

YINGYING GONG

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Education

California Institute of Technology, Expected Graduation in Mar 2026 **Sep 2022 – Present**
B.S. in Computer Science *GPA: 4.0/4.0*
Featured Coursework: Algorithms, Machine Learning, Statistical Inference, Probability Models, Hedge Funds

Skills

Languages: Python, C/C++, Rust, Java, MATLAB

Technologies: Git, AWS, MySQL, PyTorch, Linux, Gradle **Methodologies:** Agile, Scrum, OOP, DevOps, CI/CD

Internship

Software Engineering Intern | *New Relic, Inc. Portland, Oregon* **Jun.2024– Present**
Intern at Capacity Engineering Team in Cloud Platform Services

- Designing the model deployment pipeline and building **linear regression models** on time-series CPU utilization data.
- Developing a Java-based web application for managing cloud account health.

Research

Quality and Speed Trade-off for Strategic Servers | *Operation Research* **Mar. 2024– Present**
Advisors: Dr. Adam Wierman, Caltech; Dr. Raga Gopalakrishnan, Queen's University

- Model the emergent equilibrium of M/M/n/k queueing with re-entry from low quality service.
- Numerically study the equilibrium existence and classify multiple equilibria by simulating the queue in Python.

Dimensional-reduced Perturbation Network | *Machine Learning for Science* **Apr.– Dec. 2023**
Advisor: Dr. Matt Thomson, California Institute of Technology, Pasadena, CA

- Worked directly with the principal investigator and a senior Phd on a research project pending publishing.
- Analyzed large scale (1M+ times 10k+) high dimensional data by dimensional reduction and clustering.
- Reconstructed integration networks from 2M+ of cells by stochastic gradient descent and MCMC algorithm.
- Skilled in evaluating machine learning models and managing Linux clusters by Slurm.

Projects (Software Development)

Command Line Tools: Zip and Grep | Rust, [Github Link](#) **Apr.- Jun.2024**

- **Zip:** Data compression tool using DEFLATE stream, canonical huffman coding and LZ77 algorithm.
- **Grep:** Regular expression matching backed by a nondeterministic finite automata (NFA) engine.
- **10k codes in total from scratch;** wrote unit, functional, and integration tests; profiled performance for optimization.

DSPIN: Network Constructor for scRNA-seq Data | [Python Package on PyPI](#) **Jun.- Dec.2023**

- Built the API with Object-Oriented Design, encapsulated functions for intuitive use by non-technical clients.
- Improved the computational efficiency up to about 250% by pseudolikelihood algorithms for high parameters.
- Transformed laboratory codes into a polished, industry-standard Python package, ensuring robustness.

2D Physics Engine for Video Game | C, Javascript by Emscripten compiler and SDL2 library **Apr.– Jun.2023**

- Led a Team of 4, familiarized with quality control, following agile and scrum methodologies.
- Developed memory-efficient C libraries for Physics forces and graphics in polygons by vector math.
- Designed a multimedia 2D video game, “Beaver Run”, with the Physics engine, visualized by SDL2.

Activities

Participant , Virtu Financial’s Wintership **Jan. 2024**

- Learnt about market making, automatic trading, and finance technology through lectures and a weekly project.

Technical Assistant , AI Bootcamp for Professors and Graduate Researchers **Sep.- Dec. 2023**

- Prepared course materials such as slides and tutorial notebooks for unsupervised learning.

Active Member , Quantitative Finance Club **Jan. 2023 - Present**

- Learnt classical quantitative trading ideas and mathematics involved, finalists in Poker tournament.