

# Jack Lo

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## EDUCATION

**Cornell University**, College of Engineering  
*Masters of Engineering, Computer Science*  
GPA: 3.5

Ithaca, NY  
Dec 2023

**Cornell University**, College of Arts and Sciences  
*Bachelor of Arts, Computer Science*  
GPA: 3.9 | 2019 Fall — 2023 Spring Dean's List All Semesters

Ithaca, NY  
May 2023

## EXPERIENCE

**Kim Lab at Cornell University**, *Research Software Engineer*

Aug 2023—Present

- Developed a new **Java** package for the BEAST 2 program implementing a novel Bayesian statistical method that uses the seedbank coalescent model to infer phylogenetic trees and recover epidemiological parameters.
- Implemented a neighbor joining algorithm as a full **Macaulay2** package and conducted Monte Carlo experiments to estimate the volume of 10-dimensional cones corresponding to admixed phylogenetic trees.
- Architected a **Python** computational pipeline that identified tuberculosis transmissibility genes using decision trees (XGBoost) and SHAP values.
- Worked extensively with **shell scripting** on a remote **Linux** server network using **Docker** and **Singularity** for containerization and **Slurm** for scheduling jobs asynchronously

**Gamers Alliance**, *Software Engineering Intern*

Sept 2024—Present

- Developed a web application for tabletop event scheduling and managing that utilizes a **REST API**.
- Carried out the redesign and implementation of the event data object for streamlined CRUD processing and storage by coding new **Flask** endpoints in **Python** and refactoring the **PostgreSQL** database using **Liquibase** changesets.
- Implemented automatic sign-ups at session creation in the **Node.js** frontend application for enhanced user experience.
- Worked exclusively on a **VirtualBox** VM with a **Linux** OS, using **Podman** images and containers for versioning and deployment, and **Postman** for testing endpoints.

**Healthcare.com**, *Software Engineer Intern*

June 2023—Aug 2023

- Worked on the development of a web application as a full-stack engineer as part of a **scrum** team.
- Developed two new web pages for a new data management system to track and manage partnerships using **HTML**, **CSS**, **React.js**, and **Typescript** in the front-end.
- Engineered new **GraphQL** schemas and types in the service and data access layers in **Scala** to enable the display and storage of new data in **PostgreSQL** databases in the back-end.
- Implemented **SQL** optimizations to improve data access performance by over 50% on average for queries used over 20,000 times per day.
- Reconstructed multiple old web pages using **React.js** to decouple from outdated frameworks.
- Designed and coded in-depth unit and integration **JUnit** and **Jest** tests and wrote high-quality documentation to facilitate a **CI/CD** pipeline and ensure long-term code maintainability.

**Preface (Hong Kong)**, *Software Engineer Intern*

June 2022—Aug 2022

- Designed and developed 10+ responsive and reusable web application components using **React.js**, **Node.js**, and **Storybook** for a new business offering on the company website.
- Built and managed a data pipeline that automated the data entry and creation of reports for 200+ clients using **Python** and the **Google Drive API**.

## TECHNICAL PROJECTS

### Knowledge Graph Pipeline

- Built a pipeline to automate the creation of domain-specific knowledge graphs by first processing data dumps from open-source knowledge bases and then scaling the graph via information extraction from various web sources.
- Implemented supervised machine learning methods to train probabilistic binary classifiers that computed the probability of new web-scraped facts being correct and reduce noise, leveraging ChatGPT for labelling.

### Global Wheat Network Simulation

- Modified the Eisenberg-Noe financial network model to investigate the stability of the global wheat trade.
- Determined the impact of wars, embargoes, and country failures using probabilistic cascading failure models and k-cores.

## SKILLS

JavaScript/HTML/CSS ♦ React.js ♦ Node.js ♦ Python ♦ Java ♦ Scala ♦ PostgreSQL ♦ SQL ♦ C ♦ R  
Git ♦ Linux ♦ VirtualBox ♦ Docker ♦ Podman ♦ Jira ♦ CI/CD ♦ REST API ♦ Postman ♦ pgAdmin