Qifan (Eric) Yan

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EDUCATION

The University of British Columbia (UBC) Sep 2018 - Dec 2023 (Expected)

Bachelor of Science (Hons.) in Computer Science + Master of Management Dual Degree Vancouver BC, Canada

- **B.Sc. GPA**: 91.5/100 (3.92/4.0) (**Top 5%**) **Computer Science GPA**: 94.9/100 (4.0/4.0)
- **Honours Thesis Advisor**: Ivan Beschastnikh
- **Coursework**: Distributed Systems, Internet Computing, Machine Learning and Data Mining, Natural Language Processing, Advanced Software Engineering, Operating Systems and Computer Hardware, Compiler Construction

RESEARCH INTEREST

Distributed systems, systems for machine learning, federated learning

PUBLICATION

[1] Shiqi He, **Qifan Yan**, Feijie Wu, Lanjun Wang, Mathias Lécuyer, Ivan Beschastnikh. GlueFL: Reconciling Client Sampling and Model Masking for Bandwidth Efficient Federated Learning. *Conference on Machine Learning and Systems (**MLSys 2023**).* (PDF link)

RESEARCH EXPERIENCE

UBC Systopia Lab | Honours Thesis - GPFL (Work In Progress) Sep 2022 - Present

- Created GPFL, a novel scheduling algorithm for cross-device federated learning, which leverages pre-sampling of clients and pre-fetching of model updates to accelerate training through communication cost reduction
- Explored GPFL's performance gains both theoretically and empirically; conducted the empirical validation by independently building a simulation system based on the FedScale platform with Python and PyTorch
- Optimized pre-sampling + pre-fetching algorithms to address complications arising from client heterogeneity, and more specifically client availability differences under distinct network environments for federated learning

UBC Systopia Lab | Research Assistant - GlueFL Apr 2022 – Dec 2022

- Contributed to the ideation, realization, and evaluation of GlueFL, a framework designed to combine sticky sampling and mask shifting to address the communication bottleneck in cross-device federated learning
- Improved robustness of the GlueFL framework to system heterogeneity in federated learning by extracting network environment data from sources including Measurement Lab, FedScale and various paper artifacts and adapting the GlueFL framework to account for the observations
- Oversaw all hyper-parameter experiments, diagnosed system and statistical performance issues, created various visualization of experiment results, and discussed results in the final paper submission
- Supervised by Dr. Ivan Beschastnikh, Dr. Mathias Lécuyer, and Dr. Lanjun Wang

UBC Software Practices Lab | NSERC USRA Research Intern - Prusti May 2020 – Sep 2020

- Conceptualized novel verification techniques for concurrent Rust programs using threads with permission-based logic in Prusti, a front-end for the Viper verification language and the Z3 SMT solver
- Encoded Rust source code into Viper code for verification with internal/experimental Rust compiler features such as procedural macros, compiler queries, and intermediate compiler representations (HIR, MIR)
- Created a design document and a presentation to showcase use cases, syntax, encoding and implementation design
- Supervised by Dr. Alexander J. Summers and funded by a NSERC Undergraduate Student Research Award

TEACHING EXPERIENCE

UBC Computer Science | Teaching Assistant

- CPSC 416 Distributed Systems Jan 2023 - Apr 2023
- CPSC 317 Internet Computing Sep 2022 - Dec 2022
- CPSC 311 Definition of Programming Languages Sep 2021 - Dec 2021
- CPSC 210 Software Construction Jan 2020 - Apr 2020

INDUSTRY EXPERIENCE

Amazon | Software Development Engineer Intern — Jun 2022 – Aug 2022

- Implemented new back-end systems with Java and the Spring framework and related front-end web pages with JavaScript and Angular to enable new payment disbursement options for 20% of Amazon.com retail sellers
- Created and presented a detailed design document that went through multiple rounds of internal and external review to evaluate legacy system architecture and the feasibility of multiple designs for the new system based on extensibility, maintainability and scalability
- Leveraged internal tools and AWS technologies including S3, Lambda, CloudWatch, and EC2 in the design, implementation and evaluation phases to verify system correctness and performance metrics

Deloitte | Business Analyst — Jan 2022 – Apr 2022

- Reviewed existing business cases and helped develop project proposals for helping a major Canadian mining firm migrate their services to the cloud
- Staffed on the Microsoft/Azure technology development team for a federal class action claim system to support victims of residential schools and first nation water pollution in Canada

SAP | Software Developer Intern — Sep 2020 – Apr 2021

- Committed to the full-stack development of SAP Concur's next-gen homepage used by 48,000 businesses
- Researched substantial current and legacy documentation/code to build and document high-performance endpoints for the homepage's back-end services in Go as part of SAP Concur's transition to micro-services
- Implemented over a third of the front-end components and related API connection, user-permission, error handling, logging, and analytics logic using technologies like TypeScript, React and Redux
- Spearheaded the design and creation of new E2E test automation with TestCafe covering 100% of current expense features and contributed to existing internal documentation to aid future knowledge transfers
- Conducted routine code reviews, presented in daily scrums, participated in weekly sprints, and demoed frequently in sprint meetings as part of the agile development process

PRESENTATION

[1] SALmon 2023 Workshop Poster, UBC Systopia Lab, Vancouver, BC, March 2022. Qifan Yan. "GlueFL: Reconciling Client Sampling and Model Masking for Bandwidth Efficient Federated Learning".

EXTRACURRICULAR ACTIVITIES

- UBC Computer Science Student Society | Vice President Academic & Web Dev Lead — May 2021 - Apr 2022
- UBC Dept. of Computer Science Outreach, Diversity and Equity Committee | Member — May 2021 – Apr 2023
- UBC Dept. of Computer Science Student Development Committee | Member — May 2021 - Apr 2022
- UBC Dept. of Computer Science Program Experience Committee | Member — May 2021 - Apr 2022
- Computer Science Undergraduate Research Night | Host and Panelist — 2021, 2022
- HWSS Coditek Computer Science Outreach Club | President — 2016 - 2018

AWARDS

- Canada Graduate Scholarships Master's Program | $17,500 — 2023
- MM Accelerated Career Scholarship | $5,000 — 2023
- UBC Trek Excellence Scholarship (Top 5%) | $1,500 — 2019. 2022
- NSERC Undergraduate Student Research Award | $6,000 — 2020
- UBC Tuum Est Experiential Award | $3,500 — 2020
- UBC Computer Science Undergraduate Service Award — 2022
- Science Scholar — 2019-2022
- Dean's List — 2018-2022

TECHNICAL SKILLS

Programming languages: Python, Java, Go, C, C++, TypeScript, JavaScript, Rust, Racket
Frameworks & Libraries: PyTorch, Scikit-learn, NumPy, Pandas, gRPC, Spark, Spring, React, Angular, Redux
Technology: Linux, Git, AWS, Kubernetes, Docker, LLVM, PostgreSQL, MongoDB, HTML, CSS, Cypress, Postman, LaTeX