Haotian (Jack) Gong

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Education

- **The University of British Columbia** — Vancouver, Canada
  B.S. (Honors) in Computer Science; GPA: 3.9/4.0 (91/100) — *September 2019 - June 2024*
  Courses: *Tradeoffs in Designing Computer Systems(Graduate), OS Design and Implementation, Compiler Construction, Advanced Machine Learning*

Experience

- **Max Planck Institute for Informatics** — Saarbrücken, Germany
  Research Intern - Prof. Yiting Xia — *May 2023 - Current*
  - Contribute ∼ 700 lines of C++ code to the *htsim* network simulator, enabling seamless support towards reconfigurable optical datacenter networks, accurately replicating results of 2 other state-of-the-art optical routing systems.
  - Collaborate closely with Dr. Jialong Li, actively participating in the iterative design and implementation of a novel routing solution, which improves network load balance by up to 1.6× while reducing number of re-routes in the system by 20% compared to our baseline.
  - Identify and analyze key network performance indicators using Python, setup experiment pipeline which parallelizes network simulation, data extraction, and graph plotting.
- **Systopia Lab, The University of British Columbia** — Vancouver, Canada
  Research Intern - Prof. Margo Seltzer — *May 2022 - December 2022*
  - Contributed to the "FlexoGraph" graph processing system, leveraged the iterator programming model and the OpenMP parallel programming framework to speed up graph algorithms by up to 14× with multi-threaded execution. [Code]
  - Independently explored 2 prominent paradigms of memory - storage interactions within state-of-the-art graph processing systems by conducting paper review and running experiments within "FlexoGraph". Presented findings through written and verbal reports in graduate seminar course. [Report]
  - Implemented suite of graph algorithm benchmarks (Connected Components, Triangle Counting, etc.) to measure scalability of the system. Deployed Linux "perf" tool to identify and resolve performance bottlenecks.
- **Philips HealthTech** — Vancouver, Canada
  DevOps Engineer Intern — *January 2021 - April 2021*
  - Prototyped Slack chatbot using a full serverless architecture that pushes AWS CloudWatch alerts to Slack channels, eliminating human effort in monitoring the AWS Console.
  - Designed and deployed template for Bamboo CI/CD pipelines. Rolled out log collection jobs to Kubernetes cluster.
- **The University of British Columbia** — Vancouver, Canada
  Teaching Assistant
  - Teaching assistant for CPSC 121: Models of Computation(2020W1, W2), CPSC 213: Introduction to Computer Systems(2021W1, W2), CPSC 313: Computer Hardware and Operating Systems(2022W2).
  - Instructed tutorial sections with 30+ students, held office hours, and assisted with exam grading.

Technical Projects

- **Course Copilot** Part of 3-person team to develop chatbot application that answers course material related questions using large language models. Investigated and compared 3 major context extraction methods that grounds LLMs with factual truth, mitigating LLM "hallucinations". [Code, Report]
- **UBC AgroBot** Created module to transition image detection results from Tensorflow into 3D coordinates for an agriculture robot capable of fully-autonomous fertilization, targeted weeding, and data collection. [Code]
- **Clinical Data Warehouse Pipeline** Project with the Digital Health Innovation Lab @ BC Hospitals, built Python pipeline that modularizes and automates the data ingestion process, reduced size of SQL codebase by 95%.
- **AP Management System** Designed MySQL database for a mock amusement park management system, applying schema refinement and normalization techniques. Created web UI with Django. [Code]
- **Exprs-lang Compiler** Constructed a fully functional compiler in the Racket language. Compiler provided support for first-class procedures and basic data structures.

Skills Summary

- **Languages:** C++, C, Python, Java, Racket, SQL, Unix scripting
- **Tools & Frameworks:** Perf, OpenMP, WiredTiger, Kubernetes, Docker, Matplotlib, Numpy, Django, PyTorch
- **Certificates:** AWS Certified Solutions Architect – Associate

Honors and Awards

- UBC Science Undergraduate Research Experience Award — *2022*
- UBC Trek Excellence Scholarship, awarded to top 5% of students in faculty by sessional GPA — *2020, 2021, 2022*
- ACM-International Collegiate Programming Contest Pacific Northwest Div.2 Site Champions — *2020*