HUANG FANG

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EDUCATION

University of British Columbia Canada
Ph.D. in Computer Science Sep. 2017 - Nov. 2021
Advisor: Prof. Michael P. Friedlander
Research direction: mathematical optimization, machine learning, data mining.

University of California, Davis United States
M.S. in Computer Science and Statistics (double degree) Sep. 2015 - May 2017
Advisor: Prof. Cho-Jui Hsieh, GPA: 3.98/4.0

Central University of Finance and Economics China
B.S. in Financial Mathematics Sep. 2011 – May 2015
GPA: 91.2/100.

WORK EXPERIENCE

Baidu Research Beijing
Research Scientist Jan. 2022 - Now

- Conducting research on understanding the fundamentals of machine learning and optimization.
- Exploring the possibility of using machine learning techniques to solve combinatorial optimization problems.
- Developing open-source optimization software.

Huawei Vancouver
Research Intern Sep. 2020 - Oct. 2021

- Developed Huawei's general-purpose linear programming solver.
- Studied algorithmic improvements for linear programming based on the open-source software CLP. The improved presolve module leads to 100× speed up for some benchmark datasets.
- Leaded the initial development of the interior-point solver.

1Qbit Vancouver
Research Intern May. 2020 - Aug. 2020

- Developed a combinatorial optimization software based on local search.
- Used reinforcement learning to learn the hyperparameters used in the local search algorithms.

Baidu Research Beijing
Research Intern May. 2019 - Aug. 2019

- Developed a hybrid coordinate descent algorithm as an alternative for approximate greedy coordinate descent with MIPS (maximum inner product search) algorithms.
- Established the convergence rate of the new algorithm and conducted extensive experiments to evaluate the new algorithm. One paper published.

PUBLICATIONS

1. Z. Fan*, **H. Fang***, M. Friedlander. Safe-screening rules for atomic-norm regularization. *Submitted to Open Journal of Mathematical Optimization, Under revision* (*equal contribution).

2. Z. Fan, **H. Fang**, Z. Zhou, J. Pei, M. Friedlander, Y. Zhang. Fair and efficient contribution valuation for vertical federated learning. *Submitted to ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)*, 2022.

3. 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.

4. **H. Fang**, G. Fang, T. Yu, P. Li. Efficient Greedy Coordinate Descent via Variable Partitioning. In *Uncertainty in Artificial Intelligence (UAI)*, 2021.

5. **H. Fang**, Z. Fan, M. Friedlander. Fast convergence of stochastic subgradient descent under interpolation. In *International Conference on Learning Representations (ICLR)*, 2021.

6. **H. Fang**, N. Harvey, V. Portella, M. Friedlander. Online mirror descent and dual averaging: keeping pace in the dynamic case. In *International Conference on Machine Learning (ICML)*, 2020. Extended version appeared in *Journal of Machine Learning Research (JMLR)*, 2022.

7. **H. Fang**, Z. Fan, Y. Sun, M. Friedlander. Greed Meets Sparsity: Understanding and Improving Greedy Coordinate Descent for Sparse Optimization. In *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2020.

8. **H. Fang**, M. Cheng, C. J. Hsieh, M. Friedlander. Fast One-versus-All Training for Extreme Classification using Tree-Structured Initialization. In *SIAM International Conference on Data Mining (SDM)*, 2019.

9. **H. Fang**, M. Cheng, C. J. Hsieh. A Hyperplane-based Algorithm for Semi-supervised Dimension Reduction. In *IEEE International Conference on Data Mining (ICDM)*, 2017. Full paper, 9.25% acceptance rate.

10. **H. Fang**, Z. Zhang, Y. Shao, C. J. Hsieh. Improved Bounded Matrix Completion for Large-Scale Recommender Systems. In *International Joint Conference on Artificial Intelligence (IJCAI)*, 2017.

AWARDS

SIAM Student Travel Award 2019.

MISCELLANEOUS

- **Programming**: Python, PyTorch, Julia, R, C++, Matlab, Bash, MySQL, LaTeX.
- **Services**: Reviewer of ICML, NeurIPS, AISTATS, UAI, ICLR, Open Journal of Mathematical Optimization, Pattern Recognition, TMLR.
- **Personal Page**: http://www.cs.ubc.ca/~hgfang