Tuneer Roy

tuneer@seas.upenn.edu | (615) 947- 3426 | tuneer-roy.com | github.com/tuneerroy

EDUCATION

University of Pennsylvania | Philadelphia, PA **May 2025**
Master of Science (MSE) & Bachelor of Science (BSE) in Computer Science   GPA: **4.0**/4.0

- *Relevant Coursework:* Data Structures and Algorithms; Object Oriented Programming; Computer Systems; Machine Learning; Operating Systems; Databases; Big Data Analytics; Blockchain; Functional Programming; Artificial Intelligence; Automata, Computability, & Complexity; Probability; Linear Algebra
- *Technical Skills:* C++, Python, Haskell, C, TypeScript, Java, SQL, MongoDB, Kubernetes, Docker, Git, PyTorch, Apache Spark, Coq, React, Django, Node.js, Flask, FastAPI, AWS (EC2, S3, ELB), UNIX Command Line

RELEVANT EXPERIENCE

University of Pennsylvania | **Instructor for CIS 1962: JavaScript** | Philadelphia, PA   Aug 2023 – Present
- Write curriculum/assignments, deliver lectures, lead team of TAs, and hold office hours weekly
- Teach topics like MV* frameworks, query languages/databases, (client/server)-side app architecture, etc.
- Previously served as a teaching assistant for CIS 2620: Automata, Computability, & Complexity (130+ students)

Penn Labs | **Team Lead, Backend Developer** | Philadelphia, PA   Feb 2022 – Present
- Lead teams for Penn Mobile and Portal, catering to over 10,000+ active student users, by designing and developing Django REST backend and data architecture in collaboration with iOS/Android teams
- Oversee product ticketing system and app deployment, review pull requests, and train incoming engineers
- Built a notification system to enable other Penn Labs products to send alerts to the app (with optional delays using Celery) and implemented a caching system with Redis to enable faster API response times (up to 95% faster)

Martian | **Software Engineering Intern** | San Francisco, CA   Oct 2022 – August 2022
- Improved EdTech tool's website speed by over 150% by refactoring its codebase, using React & Express
- Implemented entire backend in FastAPI & MongoDB for core product in a single weekend (+4198/-1289 lines) that supports account creation, Stripe payment, API key creation, and team creation for companies
- Developed models using PyTorch and Hugging Face by finetuning existing LLMs to help with tasks such as redacting personally identifiable information from prompts and generating web code given just a description
- Wrote Python & Node.js packages to enable developers to easily integrate the core product into their codebases

University of Pennsylvania | **Research Assistant** | Philadelphia, PA   May 2022 – Aug 2022
- Analyzed and organized Ethereum blockchain data using SQL, Python, and BigQuery
- Developed a dashboard with TypeScript, React, Express, and MongoDB to automate fuzzing programs on new smart contracts on the Ethereum blockchain, resulting in a 75% reduction in analysis time for the research team

PROJECTS

Esoteric Language Compiler: Invented generic abstract language syntax to be compiled directly into ARM assembly. Built parsers for two separate esoteric languages to be translated into internal representations of logic. Ensured correctness by writing corresponding interpreters and using property-based testing with QuickCheck.   (Haskell, ARM Assembly)

Forecasting Stock Prices: Developed an ensemble model that used the ARIMA & Transformer architectures for predicting future stock prices. Achieved an average MSE of \$2.63 per stock (with prices in the thousands) and R^2 of 0.94. Outperformed prior top Kaggle submission's LSTM + GRU model whose average MSE was \$15.67 per stock.   (PyTorch)

PennOS: Implemented a UNIX-like operating system that ran as a single process on a host OS, using the ucontext library to implement a basic Round Robin priority scheduler, simulating multiprocessing. Programmed shell for OS that supports foreground/background processes, stdin/stdout redirections, multi-process pipelines, and async job control.   (C, Linux)

Book Nexus: Wrote complex SQL queries to generate book/author recommendations based on users' preferences. Enabled account registration/login through Google, Facebook, and custom process, storing user details in MongoDB. Established a CI/CD pipeline for automatic app deployment on repository updates.   (React, Express, MySQL, MongoDB)

GPT Code Critic: Set up Docker & Kubernetes-based app using GPT-3.5 for code analysis. Published separate GitHub action on the GitHub marketplace which checks code changes during pull requests.   (Docker, Kubernetes, GitHub Actions)

Car Price Predictor: Consolidated & refined a dataset of cars' attributes and prices. Employed feature engineering using techniques like PCA and created models using random forest regressors and FCNNs.   (NumPy, Pandas, Seaborn, PyTorch)