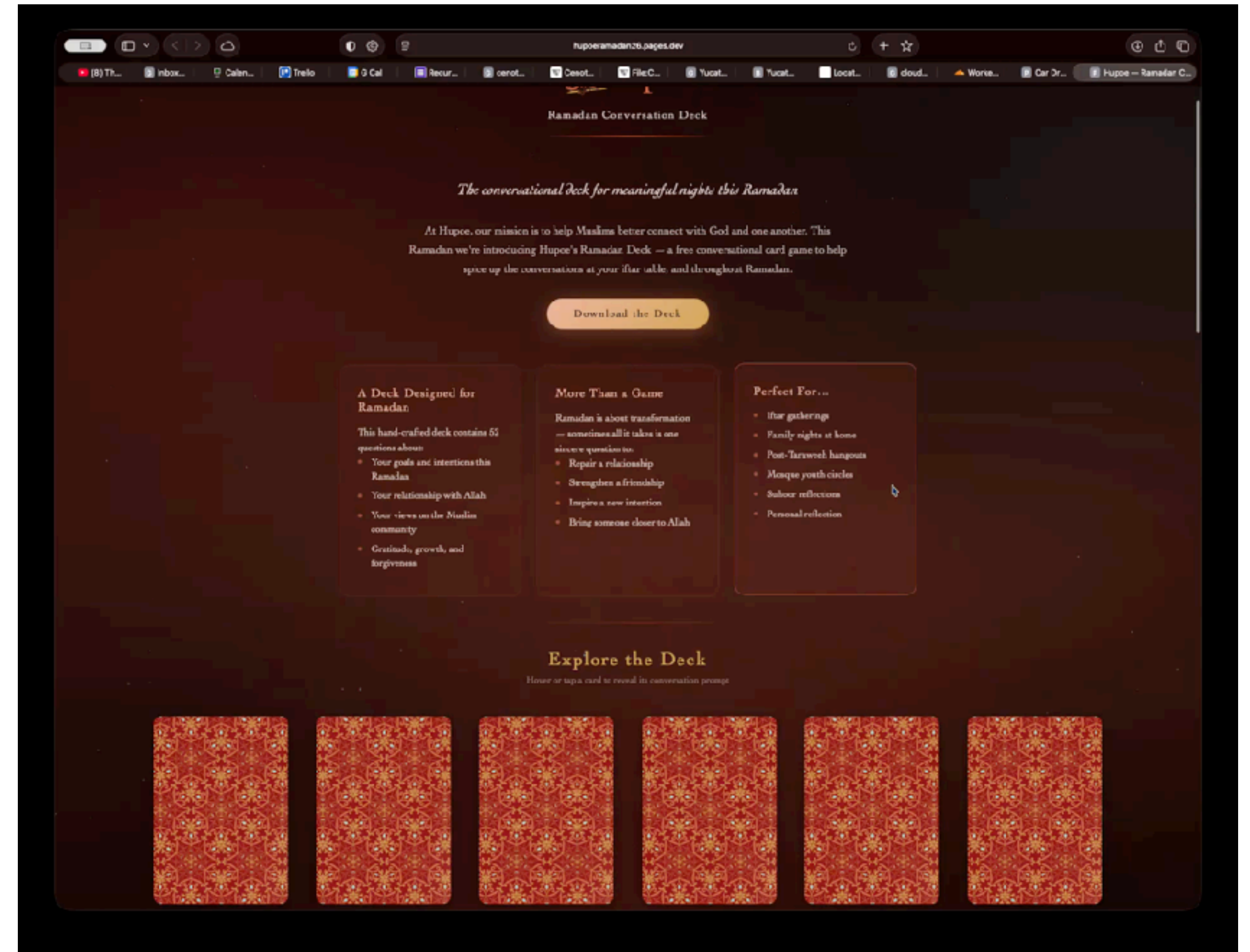


# 50 Things I Learned at RC

Tawfiq H - Spring 2026

# CloudFlare Static Hosting

- Cloudflare Pages
- Good and free
- Easy to use
- Git integration for automatic deployment
- Love static sites ❤️



# Zork

- The classic 1977 text adventure game
- Favourite game at the Barbican's exhibition
- "Game on" in 2002
- My dad found that really funny

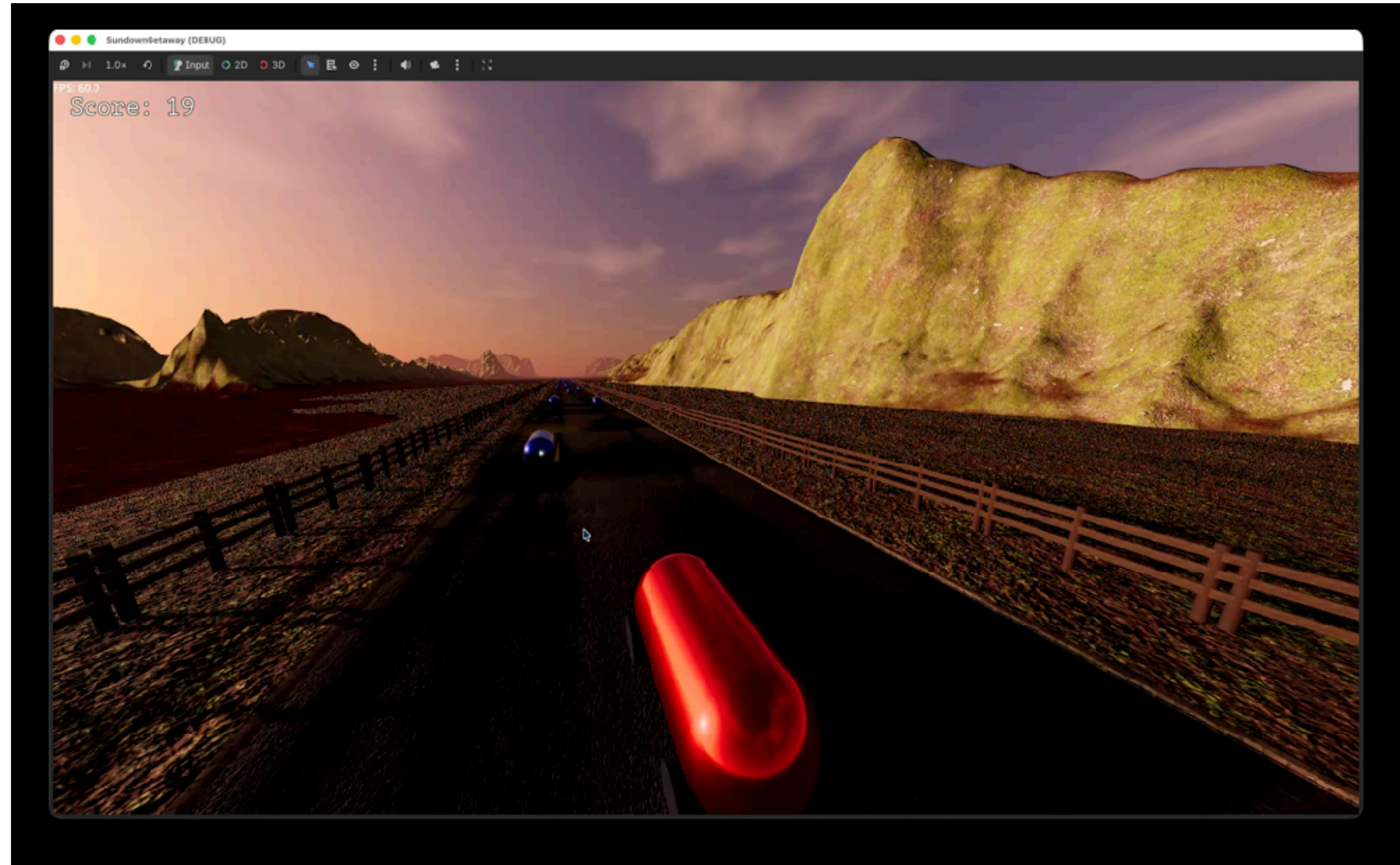
```
West of House      Score:  0  Turns:  0
ZORK I: The Great Underground Empire
Infocom interactive fiction - a fantasy
story
Copyright (c) 1981, 1982, 1983, 1984, 1985, 1986
Infocom, Inc. All rights reserved.
ZORK is a registered trademark of Infocom,
Inc.
Release 0 / Serial number 251103

West of House
You are standing in an open field west of a white
house, with a boarded front door.
There is a small mailbox here.

>
```

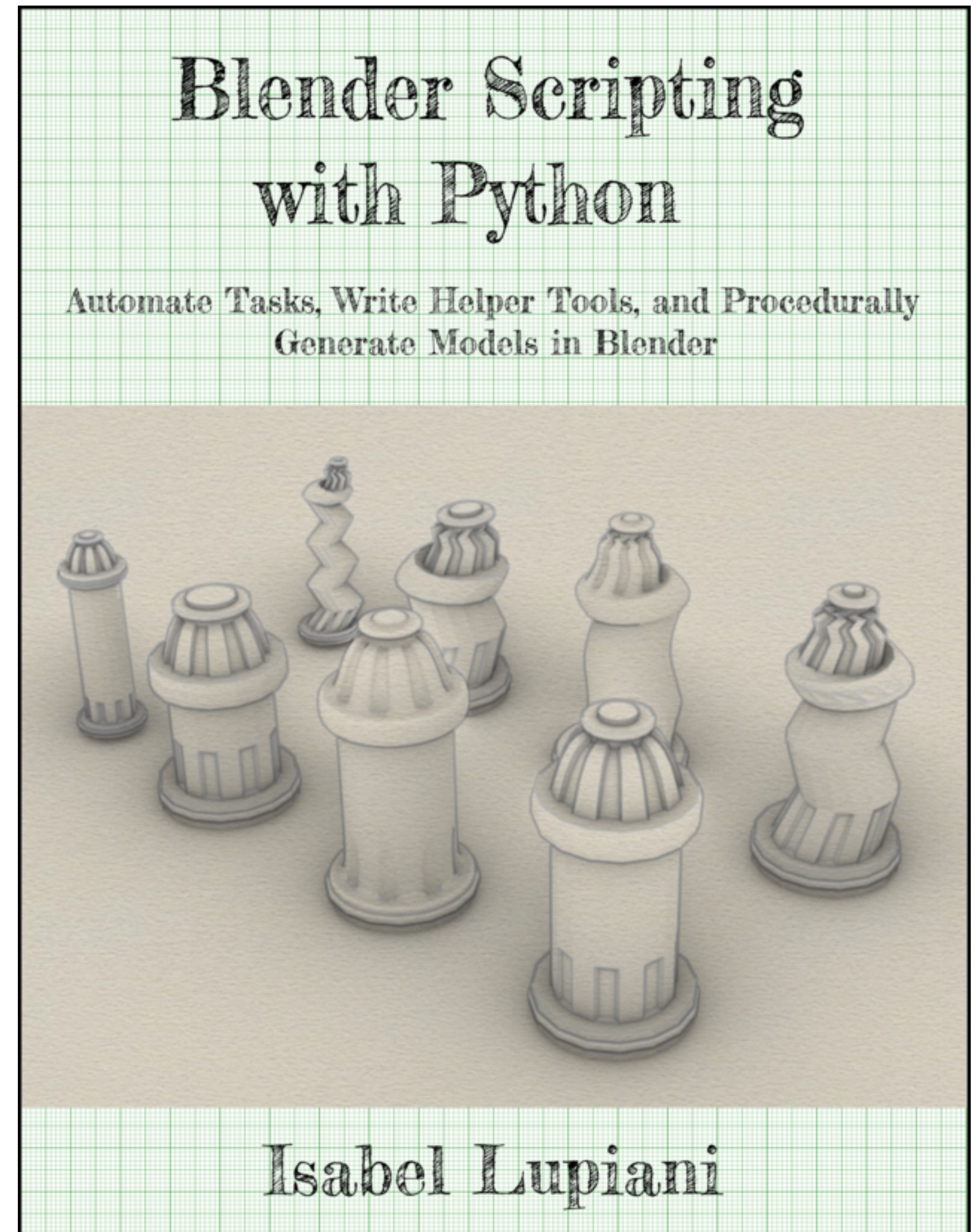
# Godot

- Cross platform game-engine
- Open Source
- Easy to export to web & iPhone etc
- Super friendly community
- Free tutorials & code



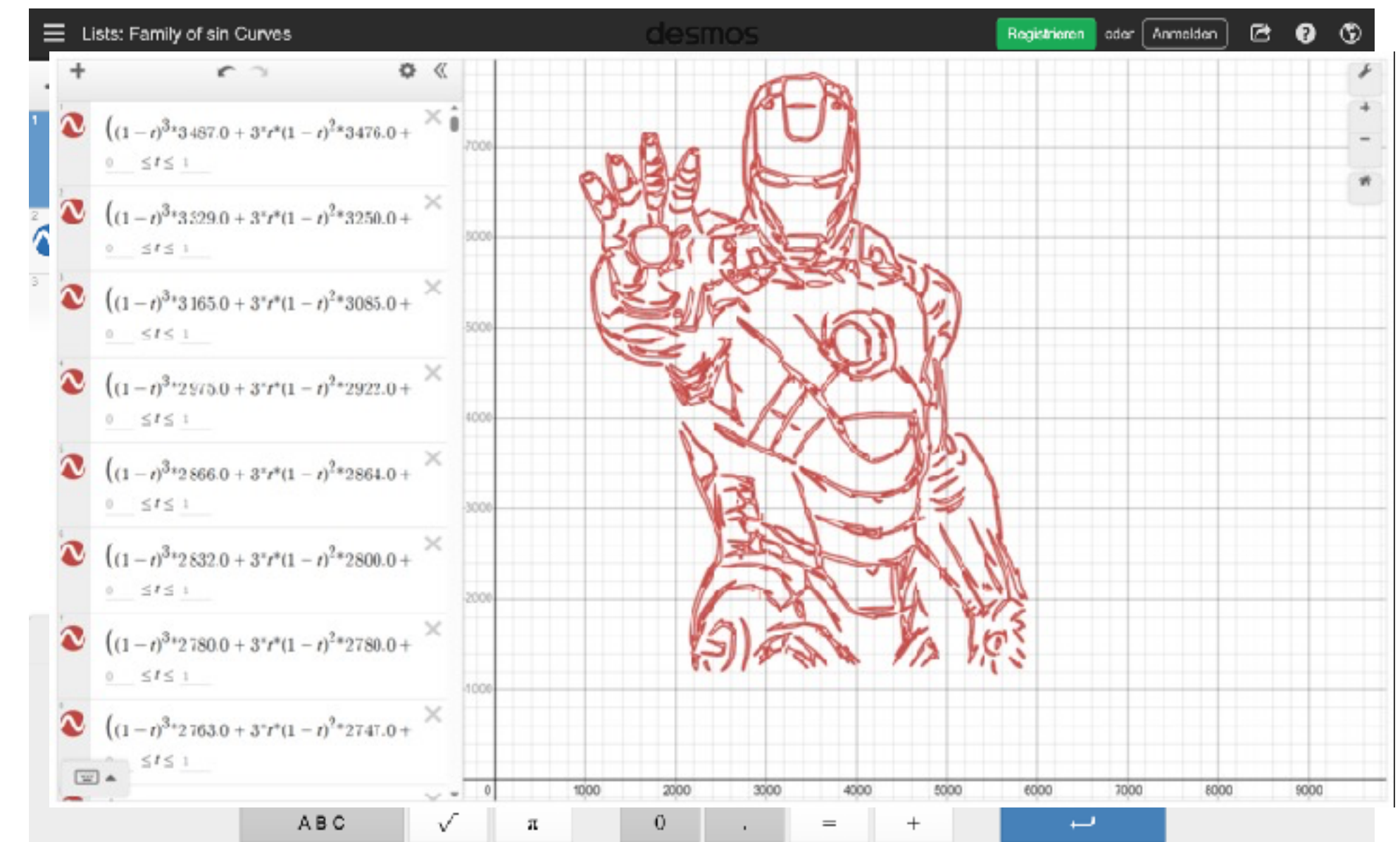
# Blender is scriptable!

- You can write Python scripts to automate and generate 3D content



# Desmos exists

- Free web based graphical calculator
- Nate is a genius at using this!



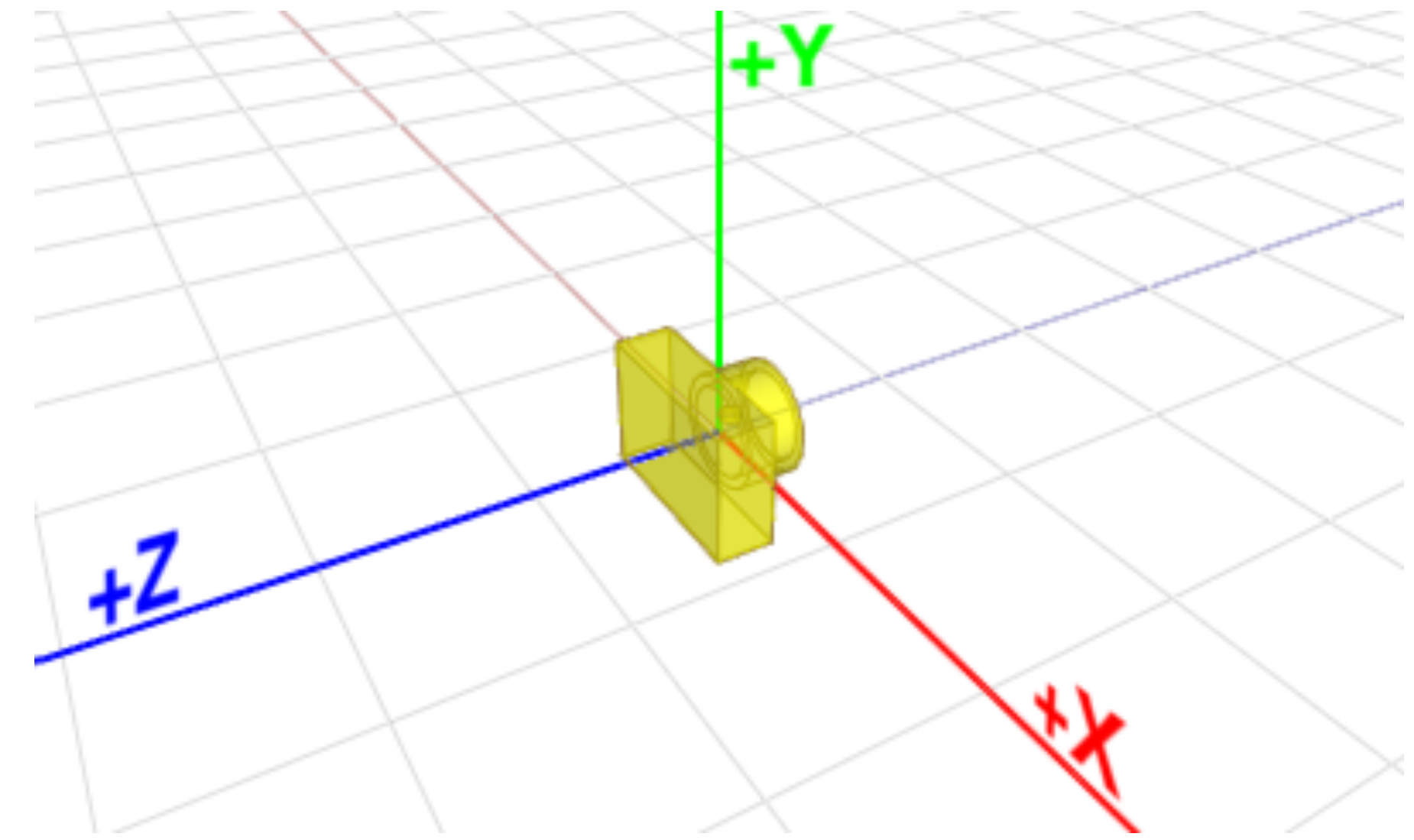
# Bevy

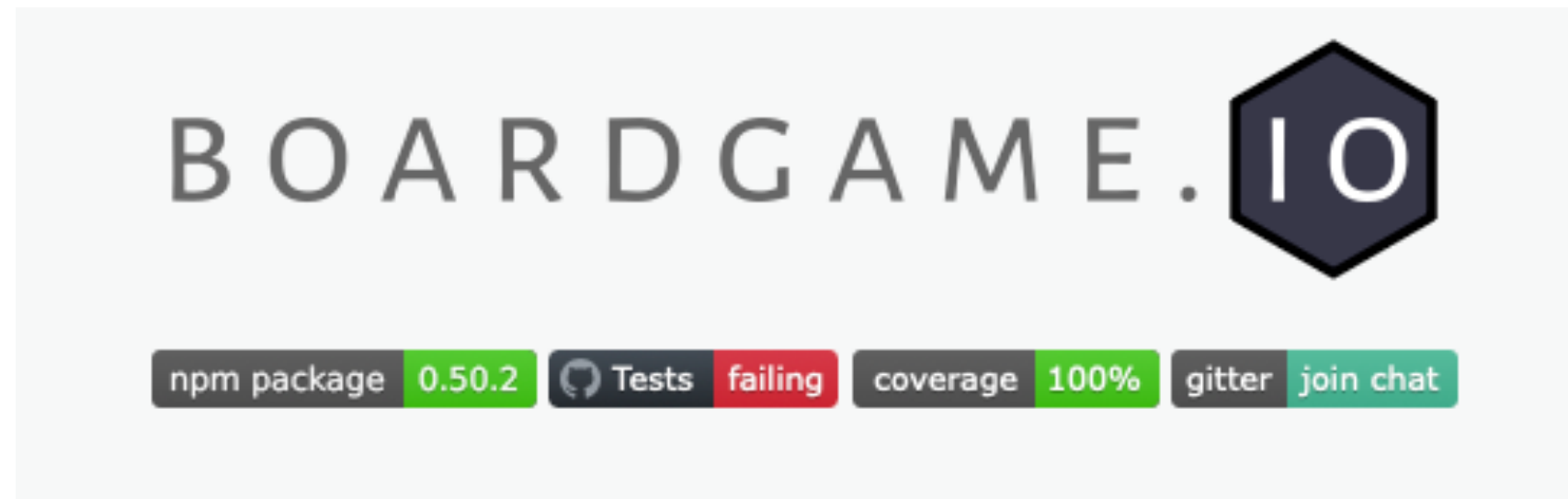
- A game engine written in Rust – super fast
- Super fast for 2D games
- Compatible with the Rcade
- Thanks Dan & Michael



# OpenGL: the camera doesn't move

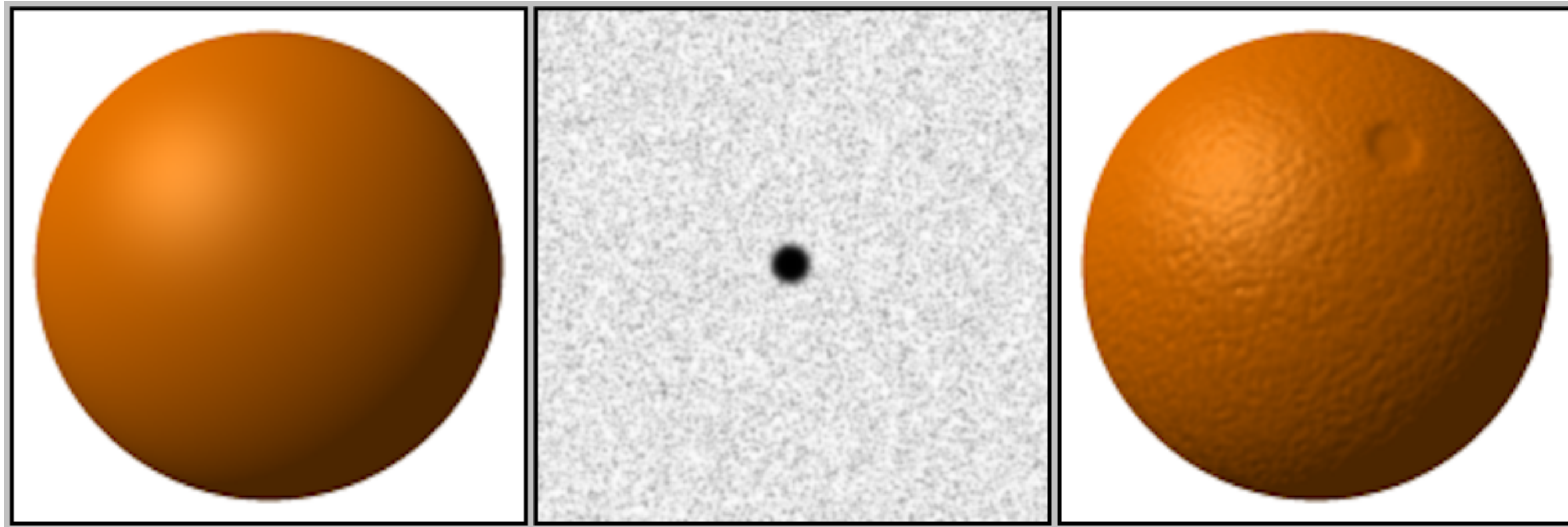
- The camera is always at (0,0) - the world is translated instead
- Graphics work by moving everything to the origin
- NOT by moving a camera through the world





- A framework for building multiplayer board games
- Abstracts lobby creation, turn logic, and game state management
- Supports simple AI players

# Realism + Bump Maps



- Nice lighting is more of a photography / artistic challenge than a coding one

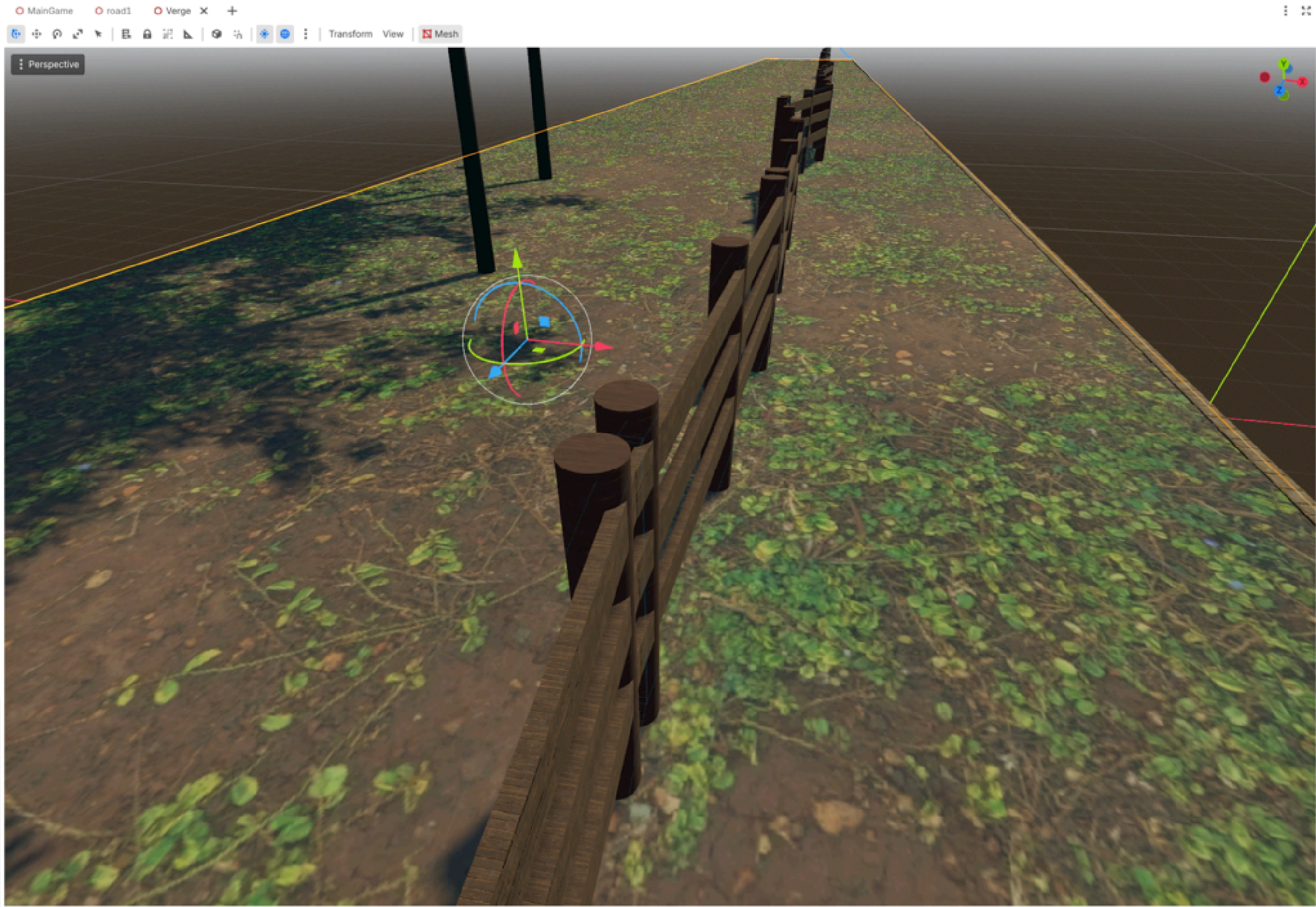
- Bump maps add surface detail and depth in

Godot

Scene Import

Filter Nodes

- Verge
  - fenceRow
  - TreesRight
  - Grass
  - StaticBody3D
  - CollisionShape3D
  - road-edge



FileSystem

res://Road/Verge/Verge.tscn

Filter Files

Favorites:

- res://
- addons
- Cars
- iosExport
- Player
  - player.gd
  - player.tres
  - player.tscn
- Road
  - road\_terrain\_2
  - Tree1
  - Verge
    - brown\_mud\_leaves\_01\_diff\_1k.jpg
    - brown\_mud\_leaves\_01\_nor\_gL1k.jpg
    - brown\_mud\_leaves\_01\_rough\_1k.jpg
    - CobbleVerge2.tres
    - CobbleVerge.tres
    - Fence.tscn
    - FenceRow.tscn
    - GrassSideRoad.tres
    - old\_wood\_floor\_diff\_2k.jpg
    - old\_wood\_floor\_nor\_gL2k.jpg
    - stone\_pathway\_02\_diff\_2k.jpg
    - stone\_pathway\_02\_nor\_gL2k.jpg
    - Verge.tscn
      - asphalt\_track\_diff\_1k.jpg
      - asphalt\_track\_nor\_gL1k.png
      - asphalt\_track\_rough\_1k.png
      - new\_terrain\_3d\_material.res
      - road1.tscn
      - RoadManager.gd
      - terrain\_assets\_textures\_and\_mesh.tres
- WebExport-dist
  - export\_presets.cfg
  - FPS\_Counter.gd
  - GameController.gd
  - icon.svg
  - MainGame.tscn
  - MobileTouchControls.gd
  - MobileTouchControls.tscn

Debugger (61)

```

Xremove - using fallback position: -1750.0 - because global position is 0.0
RoadManager::_update_segments: #NEED to spawn segment ahead - player is -1565.20849609375 and farthest segment is -1750.0 and view distance is 300with 5 segments
RoadManager::_spawn_segment_ahead: Spawned segment (number : 6) at position -2000.0 - global: 0.0
XRoadManager::_remove_segments_behind: Removing segment at position -750.0 and player position is -1565.20849609375seg_position - player_position: 815.20849609375
X Segments is currently: 5
Xremove - using fallback position: -2000.0 - because global position is 0.0
RoadManager::_update_segments: #NEED to spawn segment ahead - player is -1820.24731445312 and farthest segment is -2000.0 and view distance is 300with 5 segments
RoadManager::_spawn_segment_ahead: Spawned segment (number : 6) at position -2250.0 - global: 0.0
XRoadManager::_remove_segments_behind: Removing segment at position -1000.0 and player position is -1820.24731445312seg_position - player_position: 820.247314453125
X Segments is currently: 5
Xremove - using fallback position: -2250.0 - because global position is 0.0
RoadManager::_update_segments: #NEED to spawn segment ahead - player is -2050.09423828125 and farthest segment is -2250.0 and view distance is 300with 5 segments
RoadManager::_spawn_segment_ahead: Spawned segment (number : 6) at position -2500.0 - global: 0.0
XRoadManager::_remove_segments_behind: Removing segment at position -1250.0 and player position is -2050.09423828125seg_position - player_position: 800.09423828125
X Segments is currently: 5
Xremove - using fallback position: -2500.0 - because global position is 0.0
RoadManager::_update_segments: #NEED to spawn segment ahead - player is -2298.30829296875 and farthest segment is -2500.0 and view distance is 300with 5 segments
RoadManager::_spawn_segment_ahead: Spawned segment (number : 6) at position -2750.0 - global: 0.0
XRoadManager::_remove_segments_behind: Removing segment at position -1500.0 and player position is -2298.30829296875seg_position - player_position: 798.30829296875
X Segments is currently: 5
Xremove - using fallback position: -2750.0 - because global position is 0.0
CollisionObject3d was hit
GameController::_on_player_hit: player hit
--- Debugging process stopped ---
Set normal_enabled
Set normal_enabled
Set bent_normal_enabled
Set bent_normal_enabled
Set bent_normal_enabled
  
```

Inspector

Grass

Filter Properties

MeshInstance3D

Mesh

Size: x 15.0 m, y 250.0 m

Subdivide Width: 0

Subdivide Depth: 0

Center Offset: x 0.0 m, y 0.0 m, z 0.0 m

Orientation: Face Y

Material

Transparency: Disabled

Blend Mode: Mix

Cull Mode: Back

Depth Draw Mode: Opaque Only

No Depth Test: On

Depth Test: Default

Shading: Per-Pixel

Diffuse Mode: Burley

Specular Mode: SchlickGGX

Disable Ambient Light: On

Disable Fog: On

Disable Specular Occlusion: On

Vertex Color

Albedo

Color: [Color Picker]

Texture: [Texture Picker]

Texture Force sRGB: On

Texture MSDF: On

Metallic: On

Roughness: On

Emission: On

Normal Map: On

Bent Normal Map: On

Rim: On

Clearcoat: On

Anisotropy: On

Ambient Occlusion: On

Height: On

Subsurf Scatler: On

Back Lighting: On

Refraction: On

Detail: On

UV1

Scale: x 0.06, y 0.06, z 0.06

Offset: x 0.625, y 0.325, z 0.015

Triplanar: On

# MCP – Model Context Protocol

- Thin wrappers around existing APIs
- Useful but can feel bloated
- <https://cra.mr/mcp-skills-and-agents/>
- *many MCP servers don't need to exist" because they are either **poor API wrappers** or can be replaced with a skill file.*
- The GitHub MCP server consumed roughly 50,000 tokens of context (later trimmed to around 23,000) to teach an agent how to interact with GitHub. A SKILL.md file saying "use the gh CLI for these operations" achieved the same result in about 200 tokens.



MCP

# Skills.md

- Easier to use skills than MCP
- Swift Skills - meaningful improvement in AI-assisted Swift
- Thank you Raq for your RULES



# RAG – Retrieval-Augmented Generation

- Your context window isn't big enough for everything up front
- Selectively retrieve relevant chunks and add them to context at query time
- Sunnah Search – searches 1000's of quotes
- Thanks Victoria & Raf

Home AI Chat Vector search Admin
Hello, lawfiq Logout!

letting people sleep or waking them for prayer [Back to conversations](#)

letting people sleep or waking them for prayer

There is no evidence that the Prophet ﷺ ever woke his family to pray; rather he would go quietly to perform night prayers without disturbing them. He also discouraged forcing or compelling people into prayer. Each person's relationship with prayer is personal, and Muslims are encouraged to advise kindly and gently rather than forcibly awaken others.

The Messenger of Allah ﷺ would not come (back) to his family by night. He used to come in the morning or in the evening (before dark).

[Riyadas-Salihin 883](#)

...if you wanted to see him praying at night, you could see him praying and if you wanted to see him sleeping, you could see him sleeping.

[Sahih al-Bukhari 1141](#)

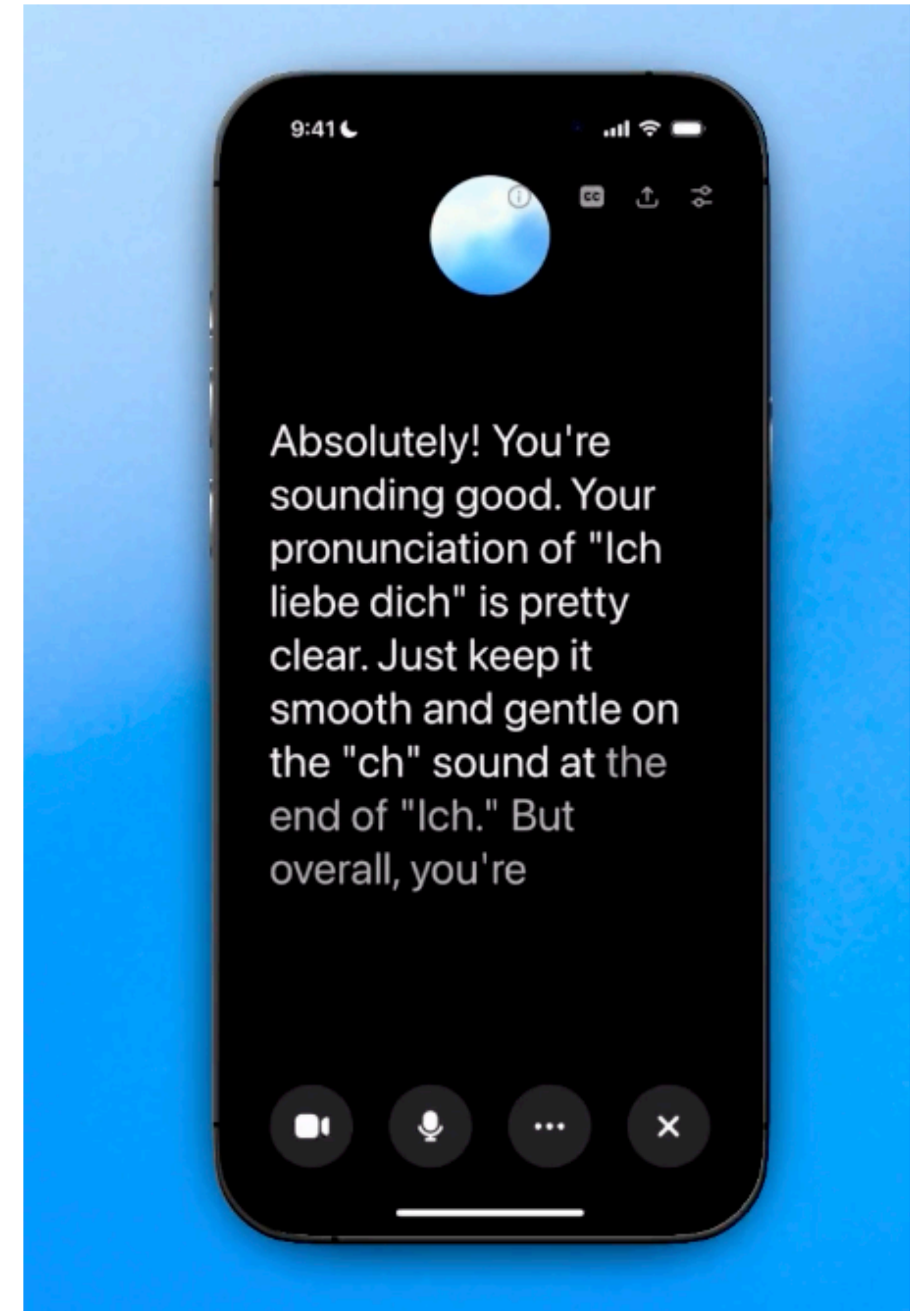
Top hadith results — let him sleep let him travel hadith

Collection	Hadith #	English	Arabic	Source URL
muslim	1927	On the authority of Abu Huraira that the Prophet (ﷺ) said: Travelling is a tortuous experience. It deprives a person of his sleep, his food and drink. When one of you has accomplished his purpose, he should hasten his return to his family.	"السَّفَرُ قِطْعَةٌ مِنَ الْعَذَابِ يَنْتَقِزُ أَحَدَكُمْ نَوْمَهُ وَطَعَامَهُ وَشَرَابَهُ فَإِذَا قَضَىٰ أَحَدُكُمْ نَوْمَهُ مِنْ رَوْحِهِ فَلْيَعَجِلْ إِلَىٰ أَهْلِهِ"	<a href="https://sunnah.com/muslim/1927">https://sunnah.com/muslim/1927</a>
riyadussalihin	984	Abu Hurairah (May Allah be pleased with him) reported: The Messenger of Allah (ﷺ) said, "Travelling is a torment because it deprives a traveller of his food, drink and sleep. So when one of you has accomplished his purpose of journey, let him return home quickly." [Al-Bukhari and Muslim].	"السفر قطعة من العذاب يمنع أحدكم طعامه وشرابه ونومه، فإذا قضى أحدكم نوبته من سفره، فارجعوا إلى أهله"	<a href="https://sunnah.com/riyadussalihin/984">https://sunnah.com/riyadussalihin/984</a>
riyadussalihin	964	Anas (May Allah be pleased with him) reported: The Messenger of Allah (ﷺ) said, "Keep to travelling by night because the earth is folded (traversed more easily) during the night." [Abu Dawud].	"عليكم بالليل، فإن الأرض تطوى بالليل"	<a href="https://sunnah.com/riyadussalihin/964">https://sunnah.com/riyadussalihin/964</a>
riyadussalihin	986	Anas (May Allah be pleased with him) reported: The Messenger of Allah (ﷺ) would not come (back) to his family by night. He used to come in the morning or in the evening (before dark). [Al-Bukhari and Muslim].	عن أنس رضي الله عنه قال: كان رسول الله صلى الله عليه وسلم لا يدارق أهله ليلاً، وكان ياتيهم قهوة أو عذيقاً (شقق عليه) الطروق لجنبه في الليل.	<a href="https://sunnah.com/riyadussalihin/986">https://sunnah.com/riyadussalihin/986</a>
bukhari	5429	Narrated Abu Huraira: The Prophet (ﷺ) said, "Traveling is a kind of torture, as it prevents one from sleeping and eating! So when one has finished his job, he should return quickly to his family."	"السَّفَرُ قِطْعَةٌ مِنَ الْعَذَابِ، يَنْتَقِزُ أَحَدَكُمْ نَوْمَهُ وَطَعَامَهُ، فَإِذَا قَضَىٰ نَوْمَهُ مِنْ رَوْحِهِ فَلْيَعَجِلْ إِلَىٰ أَهْلِهِ"	<a href="https://sunnah.com/bukhari/5429">https://sunnah.com/bukhari/5429</a>

Type a message... Send

# ChatGPT voice interviews

- Give it the job description + your CV + cover letter + full career CV
- Ask it to give model answers based on your experience
- Practice talking about your work - can feel unnatural if you're not a self-promoter



# Child's Play – Money vs a rich life (magazine article)

- A peak into life at this startup on Harpers
- Rich != successful
- Rich but with a bleak lifestyle isn't my cup of tea
- "Some people are so poor – all they have is money"
- Important things to me are family, friends, community, learning and understanding the world, emotional and spiritual growth.

## Child's Play

Tech's new generation and the end of thinking

by Sam Kriss



Illustration by Max Gucher

# "One shot" doesn't mean what I thought

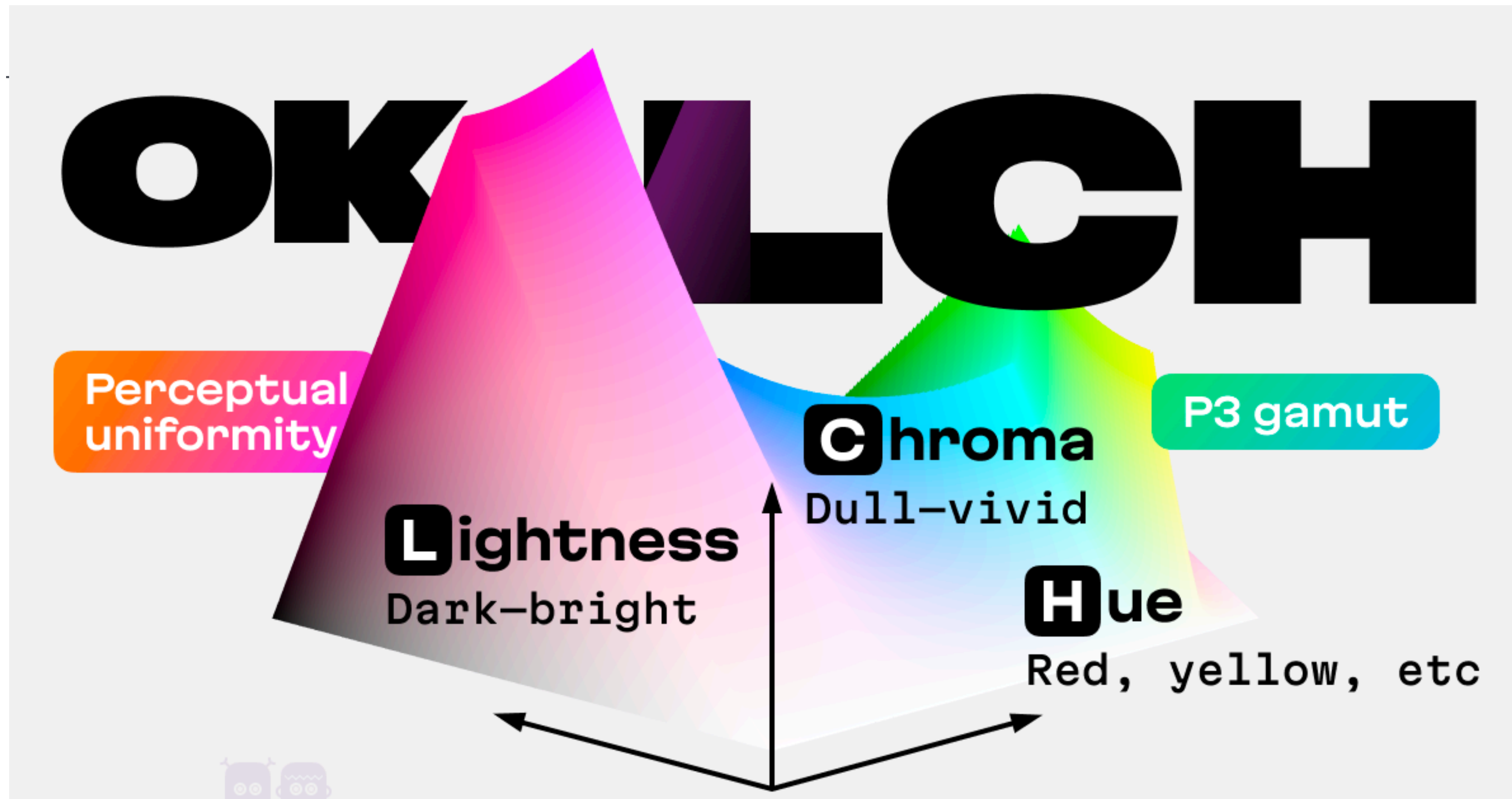
"One shot" = how many examples you give the model

- Not how many attempts it takes



# OKLCH

- An alternative colour space to HSL / HSV



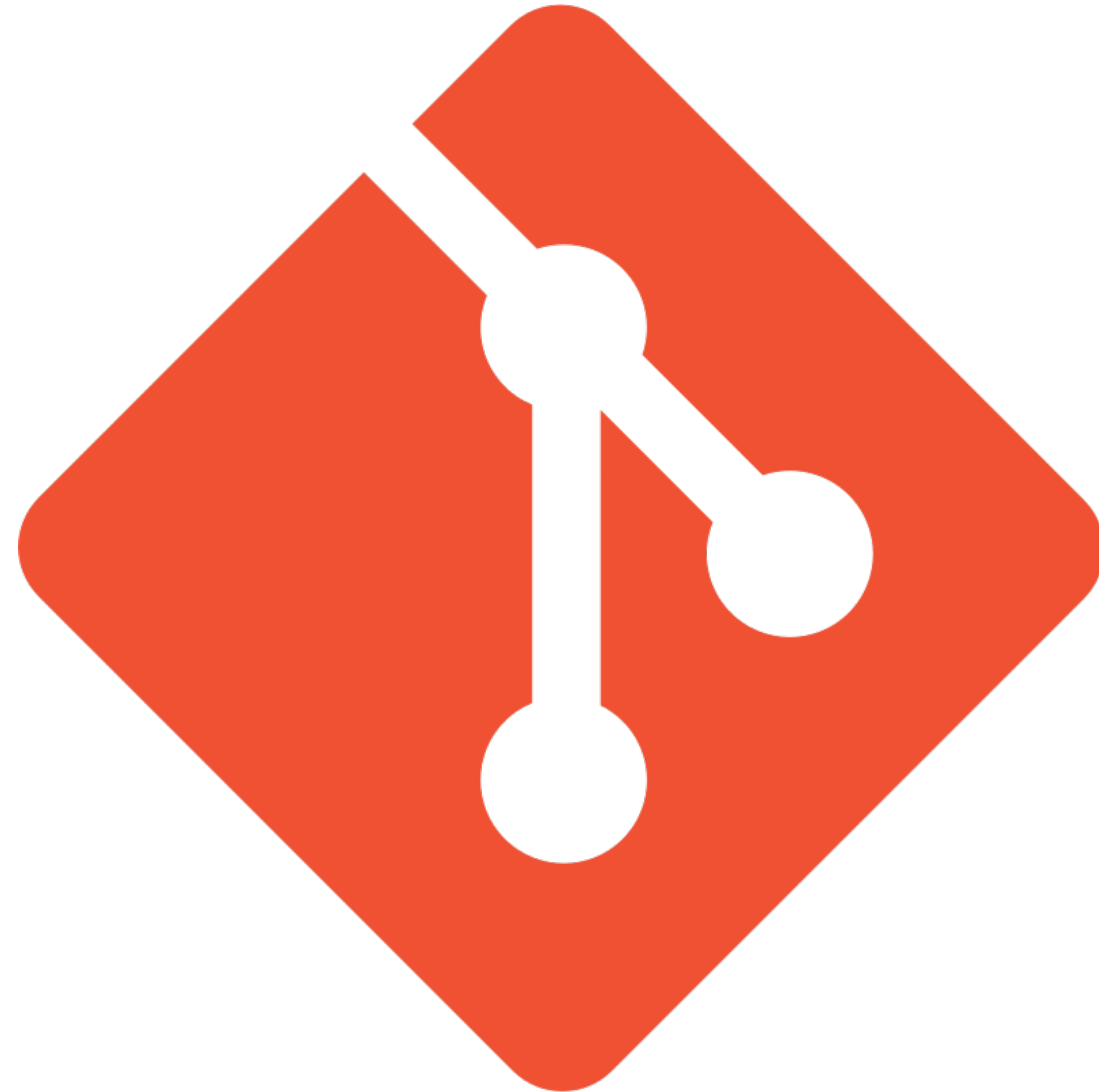
# Opus is really good – even at CSS

- Vibe-coded a bunch of things with it
- 100 apps in 100 minutes: the quality of your model matters
- I was using a smaller model – my apps were bad.
- Opus changed that, has some great styling



# Git Worktrees

- Allows multiple working trees from the same repo
- In practice: spent more time on merge conflicts than saving time
- For agents: have them work on separate branches to avoid conflicts
- Just like a regular dev team



# Capacitor exists

- Turns websites into native apps
- Easy cross-platform

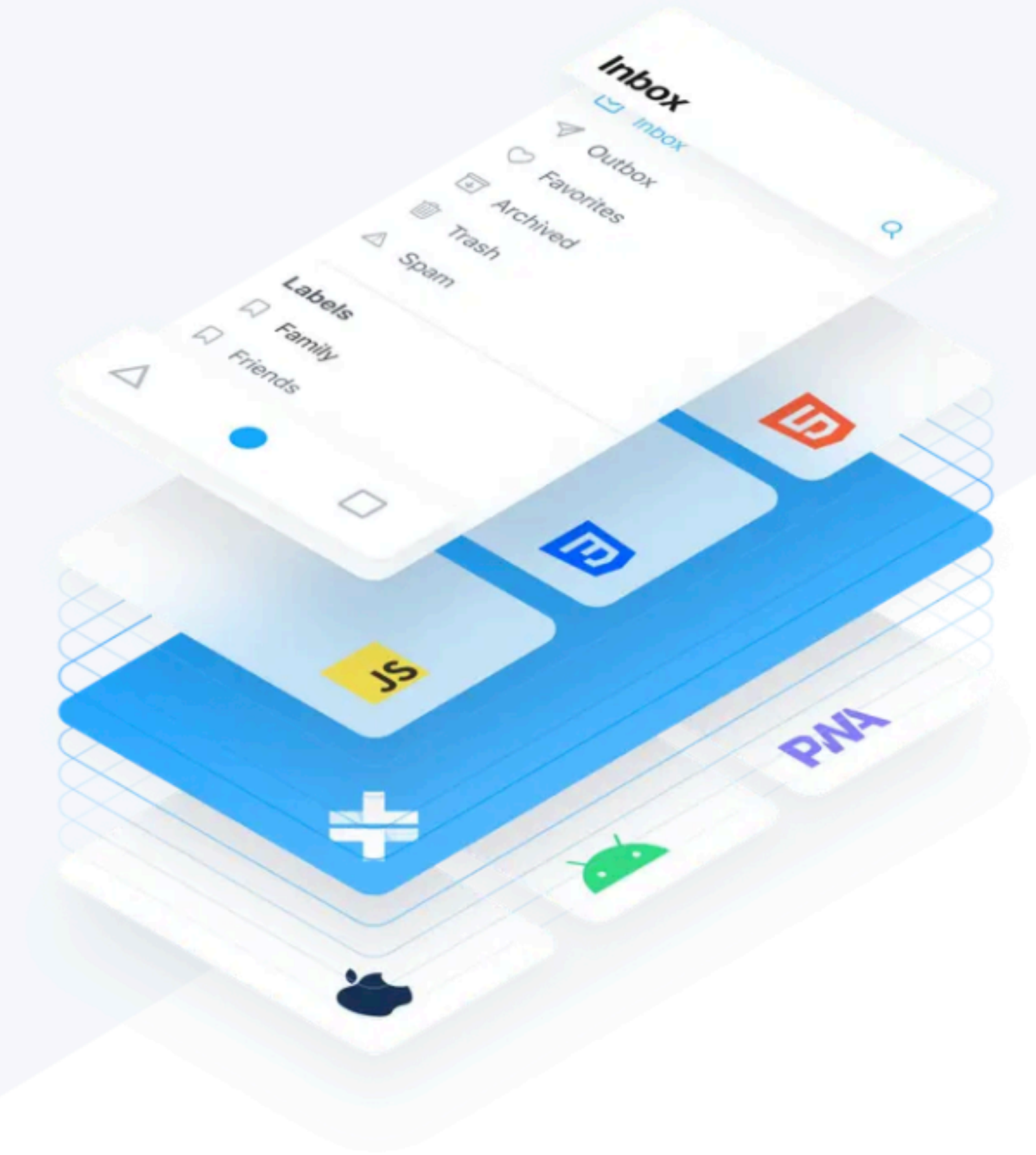
## A cross-platform native runtime for web apps.

Capacitor is an open source native runtime for building Web Native apps. Create cross-platform iOS, Android, and Progressive Web Apps with JavaScript, HTML, and CSS.

[Install Capacitor →](#)

[Explore Plugins](#)

[Migrate from Cordova →](#)



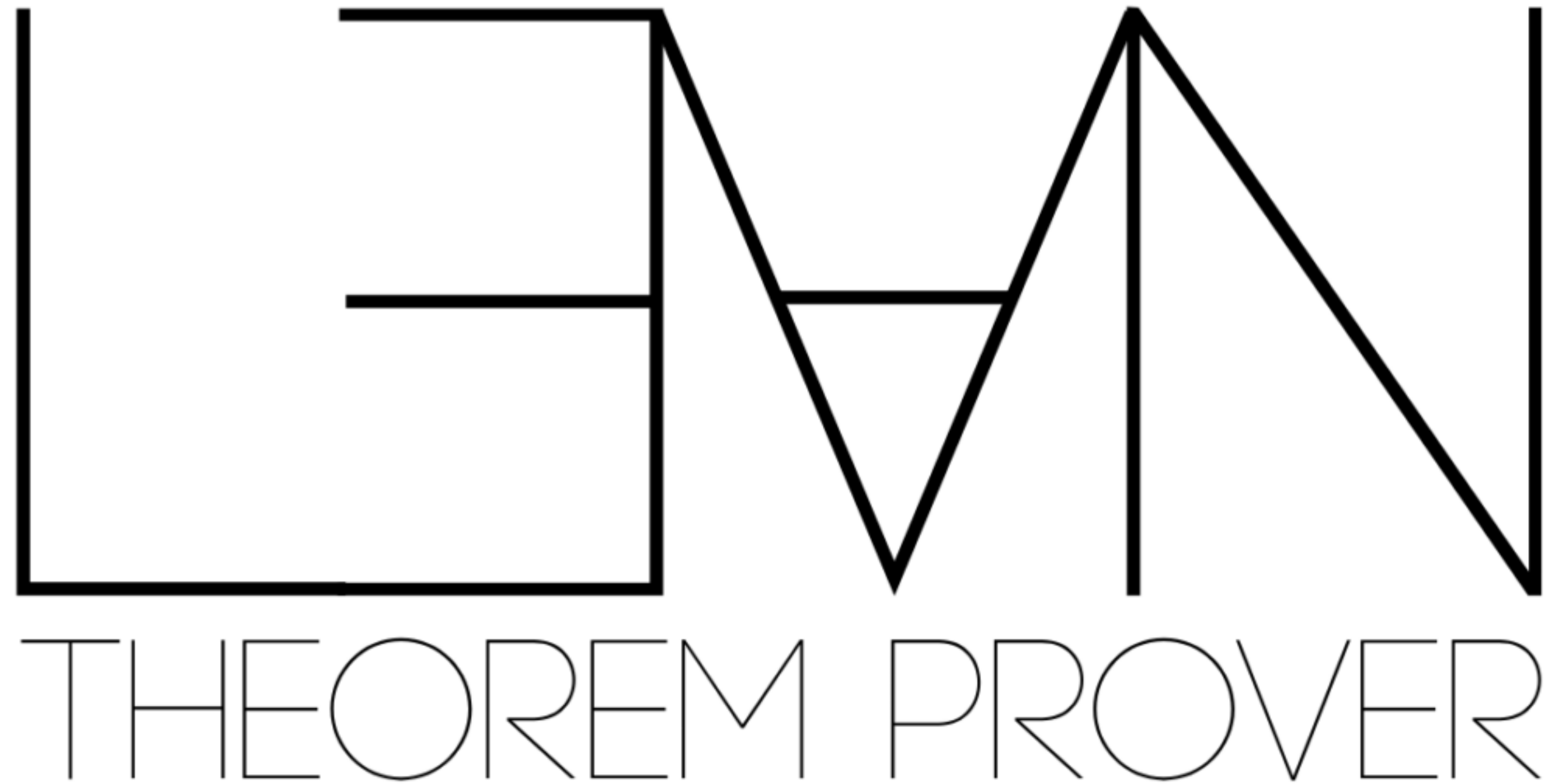
# Firecracker exists

- Super lightweight VMs used by AWS Lambda
- Spins up in milliseconds - how serverless functions work



# Lean exists

- State-of-the-art tool for formally proving mathematical theorems via computing
- Interesting intersection of maths and programming
- (I will probably never get round to actually using this)



LEAN  
THEOREM PROVER

# IAP – In-App Purchases

- Can do subscriptions and one-time purchases
- Server-to-server notifications to handle renewals, cancellations, etc.



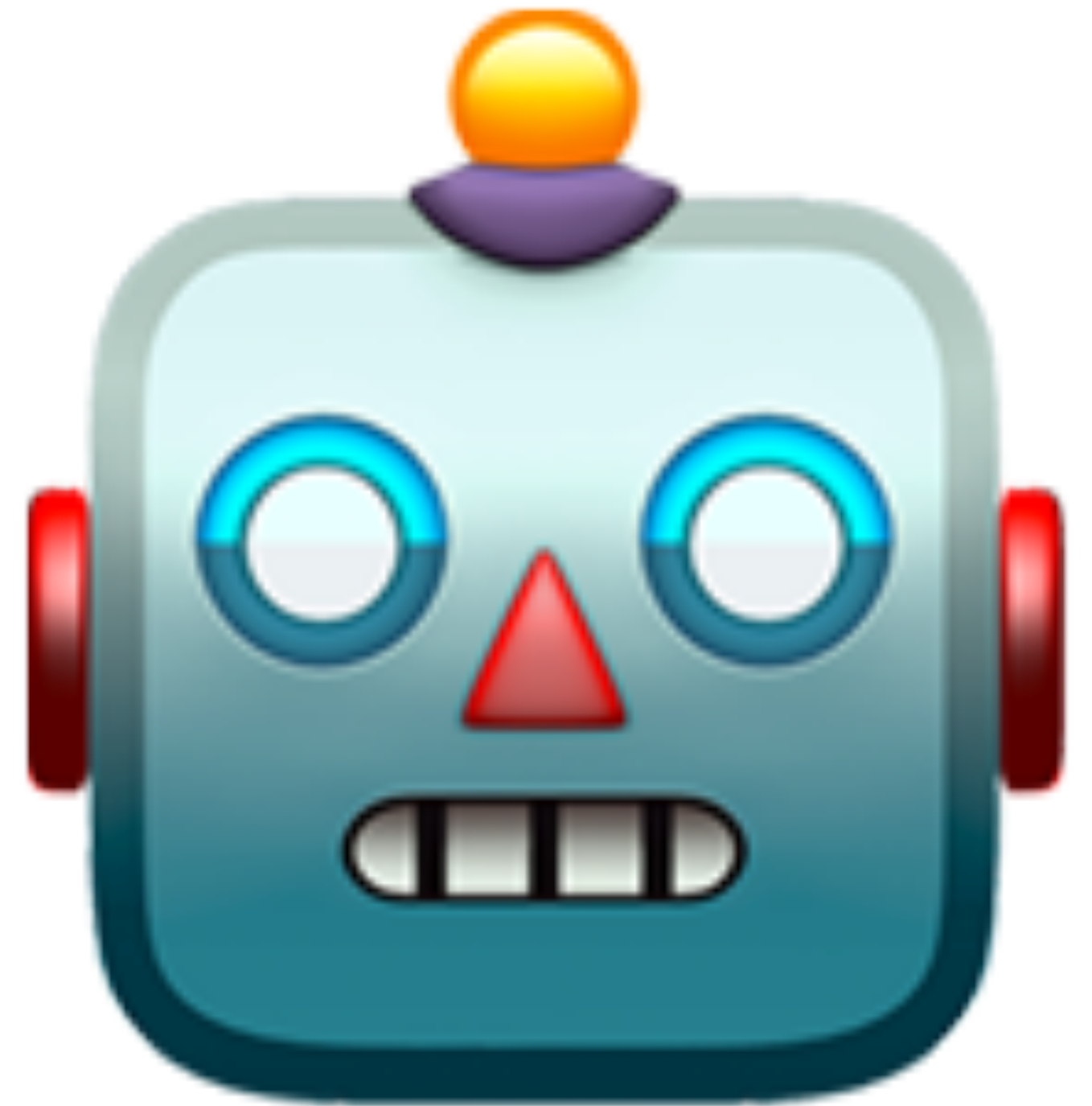
# SwiftUI under the hood

- Does some crazy stuff with structs and diffing under the hood
- Easy to optimise once you understand the model
- AI is still pretty bad at Swift



# What is an agentic loop?

- Tool calls in a loop - the model decides when it's done
- **Can set it up in ~50 lines of Python**
- Set up the tools, give decent context, let it run
- Thank you Raf!



# Ollama

- Run local LLMs insanely easily
- Not necessarily well - unless you have > 30GB RAM
- 64GB RAM: works great. 11GB RAM: not so much.
- Not run by Facebook - it's a nice independent project!



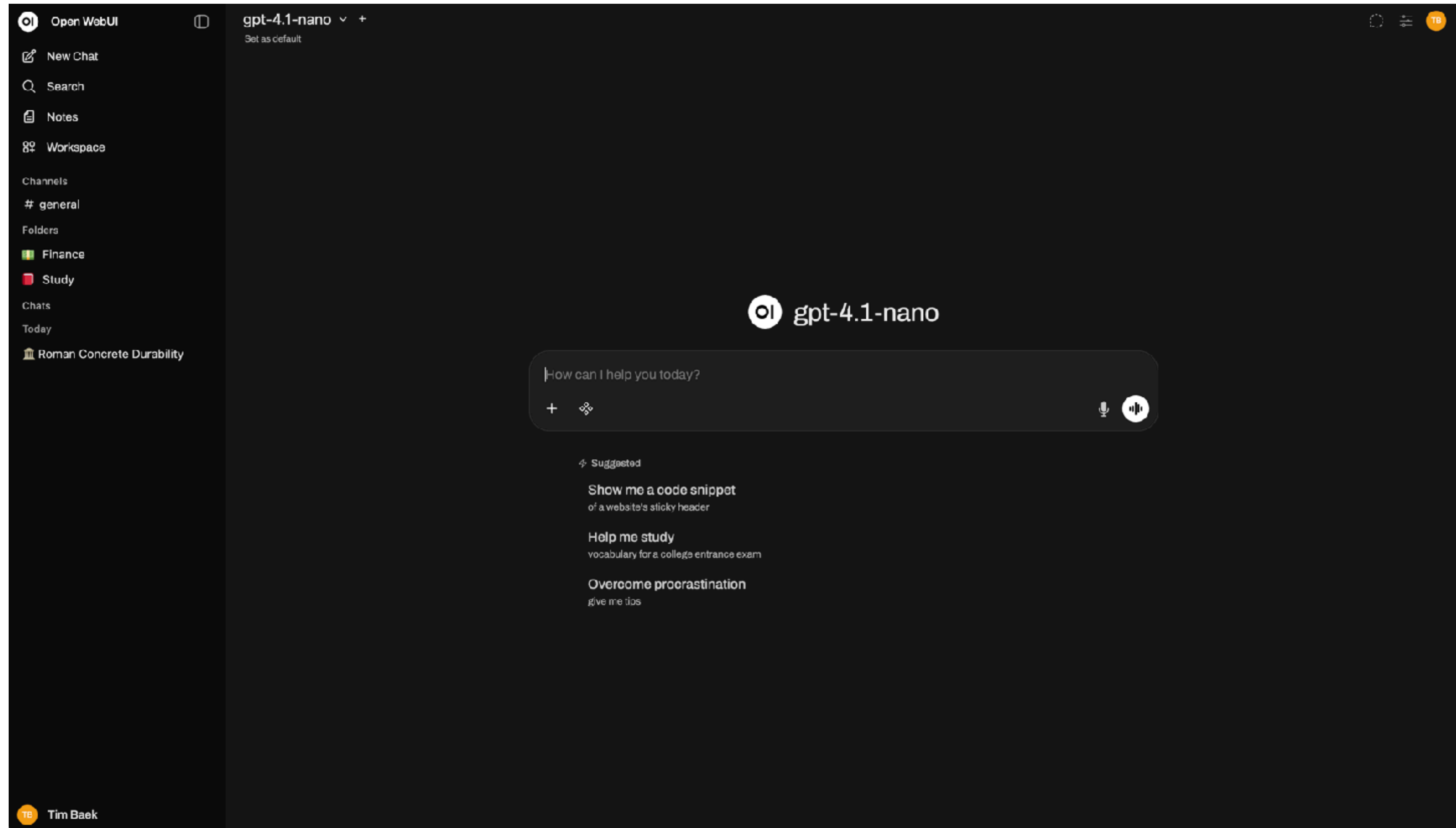
# Ollama

**Get up and running with large language models.**

# OpenWebUI

- A self-hosted ChatGPT-style interface for local models
- Pair with Ollama for your own private AI assistant

# OpenWebUI



# Claude as a code reviewer

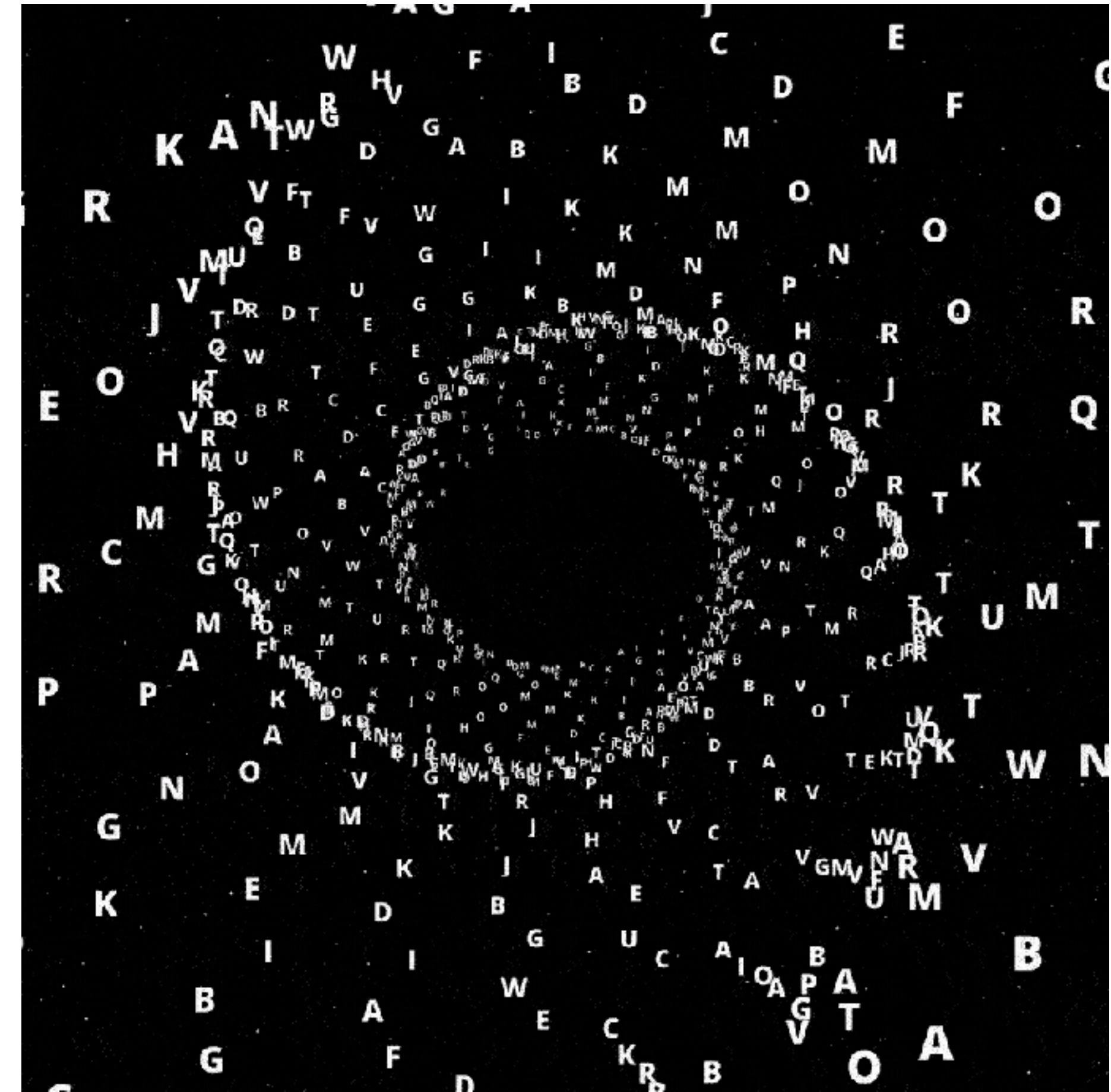
"You are an expert solution architect..."

- Found multiple production vulnerabilities in a friend's project
- They paid me ~\$100 to type that prompt and send them the output
- **Consulting: more about landing the gig than doing the work**



# Creative Coding – it's a thing!

- Making art through code: generative visuals, interactive pieces
- Thought it was just two words – it's a whole community
- Thanks Holland and Aakash



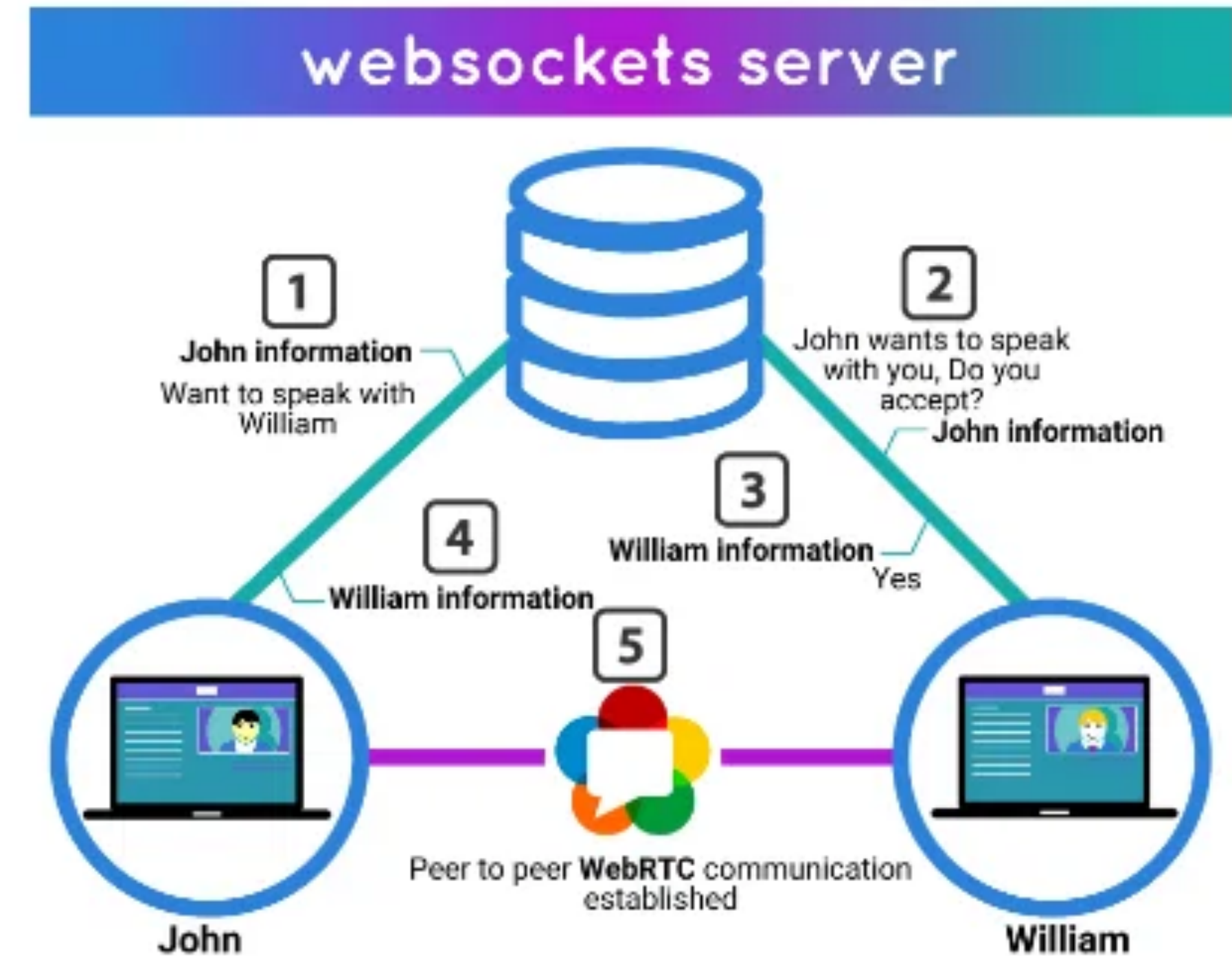
# Xcode Agentic Mode & Claude Code

- Xcode AI exists - very buggy
- Claude is token-hungry and loves asking you to buy more tokens
- Cursor is my new best friend



# WebSockets: peer-to-peer in the browser

- Real-time, bidirectional, low-latency
- Streams of data
- E.g: Realtime baby monitor



# Apple on-device text-to-speech

- Exists and is super easy to set up
- Runs entirely on device - private and fast

```
// Create an utterance.
```

```
let utterance = AVSpeechUtterance(string: "The quick brown fox jumped over the lazy dog.")
```

```
// Retrieve the British English voice.
```

```
let voice = AVSpeechSynthesisVoice(language: "en-GB")
```

```
// Assign the voice to the utterance.
```

```
utterance.voice = voice
```

```
// Create a speech synthesizer.
```

```
let synthesizer = AVSpeechSynthesizer()
```

```
// Tell the synthesizer to speak the utterance.
```

```
synthesizer.speak(utterance)
```



# UV

- Python package manager - no more pip hell
- Handles venvs, lockfiles, and installs in one tool
- If pip and venv have ever made you pull your hair out, try UV

# OAuth

- A relatively complex way of authenticating users
- But surprisingly easy to set up in practice
- Redirect → token exchange → done



# Railway hosting

- A deployment platform for the infrastructure-averse
- Kinda okay to use - some quirky backup strategies though



**Railway**

# Music classification: Essentia

- Open-source audio analysis library from the MTG
- Can classify genre, mood, tempo, key and more

 **ESSENTIA**

# Google Colab

- Run GPU-heavy code for free in the browser
- Pairs well with HuggingFace for ML experiments

# Fine-tuning an image generator

- Start with existing model weights, continue training on your own data
- ComfyUI makes the workflow visual and scriptable
- Thanks Fiona for your time and guidance

# TUIs - Terminal User Interfaces

- Not just REPLs - almost like GUIs but in the terminal
- Can even be written in React (Claude Code is!)
- **Ink**
- Thanks George & TP



# Juice in video games

- The fun extra bits that make games feel alive
- Screen shake, sound effects, particles, animations
- Juice is what separates 'playable' from 'fun'

# StyleGAN

- Interpolate smoothly between two different visual features
- Walk through latent space to morph between styles or faces



# Codex is open source

- OpenAI's coding agent - source available on GitHub
- You can build your own harness in ~200 lines of Python
- <https://www.mihaileric.com/The-Emperor-Has-No-Clothes/>

## The Emperor Has No Clothes: How to Code Claude Code in 200 Lines of Code

January 2026



Today AI coding assistants feel like magic. You describe what you want in sometimes barely coherent English, and they read files, edit your project, and write functional code.

But here's the thing: the core of these tools isn't magic. It's about 200 lines of straightforward Python.

# Local open-source alternatives to Claude Code

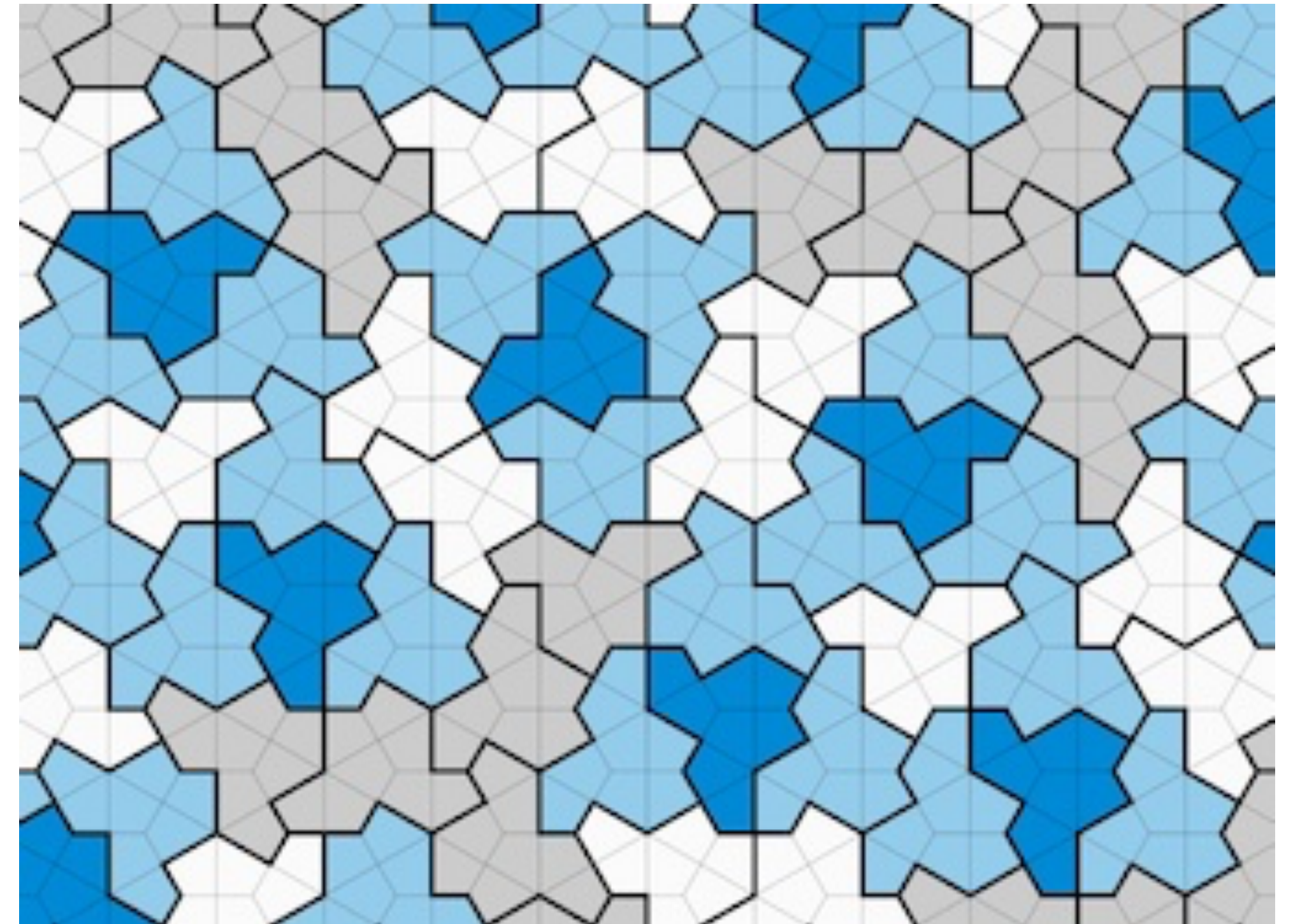
- Pi - integrates with Ollama
- Run agentic coding workflows entirely on your own machine
- [docs.ollama.com/integrations/pi](https://docs.ollama.com/integrations/pi)



*There are many agent harnesses,  
but this one is yours.*

# Aperiodic tiling (Museum of Mathematics)

- A tiling that covers a plane with no repeating pattern
- The hat / einstein tile: a single shape that tiles aperiodically
- Only discovered in 2023!



# Ghidra – reverse engineering

- Open-source reverse engineering tool from the NSA
- Disassemble, decompile, and analyse compiled binaries



# MLX – run models on Apple Silicon

- Apple's ML framework optimised for M-series chips
- Utilise RAM more efficiently



# Monads are Burritos

- I know what a Monad is
- Haskell: way worse than I remember - not my cup of tea
- Watching Raf whizz through Clojure gave me a better feel for functional languages



# Java version 8 is not the latest

- It comes up first when you Google 'Java for Mac'
- Version 8 still gets security patches - you probably want 21+
- Java 26 is the current release



# Japan has a separate App Store

- Due to anti-monopoly regulation
- An interesting advancement in anti-trust legislation in tech



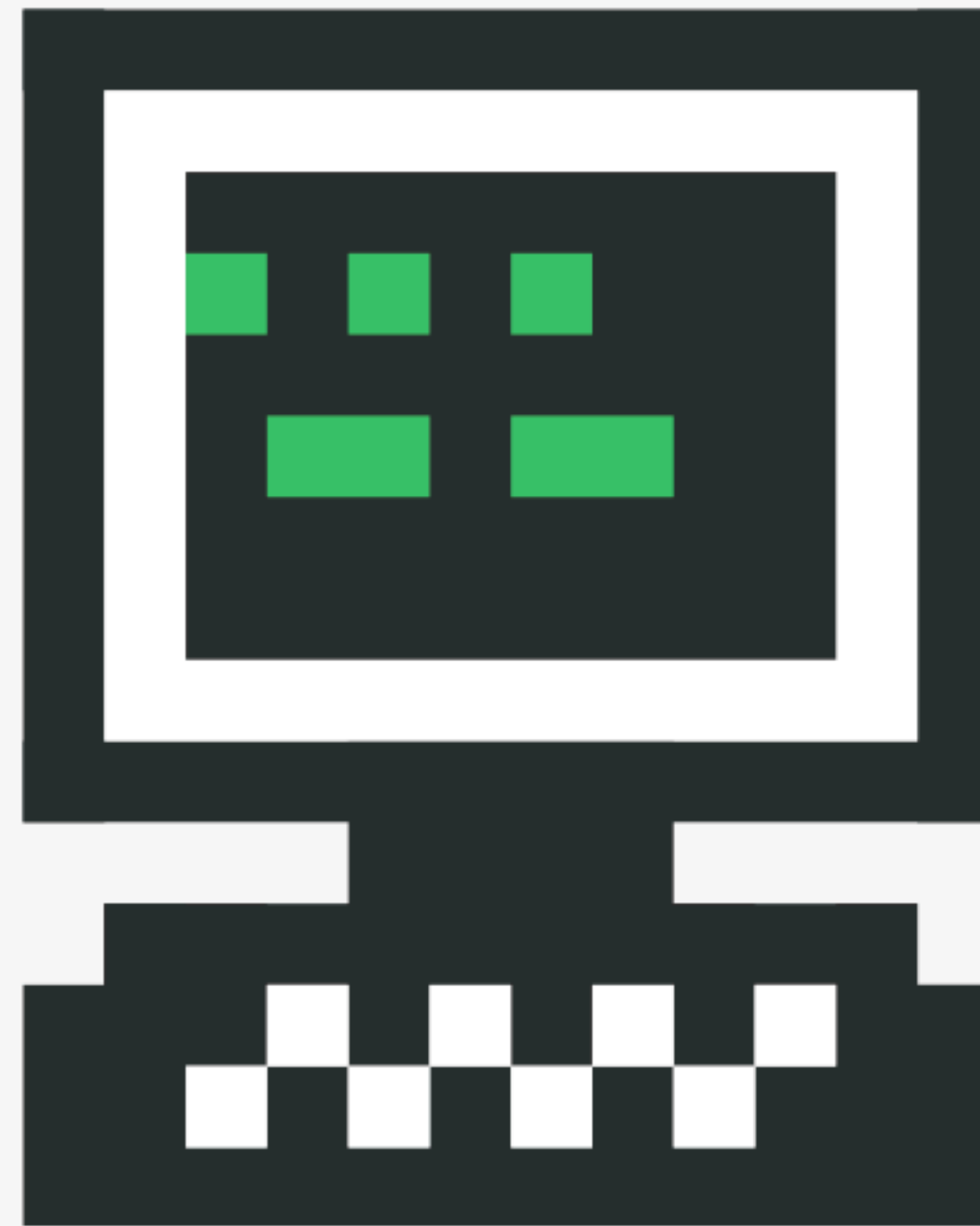
# Clipboards are wild

- Always wondered why pasting sometimes keeps formatting and sometimes doesn't
- The clipboard stores multiple representations of the same data
- Apps pick whichever format they prefer: HTML, RTF, plain text...
- Thanks George M!

# Unschooling works!

- Self-directed learning without a fixed curriculum
- RC is living proof: motivated people learn deeply and broadly





Thank you