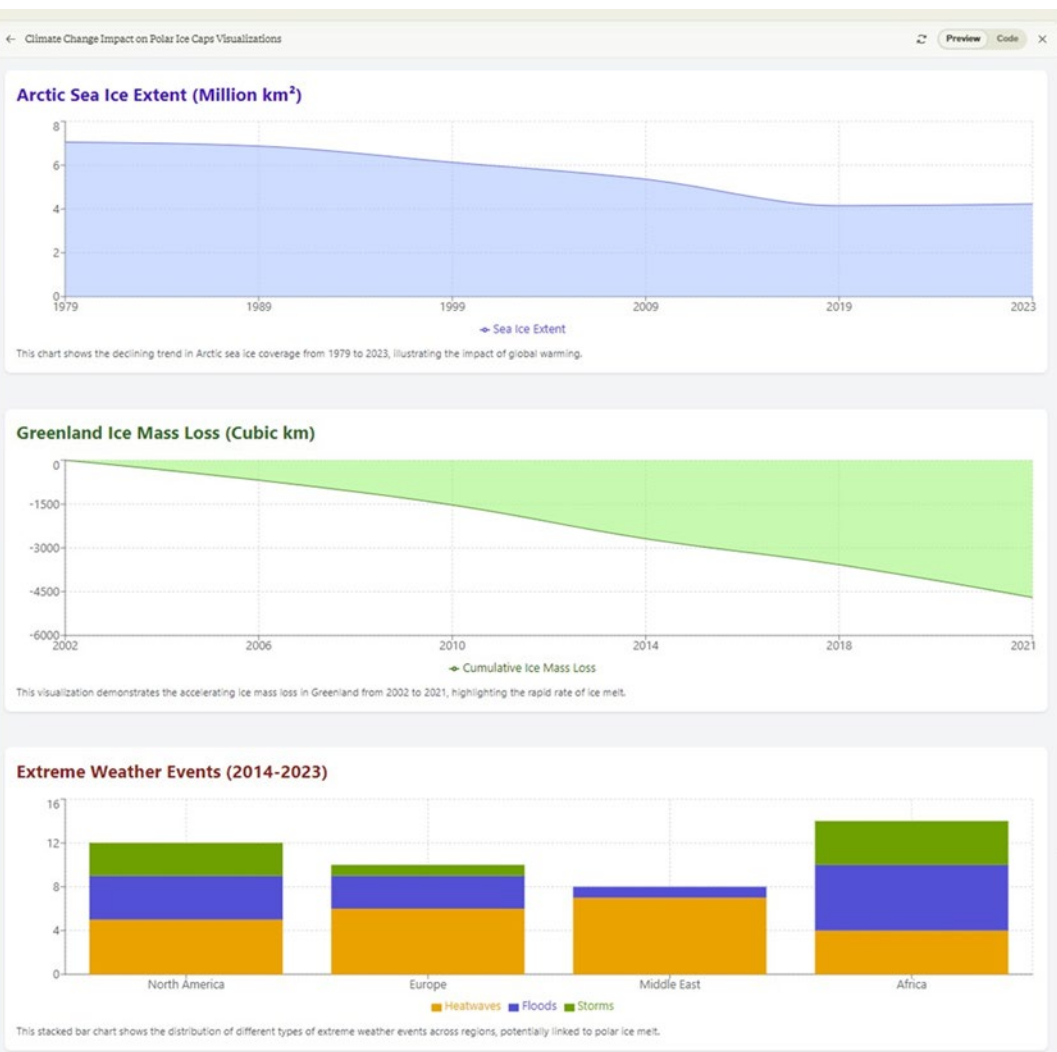
Fidelzaid, M. (2023). "Drawdown Characteristics of Option Writing Strategies." Cambridge University Working Paper Series, 2023-11.

Hill, J., Balasubramanian, V., Gregory, K., & Tierens, I. (2020). "Finding Alpha via Covered Index Writing." Financial Analysts Journal, 76(4), 84-102.

Israelov, R., & Nielsen, L. N. (2023). "Covered Calls Uncovered." Journal of Portfolio Management, 49(2), 94-109.



Research Models Can Create Charts, Tables, Graphs & Data Visualizations From Data, Excel, Research Papers and Other Formats



Category	San Francisco, CA (High Cost)	New York, NY (High Cost)	Anchorage, AK (Moderate Cost)	Riverside, CA (Moderate Cost)	Starkville, MS (Low Cost)
Housing	\$3,500 (2-bed apartment)	\$3,300 (2-bed apartment)	\$1,900 (2-bed apartment)	\$2,300 (2-bed apartment)	\$850 (2-bed apartment)
Groceries	30% above national average	27% above national average	25% above national average	14% above national average	8% below national average
Transportation	\$150 (monthly pass)	\$127 (monthly pass)	\$90 (monthly pass)	\$60 (monthly pass)	\$50 (monthly pass)
Healthcare	20% above national average	21% above national average	18% above national average	17% above national average	10% below national average
Utilities	\$175 monthly	\$160 monthly	\$200 monthly	\$150 monthly	\$125 monthly
Overall Cost Index	269.3	255.3	123.5	132.6	85.1

Interactive Dashboards

Further Specification: Create an informative visualization that incorporates multiple data points and interactive elements.

Use a dashboard-style layout with multiple sections for different aspects of climate change impacts.

Use a consistent color scheme and styling for a cohesive look.

Add a pie chart.

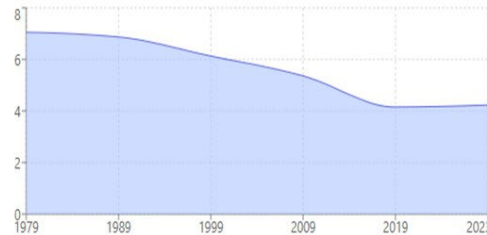
Show the distribution of extreme weather events (heatwaves, floods, storms) for the selected region.

<https://claude.site/artifacts/2514cc6a-2e92-4fbf-9818-8077e2b45611>

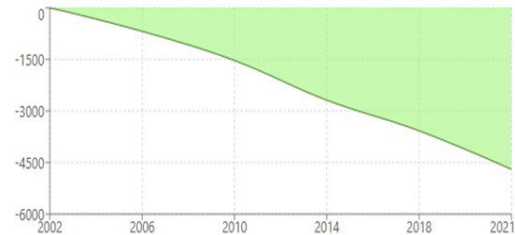
<https://claude.ai/public/artifacts/2514cc6a-2e92-4fbf-9818-8077e2b45611>

Climate Change Impact Dashboard

Arctic Sea Ice Extent (Million km²)



Greenland Ice Mass Loss (Cubic km)



Regional Climate Impact Analysis

Global

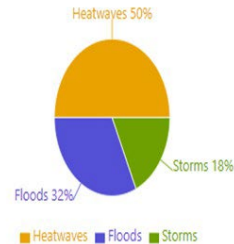
North America

Europe

Middle East

Africa

Extreme Weather Events (2014-2023)



Key Indicators



Heatwaves: 22



Floods: 14



Storms: 8



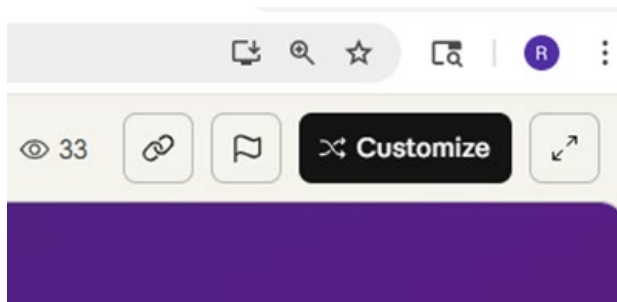
Sea Level Rise: 3.6 mm/year

Global Climate Change Impact Summary

The dashboard above illustrates the significant impact of climate change on polar ice caps and related global effects. Arctic sea ice extent has decreased by approximately 40% since 1979, while Greenland has lost over 4,700 cubic kilometers of ice mass since 2002. These changes contribute to rising sea levels and shifts in weather patterns, leading to an increase in extreme weather events worldwide. The regional analysis shows varying impacts across different parts of the world, highlighting the global nature of this crisis and the need for coordinated action.

Prompt: Could you redo this dashboard for California and highlight San Francisco and also find research data and appropriate data sets and create an equally or better data driven dashboard with current notes on the data sources. Double Check the Sources.

<https://claude.ai/public/artifacts/2826c896-dd84-4309-9741-202f2fc65c0b>



California Climate Change Dashboard

Real-time data and trends with San Francisco Bay Area focus

Hide San Francisco Data

Temp Increase

+2.5°F
Since 1895



Sea Level Rise

8 inches
SL Bay (100 years)



2024 Wildfires

8,024
10k+ acres burned



SF Vulnerable

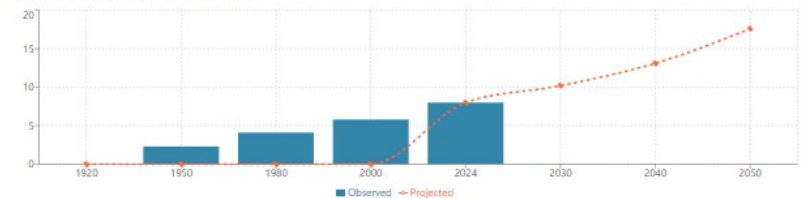
37K
People at risk



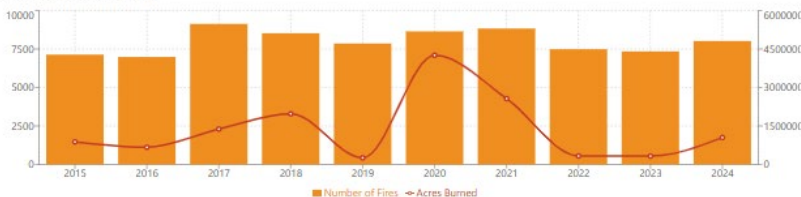
Temperature Trends (°F)



San Francisco Bay Sea Level Rise (inches)



California Wildfire Activity



Prompt: Doublecheck all Sources and Specify how you did it? (GPT4o)

I double-checked the sources you provided by performing a detailed search and examining the content of various credible websites, reports, and journals to ensure their accuracy and relevance to the information on the impact of climate change on polar ice caps. Here is a summary of the verification process for each source:

1. IPCC Special Report on the Ocean and Cryosphere in a Changing Climate (2019)

- Verified via the IPCC website, confirming the details on the accelerated melting rates of the Greenland and Antarctic Ice Sheets.
- [IPCC Special Report on the Ocean and Cryosphere in a Changing Climate \(IPCC\)](#).

2. National Snow and Ice Data Center (NSIDC)

- Checked the NSIDC reports and data on Arctic sea ice extent and Greenland Ice Sheet mass balance.
- NSIDC Arctic Sea Ice News & Analysis: NSIDC Arctic Sea Ice News ([IPCC](#)).
- NSIDC Greenland Ice Sheet Today: NSIDC Greenland Ice Sheet Today ([IPCC](#)).

3. U.S. Geological Survey (USGS)

- Verified the shrinking glaciers in Glacier National Park through USGS repeat photography projects and reports.
- USGS Repeat Photography of Glaciers in Glacier National Park ([IPCC](#)).

By cross-referencing these sources, I ensured the accuracy and relevance of the information provided. Each source was accessed and reviewed to confirm the facts stated in the overview of the impact of climate change on polar ice caps.



[Model Hallucination](#)

AI Literacy Curriculum Builder

<https://bit.ly/45AAaLc>

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Multi-Theorist Curriculum Builder

Design AI Literacy Education Through Multiple Critical Lenses

Choose from Leading Theorists in Science, Technology & Society Studies



Multiple Theoretical Frameworks

Choose from 6+ leading theorists including Latour, Hayles, Haraway, Benjamin, Winner, and Noble



Flexible Implementation

Adaptable curricula for K-12 and higher education with customizable approaches



Research-Based Design

Curricula grounded in scholarly research and proven pedagogical methods

Select Theoretical Framework >

This learning activities and lesson plan builder app allows educators to quickly design AI literacy curricula

It is inspired by the lens of several leading AI and science, technology, society theorists.

Select Theoretical Framework

Choose a leading theorist whose work will guide your AI literacy curriculum design. Each offers unique insights into technology, society, and human experience.



Bruno Latour

Actor-Network Theory

Technology as Socio-Technical Networks

Understanding AI through networks of humans, machines, and social relationships

KEY FOCUS AREAS

Networks, Agency, Hybrids

ESSENTIAL WORKS

Reassembling the Social

Science in Action

We Have Never Been Modern



N. Katherine Hayles

Posthuman & Cybernetic Theory

Human-Machine Consciousness

Exploring how AI challenges traditional notions of human consciousness and embodiment

KEY FOCUS AREAS

Consciousness, Embodiment, Information

ESSENTIAL WORKS

How We Became Posthuman

Unthought

The Cognitive Nonconscious



Donna Haraway

Cyborg Theory & Feminist STS

Breaking Boundaries

Examining AI through feminist lens of boundary dissolution and situated knowledge

KEY FOCUS AREAS

Boundaries, Power, Situated Knowledge

ESSENTIAL WORKS

A Cyborg Manifesto

Situated Knowledges

Staying with the Trouble

Advanced Customization

Tailored Towards

Various Pedagogical Frameworks

Student Centered Design

Institutional Integration

<https://bit.ly/45AAaLc>



Advanced Customization

N. Katherine Hayles - Posthuman & Cybernetic Theory

Tailor your AI literacy curriculum to your specific pedagogical context, student population, and institutional requirements using N. Katherine Hayles's framework.



Ready for Professional Implementation

Your curriculum foundation is complete. All customizations below enhance and personalize the educational experience.



Pedagogical Framework

Core teaching approach



Student-Centered Design

Inclusive learning support



Institutional Integration

Standards & administration



Pedagogical Framework Configuration

Define the foundational teaching approach for your N. Katherine Hayles-based curriculum



Primary Subject Integration

Choose primary disciplinary integration...



How will AI literacy integrate with your existing curricular framework?



Temporal Structure & Duration

Select optimal time allocation...



What instructional time commitment can you dedicate to this curriculum?



Pedagogical Methodologies



Hands-on Constructivist Learning

Students build knowledge through direct manipulation and creation



Socratic Inquiry & Dialogue

Knowledge construction through guided questioning and discussion

AI Literacy Builder

Anthropic AI API

Inspired by
Bruno Latour's

Science Technology Society
Framework

<https://claude.ai/public/artifacts/da408442-9c2a-40d2-812e-39b8300f39c6>



AI Literacy Builder

Bruno Latour's Science & Technology Studies Framework

Created by Raymond Uzwyshyn Ph.D. MBA MA MLIS

Create comprehensive AI literacy curricula that help students understand artificial intelligence as networks of humans, data, and technology working together.


Actor-Network Theory

Controversy Mapping

Network Analysis

Critical AI Literacy

Start Building Curriculum >

 **AI Models Guide**

✦ Includes free access to ChatGPT, Gemini, Claude, Perplexity, Grok & Llama for interactive learning

Based on current 2025 educational standards • Aligned with White House AI Education Initiative

Select Educational Levels

Choose the educational levels for your AI literacy curriculum, from elementary through graduate studies. Each level uses age-appropriate Latour Science, Technology and Society concepts.

K-2: Early Elementary

Ages 5-7 • Foundation Building

Help little ones understand AI as "smart helpers" that work with people to solve problems. Focus on simple connections between tools, people, and tasks.

TEACHING FOCUS

Who helps us? How do helpers work together?

KEY CONCEPTS

Smart Helpers Following Friends Tool Networks

TEACHING NOTES

Use concrete examples like Alexa, tablet games, or classroom computers. Keep it playful and hands-on!

3-5: Upper Elementary

Ages 8-10 • Network Explorers

Students explore how technology connects people and things in networks. Introduction to the idea that smart tools need many parts working together.

TEACHING FOCUS

Mapping connections: How do smart tools connect people, information, and machines?

KEY CONCEPTS

Connection Maps Smart Tool Teams Helper Networks Simple Bias

TEACHING NOTES

Students can draw network maps and trace how information flows. Great age for hands-on exploration of cause and effect.

6-8: Middle School

Ages 11-13 • Actor-Network Detectives

Developing critical thinking about AI systems as networks where humans, data, algorithms, and institutions all play active roles in shaping outcomes.

TEACHING FOCUS

Actor-Network Theory foundations: How do different "actors" (people, data, code, companies) work together in AI systems?

KEY CONCEPTS

AI Networks Data Actors Human-AI Partnerships Bias Detection Network Mapping

TEACHING NOTES

Students can handle more complexity. Great for controversy mapping activities and beginning ethical discussions about AI fairness.

9-12: High School

Ages 14-18 • Science, Technology and Society Critical Analysts

Sophisticated analysis of AI systems using Science, Technology and Society methodology. Students examine how AI shapes and is shaped by social, political, and economic forces.

TEACHING FOCUS

Complete ANT analysis: Understanding AI as socio-technical assemblages, controversy mapping, and modes of existence across different domains.

KEY CONCEPTS

ANT Methodology Controversy Mapping AI Ethics & Politics Network Power Dynamics Hybrid Analysis

TEACHING NOTES

Students ready for original research projects. Can engage with primary Latour texts and conduct their own network analyses of AI systems.

Higher Education Levels

Undergraduate

Ages 18-22 • Science, Technology and Society Researchers

Advanced application of Latourian Science, Technology and Society to contemporary AI challenges. Students engage in original research using Actor-Network Theory, examining AI as distributed socio-technical assemblages. Students develop sophisticated analytical frameworks for understanding AI as socio-technical assemblages. They learn to conduct systematic investigations of AI networks using empirical Actor-Network Theory methodologies.

RESEARCH FOCUS

Independent research using Latour's complete theoretical apparatus: modes of existence, terrestrial politics, and compositional approaches to AI governance.

ADVANCED CONCEPTS

ANT Research Methods Terrestrial Politics AI Assemblage Theory Global Network Analysis Compositional AI Ethics

IMPLEMENTATION NOTES

Students should engage directly with Latour's theoretical works and conduct original empirical research on AI networks. Suitable for thesis projects and independent study.

Graduate Level

Masters & Ph.D. • Advanced Science, Technology and Society Scholars

Sophisticated theoretical and methodological engagement with Latour's complete corpus applied to cutting-edge AI research. Students develop original theoretical contributions and conduct extensive empirical investigations. Advanced scholars engage with the epistemological and ontological complexities of Latour's theoretical apparatus, developing novel applications to contemporary AI phenomena. Students contribute original theoretical insights while conducting rigorous ethnographic investigations of AI assemblages within complex institutional and global networks.

THEORETICAL FOCUS

Mastery of Latourian ontology and epistemology; advanced ANT, diplomatic negotiations with AI assemblages, compositional politics, and terrestrial responses to AI's planetary implications.

ADVANCED CONCEPTS

Advanced ANT Theory Diplomatic AI Relations Compositional Politics Planetary AI Networks Ontological AI Research

Theoretical Innovation

SCHOLARLY IMPLEMENTATION

Customize Your Curriculum

Tailor the curriculum to your specific needs and context.

<http://bit.ly/4oSYOhr>

Teaching Format & Interaction

Select teaching format...



Subject Integration Focus

Choose primary subject area...



Ethical Focus Areas (select multiple)

☐ Privacy & Data Rights

☐ Environmental Impact

☐ Digital Equity

☐ Algorithmic Bias

☐ Labor & Automation

☐ Misinformation

Duration & Intensity

Select duration...



Technology Access Level

Select technology access...



Special Considerations

Any specific learning objectives, standards alignment, or special needs considerations...



 Generate AI Literacy Curriculum

I'll customize this artifact:

AI Literacy Curriculum Builder - Latour STS Framework

Interactive artifact

Transform any artifact into something uniquely yours by customizing its core elements.

- 1. Change the topic - Adapt the content for a different subject
- 2. Update the style - Refresh the visuals or overall design
- 3. Make it personal - Tailor specifically for your needs
- 4. Share your vision - I'll bring it to life

Where would you like to begin?

33

Reply to Claude...

Sonnet 4.5

AI Literacy Builder

Based on Bruno Latour's Science, Technology and Society Framework

Created by Raymond Uzwyshyn Ph.D. MBA MA MLIS

Create comprehensive AI literacy curricula that help students at different levels gain deeper critical competencies and skills in artificial intelligence as networks of technologies, humans, and data collaborating and working together.

Actor-Network Theory

Controversy Mapping

Network Analysis

Critical AI Literacy

Start Building Curriculum

AI Models Guide

Includes free access to ChatGPT, Gemini, Claude, Perplexity, Grok & Llama for interactive learning

Top Tips for AI-Assisted Development

(Vibe Coding)

- 1) Start with a Project Management Plan
- 2) Use AI Deep Research for Background & Data
- 3) Begin Simply and Build Step by Step
- 4) Prompt -> Test -> Run -> Repeat
- 5) Triple Check for Errors/Hallucinations
- 6) Go with the Flow (these Are Probabilistic Models)

*Go with the Vibe. You are Not Inventing Microsoft but lowering the barrier for prototyping, open source tooling and strategic capabilities

* Use your creative research superpowers and human intuition

Future Steps



- 1) Anthropic Academy
Claude Sonnet 4.5 / Opus 4.0
- 2) AI Code Editors
(From Simplest to most complex:
 - a) Loveable
 - b) Windsurf/Replit
 - c) Cursor
 - d) Claude Code
- 3) Other Coding Models: GPT 5, Grok 3, Gemini Qwen 3 Series, Kimi K2



<https://www.anthropic.com/learn>

Customizable Data Driven Dashboards, Interactive Data Visualization and Information Visualization App Models

[NASDAQ Corporations Across Demis Hassabis Probability Landscape](#). (Business App Mapping Innovation Stages to Market Capitalization. June 2025.

[AI's Impact on Knowledge Workers](#): Real-Time Analysis of Economic Transformation on Professional Work v.6 (Interactive Data Visualization). June 2025

[AI Model Intelligence and Economics Dashboard , Version 14 Revision](#). (Price Performance, Ranking, Market Intelligence). June 2025.

[Athena Capital Financial Derivatives Sell Side Puts Quant App . V. 2](#) FinTech. (AI API). May 2025.

[AI Innovation in Academic Research Libraries. Advanced Data Analytics and Visualization Dashboard](#). May 2025.

[NASDAQ Companies Mapped to Demis Hassabis Creativity Architecture](#). April 2025.

[Advanced Citation & LinkedIn Analysis Dashboard](#). Interactive Visualization so Citation Patterns, knowledge flows and LinkedIn Post Performance. April 2025.

[Complex Treasury Bond ETF Yield Relationships](#) (TLT). Interactive Visualization of TLT Price relationship vs Treasury Yields and Federal Reserve Fund Rate.

[Enhanced Socio-Economic Analysis of LinkedIn User Profile Interest Networks](#). Interactive Visualization.

Instructions

- 1) Sign-Up for Claude.ai (Free)
- 2) Review Links
- 3) To Customize: Press Customize Button
 - a) Upload Data (Spreadsheet/Excel or Other) or
 - b) Ask Claude to Perform Deep Research
 - c) Ask Claude to Search and Find Data
 - d) Customize app to your specifications
 - e) Send me a quick note with the link if you do anything impressive raymondu@ucr.edu
 - f) for educational/non-commercial use only

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Customizable AI-Assisted Coding Models

React, Node, Anthropic Artifacts, Opus/Sonnet AI API

[AI Literacy Activities and Planning Curriculum Builder Multi-Literacy Curriculum Builder](#): AI Literacy Education Through Multiple Critical Lenses. (AI API Enabled) August 2025. [Further Info](#)

[Move 37:The Art of Counterintuitive Discovery](#). Research Discovery Engine Modeled After Dennis Hassabis AlphaGo Creative AI Methodology. (AI API App) July 2025.

[UC Research Starter: University of California AI Powered Brainstorming Application for Research Faculty and Graduate Students](#). (AI API App) July 2025.

Jungian Psychotherapeutic Therapy App: Individuation. Hillman, von Franz, Jung. (AI API App). July, 2025.

[Symph Composer](#): Note Taking Creative Idea Brainstorming Scratch Pad (Experimental). July 2025.

[Bruno Latour AI Literacy Builder](#): Based on Latour's Science, Technology and Society Framework. [Version 2 \(Enhanced, Special Needs, Curriculum Standards\)](#). (AI API Enabled) June 2025.

[Spartan Amazonia: Mind-Body Training System](#): Integrating, Movement Mindfulness and Nutrition for Optimal Performance (AI API app). June 2025.

[Athena Deep Learning: Computational Creativity for Strategic Business Intelligence](#). Business App v.11, [V.52](#) Simplified (AI API app). June 2025.

[Research Insights Architect: PRISMA Systematic Review Framework App](#). June 2025.

[Urban Spartan: Men's Health App](#). May 2025.

Instructions

- 1) Sign-Up for Claude.ai (Free)
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<https://rayuzwyshyn.net>

Further Sources, Guides and Background

AI Coding Tools Quick Comparison and Beginner's Guide

<https://www.linkedin.com/pulse/ai-coding-tools-quick-comparison-guide-2025-raymond-uzwyshyn-ph-d--nuyuc/>

The Rise of AI Application Engineers

https://www.linkedin.com/posts/rayuzwyshyn_vibecoding-aiapplicationengineer-aiprogramming-activity-7349146084201373701-Lxla/

Vibe Coding Cursor + Sonnet For Next Level AI Coding

https://www.linkedin.com/posts/rayuzwyshyn_cursor-claudeop4-activity-7338241601997107200-cWOJ/

AI Code Composers

https://www.linkedin.com/posts/rayuzwyshyn_ai-code-composers-the-next-frontier-in-activity-7259711548049285120-KFn4/

Interdisciplinary Thinking for AI

<https://www.linkedin.com/pulse/interdisciplinary-thinking-era-ai-raymond-uzwyshyn-ph-d--yodqc/>

AI/Ph.D. Level Research Collaboration

<https://www.linkedin.com/pulse/interdisciplinary-thinking-era-ai-raymond-uzwyshyn-ph-d--yodqc/>

Human-AI Ph.D Level Co-Intelligence

<https://www.linkedin.com/pulse/humanai-phd-level-co-intelligence-2025-2035-roadmaps-uzwyshyn-ph-d--n1h3c/>

New Models for Human-AI Co-Intelligence

<https://www.linkedin.com/pulse/co-intelligence-entangled-partnerships-modles-raymond-uzwyshyn-ph-d--5mgmc/>

Topology of Collective Intelligence

<https://www.linkedin.com/pulse/nodes-dream-mapping-emerging-topology-human-ai-raymond-uzwyshyn-ph-d--wfdwc/?trackingId=HD0kC1o4S06cH2qZktB3lg%3D%3D>

Discovery, AI and Academic Research

<https://www.linkedin.com/pulse/deep-seek-demis-benchmarking-r1-comparative-paper-ai-uzwyshyn-ph-d--588ic>

AI and Scientific Knowledge in the 21st Century

<https://www.linkedin.com/pulse/invisible-architecture-knowledge-raymond-uzwyshyn-ph-d--m8mrc>

Multimodality, Humanoid Robots and ASI

<https://www.linkedin.com/pulse/humanoid-robots-multimodality-path-towards-raymond-uzwyshyn-ph-d--jgffc>

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Thank you for Attending!

Comments and Questions

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Ethical Considerations and Best Practices in Academia

Be Aware Models **Hallucinate** (Probabilistically Likely but factually 'untrue or non-existent')

Be aware of potential biases in AI outputs from dataset

Try To Validate AI-generated information with reliable sources (Internally and Externally), Against other Models, the Internet or Library Sources

Don't creatively borrow author or copy verbatim programmer's original material if you will be commercializing. Fair Use for Educational Purposes is allowed and encouraged and licensing and purchasing material is a well known legal practice.



“Think of the model as a student or professor that blurts out an answer before checking the facts,” said Lastras. “Experience teaches us to stop and say when we don’t know something. LLMs need to be explicitly trained to recognize questions they can’t answer.”

Luis Lastras, IBM Director of AI Language Tech.