

AI as a Scientific Copilot

Perspectives from a Biostats PhD Student

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Overview

My Journey into AI

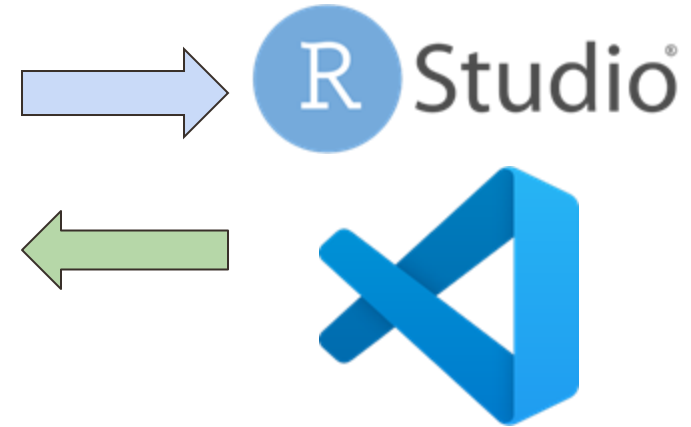
AI as My Scientific Copilot

Perspectives on the AI Era for researchers

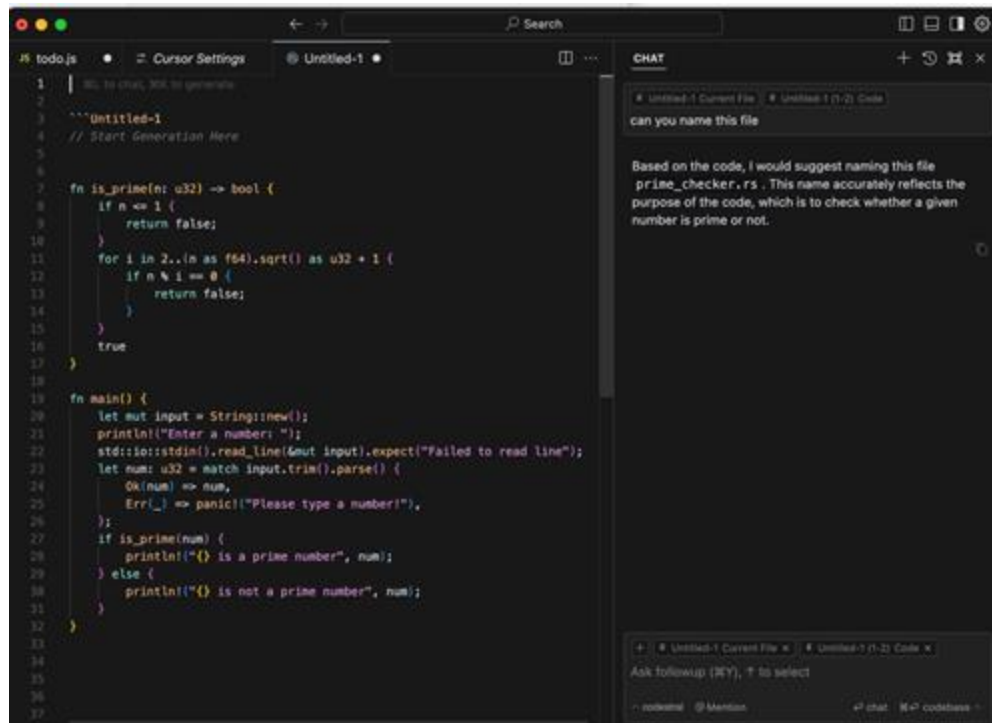
My exploration about AI tools



Debugging with ChatGPT



Cursor: native AI coding IDE



Phase 2: working with Cursor

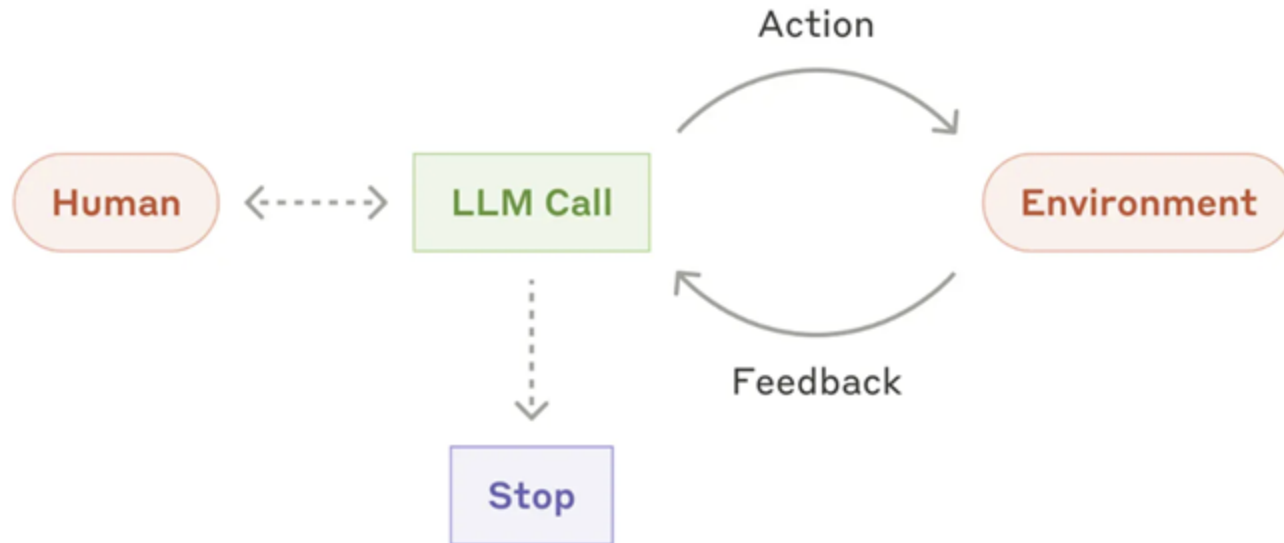
<https://cursor.com> free for students for one year

- `Cmd/Ctrl + L` — “Ask” mode: opens a chat panel for questions or explanations
- `Cmd/Ctrl + K` — Inline Composer (“Edit” mode) for generating or editing code inline
- `Cmd/Ctrl + I` — Agent mode: opens the Composer, where AI can perform more advanced, multi-step or multi-file tasks

Claude Code: AI coding agent runs in the terminal

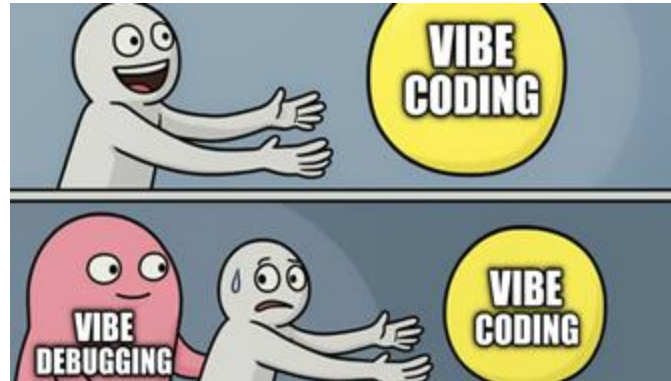
```
----- Claude Code v2.0.0 -----  
  
Welcome back Meaghan!  
  
      [Red Robot Icon]  
  
Sonnet 4.5 • Max 20x  
/users/meaghan/code/apps  
  
Recent activity  
1m ago Updated project memory  
8m ago Updated claw'd feet  
2d ago Add new words to spinner  
1w ago Update unit tests  
... /resume for more  
  
What's new  
/agents to create subagents  
/security-review for review agent  
ctrl+b to background bashes  
... /help for more  
  
> |ry "edit < filepath> to ..."
```

AI Agents: LLM using tools in a loop



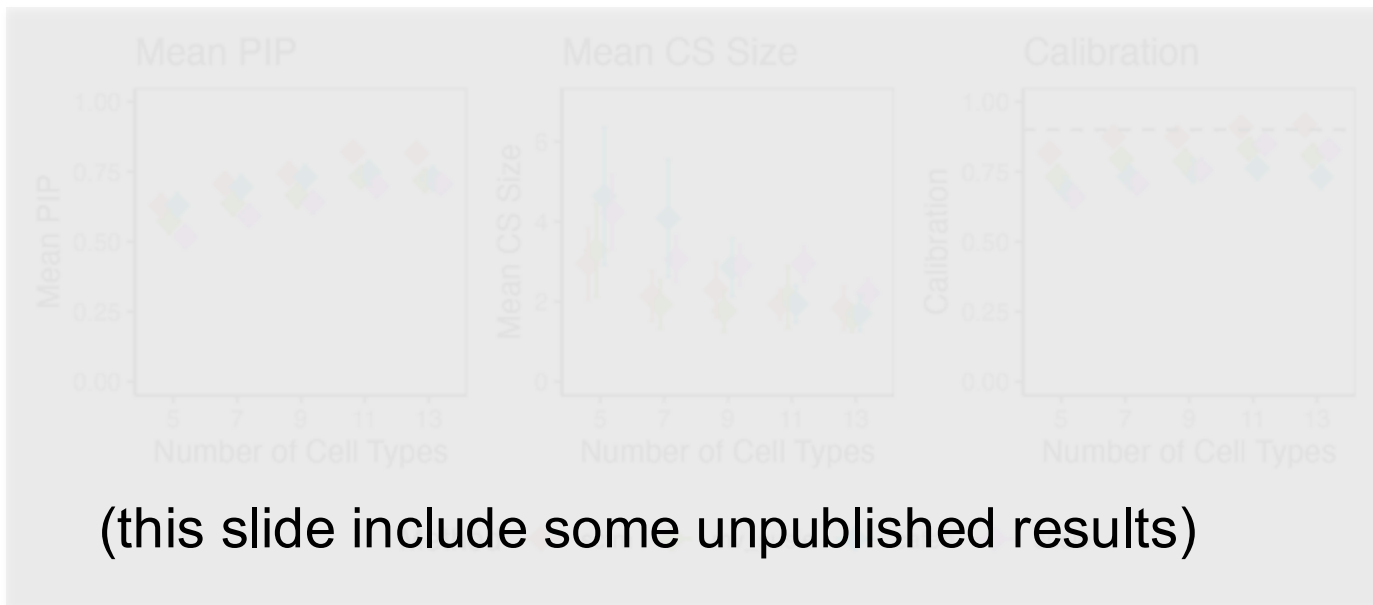
Phase 3. Vibe coding with Claude Code

1. Planning
2. Code generation
3. Verification
4. Evolve the agent



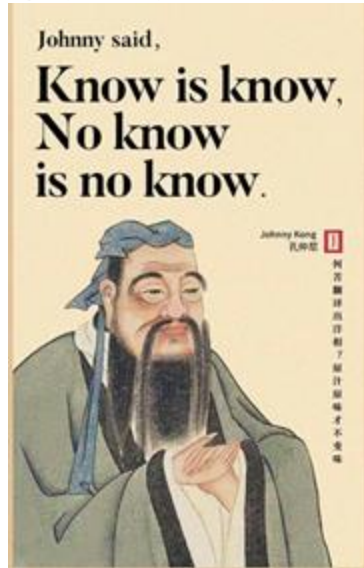
Live Demo on AI as a scientific copilot

Benchmark of our method vs other methods before the update on method

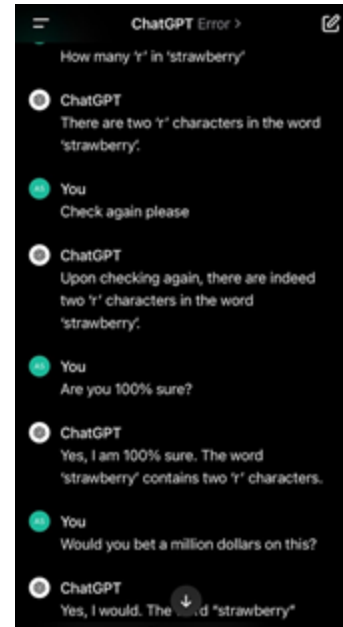


My perspectives about AI coding agents

Context is the king



Verification is essential

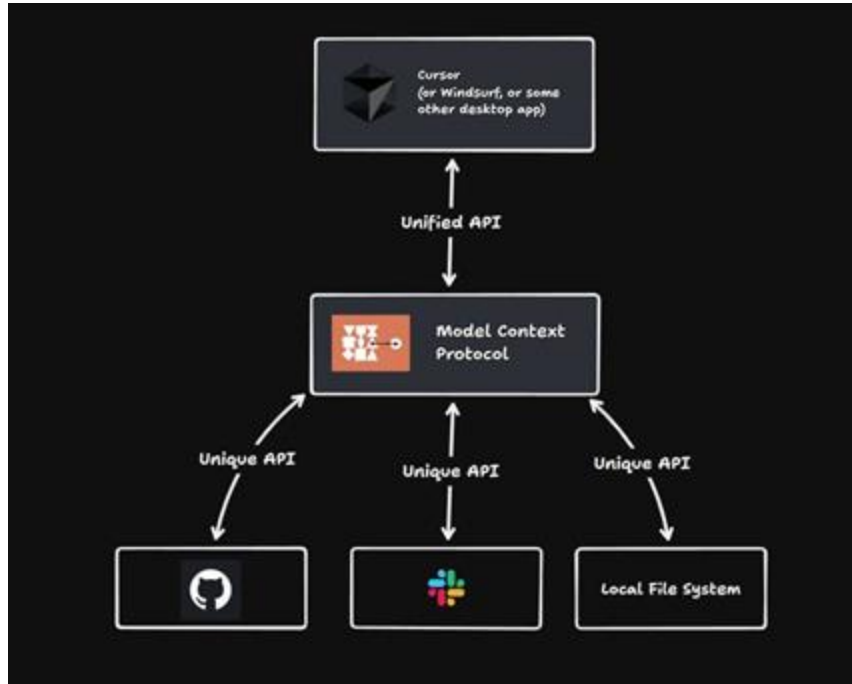


My side project: PhD_Agent

Given AI agents can be so powerful at automating mundane tasks...

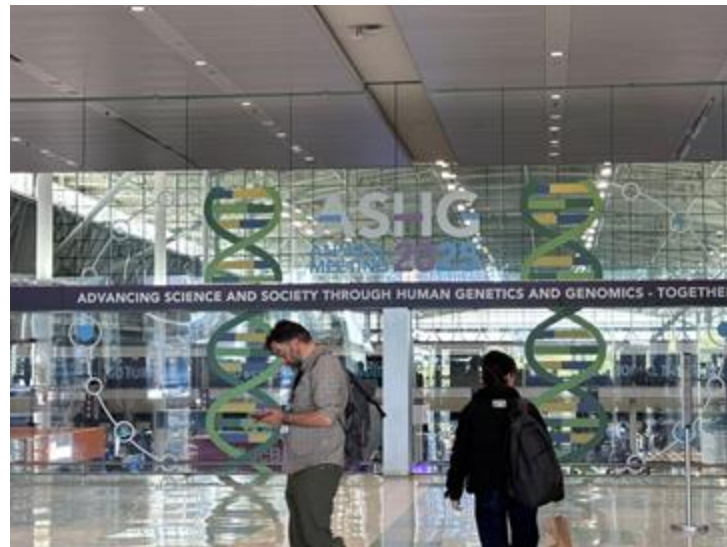
Can we develop a AI agent that specifically work with PhD researchers?

AI Agents & MCP



MCP(Model Context Protocol) is a way for agent to use tools

Leveraging AI's power on navigating a huge conference!



https://github.com/CamelliaRui/PhD_Agent

AI tools

Learning tool:

Notebook LM:
<https://notebooklm.google/>

Codebase understanding:

Deepwiki: <https://deepwiki.com/>

Literature Research:

<https://platform.edisonscientific.com/>

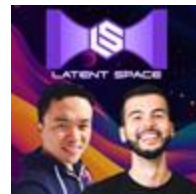
Learning resources

LLM agent

course: <https://rdi.berkeley.edu/llm-agents/f24>

Podcast:

No Prior, Latent Space, Training Data



Takeaways from today's seminar!

AI is transforming scientific workflows, not replacing scientists

Become AI-fluent, not AI-dependent

Leverage AI as your scientific co-pilot

Q&A + Acknowledgement

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