

Patrick (Shuye) Liu

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Senior Backend / Distributed Systems Engineer with 5+ years of experience building high-performance distributed systems, AI agent runtimes, and search and recommendation infrastructure. Strong C++ and Python expertise, with a track record of delivering low-latency production systems at 100M+ user scale.

Education

University of Bristol

BSc in Computer Science, First-Class Honours

UK

Sep 2017 – Jul 2020

Professional Experience

Huawei

Software Engineer

Shenzhen, China

Jan 2021 – Jun 2026

Poisson Lab

Jan 2023 – Jun 2026

Backend development and operations for search and recommendation systems (C++/Python)

Timely Graph Flow (TGF) — Real-Time Graph Computing Engine

- Designed features and enhancements for the C++ graph-execution engine underpinning the agent runtime for Huawei's Xiaoyi AI Assistant, using Seastar and a share-nothing architecture to support asynchronous, lock-free execution.
- Designed and implemented branching, loops, streaming responses, and cross-language operator invocation, enabling the runtime to execute complex agent workflows. Productionised the runtime for Huawei Developer Conference 2025, where it powered the conference's intelligent Q&A assistant.
- Optimised long-sequence behavioural-feature retrieval for Huawei's advertising platform, achieving P99 latency below 6 ms for a user base exceeding 100M and keeping end-to-end retrieval and computation below 20 ms, while reducing server resource consumption by over 30%.
- Automated production resource provisioning and deployment workflows using Huawei's internal infrastructure-as-code platform, and implemented graceful shutdown and canary rolling upgrades to achieve zero-interruption production changes and significantly improve operational efficiency.

Huawei Mobile Search — Product Retrieval and Ranking

- Built a product-search retrieval and ranking pipeline combining inverted-index and semantic retrieval with relevance filtering and result diversification; A/B tests showed semantic results generated 6% more clicks.
- Led backend development of Aesthetic Search, integrating query inference, MLOps services, vector search, database retrieval, filtering and ranking into an end-to-end production pipeline launched in Huawei Petal Search.

Optical Access Hardware Development Department

Jan 2021 – Jan 2023

Chip driver software development (C)

- Implemented GPON protocol support and adapted OLT and modem software to multiple optical-chip specifications.
- Built a Python toolchain that generated C register-access code and unit tests from chip manuals, cutting implementation time by approximately 50%.
- Refactored legacy C code by identifying commonalities and differences across optical chips and consolidating implementations. Reduced the overall codebase by 30,000 lines, achieving a 28% reduction in total repository lines of code.

Footium

Jun 2020 – Jan 2021

Co-Founder

- Founding team member of a blockchain-based multiplayer football management game, developed from a Spark Hackathon 2020 project into a functional product; reached the finals among 100+ teams.
- Contributed to core game and blockchain features including NFT-based club and player ownership, player recruitment, trading, and match simulation, including the transition from Ethereum to Algorand.

Awards

- Huawei Terminal Cloud Services Business President's Award, 2023.
- Barry Thomas Scholarship in Computer Science — merit scholarship awarded to fewer than 10% of incoming international students.

Skills

Programming: C++ / Python / C / Shell / SQL / Docker

Technologies: Linux / Docker / Seastar / FlatBuffers / Unix domain sockets / distributed systems

Languages and Tests: English (IELTS 7.0/9, Speaking 8.0/9) / Japanese (JLPT N3)