ZHENAN FAN

501-5629 Birney Ave. ◇ Vancouver, BC ◇ (+86)17278203191 ◇ zhenanfan@gmail.com

EDUCATION

University of British Columbia Sep. 2019 - Sep. 2022
Ph.D. in Computer Science
Supervisor: Michael P. Friedlander
Area: Optimization and Machine Learning

University of British Columbia Sep. 2017 - June 2019
M. S. in Computer Science

University of Toronto Sep. 2013 - June 2017
B.S. in Math and Computer Science (double major), Overall GPA: 3.98/4.0

EXPERIENCE

Senior Research Engineer Oct. 2022 - Present
Huawei Vancouver Research Center *Research and Software Development*

- Advanced the development of an optimization solver, contributing to modeling tasks in operations research projects such as production planning and flight scheduling.
- Spearheaded the development of Huawei's large language model for Business Intelligence (BI) services, focusing on natural language to SQL (nl2sql) and natural language to API (nl2api) functionalities.

Research Internship June 2020 - Sep. 2022
Huawei Vancouver Research Center *Research and Software Development*

- Developed a robust optimization solver for linear and quadratic programming problems utilizing the interior point method, implemented in C++.
- Innovated a contribution valuation framework for federated learning to assess individual data provider contributions, enhancing collaborative model training efficiency.

PUBLICATIONS (* MEANS EQUAL CONTRIBUTION)

- **Z. Fan***, X. Wang*, O. Yakovenko*, A. Sivas, O. Ren, Y. Zhang, Z. Zhou. Smart Initial Basis Selection for Linear Programs. In *International Conference on Machine Learning (ICML), 2023*.
- **Z. Fan***, H. Fang*, M. Friedlander. Cardinality-constrained structured data-fitting problems. Submitted to *Open Journal of Mathematical Optimization, 2023*.
- **Z. Fan**, H. Jeong, B. Joshi, M. Friedlander. Polar Deconvolution of Mixed Signals. In *IEEE Transactions on Signal Processing, 70:2713-2727, 2022*.
- **Z. Fan**, H. Fang, Z. Zhou, J. Pei, M. Friedlander, C. Liu, Y. Zhang. Improving Fairness for Data Valuation in Federated Learning. In *IEEE International Conference on Data Engineering (ICDE), 2022*.
- H. Fang, **Z. Fan**, M. Friedlander. Fast convergence of the stochastic subgradient method under interpolation. In *International Conference on Learning Representations (ICLR), 2021*.
- **Z. Fan**, Y. Sun, H. Jeong, M. Friedlander. Atomic decomposition via polar alignment: the geometry of structured optimization. In *Foundations and Trends in Optimization, 3(4):280–366, 2020*.
- H. Fang, **Z. Fan**, Y. Sun, M. Friedlander. Greed Meets Sparsity. In *International Conference on Artificial Intelligence and Statistics (AISTATS), 2020*.
- **Z. Fan**, Y. Sun, M. Friedlander. Bundle-type method for dual atomic pursuit. In *Asilomar Conference on Signals, Systems, and Computers (ACSSC), 2019*.

PREPRINTS (* MEANS EQUAL CONTRIBUTION)

- L. Xing, X. Wang, Y. Feng, **Z. Fan**, J. Xiong, Z. Guo, X. Fu, R. Ramamonjison, M. Mostajabdaveh, Z. Zhou, Y. Zhang. Towards Human-aligned Evaluation for Linear Programming Word Problems. Submitted 2023.
- **Z. Fan**, Z. Zhou, J. Pei, M. Friedlander, J. Hu, C. Li, Y. Zhang. Knowledge-Injected Federated Learning. Submitted 2022.
- C. Liu*, **Z. Fan***, Z. Zhou, Y. Shi, J. Pei, L. Chu, Y. Zhang. Achieving Model Fairness in Vertical Federated Learning. Submitted 2022.
- **Z. Fan***, H. Fang*, M. Friedlander. A dual approach for federated learning. Submitted 2022.
- **Z. Fan**, H. Fang, Z. Zhou, J. Pei, M. Friedlander, Y. Zhang. Fair and efficient contribution valuation for vertical federated learning. Submitted 2022.

OPEN-SOURCE SOFTWARES

- **AtomicOpt.jl**: Julia package for solving the a class of non-convex structured optimization problem. `https://github.com/MPF-Optimization-Laboratory/AtomicOpt.jl`.
- **FedDCD.jl**: Julia package for solving the horizontal federated learning problem. `https://github.com/ZhenanFanUBC/FedDCD.jl`.
- **VerFedLogistic.jl**: Julia package for solving the vertical federated learning problem. `https://github.com/ZhenanFanUBC/VerFedLogistic.jl`.
- **FedMech.jl**: A julia framework for personalized federated learning with mechanism models. `https://github.com/ZhenanFanUBC/FedMech.jl`.

HONORS AND AWARDS

- UBC Computer Science Merit Scholarship C$5000×5, 2017-2022
- UBC International Tuition Awards C$3000×5, 2017-2022
- University of Toronto Dean's list for all semesters, 2013-2016
- William Lowell Putnam Mathematical Competition, Rank 273 out of 4275, top 3rd in UofT, 2015
- U of T Hackathon 3rd Place, C$3000 (with W. Xiao, Y. Chen), 2016
- University of Toronto Excellent Awards C$6000 2016 Summer

TECHNICAL STRENGTHS

Programming	C++, Julia, Python
Personal Page	`https://zhenanf.me`