Faith Luo (she/her)

Software Engineer // CS Researcher

Columbia University | UCLA || Los Angeles
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PERSONAL STATEMENT

Highly motivated **Software Engineer** and **ex-startup founder** with **5+ years** of experience driving high-impact projects from ideation to production with **end-to-end ownership**. Proven track record building **high-performance**, **networked** applications for **real-time** environments using **C++**, **Typescript**, **Python**, and **WebGL**. Top 2% **Columbia Engineering** graduate and **UCLA graduate researcher** with a strong foundation in theoretical CS, **data structures**, and **algorithms**.

RELEVANT EXPERIENCE

Engineer @ thatgamecompany 2023 -

Architected and engineered **live systems** for **performance-sensitive** and **cross-platform** environments for **250+ million** users and **hundreds of different devices** ranging from PS4 to Android. Specialized in managing **full-stack systems** across Golang backend, C++ client, and Python integrations.

- **Project Lead** on Quest Service: Spearheaded **refactor** of multiple legacy services into a **single unified service**. Acted as **PM** and **engineering lead**: architected the system while setting long-term strategic goals and deadlines, negotiating with leadership and cross-department collaborators in design, UI, and beyond. Increased player retention by 10%.
- **Application Layer Engineering** point-of-contact for Trust Service: Coordinated with design, UI, QA, and player support to refactor and redesign a major service to improve user engagement.
- **Spearheaded** development of novel **testing-oriented framework** through interaction and integration tests. Expanded testing coverage which significantly improved system stability and reduced incident response time.
- **Refactored HTTP request client** logic in C++ to adapt to more complex systems and provide better retry logic for timeouts in high-latency regions.
- Provided input on **candidate evaluation**, contributing to two hires in the past year.

Co-Founder, Creative Director, Lead Client Engineer @ Dark Forest (x.com/darkforest_eth) 2020 - 2021

Co-Founded a company developing the first real-time interactive application for the blockchain using C++ and Typescript.

- Covered by MIT Technology Review. Project has been cited by academic papers measuring its impact on cryptography.
- Helped to **scale team** from 3 founders to **8 engineers**, designers, and researchers.
- Managed ICs and reviewed code as **Creative Director** and **lead client engineer**.
- Defined **visual identity** for all branding, design, and social media. Scaled to **24k+ followers** on X (@darkforest_eth).
- Designed and integrated **low-latency real-time** server reconciliation logic for the blockchain using lazy updating.
- **Architected** an extensible and scriptable complex windowing UI using React and Typescript.
- Developed **highly-performant WebGL renderer** to render **millions of objects** sourced from 10000+ concurrent users.
- Helped to **negotiate** collaborations with investors and industry partners such as Ethereum Foundation, Gnosis Chain, Thiel Foundation, Mozilla, and others. Participated in **fundraising** leading to **eight-figure** valuation by a **top VC**.
- Gave talks at **international conferences** such as EthGlobal.

RELEVANT PROJECTS

UnitLib - A highly-optimized C++ matrix and vector library supporting arbitrary SI units and beyond using C++20 compile-time programming features. Comparable to or faster than glfw, the industry-standard matrix library, in a fraction of the lines of code, while offering type and unit safety on matrices. [github]

xml-peruse - A typed and memory-optimized XML parser for Typescript/Javascript. [github]

Sappho in Space - A web experiment and interactive game built in a real-time simulation and physics engine with collision rendered entirely using DOM elements. Built in React and Typescript. [github] [web game]

Dark Forest Client - Highly-performant realtime renderer and windowing UI for the web. 230+ stars on Github. [github]

Little Planet Procedural - Procedural landscapes generated in the browser. 100+ stars on Github. [github] [demo]

EDUCATION

Columbia University | Bachelor's, Computer Science Class of 2026

GPA: 3.9/4.0. Theoretical Computer Science track. Egleston Scholar (funded research scholarship, ~10/year); Columbia Tau Beta Pi Engineering Honors (all years); Dean's List (all semesters); Core Scholar Award

Relevant Courses (PhD-level): Readings in Language Design (Bjarne Stroustrop), C++ Language Design (Stroustrop), Operating Systems, Computer Graphics, Programming Languages, Algorithms, Cryptography, Computational Complexity

University of California Los Angeles | Graduate Researcher 2025 -

Visiting researcher in Computer Science, advised by Chenfanfu Jiang. Supplemental coursework in CS (GPA: 4.0/4.0).

SKILLS

Deep knowledge of C++, Typescript/Javascript, HTML/CSS, Python. **Proficient in** WebGL, C, C#, Java, Linux.

Technologies: P4, Git, React, Node.js

Spoken Languages: English (native), Chinese (fluent), Japanese (fluent)

ADDITIONAL EXPERIENCE

Quantitative Developer Intern @ D. E. Shaw 2023

Engineer on Python Infra team. Static and dynamic analysis for developer tooling using Python metaprogramming.

Software Engineering Intern @ Figma 2022

Engineer and PM on Editor Experience team. Developed plugins for FigJam and led Scale Tool strike. Typescript/WebGL.

Applied Cryptography Systems Engineer @ Ethereum Foundation 2020

Developed open-source applications using zero-knowledge proofs and experimental applied cryptography.

WebGL Developer @ Countable Web Productions 2019

Developed map applications for Canadian public service projects using Javascript and WebGL.

PUBLICATIONS

[2022] Thomas Chen, Hui Lu, Teeramet Kunpittaya, Faith (Alan) Luo. *A review of zk-snarks*. arXiv preprint arXiv: 2202.06877. 91 citations. [Google scholar link]

RESEARCH EXPERIENCE

Graduate Researcher @ UCLA AIVC 2025 -

Advised by Prof. Jiayin Lu, Ying Jiang, and Chenfanfu Jiang. Developing performant **Reinforcement Learning** models in Python and C++ for **mesh simplification** and problems in computational geometry and computer graphics. Working collaboratively with international partners. Mentoring a UCLA undergraduate student. Built a **highly-performant** mesh representation library in Python optimized for learning problems.

Research Assistant @ Columbia University 2021 - 2022

Advised by Prof. Tim Roughgarden. Researched zero-knowledge proofs and blockchains. Organized weekly reading group for undergraduate and graduate students. Published paper with 91 citations on arXiv preprint.

ORGANIZATION AND TALKS

[2022] Columbia Blockchain Reading Group, presenter, host, and organizer (advised by Prof. Tim Roughgarden)

[2020] *zkSNARKs for Hidden Information Blockchain Games*, presenter (zkSummit 6)

[2020] *Dark Forest: Challenges and Constraints in ZK Gaming*, presenter (EthGlobal)

[2020] *Applied cryptography for games*, presenter/panelist (Stanford Blockchain Conference)