

# Vibe Coding: For AI-Driven Development

## An Introduction for Research and Learning



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Orbach Library AI Literacy Series  
11/12/2025



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- 02** Development Methodology
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- 04** Customizable Applications
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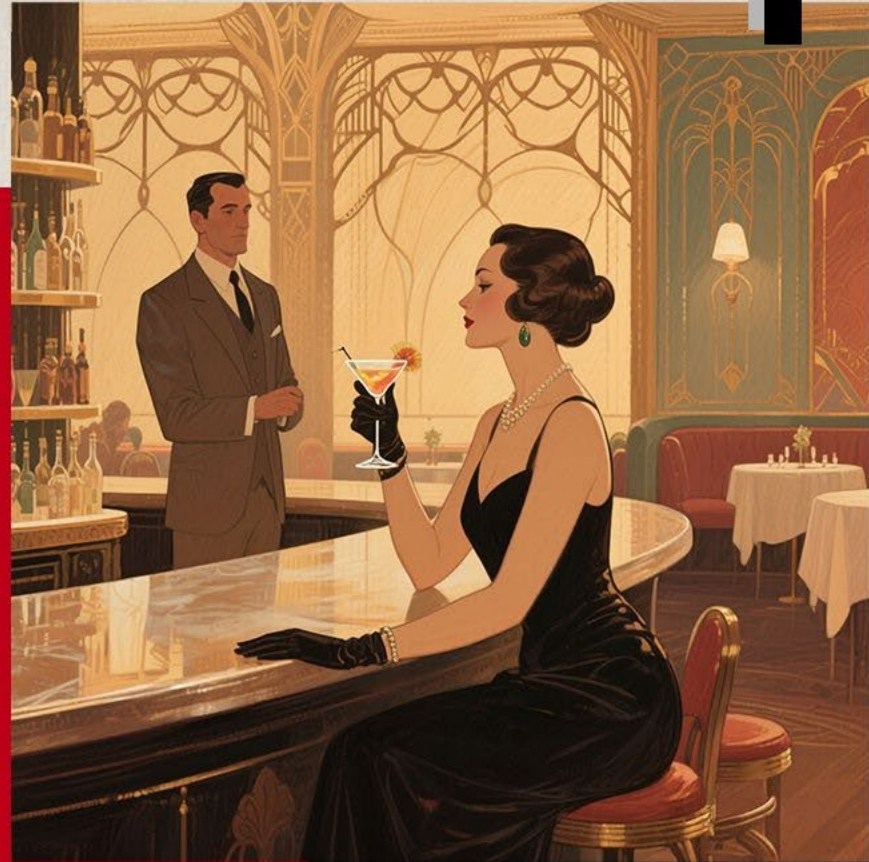
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A Few Definitions

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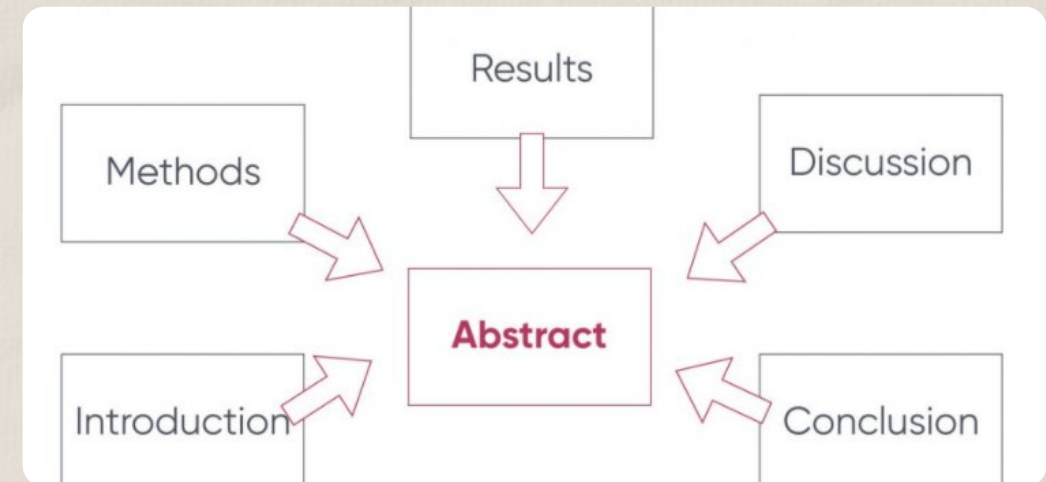
Environmental Scan



# What is Vibe Coding?

Programming with AI Large Language Models, enabling **Natural Language Coding** through probabilistic/stochastic methods, contrasting with traditional deterministic programming.

Sometimes Called No or Low Code Programming  
Or AI-Assisted Development



# AI- Assisted Development: Lowering Barriers, Accelerating Innovation



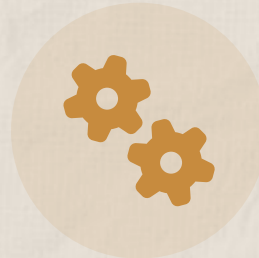
## Rapid Prototyping

Create applications through  
conversational interfaces.

Apps, Data Visualization

Not Massive Operating Systems

1000-3000 lines of code



## Accelerated Cycles

Leverage AI for debugging, optimization,  
and feature implementation for  
Research and Learning



## Versioning

Iterate quickly and iterate often  
For Startups or Software  
Development.

# ◆ AI Development Benefits



## Rapid Prototyping

AI-assisted development accelerates the creation of initial prototypes by allowing developers to describe desired outcomes in natural language, reducing the time needed for coding.



## Innovation Cycles

The iterative nature of AI development enables faster innovation cycles, allowing teams to quickly test and refine their applications based on real-time feedback.



## Lowering Barriers

Vibe coding lowers the technical barriers to entry, making it easier for non-technical users to create functional applications without extensive programming knowledge.



## Natural Language Support

AI models can support multiple programming or human languages, enabling developers to work in their preferred language while leveraging AI for debugging, optimization, and feature implementation.

# Available in All Best-in-Class Reasoning Models

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## Proprietary

**Anthropic:** Claude Sonnet 4.5, Opus 4.0

**OpenAI:** GPT 5.1, o1/o3 pro, o4 mini-high

**Google:** Gemini 2.5 Pro (2M Context)

**xAI:** Grok Code Fast 4

## Open Source

**Meta:** Llama 4 Series (2T, 400B)

**Alibaba:** Qwen3 Model Family (72B)

**DeepSeek:** R1 (768B), R2 (Coming Soon)

**Mistral:** Codestral

**Kimi K2:** Thinking Model



— **LET'S MOVE ON** —

# CHAPTER.02

## Development Methodology

# The AI-Enhanced Development Workflow



## 1. Define Goals

Start with a clear project statement.



## 2. Plan Steps

Create a step-by-step project plan.



## 3. AI Research

Use AI for deep research and analysis.



## 4. Web Search

Ensure currency with web searches.

The graphic features a background image of a modern city skyline with glass skyscrapers. Overlaid on this are three white rectangular boxes, each containing a step of the AI development workflow. The first box on the left is titled 'Project Goals' and describes starting with a clear statement of goals to align AI capabilities with desired outcomes. The middle box is titled 'Step-by-Step Planning' and describes following a step-by-step project management plan to break down the development process into manageable tasks. The third box on the right is titled 'AI-Enhanced Research' and describes utilizing AI's extended thinking capabilities for research, data analysis, and web searches to gather and verify the latest information and insights.

# AI Development Workflow

## Project Goals

Start with a clear statement of project goals to provide a focused direction. **This helps in aligning the AI's capabilities with the desired outcomes.**

## Step-by-Step Planning

**Follow a step-by-step project management plan to break down the development process into an iterative buildout process** manageable tasks, ensuring systematic progress.

## AI-Enhanced Research

Utilize AI's extended thinking capabilities for research, data and deep analysis, and web searches to gather and verify the latest information and insights.

# What is the Iterative Development Buildout Process?

Follow a **Prompt-Test-Run-Repeat** cycle.

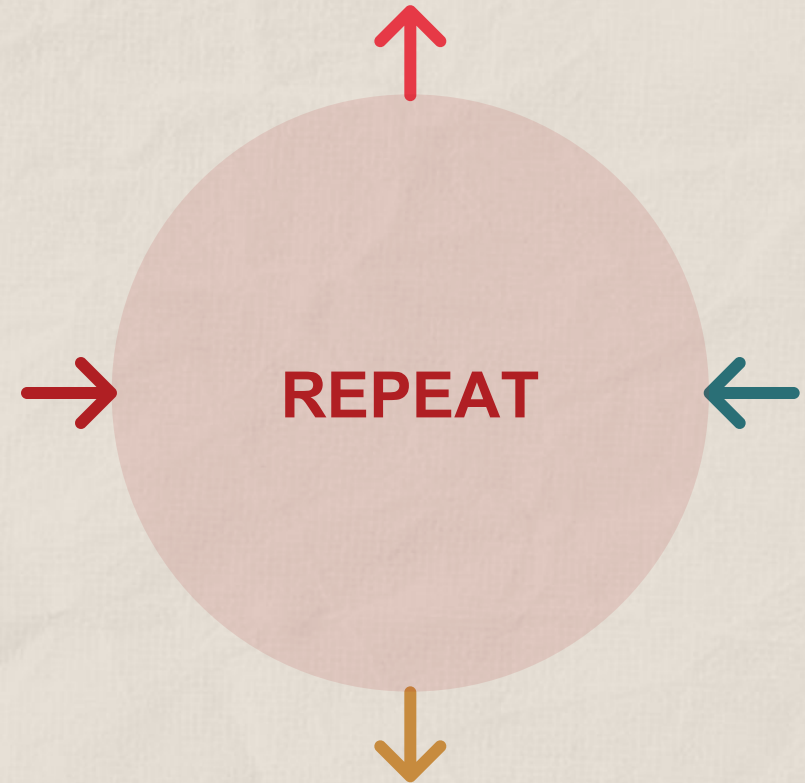
(The Vibe)

**Begin simply,**

**Build step by step**

**Maintain flexibility** with probabilistic outputs.

- ✓ Triple-check for AI hallucinations and errors.
- ✓ Focus on lowering barriers for **prototyping**.
- ✓ Use your creative research superpowers and human intuition.



# ❖ Iterative Development Process – Major Pillars

## Prompt-Test-Run-Repeat

Adopt a prompt-test-run-repeat cycle to iteratively refine the application. This approach ensures continuous improvement and adaptation.

## Error Checking

Triple-check for AI hallucinations and errors to ensure the reliability of the generated code. Maintain flexibility with probabilistic outputs.

AI models can hallucinate. Human validation is crucial.



**Always Verify**

## The Balance of Work Changes to:

### Source Verification, Critique, Debugging and Source Evaluation



Cross-reference against other models & library sources.



Validate with reliable internet resources and primary sources.



Ensure accuracy and reliability through human judgment, intuition, critique and discrimination.



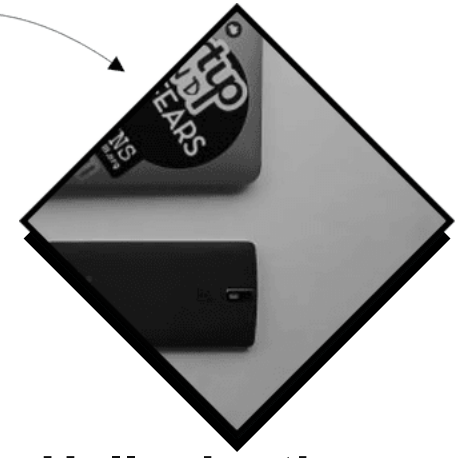
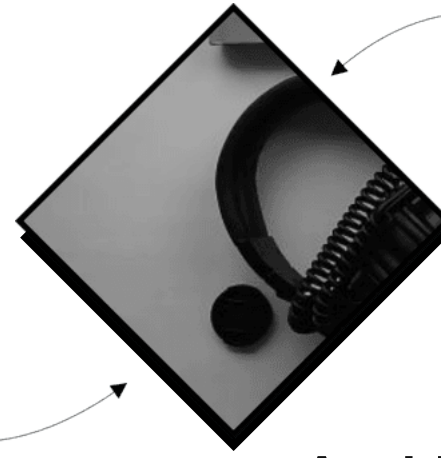
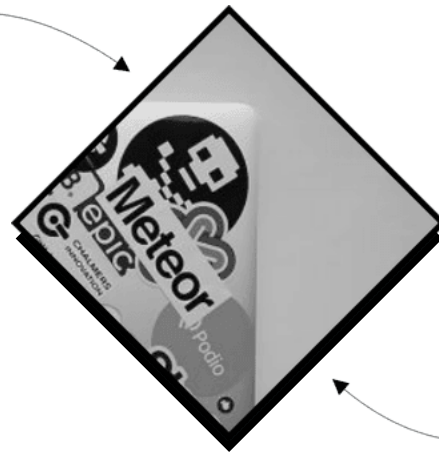
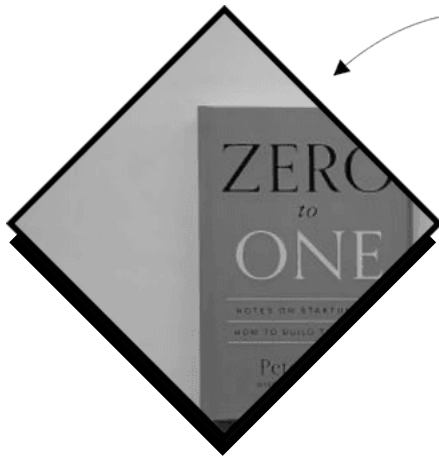
# Source Verification, Evaluation, Critique, Discrimination

## Reliable Sources

Always verify AI-generated information through reliable sources such as academic databases, industry reports, and credible websites.

## Cross-Referencing

Cross-reference information against other AI models, internet resources, and library databases to ensure accuracy and reliability.



## Human Validation

Human validation is crucial to confirm the factual correctness of AI-generated outputs, as AI models can sometimes produce probabilistically likely but factually incorrect information.

## Avoiding Hallucinations

Be aware of AI hallucinations, which are outputs that seem plausible but are not based on factual data. This requires careful scrutiny and verification.



— **LET'S MOVE ON** —

# CHAPTER.03

## Practical Applications

# Data-Driven Dashboards

AI excels at creating interactive visualizations and analytics apps. Be specific in your prompts.



Specify colors, fonts, and styles.

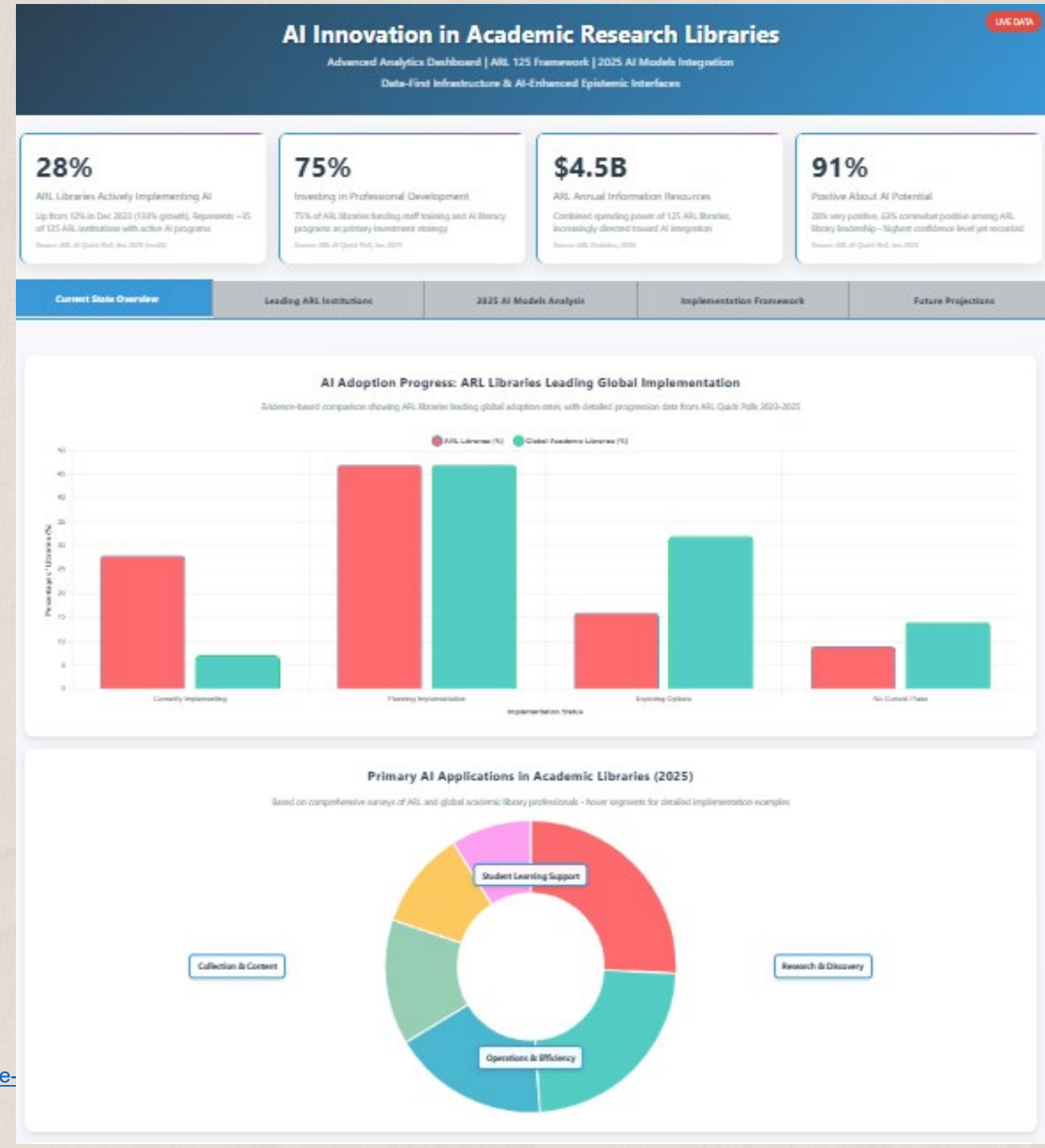


Define sections and dropdown menus.



Start with a summary, then break it down.

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



# AI as a Multimodal Research Powerhouse



Research Papers

+



Excel Data

+



Video Content

=



Insights & Visuals

**AI models can synthesize information from diverse sources to create comprehensive analyses and visualizations.**

# Multimodal AI Models : Beyond Text

Advanced models like GPT-4o, Sonnet 4.5, and Gemini 2.5 Pro handle diverse inputs and outputs.



## Text + Image

Art analysis, architectural speculation.



## Text + Data

Summarize trends from charts.






## Text + Video

Summarize lectures, create study guides.

AI can structure and accelerate the creation of comprehensive research reviews by helping to organize, analyze, and synthesize vast amounts of literature.

# Systematic Review & Synthesis

-  Develop systematic review frameworks.
-  Structure literature for meta-analyses.
-  Create research synthesis across disciplines.

Prisma Checklist: <https://claude.ai/public/artifacts/c27167a0-49a1-4464-8e33-9b3e78041956>

## 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

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



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# CHAPTER.04

## Vibe Coded Apps The AI API



# 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

I'll customize this artifact:

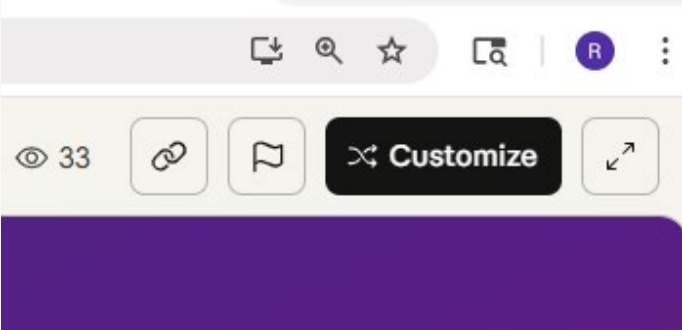
AI Literacy Curriculum Builder - Latour STS Framework  
Interactive artifact



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?



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

# Building AI Literacy: Multiple Critical Lenses

Understanding AI's social, political, and cultural contexts beyond technical implementation.



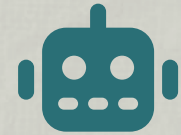
**Bruno Latour**

Actor-Network Theory: AI as socio-technical networks.



**Katherine Hayles**

Posthuman Theory: AI challenging human consciousness.



**Donna Haraway**

Cyborg Theory: Examining AI through a feminist lens.

# Incorporating Critical Perspectives



## **Ruha Benjamin**

Race & Tech: How AI perpetuates or challenges inequalities.



## **Langdon Winner**

Politics of Tech: AI systems embodying political values.



## **Safiya Noble**

Algorithmic Bias: Critical analysis of discrimination in information systems.



# Educational Applications

AI literacy curricula empower educators and prepare students for an AI-integrated future.



Empowers educators with new millennial AI curricula.



Helps students understand AI's societal context.



Aligns with White House AI plans and European mandates.



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# CHAPTER.05

**AI LLMs Can Also Be  
Connected to Advanced  
Tools**

# AI Code Editors: A Spectrum of Power

Claude Code

Most Complex

Cursor / Replit

Advanced

Windsurf

Intermediate

Loveable

Simplest

These tools integrate with models like **Sonnet 4.5**, **GPT-5**, **Grok 3**, **Gemini**, and **Qwen 3**.



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# CHAPTER.07

**Future Directions  
Metaphors for Human  
Ai Collaboration**

# The Topology of Collective Intelligence

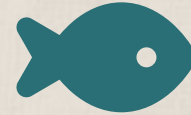
New models for human-AI interaction are emerging, described by metaphors that capture different integration levels.



**Cyborgs**



**Centaurs**



**Mermaids**



**Maenads**

Wharton Business Professor Ethan Mollick uses Centaurs, Cyborgs, Mermaids and Maenads to describe human AI Co-Intelligence

Karen Barad's uses Bohr's quantum physic analogy and **entanglement theory** to describes agency emerging from human-AI intra-action.

# The Future is Entangled Co-Intelligence

The focus is shifting from AI replacement to AI partnership, creating collaborative intelligence that surpasses what either humans or AI can achieve alone.

This involves **entangled partnerships** where human creativity and intuition are amplified by AI's speed and scale.

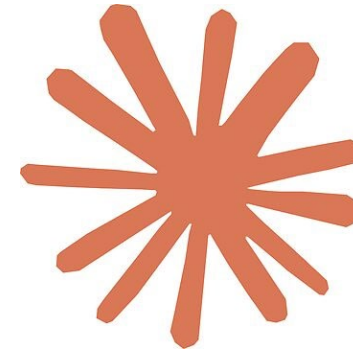
MEETING  
THE UNIVERSE HALFWAY



quantum physics and the entanglement of matter and meaning  
KAREN BARAD

# Part II Workshop Component and Examples

## Vibe Coding For Research and Learning



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

# 2025 Best in Class Reasoning 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

## AI AGI Research, Reasoning & Deep Research LLM's

Proprietary

**Anthropic Claude Sonnet 4.5 Opus 4.0 , Try**

**Open AI Chat GPT 5.1**

(Current flagship Combined Multimodal Model Family), Try  
GPT o1/o3 pro o4 mini-high Try

**Grok Code Fast 4, Try**

**Gemini 2.5 Pro (Deep Think, Multimodal/video image)**  
2M Context Window Try

### Open Source

Llama 4 Series  
(2T, 400B, 109B, 72B)

Qwen3 Model Family (Alibaba, 72B)  
Mistral Codestral

### Open Source

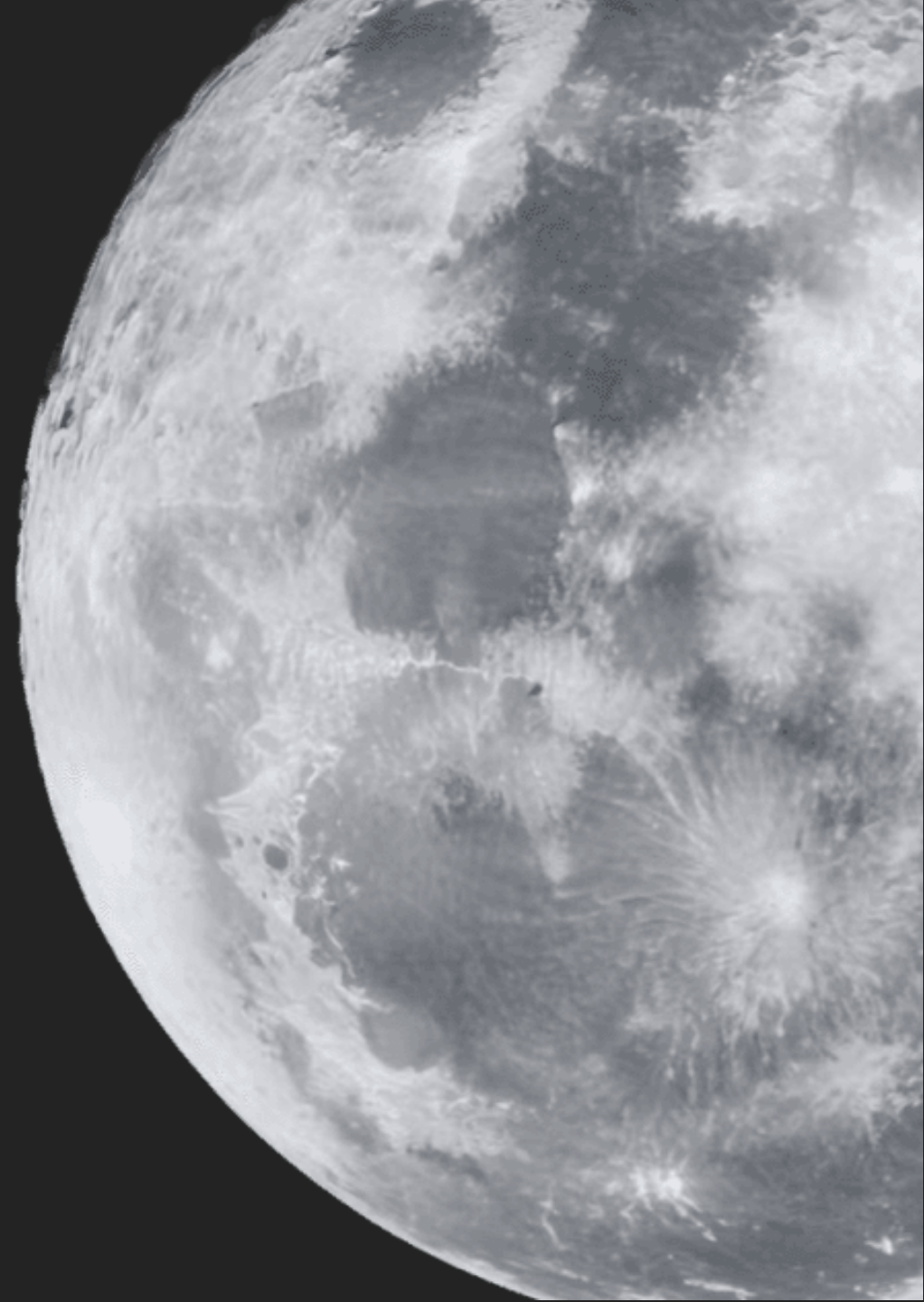
**DeepSeek R1** (768 Billion Parameters), Try, [Perplexity, US R1-1776 Uncensored Version](#)

**Kimi K2 Thinking**

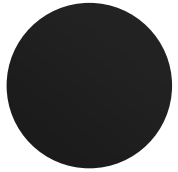
**Co-Scientist (Google, Beta)**  
**Co-Evolve (Deep Mind)**

• • • • •

# One Small Step

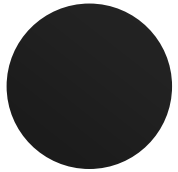
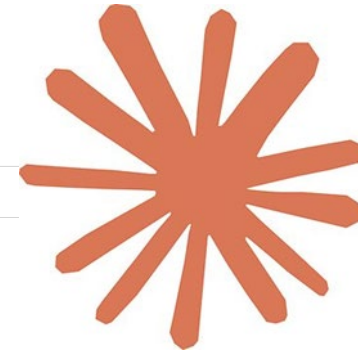


# ◆ Implementation Roadmap



## Getting Started

Begin with a free <https://claude.ai> signup, review provided links, and use customize buttons for data upload or research requests.



## Educational Use

Focus on educational and non-commercial use, and contact [raymondu@ucr.edu](mailto:raymondu@ucr.edu) for notable projects and further guidance.

# Your Roadmap to Implementation

1

## Sign Up

Start with a free Claude.ai account.

2

## Explore

Review the provided links and resources.

3

## Customize

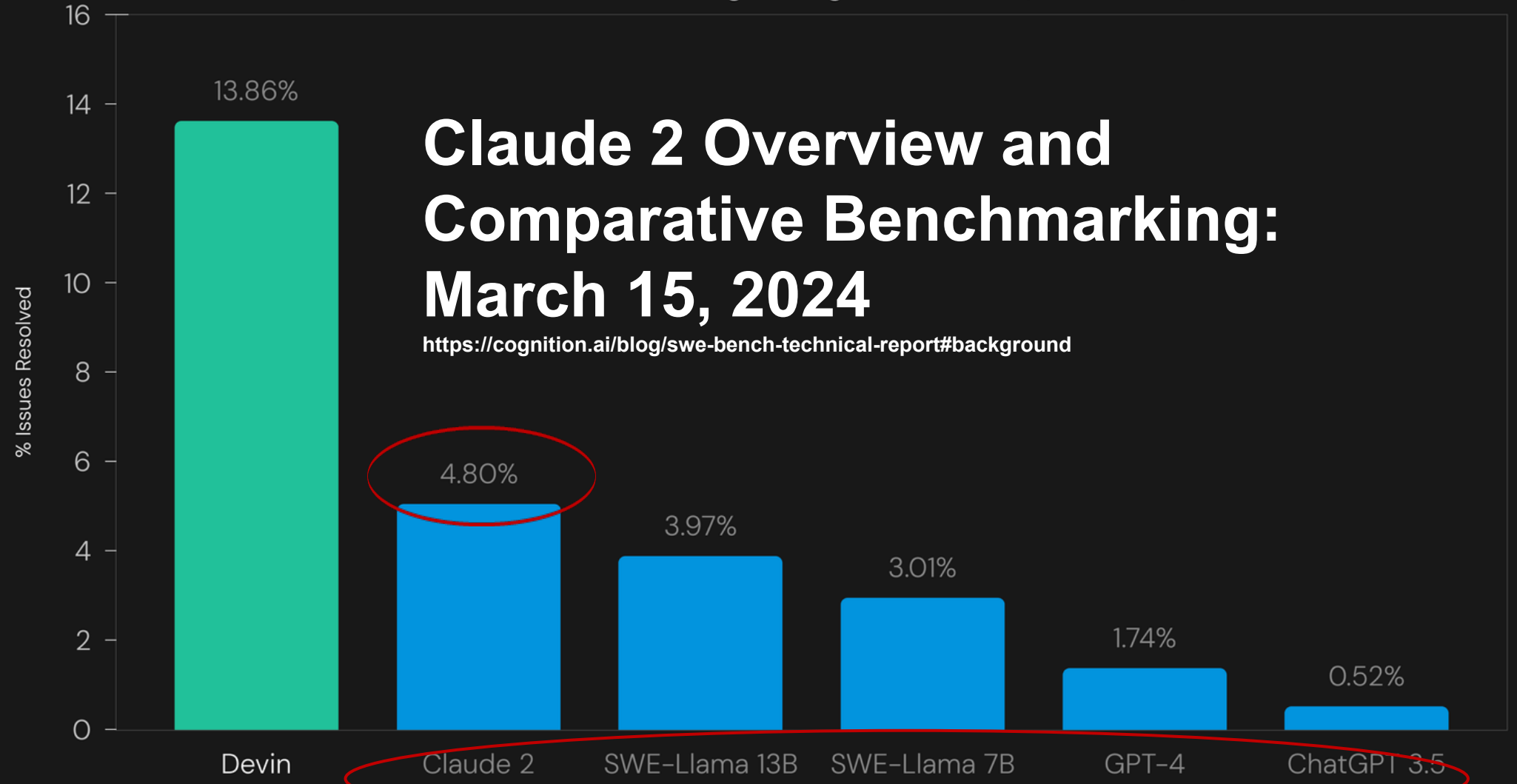
Upload data or ask AI to find it for you.

4

## Share

Send impressive projects to [raymond@ucr.edu](mailto:raymond@ucr.edu).

For educational/non-commercial use only.



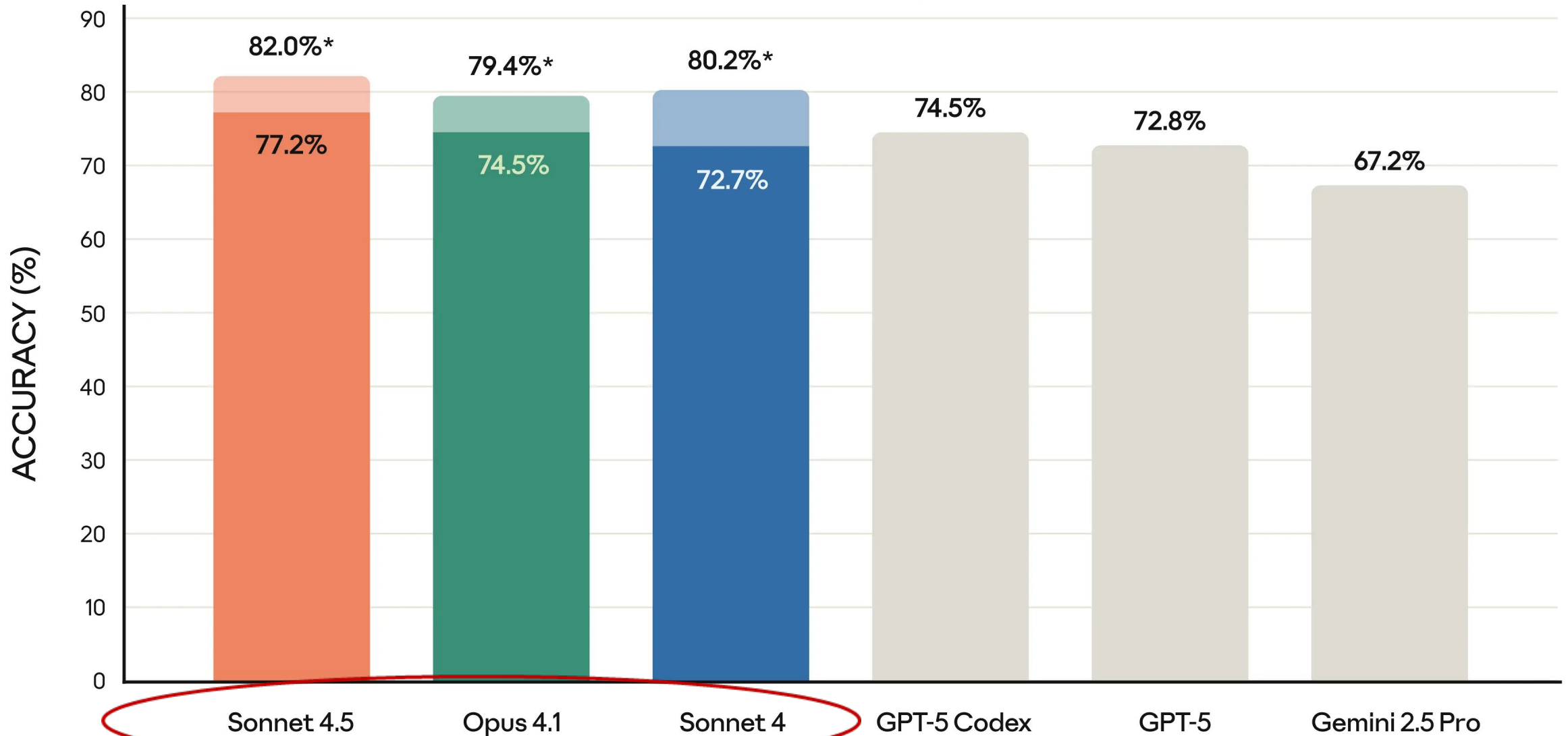
# Claude 2 Overview and Comparative Benchmarking: March 15, 2024

<https://cognition.ai/blog/swe-bench-technical-report#background>

# Software engineering

\* With parallel test-time compute

SWE-bench Verified (n=500)



~~Sonnet 4.5 Overview and Benchmarking: October 2025~~

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

# Afternoon, Ray



How can I help you today?



Sonnet 4.5 ▾



 Write

 Learn

 Code

 Life stuff

 From Drive

<https://claude.ai/new>

# Data Driven Dashboards, Apps, Guides 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

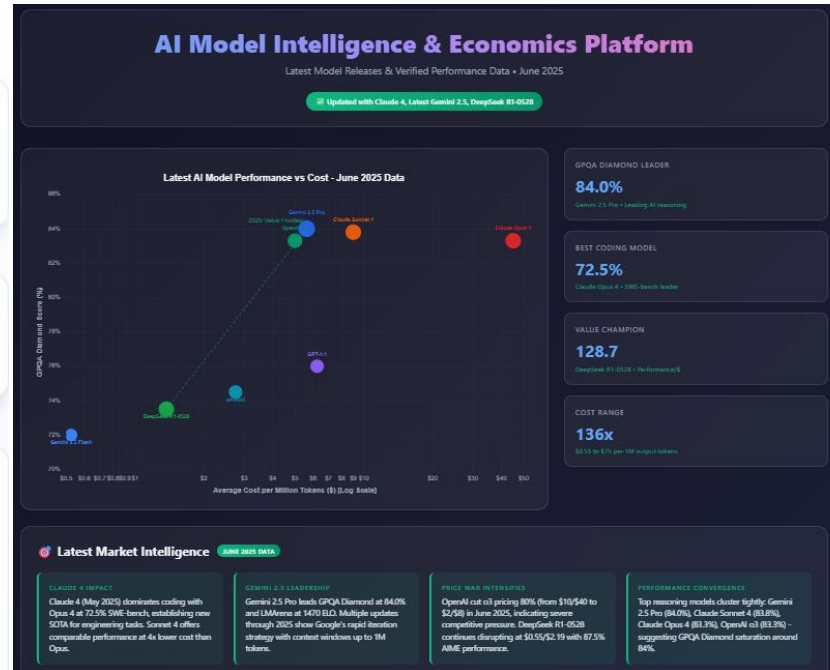
#### Systematic Review

Comprehensive, structured review with meta-analysis potential

6-18 months

High Complexity

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



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



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

# 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

Systemic Review Guide

Specify in Detail What Your Guide is and What You Wish To Accomplish

Upload Research Methodology for AI Model

Here: Prisma 2020 Paper

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

# Research Insights Architect

Building frameworks for research and R&D - Module 1

 **Based on PRISMA 2020:** This guide adapts the gold-standard PRISMA framework for interdisciplinary PhD research beyond medical fields.



## Choose Your Review Type

### Systematic Review

Comprehensive, structured review with meta-analysis potential

**Best for:** Answering specific research questions with quantitative synthesis

🕒 6-18 months

High Complexity

### Scoping Review

Broad exploration of research landscape and key concepts

**Best for:** Mapping literature, identifying research gaps

🕒 3-9 months

Medium Complexity

### Rapid Review

Streamlined systematic review with time constraints

**Best for:** Quick evidence synthesis for decision-making

🕒 1-6 months

Medium Complexity

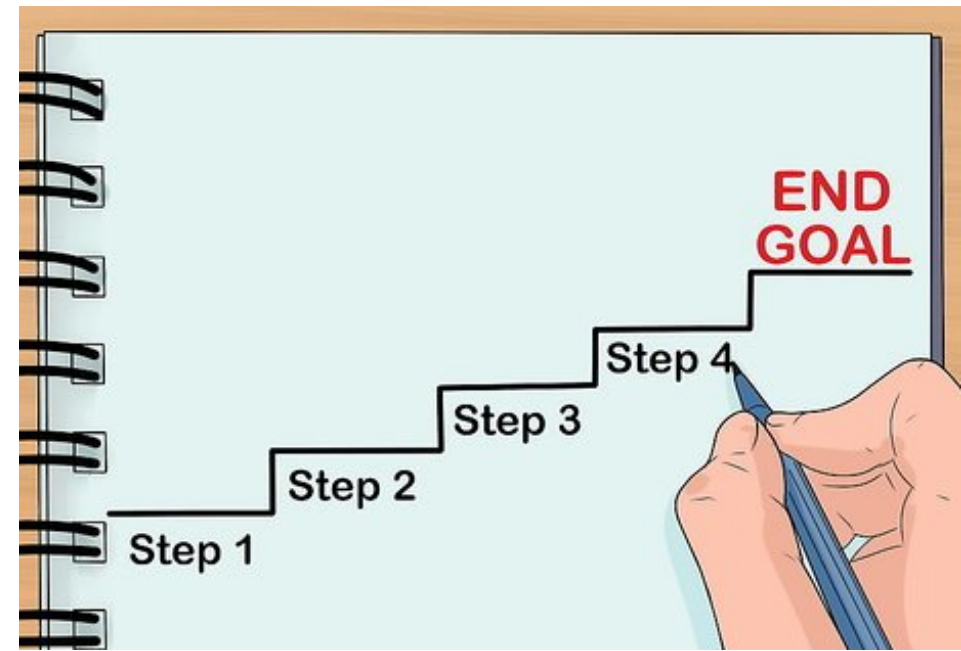
Select your academic discipline:

Other

- \*\*Start with a summary of your project and progressively break it down into sections
- Specify the larger sections and
- Various Options for The User
- Colors and Fonts if You Have Preference
- Drop Down Menus and Major Sections if You Wish These Specified

# 💡 Tips for AI-Assisted Development (Vibe Coding)

- 1) Start with a General Statement of What you want to Create or Accomplish
- 2) Continue with a Step by Step Project Management Plan  
If Errors: (Breakdown Step and Try Again)



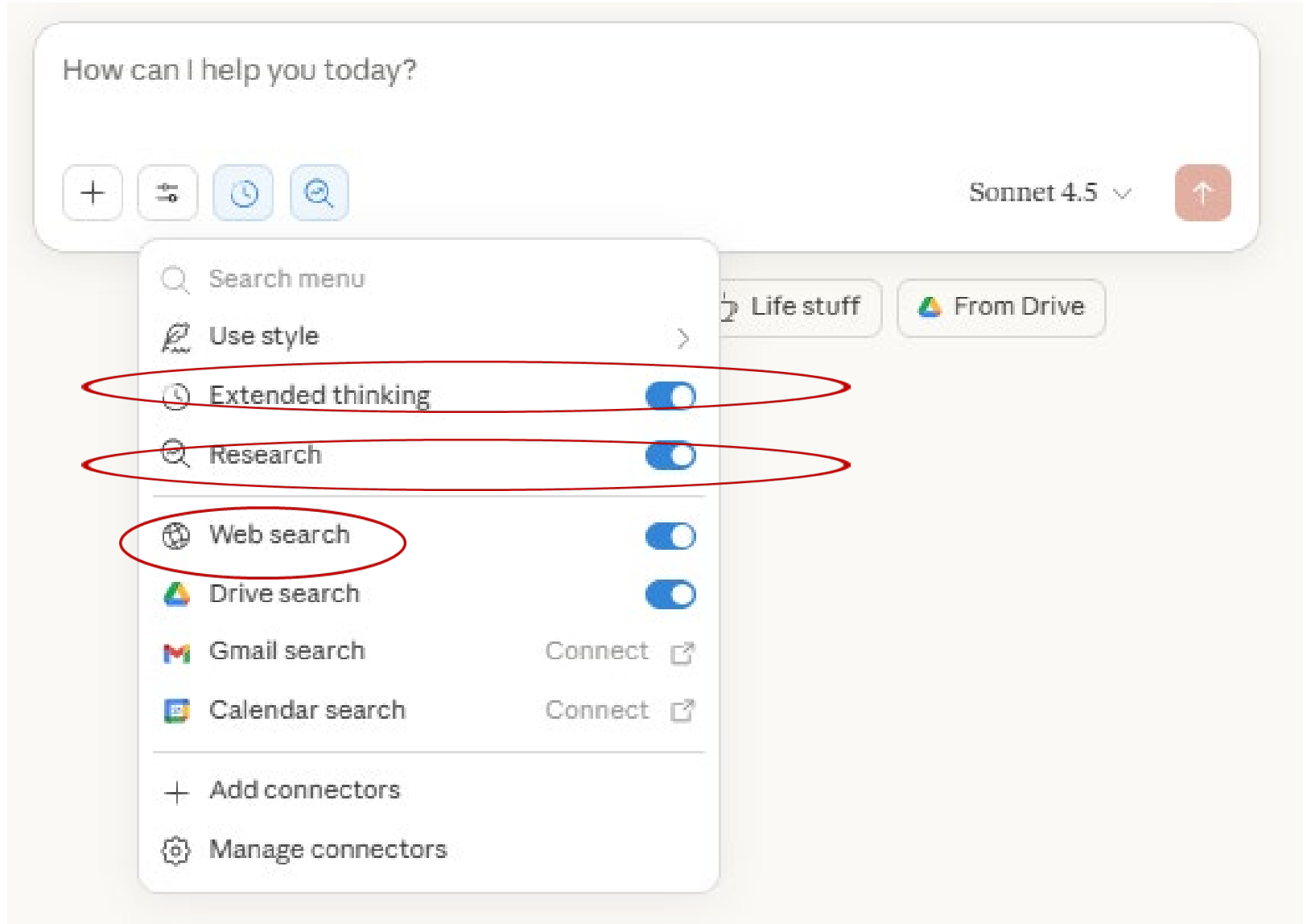
# 💡 Tips for AI-Assisted Development (Vibe Coding)

Use the AI Window AI:

**Extended Thinking for  
quick research**

**Research for Deep Research  
Reports, Background &  
Data**

**Web Search for To the Date  
Currency**



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](https://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](https://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 Button,

*Reports, Articles, Papers and Data*

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

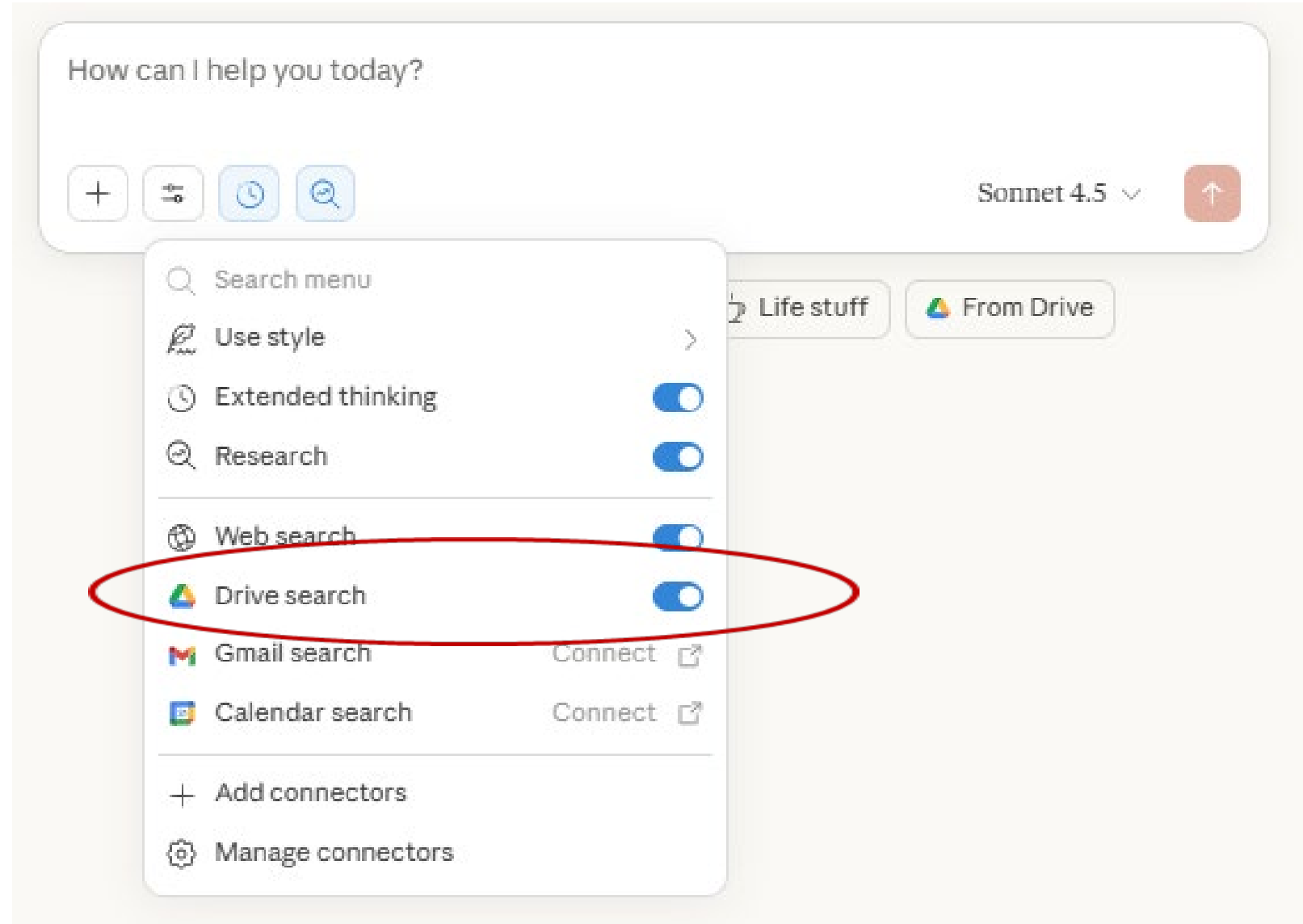
# More Precise Thinking Window for Sources

# 💡 Top Tips for AI-Assisted Development (Vibe Coding)

## 2) Use Drive Search for Your Research or Data (i.e. Excel, Word, PDF)

"Look in my [folder name:EnvironmentalData] for [file: Climate Change .xls file]"

- Find my documents about [topic]"
- "Search my Drive for [keywords]"
- "Show me folders related to [project]"



# 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.

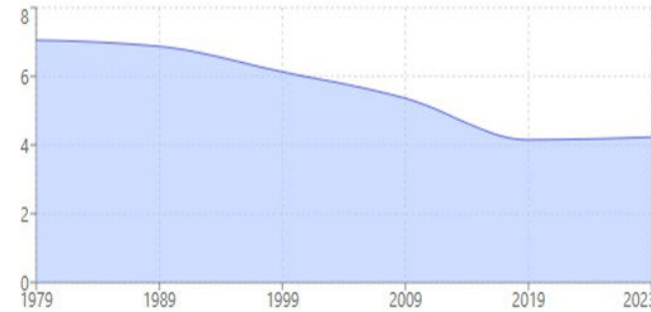
Add a pie chart.

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

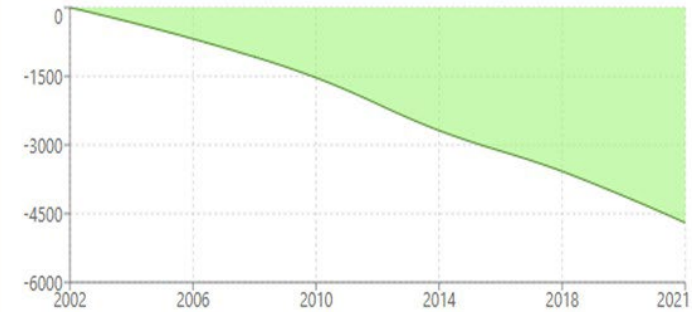
<https://claude.ai/public/artifacts/2514c6a-2e92-4fbf-9818-8077e2b45611>

## Climate Change Impact Dashboard

Arctic Sea Ice Extent (Million km<sup>2</sup>)



Greenland Ice Mass Loss (Cubic km)



## Regional Climate Impact Analysis

Global

North America

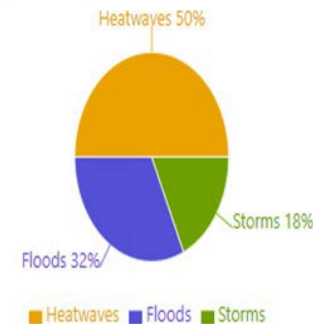
Europe

Middle East

Africa

Claude 3.5 (2024)

### 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.

## 💡 Top Tips for AI-Assisted Development (Vibe Coding)

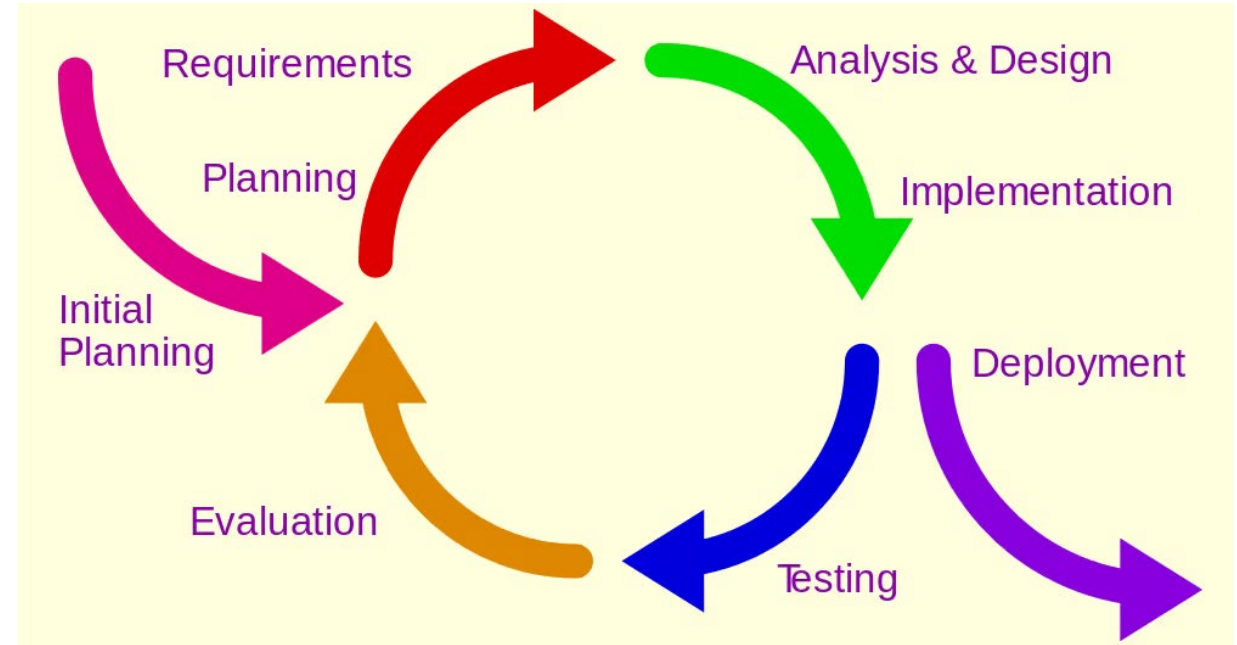
5) Triple Check for Errors/Hallucinations

6) Go with the Flow or Vibe  
(these Are Probabilistic Models)

\*Go with the Vibe.

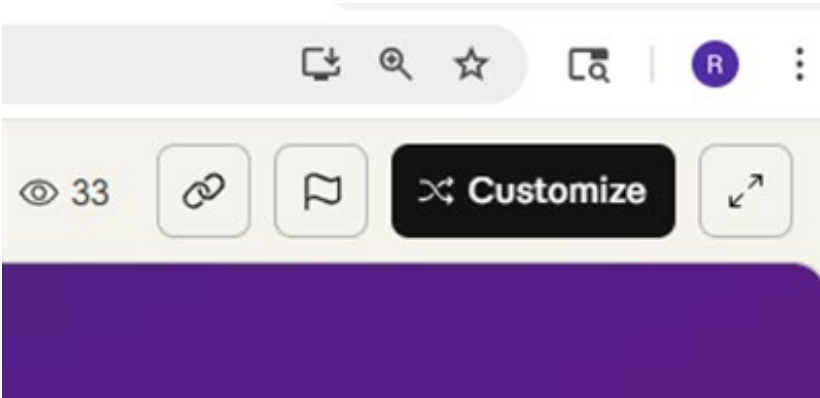
You are Not Inventing Microsoft but lowering the barrier for prototyping, open source tooling and strategic capabilities

\* Use your creative research superpowers and human intuition

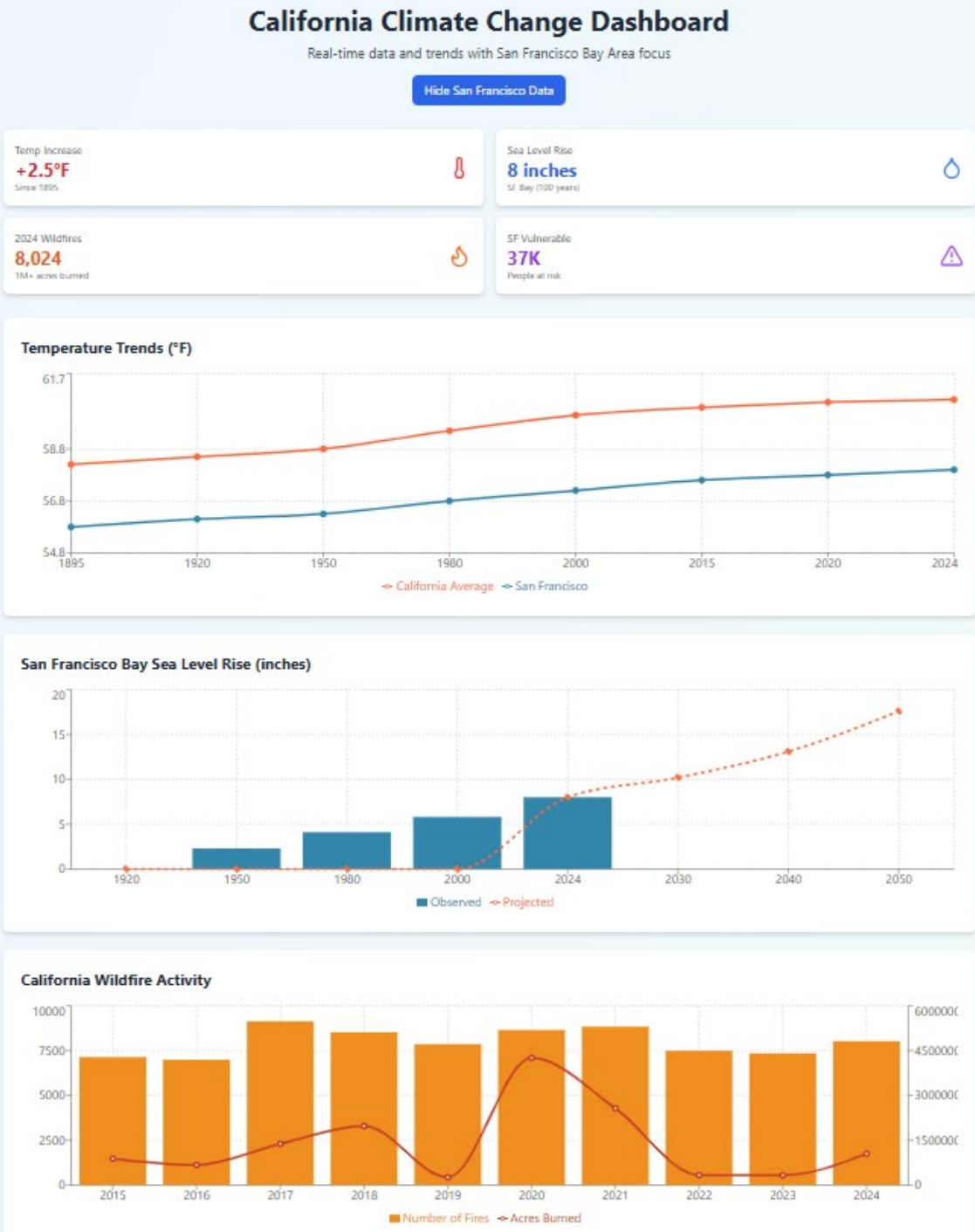


**Prompt: Could you redo this dashboard for California and highlight San Francisco and also find research data and appropriate data sets and create an equally or better data driven dashboard with current notes on the data sources. Double Check the Sources.**

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



**Claude 4.5 2025**



# Prompt:

## Please Verify Your Sources

I've verified all the citations against the original search results. Here's the verification:

### ☒ All Citations Verified Accurate

#### 1. Temperature Data (2.5°F increase since 1895)

•**Source:** California Office of Environmental Health Hazard Assessment (OEHHA)

•**Citation:** Statewide annual mean temperatures have increased by about 2.5 degrees Fahrenheit (°F) since 1895. Warming has accelerated, and seven of the past eight years have been the warmest on record [Air temperatures - OEHHA](#)

•**Status:** ☒ Verified

#### 3. 2024 Wildfire Statistics (8,024 fires, 1M+ acres)

•**Source:** Wikipedia (sourcing official CAL FIRE data)

•**Citation:** By the end of 2024, a total of 8,024 wildfires burned a cumulative 1,050,012 acres (424,925 ha) throughout the U.S. state of California [2024 California wildfires - Wikipedia](#)

### Source Quality Assessment:

•**Government Agencies:** OEHHA, SF Planning, CA State Coastal Conservancy ☒

•**Official Data:** CAL FIRE statistics, NOAA tidal gauges ☒

•**Current Data:** All from 2024-2025 reporting ☒

•**Peer-Reviewed:** California Climate Change Assessment referenced ☒

All data sources are authoritative, current, and properly cited. The dashboard uses verified, official climate data from California state agencies and federal sources.

# 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.



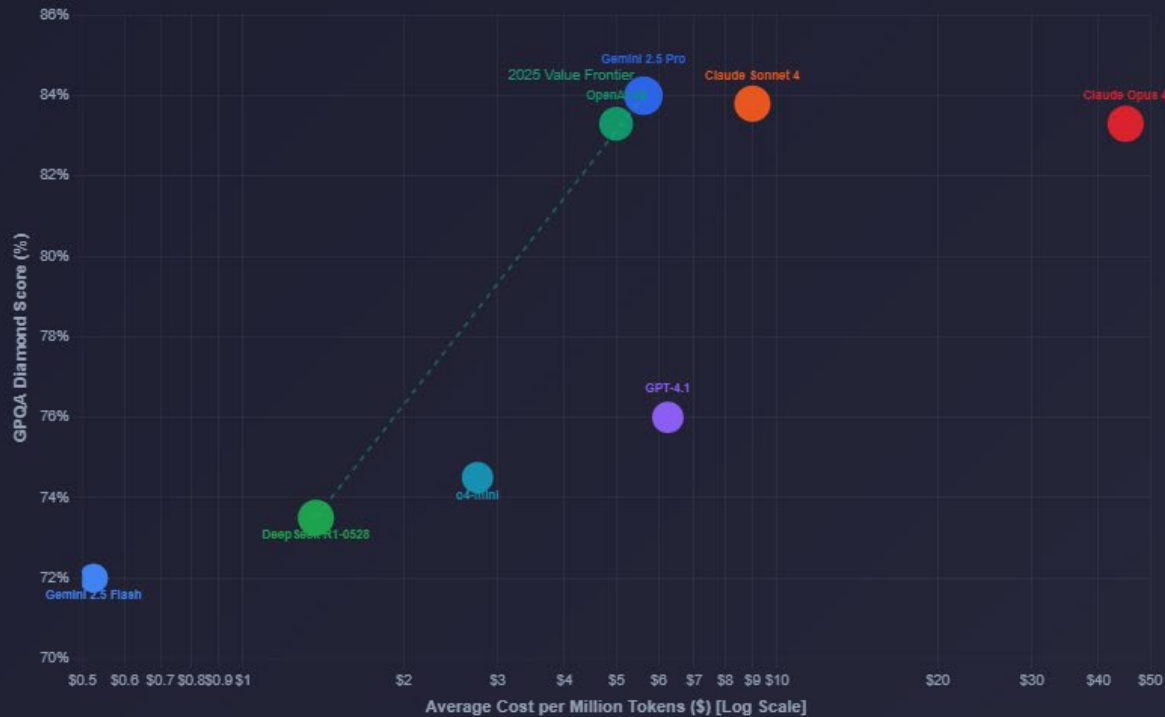
[Model Hallucination](#)

# AI Model Intelligence & Economics Platform

Latest Model Releases & Verified Performance Data • June 2025

✓ Updated with Claude 4, Latest Gemini 2.5, DeepSeek R1-0528

Latest AI Model Performance vs Cost - June 2025 Data



GPQA DIAMOND LEADER

**84.0%**

Gemini 2.5 Pro • Leading AI reasoning

BEST CODING MODEL

**72.5%**

Claude Opus 4 • SWE-bench leader

VALUE CHAMPION

**128.7**

DeepSeek R1-0528 • Performance/\$

COST RANGE

**136x**

\$0.55 to \$75 per 1M output tokens

Information  
Visualization  
Dashboard  
Cost/Performance  
Comparison  
of Leading AI Models

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

BEST CODING MODEL

**72.5%**

Claude Opus 4 establishes new state-of-the-art through revolutionary extended thinking methodology, solving real GitHub issues from popular repositories and delivering 3-5x development productivity gains, 40-60% faster bug resolution, and measurably improved code quality for mission-critical software engineering applications.

Claude Opus/Sonnet 4

GPQA DIAMOND LEADER

**84.0%**

Gemini 2.5 Pro achieves the highest reasoning performance on PhD-level scientific questions, enabling enterprise strategic analysis, technical due diligence, regulatory compliance, and expert-level decision support across physics, chemistry, and biology domains with 1M token context for comprehensive document analysis.

Gemini 2.5 Pro

VALUE CHAMPION

**128.7**

DeepSeek R1-0528 delivers exceptional 87.5% AIME mathematical reasoning performance at \$0.55/\$2.19 pricing structure, enabling 95% cost savings versus premium alternatives while maintaining competitive analytical capabilities, open-source MIT licensing, and self-hosting options for complete data sovereignty.

DeepSeek R1

 **Software Engineering Excellence**

For mission-critical development workflows requiring maximum coding capability, architectural understanding, and development productivity optimization:

- Claude Opus 4 (72.5% SWE-bench SOTA)
- Claude Sonnet 4 (72.7% cost-efficient)
- OpenAI o3 (69.1% competitive)

**Strategic Advantage:** Claude 4 series dominates through extended thinking innovation, delivering unprecedented 3-5x productivity multipliers for complex development workflows, superior architectural comprehension, and measurable code quality improvements that justify premium pricing for business-critical applications.

 **Strategic Analysis & Intelligence**

For comprehensive research, strategic planning, complex reasoning, and expert-level analytical tasks requiring PhD-level domain expertise:

- Gemini 2.5 Pro (84.0% reasoning leader)
- Claude Sonnet 4 (83.8% balanced excellence)
- OpenAI o3 (83.3% cost-effective)

**Context Champion:** Gemini 2.5 Pro's industry-leading 1M token context window enables comprehensive enterprise document analysis, strategic intelligence synthesis, and multi-document comparative research that transforms executive decision-making capabilities.

 **Value Optimization & Scale**

For cost-conscious deployments requiring strong performance with optimal economics, enabling unprecedented scale and budget efficiency:

- DeepSeek R1-0528 (87.5% AIME, \$1.37 avg)
- OpenAI o4-mini (efficient reasoning)
- OpenAI o3 (post-cut pricing)

**Efficiency Revolution:** DeepSeek R1-0528 delivers enterprise-grade 87.5% AIME mathematical reasoning at revolutionary \$0.55/\$2.19 pricing, enabling 95% cost savings and unprecedented scale economics through open-source MIT licensing and self-hosting capabilities.

# AI Model Intelligence & Economics Platform

Top 10 Global AI Models • November 2025 • Including Chinese Leaders

✓ Updated Nov 7: Claude 4.5, GPT-5, Grok 4, DeepSeek V3.1, Qwen 2.5-Max

Top 10 Global AI Models: Performance vs Cost - November 2025



OVERALL LEADER

**86.5%**

Claude Sonnet 4.5 • Best coding & reasoning

TOP CHINESE MODEL

**82.0%**

DeepSeek V3.1 • 13x cheaper than GPT-5

BEST VALUE

**119.0**

DeepSeek V3.1 • 82.0% / \$0.69 avg cost

COST RANGE

**65x**

\$0.69 to \$45 per 1M avg tokens

Data Driven  
Dashboard,  
Guides  
Apps and  
Analytics

AI-Assisted  
Development and  
Vibe Coding

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

Where would you like to begin?

Update this app for the current date and models including now top Chinese and Global Models, Top 10 Globally

Researching latest AI model rankings and performance metrics.

I'll search for the latest AI model information to update this with current November 2025 data.

4 steps  
GPT-5 Grok 4 pricing API costs November 2025

Synthesized global and Chinese AI models with current benchmarks and pricing data.

Perfect! I have all the latest data for November 2025. Let me update the app with current models, including the top Chinese AI models.

9 steps  
Orchestrated tooltip refinement for updated model information.  
Refined label positioning for expanded model roster.

Perfect! I've completely updated the app with the latest November 2025 data. Here's what's new:

## Top 10 Global AI Models (Nov 2025)

### Western Leaders:

1. **Claude Sonnet 4.5** - 86.5% overall, 77.2% SWE-bench (best coding model)
2. **GPT-5** - 85.8%, aggressive pricing at \$1.25/\$10 with 90% caching discount
3. **Claude Opus 4.1** - 84.5%, deep reasoning specialist
4. **Gemini 2.5 Pro** - 84.0%, massive 2M token context window
5. **Grok 4** - 83.5%, live X/Twitter data integration

**Chinese Powerhouses:** 6. **DeepSeek V3.1** - 82.0%, trained for only \$5.5M (vs \$100M+ Western models) 7. **Qwen 2.5-Max** - 81.5%, Alibaba's flagship with 89.4 Arena-Hard score 8. **DeepSeek R1** - 80.0%, 87.5% AIME at \$0.55, 2.19 (MIT license)

# AI Model Intelligence & Economics Platform

Top 10 Global AI Models • November 2025 • Including Chinese Leaders

Updated Nov 7: Claude 4.5, GPT-5, Grok 4, DeepSeek V3.1, Qwen 2.5-Max

## Top 10 Global AI Models: Performance vs Cost - November 2025



### OVERALL LEADER

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65x

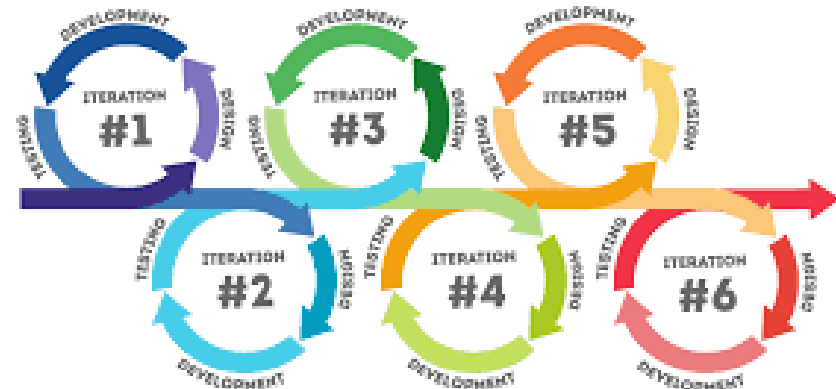
\$0.69 to \$45 per 1M avg tokens

Publish and Copy Link: <https://claude.ai/public/artifacts/378c887b-efdf-4457-9d69-10b728e1641a>

# 💡 Top Tips for AI-Assisted Development (Vibe Coding)

3) Begin Simply and Build Step by Step

4) Iterative Development Process  
Prompt -> Test -> Run -> Repeat



# AI Economic Impact on Higher Education

Executive Strategic Overview | Data as of Q2 2025

Federal Reserve

Market Verified

Overview

Employment Crisis

Investment & ROI

Strategic Insights

CRITICAL

ADOPTION

JOBS

MARKET

5.8%

Peak Grad Unemployment  
↑ 41% vs 2023

92%

Students Using AI  
↑ from 66% (2024)

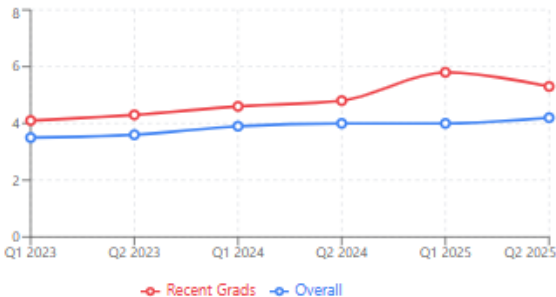
-50%

Tech Entry Hiring  
Since 2019

\$1.85B

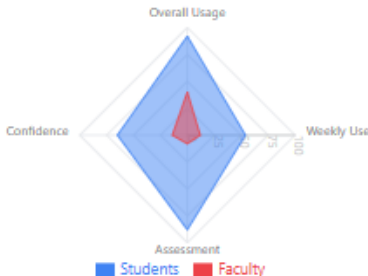
US AI in Ed (2025)  
+25% YoY

## Graduate Employment Crisis



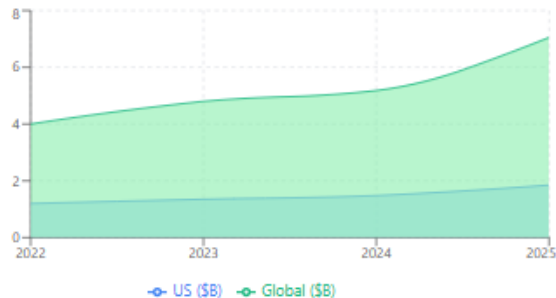
Fed Data: Q1 2025 peak of 5.8%, highest since 2013

## Adoption Gap: Students vs Faculty



HEPI 2025: 92% student vs 14% faculty teaching confidence

## AI Education Market Growth



Market Research: \$7.05B global, 36% CAGR to 2034

## Entry-Level Job Impact



Oxford Economics: -35% entry-level since Jan 2023

# AI Economic Impact on Higher Education

Executive Strategic Overview | Data as of Q2 2025

Federal Reserve

Market Verified

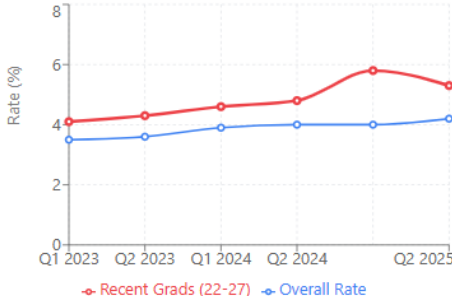
Overview

Employment Crisis

Investment & ROI

Strategic Insights

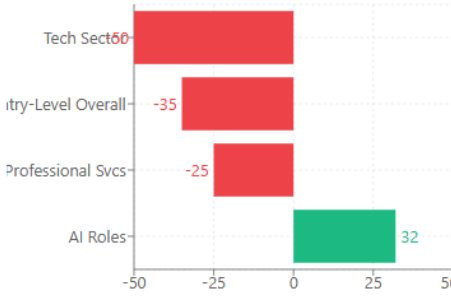
## Unemployment Trend Analysis



### Key Findings

- Peak unemployment: 5.8% in Q1 2025 (highest since 2013)
- 41% increase from 2023 baseline (4.1%)
- First sustained period above overall rate since 1990
- Source: Federal Reserve Bank of New York & St. Louis

## Job Market Disruption



### Impact Summary

- Tech hiring down 50% from 2019 pre-pandemic levels
- Overall entry-level declined 35% since January 2023
- AI-related roles up 32% (offsetting traditional losses)
- 49% of Gen Z believe AI reduced college ROI

Link to Source:

<https://claude.ai/public/artifacts/5c72bfbc-2b9e-4123-8649-5f3214e242e7>

<iframe src="https://claude.site/public/artifacts/5c72bfbc-2b9e-4123-8649-5f3214e242e7/embed" title="Claude Artifact" width="100%" height="600" frameborder="0" allow="clipboard-write" allowfullscreen"></iframe>

# The Prompt Window and Artifact/Code Window

Remix of Interactive Climate Change and Polar Ice Dashboard ▾

RU

Could you verify the data but also make this suitable for an administrator at a top university in the US with suitable aesthetics and contextualization.

Verifying data and contextualizing for university administration. ▾

I'll verify the data and create a professional executive dashboard suitable for university administrators.

^ 2 steps

🌐 "higher education" AI investment spending US 2024 2025 billions 10 results ▾

• Verified investment data and curated professional dashboard presentation. ⌚ 18s ▾

Now I'll create a professional executive dashboard with verified data:

AI Economic Impact: Executive Dashboard for Higher Education

Interactive artifact

Get notified when Claude finishes longer tasks like this one. [Turn on notifications](#)

v2 • Latest

Copy ▾ Publish ✕

```
... className="text-blue-800 rounded-full font-medium">
  Federal Reserve Data
</span>
<span className="px-3 py-1 bg-green-100 text-green-800 rounded-full font-medium">
  Market Research Verified
</span>
<span className="px-3 py-1 bg-purple-100 text-purple-800 rounded-full font-medium">
  Multi-Source Analysis
</span>
</div>
</div>
</div>

{/* Key Metrics Cards */}
<div className="max-w-7xl mx-auto mb-8">
  <div className="grid grid-cols-1 md:grid-cols-4 gap-6">
    <div className="bg-white rounded-lg shadow-md p-6 border-t-4 border-red-500">
      <div className="flex items-center justify-between mb-2">
        <AlertCircle className="text-red-500" size={24} />
        <span className="text-xs text-gray-500 font-medium">CRITICAL</span>
      </div>
      <div className="text-3xl font-bold text-gray-900 mb-1">5.8%</div>
      <div className="text-sm text-gray-600">Peak Recent Grad Unemployment</div>
      <div className="text-xs text-red-600 mt-2 font-medium">↑ 41% vs 2023 (4.1%)</div>
    </div>

    <div className="bg-white rounded-lg shadow-md p-6 border-t-4 border-blue-500">
      <div className="flex items-center justify-between mb-2">
        <Users className="text-blue-500" size={24} />
      </div>
      <div className="flex items-center justify-between mb-2">
        <Users className="text-blue-500" size={24} />
      </div>
    </div>
  </div>
</div>
```

# Please Verify Primary Sources

## PRIMARY SOURCES CITED:

1. Federal Reserve Bank of New York - Labor Market for Recent College Graduates
2. **Federal Reserve Bank of St. Louis** - Economic research and analysis
3. **HEPI (Higher Education Policy Institute)** - Student Generative AI Survey 2025
4. **Precedence Research** - AI in Education Market analysis
5. **Global Market Insights (GMI)** - Market sizing studies
6. **Oxford Economics** - Graduate employment research
7. **SignalFire** - Tech hiring and VC research
8. **Ellucian** - Higher education technology surveys
9. **Ithaka S+R** - Faculty AI adoption research
10. **Digital Education Council** - Global student surveys
11. **Government of Canada** - Budget 2024 documents
12. **New York State** - Budget documents
13. **Universities Canada** - Research and statistics
14. **Chronicle of Higher Education** - Institutional reporting
15. **Stanford AI Index Report 2025** - Global AI trends

All data points in the dashboard are verifiable from authoritative primary sources.

# Specify Other Areas needed

## Strategic Implications, Institutional, Investment, Budget Impact Scenarios

### ⚠ Strategic Implications for Leadership

#### Workforce Readiness Crisis

With 92% of students using AI but only 14% of faculty confident teaching with it, institutions risk graduating students unprepared for an AI-transformed workplace. Entry-level jobs—traditionally the bridge between education and career—are declining rapidly (50% in tech, 35% overall since 2023).

#### ROI Opportunity

Administrative automation offers tangible returns: 10-15% workload reduction translating to \$5-10M annual savings for large institutions. However, initial infrastructure investment (2-5% operating budget) and ongoing faculty development (1-3%) require strategic budget reallocation.

#### Investment Imperative

The \$1.85B US AI education market (2025) represents both opportunity and competitive pressure. Peer institutions are making substantial investments: Empire AI (\$275M), major research universities (\$50M+ partnerships). Delayed action risks institutional competitiveness.

#### Faculty Development Gap

The adoption divide isn't just about technology—it's about pedagogy and institutional culture. 93% of higher ed staff expect to expand AI use, yet implementation lags. Success requires comprehensive faculty training, clear policies, and change management beyond IT deployment.

**Data Sources:** Federal Reserve Banks (NY, St. Louis), HEPI 2025, Digital Education Council, Ellucian, Market Research (Precedence Research, GMI), Oxford Economics, SignalFire, NACUBO, Universities Canada, Stanford AI Index 2025

### AI Economic Impact on Higher Education

Executive Strategic Overview | Data as of Q2 2025

Federal Reserve Market Verified

Overview Employment Crisis Investment & ROI Strategic Insights

#### Major Institutional Investments

UC Berkeley <small>Federal Research</small>	\$392M
Empire AI (NY) <small>State Initiative</small>	\$275M
U. of Florida <small>Nvidia Partner</small>	\$50M
Stony Brook <small>AI Institute</small>	\$15M
Additional: Canada committed \$2.4B in Budget 2024, including \$2B over 5 years for AI compute infrastructure.	

#### Budget Impact Scenarios

Area	Low	Mid	High
AI Infrastructure	2%	5%	10%
Admin Savings	+5%	+10%	+15%
Faculty Training	1%	3%	5%
AI Literacy Programs	1%	2%	4%

**ROI Evidence:** Georgia State's AI chatbot saves \$5-10M annually (10-15% admin workload reduction). UMaine: \$500K AI budget = 0.7% of operating budget.

# Correcting Errors Running Artifact

## Repeat and Iterate Until App Achieved (7 Versions)

Error running artifact

An error occurred while trying to run the generated artifact.

Cell is not defined

Try fixing with Claude

Artifact published

Published (Public)

Anyone on the web with the link can view the Artifact only. Your chat will remain private.

<https://claude.ai/public/artifacts/5c72bfbc...>

Copy link

Unpublish

Once Artifact is unpublished, it cannot be republished. A new Artifact must be created.

Get embed code

RU Place visualizations near top and Make suitable for single page presentation and navigation.

2 steps

Refactored code by swapping Growth terminology for TrendingUp.

Wait, I did that backwards. Let me fix it properly.

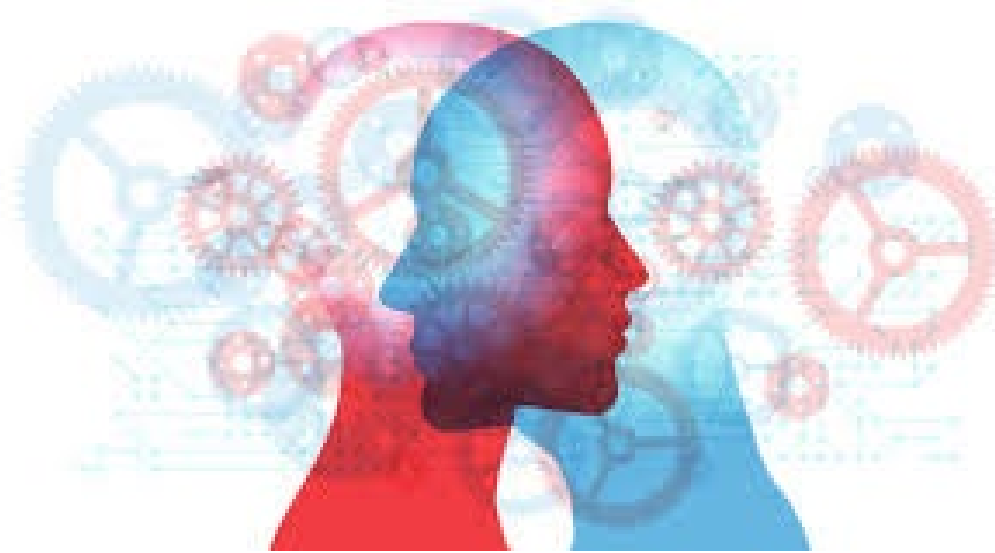
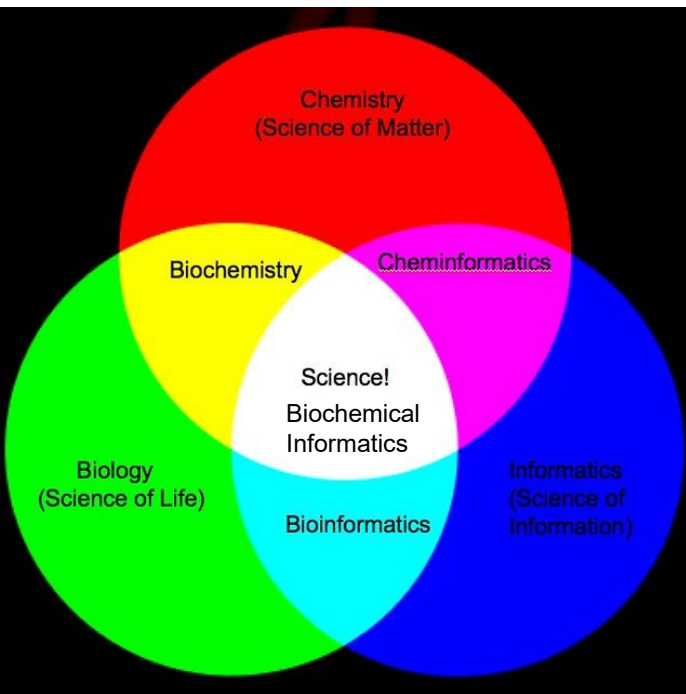
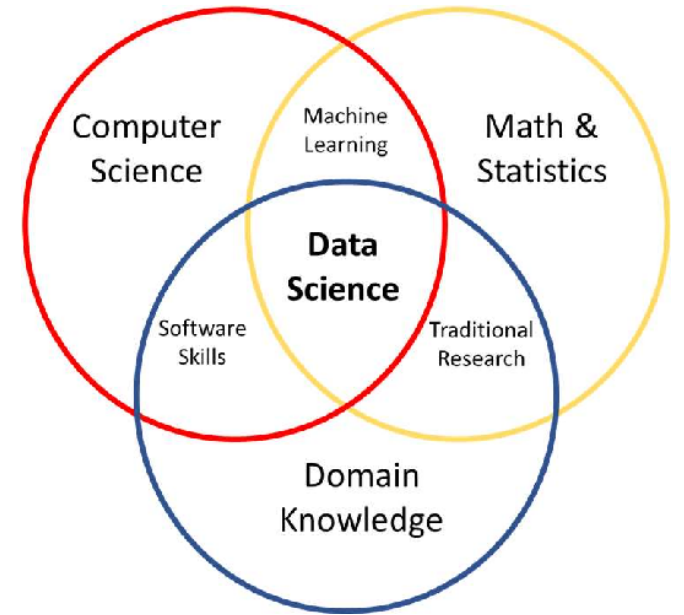
Perfect! I've restructured the dashboard for single-page presentation with:

**Navigation Features:**

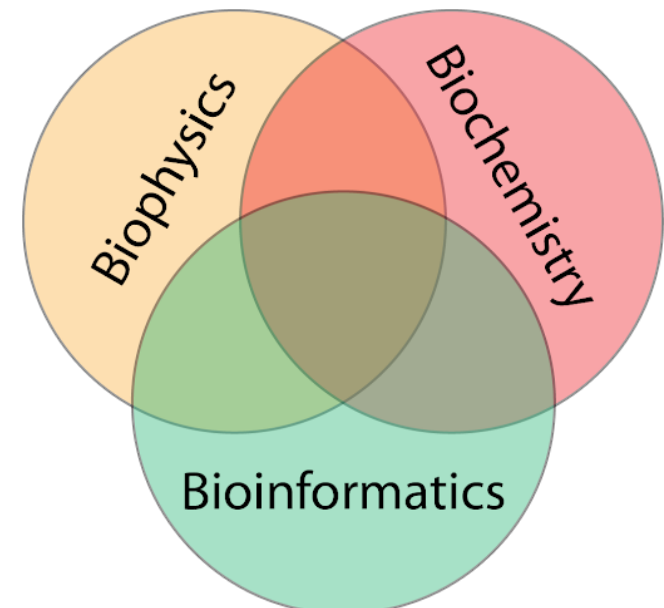
- 4 tabbed views at the top: Overview, Employment Crisis, Investment & ROI, Strategic Insights
- Easy switching between different perspectives
- All content fits on one screen per view

**Layout Improvements:**

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



Interdisciplinary Research



# Interdisciplinary Research Synthesis

AI excels at making connections across disparate domains, fostering new insights through analogies and pattern matching.



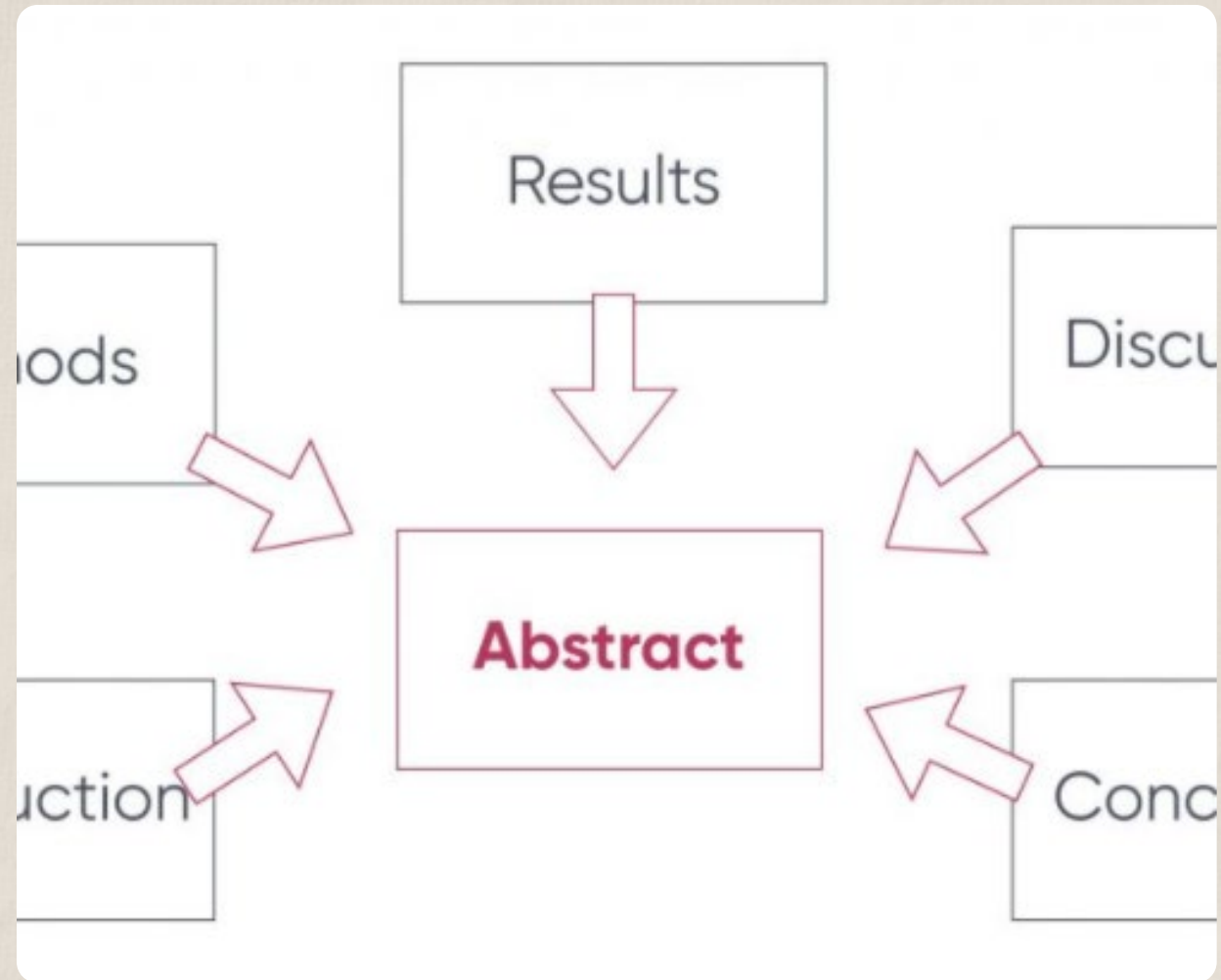
Biochemical Informatics



Systematic Review Frameworks

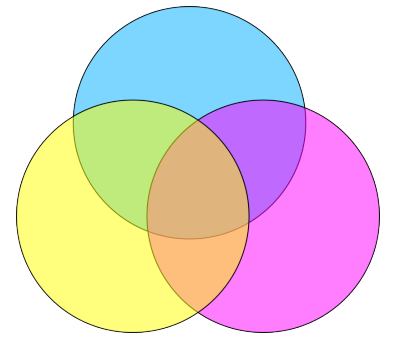


Research Insight Architects



# Jungian Psychoanalysis (Personas) + Exercise and Nutrition App

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



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

Psychiatrist/Psychoanalyst  
Persona's: Dr: C.G Jung,  
James Hillman,  
Dr. 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

## Spartan Amazonia

Mind-Body Training System

Integrating movement, mindfulness, and nutrition for optimal performance.

### Begin Your Journey

What physical and psychic levels and balance are you able to achieve?

It's afternoon and I'm thinking about yoga...

Initiate Suggestions

### Urban Spartan

Elite Performance Optimization System  
For High-Performing Men Who Demand Peak Performance

Start Your Optimization

### Preview Your Dashboard

See what you'll get after 30 days of tracking

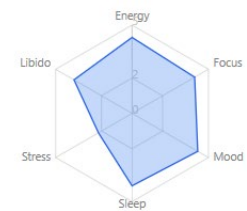
30  
Days Tracked

4.3  
Energy Level

4.1  
Focus Level

8.2h  
Sleep Average

### Performance Profile





# The Evolution of Scientific Knowledge

AI is transforming research by creating new methodological infrastructures that enable thousands of subsequent discoveries.



Single methodological innovations birth new fields.

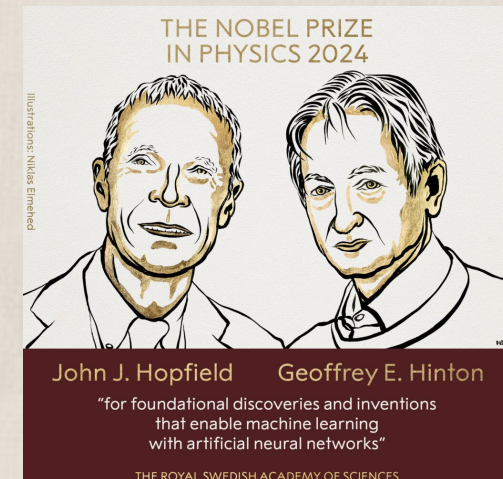
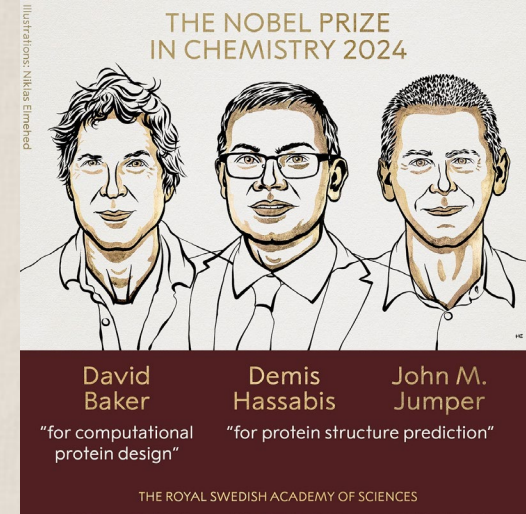
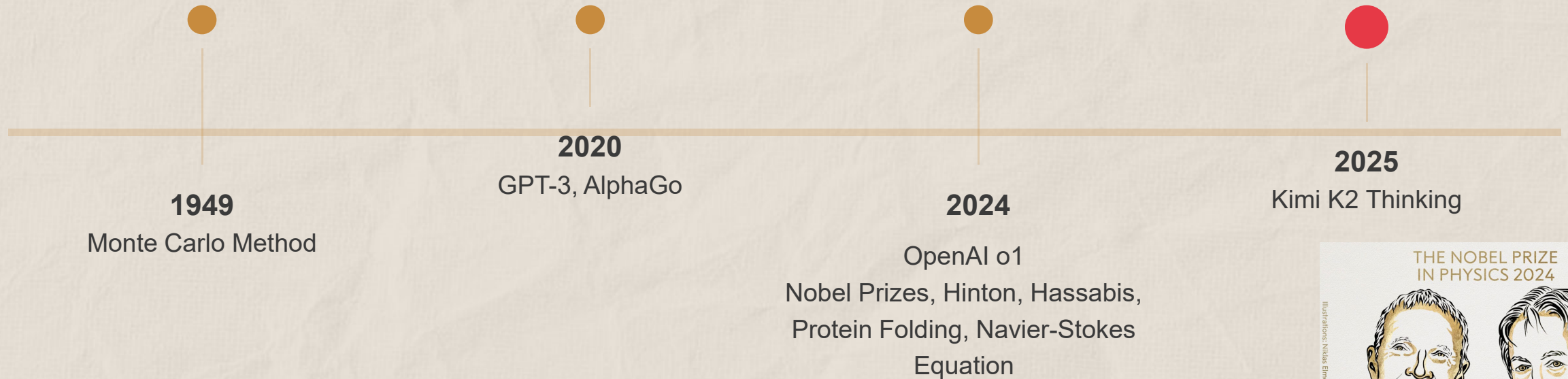


New common languages are created across disciplines.



Cumulative adoption builds bridges for research.

# The Road to ASI: A Timeline of Innovation



# AI Literacy Curriculum Builder

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

Dr. Raymond Uzwysyn,  
University of California, Riverside

[raymondu@ucr.edu](mailto:raymondu@ucr.edu)

<https://www.linkedin.com/in/rayuzwysyn/>



## 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 >

# Current Frameworks Available



**Bruno Latour (Actor-Network Theory):** Understanding AI as socio-technical networks where humans, machines, and social relationships are interconnected actors. Laboratory Life



**N. Katherine Hayles (Posthuman & Cybernetic Theory):** Exploring how AI challenges traditional notions of human consciousness, embodiment and technosymbiosis. Essential works: How We Became Posthuman, Unthought, From Bacteria to AI



**Donna Haraway (Cyborg Theory & STS):** Examining AI through a feminist angles of situated knowledge. Focus on relationality and breaking traditional categories. Essential works: A Cyborg Manifesto, Situated Knowledges

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

# 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

# Present and 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 Thinking

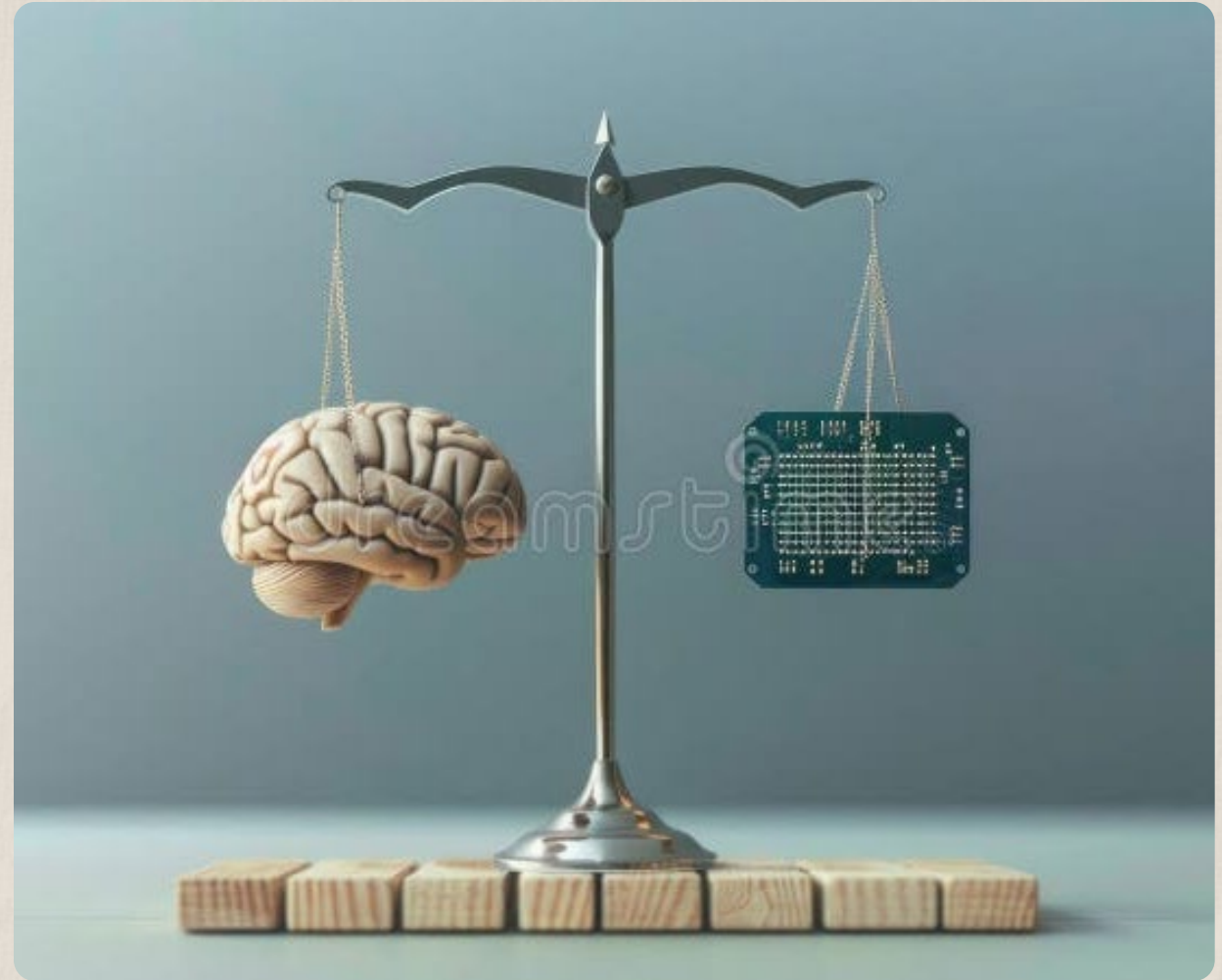


<https://www.anthropic.com/learn>

# Ethical Considerations

Responsible AI development requires awareness of potential pitfalls and a commitment to best practices.

- 👁 Be aware of AI hallucinations and biases.
- 🛡 Validate information with reliable sources.
- © Respect IP through fair use and proper licensing.



# Ethical Considerations



## AI Hallucinations

Maintain awareness of AI hallucinations, which are probabilistically likely but factually incorrect outputs, requiring careful validation.



## Bias Awareness

Be aware of potential biases in AI outputs stemming from training data, ensuring fairness and accuracy in applications.



## Intellectual Property

Respect intellectual property by using fair use for educational purposes and properly licensing material for commercial applications.



## Human Judgment

Consider AI as probabilistic tools requiring human judgment rather than infallible oracles, ensuring responsible use and development.



# 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](mailto:raymondu@ucr.edu)
  - f) for educational/non-commercial use only

# 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.

# 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/](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-claudesonnet4-claudeopus4-activity-7338241601997107200-cWOJ/](https://www.linkedin.com/posts/rayuzwyshyn_cursor-claudesonnet4-claudeopus4-activity-7338241601997107200-cWOJ/)

AI Code Composers

[https://www.linkedin.com/posts/rayuzwyshyn\\_ai-code-composers-the-next-frontier-in-activity-7259711548049285120-KFn4/](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 21<sup>st</sup> 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--jgifc/>

# Thank you for Attending!

## Comments and Questions

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<https://rayuzwysyn.net>