

DAWEI (DAVID) LIU

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Website | GitHub | Scholar | OpenReview | LinkedIn

EDUCATION

University of Pennsylvania | M.S.E. in Computer & Information Science Philadelphia, PA | Aug 2024 - May 2026

- **GPA:** 3.90/4.00.

Northeastern University (China) | B.E. in Software Engineering Shenyang, China | Sep 2020 - Jun 2024

- **Rank:** 5/396 in Software Engineering (record dated Sep 11, 2023).

RESEARCH & OPEN-SOURCE EXPERIENCE

Selected Agent-Infrastructure Projects | Research & Open Source Remote | 2026 - Present

- **Graph-of-Skills.** Primary developer and experiment lead. Built dependency-aware retrieval for large skill libraries using hybrid semantic-lexical seeding, reverse-weighted Personalized PageRank, and budget-aware context loading.
- On the 1,000-skill SkillsBench setting with GPT-5.2 Codex, GoS increased reward by **25.55%** and reduced total tokens by **56.72%** versus full skill loading; validated across three model families, two benchmarks, and 200-2,000-skill library studies.
- **Dr. Claw.** Core contributor. Shipped Gemini and Codex providers, multi-session and isolated-project workflows, CLI/desktop access, reliability fixes, and cross-platform releases.
- **COMFYCLAW.** Co-developed a typed-graph agent harness with stage-aware tools, invalid-edit rollback, VLM-guided repair, and validated skill evolution for recurring image-generation workflows.

PROFESSIONAL EXPERIENCE

ByteDance Inc. | Software Engineer Graduate (Commerce Ads) Seattle, WA | Jun 2026 - Present

- Build and operate production commerce-ads backends across reliability, latency, observability, service integration, and controlled experiments; use AI-assisted workflows for development, testing, diagnosis, and operational efficiency.

ByteDance Inc. (TikTok) | Software Engineer Intern | Shop Ads (Commerce Ads) Bellevue, WA | May 2025 - Dec 2025

- Built a Shop Ads image-selection system combining posterior features, exploration-exploitation ranking, and multimodal LLM quality evaluation.
- Developed a generative-AI creative pipeline for high-value products using Flink-backed asset persistence and scheduled generation.
- Built a modular preview and diagnostics flow that injected test entities at each stage, enabling validation of new ad formats and regional rollouts.
- Addressed product-serving reliability and tail latency using caching, asynchronous batch fetches, and offline computation.

Amazon | Software Development Engineer Intern | Global-Mile Team Beijing, China | Jun 2024 - Aug 2024

- Built a ByteBuddy-based OpenTelemetry Java agent for runtime instrumentation, payload capture, and distributed tracing without application changes.
- Correlated traces by business ID across partially instrumented services and dynamically selected Kinesis or SQS for Fargate and Lambda runtimes.
- Built a React/Java telemetry console with filtering, aggregation, fuzzy search, pagination, and tree, table, timeline, and span-payload views.

JD Technology (JD.com) | SDE Intern, Algorithm Tools Beijing, China | Jul 2023 - Oct 2023

- Redesigned a Kubernetes resource-management service using ConfigMaps, Informers, asynchronous recalculation, observer-based updates, and sharded locking to reduce cold-start overhead.
- Refactored campaign-page generation with a modular Strategy pattern and introduced a generative-AI content pipeline to reduce manual operations.
- Improved CI/CD with Argo Workflows, Argo CD, and Helm-based multi-tenant deployment tooling for hybrid-cloud delivery.

SELECTED PUBLICATIONS

- Graph-of-Skills: Dependency-Aware Structural Retrieval for Massive Agent Skills** 2026
Dawei Liu[†], Zongxia Li[†], Hongyang Du, Xiyang Wu, Shihang Gui, Yongbei Kuang, Lichao Sun. *Agent Skills Workshop, ACM CAIS 2026*; arXiv:2604.05333. [paper] [code]
- COMFYCLAW: Self-Evolving Skill Harnesses for Image Generation Workflows** 2026
Zongxia Li^{*}, **Dawei Liu**^{*}, Fuxiao Liu, Yuhang Zhou, Xiyang Wu, et al. *2nd MUCG Workshop, ECCV 2026*; arXiv:2607.01709. [paper] [code]
- A Cookbook of 3D Vision: Data, Learning Paradigms, and Application** 2026
Hongyang Du^{*}, Zongxia Li^{*}, **Dawei Liu**^{*}, Runhao Li^{*}, Haoyuan Song, Qingyu Zhang, et al. *OpenSUN3D Workshop, CVPR 2026*, pp. 8376-8390. [paper] [code]
- Multimodal Video Generation Models with Audio: Present and Future** 2026
Zongxia Li, Hongyang Du, **Dawei Liu**, Xiyang Wu, Lantao Yu, Jingxi Chen, et al. *JAV-CG Workshop, ACM Multimedia 2026*. [paper] [code]
- TIMEDB: tumor immune micro-environment cell composition database with automatic analysis and interactive visualization**
Xueying Wang^{*}, Lingxi Chen^{*}, Wei Liu^{*}, Yuanzheng Zhang, **Dawei Liu**, et al. *Nucleic Acids Research*, 2023, 51(D1):D1417-D1424. Developed the visualization framework and supporting analyses. [paper] [site] [team]

^{*} Equal contribution; [†] Core Contribution, as designated by the cited papers.

SELECTED HONORS

- Winner, Apple Swift Student Challenge** 2026
• Selected as a 2026 winner; submitted **Aura Chef**, a touchless Swift playground using hand-pose recognition and voice commands. Apple's cohort included 350 winners from 37 countries and regions.
- China Collegiate Computing Contest - Mobile Application Innovation** 2022
• **Team Lead**. Served as sole software developer for *Trace Note*, an iOS/AR application that won National Final Second Prize and Northeast Division Innovation Track First Prize.
- National Scholarship for Undergraduate Students | Ministry of Education, China** 2020-2021

RESEARCH IMPACT & SERVICE

Metrics current Aug 15-16, 2026. Citation databases are non-additive.

Google Scholar | 77 citations; h-index 3; i10-index 2

Graph-of-Skills | 201 stars, 25 forks; 30 Google Scholar / 37 Semantic Scholar records

- Source-checked 11 later papers that used public assets, reimplemented or compared the baseline, or reused/tested GoS components; this indicates technical engagement, not adoption.

Dr. Claw | 1,045 stars, 117 forks; 4th by non-merge commits to main (51)

Reviewer, AgentSkills 2026 | ACM CAIS Workshop

2026

- Completed two manuscript reviews through OpenReview.

TECHNICAL SKILLS

Languages	Python, Go, Java, C/C++, JavaScript/TypeScript, SQL, Swift
AI/ML	PyTorch, LLM agents, retrieval/GraphRAG, multimodal evaluation, recommendation and ranking
Systems/Data	Distributed services, MySQL, Redis, Elasticsearch, Kafka; Flink, Thrift/Protobuf, OpenTelemetry
Cloud/DevOps	Linux, Docker, Kubernetes, AWS, Helm, CI/CD, Grafana, Git