Christopher Yoon

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Education

Columbia University New York, NY

B.A. Computer Science; Concentration in Mathematics (GPA: 3.92; Columbia College) Sep 2020 – May 2024

Coursework: Graduate Operating Systems, Graduate Compilers, Graduate ML Privacy, AI, Real Analysis, Abstract Algebra

Experience

Virtu Financial New York, NY

Software Engineer Intern Jun 2023 - Present (Aug 2023)

- Implemented the TLS protocol using only Java standard libraries, specifically for nonblocking TCP streams
- Migrated the *stunnel*-based Drop Copies to use the TLS implementation for ingesting real-time market trades
- Implemented proprietary data access control mechanism into company's REST & GraphQL post-trade data servers
- Technologies used: Java standard libraries (networking, security, NIO); Java concurrency; Spring

Riot Games (Remote) Los Angeles, CA

Software Engineer Intern, Live Operations Engineering - Incident Management Team May 2022 - Aug 2022

- Built a GitOps config manager to improve cross-team collaboration on operating Riot's service monitoring systems
- Built a CI/CD pipeline to deploy new configs to monitoring systems and execute backups and rollbacks at crash
- Refactored internal API client for the BigPanda alert monitoring system to be aligned with industry best practices
- Technologies used: Python for GitOps infrastructure and API Client; Docker and Jenkins for CI/CD pipelines

Columbia University Department of Computer Science New York, NY

Compilers Researcher Sep 2022 – Present

- Building *sslang*, a programming language with precise timing prescriptions, advised by Prof. Stephen Edwards
- Implemented pattern matching error detection (nonexhaustive *match* statements) in *sslang*'s compiler, with Haskell

Operating Systems Researcher Sep 2022 – May 2023

- Contributed to building a secure containerization mechanism on ARM Linux (Realms), advised by Prof. Jason Nieh
- Helped implement the kernel interface that orchestrates container memory protection against the host OS
- Technologies used: Linux kernel engineering, ARMv9 CCA/Realm Architecture

Teaching Assistant Jan 2022 – Present

- Head TA for *Artificial Intelligence*, a programming-heavy (with Python) masters-level course on AI
- TA for *Parallel Functional Programming*, a masters-level course teaching Haskell and its concurrency primitives
- TA for *Fundamentals of Computer Systems*, an undergrad course on computer systems and Assembly programming
- Duties include: running office hours; organizing recitations on clean code; writing and grading homework/exams

Skills

Languages: Python, C, Haskell, OCaml, Java, Rust, Go, Assembly

Interests: Compilers, ML Systems, Kernel Engineering, Virtualization/Containerization/Hypervisors

Selected Projects

Encrypted-TAO [Rust, Postgres]: Implementation of Facebook's TAO model and API, but encrypted **[Github]**

- Implemented Facebook's TAO model and API, a proxy over a SQL DB to serve queries on the social graph
- Features query execution on fully encrypted social graph data, via deterministic and homomorphic encryption
- Implementation includes: order-preserving encryption; query parser and SQL translator; and caching mechanisms

Orlang [OCaml]: A Functional Programming Language (Poor Man's OCaml) **[Github]**

- Implemented a compiler for an OCaml-like functional programming language targetting the LLVM IR
- Features higher-order functions; a Hindley-Milner type system; pattern matching; list operations; and many more