CMU MSE FIRESIDE CHAT · NOV 3, 2026

From Duolingo to Temporal

Growing into Platform Engineering and Choosing My Path in the Age of AI

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MSE Class of 2022 · Staff Software Engineer, Infrastructure Foundations @ Temporal

ABOUT ME

Hi, I'm Zhihao

2016
VIPKID
Software Engineer

2018
data.ai
Senior Backend Software Engineer & Scrum Master

2021
CMU MSE
Master of Software Engineering

2023
Duolingo
Senior → Staff Software Engineer, Cloud Operations

2026
Temporal
Staff Software Engineer, Infrastructure Foundations

Two moves: from product to platform engineering, then from building on top of Temporal to building Temporal itself.

AGENDA

What we'll cover today

01	**Product to platform**	Why I moved from building features to building for engineers
02	**Duolingo, 3.5 years**	How Temporal grew from one team's tool into a company-wide platform
03	**Why I left**	Why I chose Temporal and deeper infrastructure work
04	**Advice**	Finding your path and navigating today's job market
Q&A	**Your questions**	Most of our time today

PART 1 · PRODUCT TO PLATFORM

Curious about the teams downstream of me

Before CMU

Built microservices at VIPKID and data.ai (now part of Sensor Tower).

The curiosity

How do platform infrastructure, deployment, and API gateways actually work?

At CMU

Software engineering major, with electives in systems, databases, and cloud. Led Studio Project's cloud infrastructure.

After MSE, I joined Duolingo's Cloud Operations team as a Senior Software Engineer in platform engineering.

PART 2 · DUOLINGO, 3.5 YEARS

First stop: databases. Critical, and nobody wanted them.

If you mess up

Duolingo goes down.

If you do well

Nobody notices.

PART 2 · DUOLINGO, 3.5 YEARS

Automating database upgrades

Before

A Google Doc of action items, and click ops on every single database.

After

One script that covered the failure scenarios and supported in-place and blue-green zero-downtime upgrades.

Why I loved it: automation saves engineering time, empowers other engineers, removes repetitive work, and makes operations safer.

PART 2 · DUOLINGO, 3.5 YEARS

Disaster recovery, built on Temporal

Temporal is an open-source workflow engine. You write workflows as ordinary code, and it keeps them running reliably through failures, retries, and restarts.

RDS	DynamoDB	S3	Redis

A full restoration pipeline across AWS regions, orchestrated with Temporal.

> **“Temporal should not stay a team-only tool. It should be available company-wide.”**

PART 2 · DUOLINGO, 3.5 YEARS

Building for everyone else

- **Onboarding automation**
- **Bootstrap workflows**
- **Shared libraries**
- **Self-service platform**

Local setup

~10 min

down from a couple of days

Then I kept telling the story: demos at Platform Area meetups, internal blog posts, and talks at our Engineering Summit.

PART 2 · DUOLINGO, 3.5 YEARS

From one team to the whole company

<5

engineers on Temporal when I started

20+

teams building on it

230+

production workflows

For a long stretch, I was the only one who believed in it, and there was no payoff.

Proudest part: other engineers built much of the supporting infrastructure themselves.

PART 2 · DUOLINGO, 3.5 YEARS

What followed, unexpectedly

Innovation Award

Duolingo Innovation Award, presented by CEO Luis von Ahn.

Staff Engineer

Promoted to Staff for the Temporal work.

Temporal Replay

Conference talk in San Francisco.

Webinar

Earlier, a webinar with the Temporal team.

THE MINDSET

Do the right thing.

Sometimes you need conviction, a firm belief, to make decisions and do what you believe is right.

Have conviction → Do the work → Prove the value → Empower others → Create impact

PART 3 · WHY I LEFT

Hitting a ceiling

Scale

Duolingo's scale is limited by the nature of its business.

Priorities

A product-driven company, where infra just needs to work.

Growth

Less chance at challenging, large-scale, deeper work.

> Could I get large-scale infra experience at Duolingo?
>
> **Honestly, no. That's the right call for Duolingo's business, just not for my growth.**

PART 3 · WHY I LEFT

Two kinds of engineers

Product engineers

Strong product sense, fast iteration, cross-functional collaboration. They understand product, engineering, design, and the business.

Infra engineers

Operate large-scale systems and find the bottlenecks. They understand how distributed systems work at the bottom layer.

My bet: AI agents still need compute: GPU clusters, VMs, sandboxes, Kubernetes. People have to run them. I'm an infra engineer, so I chose a larger, deeper system and optimized for growth.

PART 3 · WHY I LEFT

Where I went: Temporal

The company behind open-source Temporal and Temporal Cloud. Founded in 2019, it powers companies like OpenAI, NVIDIA, Netflix, and Cursor. My team, Infra Foundations, builds the compute infrastructure Temporal Cloud runs on.

3,000+
Customers worldwide

1T+
Monthly Cloud actions

99.99%
Uptime on Temporal Cloud

The world's best AI runs on Temporal.
Many of the AI agents you use every day run on it under the hood.

Mission-critical long before AI.
Financial transactions, order fulfillment, infrastructure management, and data pipelines.

PART 4 · ADVICE

What can you do that AI cannot replace?

Keep carrying this question. AI is moving fast, so the answer will keep changing as you shape your career.

PART 4 · ADVICE

Find your path, then the right company

Going product?

Join a company that iterates fast on product. Build real product sense, and learn engineering, design, and the business.

Going infra?

Join a company whose infra is large enough to expose hard problems. Learn how compute, network, and each component work, and where systems break at scale.

Infra is not the best path for everyone. I just happen to like it. Figure out which kind of engineer you are.

PART 4 · ADVICE

Job hunting has changed

Less weight

- Grinding LeetCode
- Pure coding rounds

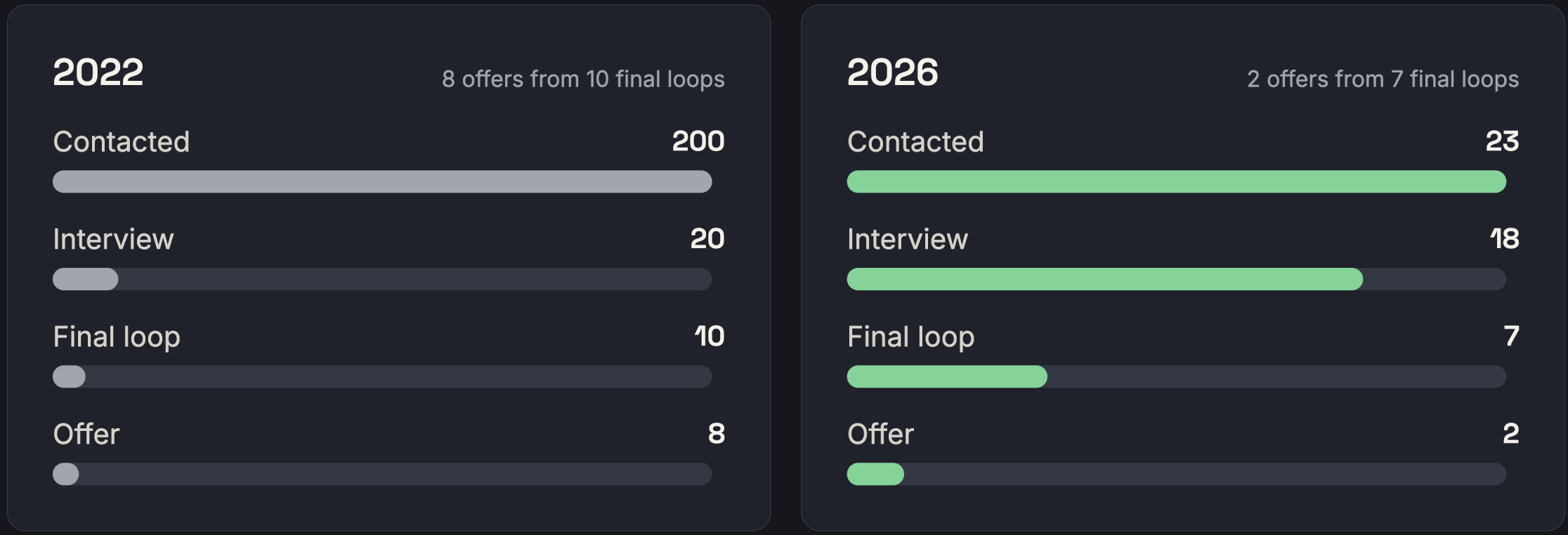
More weight

- Clean, organized, readable code
- System design and debugging
- How you use AI tools
- Deep dives on your own projects

Coding is no longer the hardest part. The bar is going up, and the focus is on systems skills.

PART 4 · ADVICE

My job hunt: 2022 vs 2026



Bars scaled to each year's contacted count

PART 4 · ADVICE

When you join a company, imagine how you'll leave it.

What kind of engineer do you want to be when you walk out? Carrying that question helps you learn more, and sets up a better next role.

Thank you. Questions?

Work hard

The market is tough. Prepare deeply and do as many interviews as you can.

Do the right thing

Keep improving yourself, even when the payoff is slow.

Take initiative

Own new problems, so this job places you into a better next one.

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