ZHANG QIXIANG

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EDUCATION

National University of Singapore **Aug 2023 - May 2027**
Bachelor of Computing in Computer Science

- Concentrate on Programming Language, Software Engineer and AI agent development
- Second Major in Mathematics
- GPA: 4.1/5.0

SKILLS

Programming Languages: Typescript, C++, CSS, HTML, Ocaml, tCPA, Python, Java, Go, Rust,
Specialisation: High performance computing, Interpreter/Compiler Design, AI agent design.
Tools: React, Django, Jest, Tailwind CSS, Zustand, Redis, Fast API, CUDA, OpenMP.
Databases: MongoDB, PostgreSQL, SQLAlchemy.
ML/AI: Google Gemini API, Gemini Semantic Retrieval, LightGBM, Ollama.
Infrastructure: Docker, Terraform.

INTERNSHIP & WORK EXPERIENCE

Research Assistant, National University of Singapore, Singapore **Dec 2025 - Present**

- Designed and implemented a more expressive type system for typescript using separation logic based verification engine.

Teaching Assistant, National University of Singapore, Singapore **Feb 2025 - Dec 2025**

- TIC2701: Principles of Programming Language(Past). Taught tutorials and marked assignments in a 20 students' class.
- CS2104: Programming Language Concepts(Current). Assist Professor Olivier Danvy to conduct an innovative teaching, and communicate with students to identify potential problems haven't emerged in other courses.

Research Assistant, Illinois Advanced Research Centre at Singapore Ltd., SingaporeAug 2023 - Jan 2024

- Collaborated with a 4-person team to develop new features and enhanced UI components for a no-code Terraform editing platform, extending system architecture to support user-uploaded custom building blocks.
- Optimised frontend performance by constructing a memory hierarchy system, achieving 95% reduction in computing space usage.

PROJECTS

Software Engineer, Visualised Pie with AI support, Singapore **Dec 2025 - Present**

- Lead a six software developers' team under the supervision of Professor Martin Henz.
- Built a graph-based proof visualisation using React Flow, allowing users to manipulate proof trees with drag-and-drop tactics, real-time type checking, and undo/redo history.
- Implemented an AI-powered progressive hint system using Google Gemini API that provides Socratic-style guidance at three levels (category → tactic → full solution), with rule-based fallback for offline use.

Software Engineer, Great Transport — ML-Powered Video Distribution Platform, Singapore **Aug 2025 - Present**

- Architected hybrid Go/Python micro-services system for intelligent video discovery, scoring, and cross-platform upload automation
- Built 3-stage ML pipeline combining rule engine, LightGBM ranking model with 50+ engineered features and LLM review
- Implemented vector search using PostgreSQL pg-vector with DistilBERT/CLIP embedding for semantic video similarity
- Designed feedback loop tracking upload performance to auto-label outcomes and trigger model retraining

Programming Language Developer, Extended Pie: New features and Interactive Design, Singapore **Aug 2024 - Dec 2025**

- Implemented dependently typed programming language Pie in TypeScript and worked with frontend development team to integrate it into Source Academy, enabling users to write Pie code directly in browser.
- Extended Pie (the project listed above) with a tactics system and general inductive definitions, as well as a language server for VS Code integration and online playground.
- Presented in Singapore first Programming Language Summit. Awarded Best Project Prize at NUS's 26th Steps.

Web Developer, VinipoonPN, Singapore **May 2024 - Jul 2024**

- Built a Windows VPN client with automatic global proxy management, featuring connections to default VPN servers and support for user-uploaded custom server configurations for private networking.

Course Project, C-to-Assembly Compiler, Singapore **Aug 2025 - Dec 2025**

- Developing a compiler translating C-like language to X86Lite assembly code using OCaml, with LLVM as intermediate language.

Course Project, Rust Sublanguage Interpreter with Ownership Handling, Singapore Mar 2025 - Apr 2025

- Developed an interpreter for a Rust sublanguage using TypeScript, implementing ownership handling in type-checking system.

CO-CURRICULAR ACTIVITIES

- Active member of School of Computing Peer Student Supporter (SoC PSS), a student organisation established to address mental health challenges within NUS SoC. Contribute to improving student psychological well-being through mental health awareness programs and variance social activities.
- Member of a reading group focusing on Continental Philosophy, with special interests in dialectical reasoning and philosophy of history.