

Shyam Mehta

26 Lalique Dr, Montville, NJ 07045 • (973) 641-2989 • shyam.mehta@hotmail.com • [GitHub](#) • [LinkedIn](#)

EDUCATION

University of Pennsylvania – Philadelphia, PA

M.S.E. in Computer Science | GPA: 3.9/4.0

December 2024

B.S.E. in Computer Science | *Minors in Mathematics, Statistics, and Data Science* | GPA: 3.9/4.0

May 2024

- *Relevant Coursework:* Data Structures & Algorithms; Distributed Systems; Machine Learning; Randomized Algorithms; Big Data Analytics; Operating Systems; Compilers & Interpreters; Computer Organization; Computer & Network Security; Convex Optimization; Advanced Linear Algebra; Real Analysis; Probability; Stochastic Processes; Bayesian Statistics

TECHNICAL SKILLS

Languages: Java, C/C++, Python, Kotlin, OCaml, Haskell, TypeScript, SQL, CodeQL, Bash, HTML/CSS, (subset of) x86 Assembly

Frameworks: Spring, React, Express, Django, PySpark, PyTorch, Tensorflow, MXNet, OpenCV, Scikit-learn, Guice

Cloud: AWS CDK/CloudFormation, EC2, Lambda, AppConfig, EventBridge, CloudWatch, SQS, DynamoDB, S3

Databases/Other: MySQL, MongoDB, Redis, Cassandra, Docker, Kubernetes, Jenkins (CI/CD)

PROFESSIONAL EXPERIENCE

Amazon, Prime Video | Incoming Software Development Engineer Intern

June 2024 – August 2024

Amazon, Alexa AI | Software Development Engineer Intern

May 2023 – August 2023

- Designed and deployed (for beta-testing) a low-latency, massively scalable AWS service to process, store, and delete data involved in the Entity Resolution (ER) pipeline at adjustable time intervals, allowing a throughput of 8,000 write requests per second from external services, generalized for all services using the Alexa ER data lake
- Resulted in an average cost reduction of \$20,000 per year for the ER Search team

Moderne, Inc. | Software Engineer (Part-time)

September 2022 – January 2023

- Focused on OpenRewrite recipe development and expanding OpenRewrite's language support beyond Java

HUMAN Security, Inc. | Software Engineering Intern

May 2022 – August 2022

- Contributed to the OpenRewrite project, a format-preserving Abstract Syntax Tree transformer for scalable code refactoring
- Implemented control and dataflow analyses to allow for guard and taint tracking analysis, as well as a visualizer for control/dataflow analyses to assist users of OpenRewrite in constructing custom recipes
- Received a bounty from the GitHub Security Lab for identifying *Partial Path Traversal* (CWE-23) vulnerabilities in Java projects across GitHub using CodeQL and remediating them using custom OpenRewrite recipes

TEACHING

University of Pennsylvania | CIS Undergraduate Teaching Assistant

Courses: CIS 5050 – Distributed Systems (Spring 2024), CIS 3800 – Computer Operating Systems (Fall 2023, Spring 2024)

PRESENTATIONS

Leitschuh, J., Way, P., & Mehta, S. (2022, August 11). *Scaling the Security Researcher to Eliminate OSS Vulnerabilities Once and For All* [Conference presentation]. Black Hat USA 2022, Las Vegas, NV, United States.

PROJECTS

Tidal Translator | *Haskell, Stack*

December 2023

- Built a transpiler from Tidal Cycles (a DSL to create musical compositions) to LilyPond (a DSL for writing musical score)
- Developed an interactive environment for real-time score generation, which accepts Tidal patterns among other commands; upon the termination of an interactive session, the Tidal composition provided is exported as a Lilypond file
- Utilized monadic QuickCheck for round-trip testing to verify correctness of the transpiler

PennCloud | *C++, C, React, HTML/CSS, JavaScript, gRPC, Make, Bash*

April – May 2023

- Designed and implemented a scalable, fault-tolerant distributed system hosting a platform akin to Google Apps (with storage and SMTP-driven email services), backed by a simplified, BigTable-type data store using primary-based replication
- Employed a frontend load balancer and backend master node to redirect requests, manage nodes, and track node statuses
- Utilized gRPC for inter-server communication and multithreading to handle multiple simultaneous requests

PennOS | *C, Make, Bash*

November – December 2022

- Implemented a Unix-like, single-process OS with a round-robin priority scheduler using the ucontext library
- Upon boot and mounting of PennFAT file system, a shell is executed, supporting foreground/background processes, synchronous child waiting, redirection, and built-ins (including cat, sleep, touch, etc.)

Oat Compiler | *OCaml, ocamllex, menhir, LLVM, x86 Assembly, C*

February – April 2022

- Developed a fully functional compiler for Oat, a type-safe language (similar to C) featuring structs, function pointers, arrays, and subtyping, using the LLVM compiler infrastructure (with ocamllex and menhir used for lexing and parsing)
- Implemented optimizations at the LLVM level using several dataflow analyses, including liveness, alias, and constant propagation analysis, to allow for constant folding and dead code elimination; used graph coloring for register allocation

Participatory Learning Platform | *React, Express, Node.js, MySQL, Redis*

March 2018 – January 2022

- Developed an online platform to facilitate the Participatory Learning (PL) educational model, allowing for custom (potentially student-driven) assignment creation and workflows; to date, it supports 1,000+ students and 20+ courses