Zhihua Lai, PhD

Senior Software Engineer — Systems, Cloud & Networking

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Version 17-June-2026	**View Source** https://doctorlai.github.io

- **The Longer Version** https://doctorlai.github.io/full
- **LinkedIn:** https://www.linkedin.com/in/doctorlai
- **GitHub:** https://github.com/DoctorLai
- **GitHub (Microsoft Research):** https://github.com/doctorlai-msrc
- **Microsoft Research Profile:** https://www.microsoft.com/en-us/research/people/zhihualai/

PROFESSIONAL SUMMARY

- Senior Software Engineer at **Microsoft Research Cambridge**
  working on **AI Tooling, high-performance systems, cloud infrastructure, robotics AI and 5G/6G networking**.
- Former **Amazon AWS** engineer (Day-1 contributor to **Amazon S3 Object Lambda**)
- Former **General Electric** Staff Software Engineer. working on Magik Compiler
- **PhD in Computer Science**, published researcher (ACM MobiCom)
- **Top-3 Witness (Block Producer)** on the **Steem Blockchain** (https://steemyy.com).

Proven record of delivering **low-latency, production-grade systems** across **C/C++, eBPF, distributed cloud platforms, and large-scale storage systems**.

Microsoft Certified

Code	Domain	Name	Certification Number	Earned-on Date
PL-300	PowerBI	**Power BI Data Analyst Associate**	6C25D7-M05B60	June 17, 2026
PL-900	Power Platforms	Power Platform Fundamentals	69AAEZ-FD6360	June 1, 2026
AZ-500	Security	**Azure Security Engineer Associate**	6318AC-1F9DEE	May 22, 2026
SC-100	Security	**Cybersecurity Architect Expert**	7EE065-8C3CBW	May 8, 2026
SC-300	Security	**Identity and Access Administrator Associate**	580B52-T0A5BD	May 8, 2026
GH-500	Git	**Github Advanced Security**	50295R-7F754	May 8, 2026
AI-901	AI	Azure AI Fundamentals (Beta)	Pending	May 1, 2026
GH-100	Git	**Github Administration**	BF44B3-48M622	April 29, 2026
AZ-400	DevOps	**Azure DevOps Engineer Expert**	692747-12AEA4	April 17, 2026
GH-300	Git	Github Copilot	DCJD08-DF0F44	April 17, 2026
AZ-700	Network	**Azure Network Engineer Associate**	53E66B-4XA079	April 10, 2026
GH-200	Git	Github Action	11F89A-3CC7A3	April 6, 2026
GH-900	Git	Github Foundation	7C1674-5CE607	March 30, 2026
AZ-305	Cloud	**Azure Solutions Architect Expert**	E45B62-19NE7E	March 27, 2026

Code	Domain	Name	Certification Number	Earned-on Date
AZ-104	Cloud	**Azure Administrator Associate**	CBE3B7-4911PC	March 13, 2026
AB-731	AI, Business	AI Transformation Leader	BNBA25-32A1F8	March 13, 2026
AZ-204	Cloud	**Azure Developer Associate**	T6D896-FDCEDF	February 27, 2026
AB-730	AI, Business	AI Business Professional	BA3490-GD0796	February 27, 2026
AI-102	AI	**Azure AI Engineer Associate**	25A6FZ-E1AF43	February 20, 2026
AZ-900	Cloud	Azure Fundamentals	B6FAD6-2S7125	January 16, 2026
SC-900	Security	Security, Compliance, and Identity Fundamentals	B6A851-BECO96	January 13, 2026
AI-900	AI	Azure AI Fundamentals	7Z9DA9-388866	December 19, 2025
DP-900	Data	Azure Data Fundamentals	CD4244-E236BG	December 19, 2025

Google Cloud Certified

Code	Domain	Name	Certification Number	Earned-on Date
PR000309	AI	Generative AI Leader	03429e7450ad4c33926ed613d65793e8	March 27, 2026

CORE SKILLS

- **Systems & Networking:** C, C++, eBPF, Linux, O-RAN, 4G/5G, RAN, low-latency systems
- **Cloud & Distributed Systems:**
  Azure (AKS, Kubernetes, Functions, Service Bus, CI/CD etc),
  AWS (S3, EC2, Lambda, DynamoDB, CloudFormation etc)
- **Languages:** C/C++, Python, Go, Java, C#, Rust, PHP, Node.js etc
- **Research & Engineering:** Performance optimization, rapid prototyping (0→1)
- **Blockchain:** Infrastructure, tooling, APIs, block production (Steem)

PROFESSIONAL EXPERIENCE

Microsoft Research Cambridge — Senior Software Engineer

Intelligent Network Systems (formerly Azure for Operators)
https://www.microsoft.com/en-us/research/group/ins/ *July 2021 – Present*

- Contribute to AI Tooling for the researchers in MSR
- Build **high-performance software** running on **5G base stations** using **C/C++, eBPF, and Linux**
- Support researchers in turning ideas **from prototype to production**
- Contribute to **open-source research platforms** used by the global RAN community

As an engineer in the Research Organization, I help researchers rapidly prototype ideas from 0 to 1. I've contributed across a broad technical spectrum — from low-level systems programming (eBPF in C) and performance-critical C++ components to application development in C#, Android (Java/Kotlin), and robotics (ROS2). I was also involved in Embedded Rust projects, including development on ESP32. Recently, I have been working on the AI tooling for the researchers in the MSR.

Selected Open Source Contributions (username *doctorlai-msrc*)

- https://github.com/microsoft/jbpf
- https://github.com/microsoft/jrt-controller

- https://github.com/microsoft/jbpf-protobuf
- https://github.com/microsoft/exekias
- https://github.com/microsoft/jrtc-apps

Publications (Selected)

- *Distributed AI Platform for the 6G RAN* — Open-AI RAN'25
  https://doi.org/10.48550/arXiv.2410.03747
- *Taking 5G RAN Analytics and Control to a New Level* — ACM MobiCom'23
  https://dl.acm.org/doi/10.1145/3570361.3592493
- *Programmable RAN Platform for Flexible Real-Time Control and Telemetry* —
  ACM MobiCom'23 (**Best Demo Award Runner-Up**)
  https://dl.acm.org/doi/10.1145/3570361.3614065

Previous Publications

- Chapter 2 - *Radio Propagation Modelling*, in Book "Heterogeneous Cellular Networks: Theory, Simulation and Deployment", Cambridge University Press, 2012.
- Chapter 5 - *Outdoor-Indoor Channel*, in Book "LTE-Advanced and Next Generation Wireless Networks: Channel Modelling and Propagation", John Wiley & Sons, November, 2012.
- *Intelligent Ray Launching Algorithm for Indoor Scenarios* - Radioengineering, Towards EUCAP 2012

Amazon Web Services — Software Development Engineer (L5)

AWS S3, Cambridge, UK
January 2020 – July 2021

- **Day-1 engineer** on **Amazon S3 Object Lambda**
  https://aws.amazon.com/s3/features/object-lambda/
- Contributed to the **successful global launch**
  https://aws.amazon.com/blogs/aws/introducing-amazon-s3-object-lambda/
- Built internal tooling to **identify performance bottlenecks** in one of the world's largest distributed storage systems.
- Participated in **on-call rotation** for mission-critical AWS services e.g. S3 Object Lamda

Tech Stack: Java, Python, Node.js, AWS S3, Lambda, DynamoDB, CloudFormation

General Electric — Staff Software Engineer

Smallworld GIS, Cambridge, UK
December 2018 – January 2020

- Core contributor to **Smallworld GIS platform**
  https://en.wikipedia.org/wiki/Magik_(programming_language)
- Designed and implemented **language-level features** in the Magik compiler

Key Contributions

- Added **while-loop**, **regular expression engine**, **HTTP** and **JWT libraries**
- Improved runtime performance and fixed multithreading race conditions
- 165+ pull requests merged; significant impact within first 3 months

Ranplan Wireless — Principal Algorithm Engineer

Cambridgeshire, UK *September 2010 – November 2018*
https://ranplanwireless.com/

- Lead developer of **radio wave propagation engine** (core IP, ~500K LOC)

- Designed **ray-tracing and channel modeling algorithms** used in commercial tools
- Led C++ rewrite, GPU acceleration (OpenCL), and performance-critical inline assembly

EDUCATION

PhD, Computer Science (Wireless & Algorithms)
<The development of an intelligent ray launching algorithm for wireless network planning>
2010, University of Bedfordshire, UK

BSc, Computer Science (First Class)
2006, University of Luton, UK

PATENTS (SELECTED)

- *Method for Predicting Outdoor 3D Signal Field Strength* PCT/GB2015/053224
- *Method for Predicting Indoor 3D Signal Field Strength* PCT/GB2015/053223
- *Wifi Multi-Band Fingerprint-Based Indoor Positioning* WO/2018/167500

BLOCKCHAIN & OPEN SOURCE LEADERSHIP

- **Top-3 Witness (Block Producer)** on the **Steem Blockchain**
  https://steemyy.com/witness-ranking/
- Architect and operator of **Steem infrastructure, APIs, explorers, and services**
- Maintainer of open-source blockchain tooling and load-balancing infrastructure

HONORS

- **ACM National Olympiad in Informatics (NOI)** — Third Prize
- **Marie Curie Fellowship** (EU)

MISCELLANEOUS

- Clean UK Driving License (13 yr+)
- Teaching Kids Programming (Python, Data Structures and Algorithms) for **700+ days**