

Zhihao Wang

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EDUCATION

Carnegie Mellon University, School of Computer Science

Master of Software Engineering

Pittsburgh, PA

Aug 2021 – Dec 2022

China University of Mining and Technology, Beijing, School of Science

Bachelor of Science in Information and Computing Science

Beijing, China

Sep 2013 – Jun 2017

Peking University, National School of Development

Bachelor of Economics (double major)

Beijing, China

Sep 2014 – Jul 2017

EXPERIENCE

Duolingo

Staff Software Engineer

Pittsburgh, PA

Apr 2026 – Present

- Serving as technical lead for a Temporal infrastructure project team of 5 engineers: defining project direction, mentoring engineers on Temporal internals and infrastructure patterns, and partnering with teams across the org to design and onboard new use cases.
- Leading zero-downtime, transparent-to-service-teams namespace-by-namespace ECS→EKS migration of the Temporal worker fleet (multiple namespaces fully on EKS); implementing KEDA-based autoscaling to handle unpredictable bursty workflow loads across hundreds of workers.
- Leading zero-downtime migration of datastores (RDS, DynamoDB, S3) and services from a monolithic AWS account to dedicated accounts for improved security isolation and scalable multi-account management; leveraging Terragrunt to abstract account-level infrastructure (VPC, subnets, peering, etc.); automating CIDR planning based on resource topology, programmatically generating migration playbooks for service teams, and continuously improving migration guides.

Senior Software Engineer

Feb 2023 – Mar 2026

- Championed Temporal adoption at Duolingo from 0→1: introduced the technology, built foundational infrastructure from scratch, fostered a cross-org community, and scaled it into an org-wide durable workflow platform powering 140+ production workflows across 10+ teams with hundreds of workers — establishing Duolingo as a recognized reference implementation in the Temporal ecosystem.
- Designed and built the Temporal Self-Service Platform — UI, gateway microservice, router workers, shared libraries, and onboarding tooling — enabling 15+ CloudOps self-service workflows (RDS resize, upgrade, deletion, PG replication, Redis→Valkey migration) and saving thousands of engineering hours annually.
- Improved developer experience in the Temporal monorepo: refactored Dockerfiles, folder structure, and deployment scripts to scale with growing team adoption; shipped Agent Skills for workflow authoring; reduced CI, build, and pre-commit times by 50%; and introduced higher-level abstractions via Temporal Nexus for cross-namespace workflow communication.
- Implemented full data store disaster recovery via Temporal workflows; designed workflow orchestration patterns for multi-step RDS, DynamoDB, S3, and Redis restoration across AWS regions.
- Stepped into de facto DBRE ownership; built production-grade monitoring for all Aurora PostgreSQL clusters from scratch — custom exporters, Grafana dashboards (table size trends, slow queries, blocked queries); automated DB upgrades with zero downtime and AI-driven Terraform PR generation; upgraded 30+ Aurora PostgreSQL clusters v11→v14 in under one month with zero learner impact.

data.ai (formerly App Annie)

Senior Backend Software Engineer & Scrum Master

Beijing, China

Feb 2018 – Jul 2021

- Migrated monolithic Django service to Flask and Go microservices on ECS; built unified query translation, data aggregation, and permission control — improving API performance by 50+%.
- Built unified connection workflow migrating 30+ platform integrations to microservices with scalable MFA handling for Apple and Google — cutting connection time by 50+% and improving success rate by 30+%.
- Built monitoring dashboards and troubleshooting tooling for data scraping and ETL pipelines, reducing MTTR by 50+%.

VIPKID

Software Engineer

Beijing, China

Aug 2016 – Feb 2018

- Built microservices (Flask, gRPC, Java, SpringBoot) for VIPKID App and internal systems; built async Celery task pipelines.

TALKS & PUBLICATIONS

How Duolingo Built Workflow-as-a-Service with Temporal Nexus | *Talk, Temporal Replay*

2026

Scaling Developer Productivity with Temporal Nexus & Duolingo | *Webinar*

2025

Duolingo simplifies self-service infrastructure with Temporal Nexus | *Case Study, Temporal.io*

2025

SKILLS

Languages: Python, Go, JavaScript, Java, C++, C, SQL, R

Cloud: AWS (Solutions Architect Professional), EC2, ECS, EKS, IAM; Terraform, Terragrunt, Docker, Kubernetes

Data Storage: PostgreSQL, MySQL, Redis/Valkey, DynamoDB, S3

Workflow & Observability: Temporal, Grafana, Sentry, Honeycomb, Kibana, Datadog, New Relic