YUXI HONG

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EDUCATION

King Abdullah University of Science and Technology (KAUST), Thuwal, KSA
August 2019 - May 2022(expected)
Ph.D. in Computer Science, GPA: 3.75/ 4.0, Advisor: David Keyes
Research interest: HPC, GPU, Linear Algebra, Distributed Machine Learning Systems

Tsinghua University (THU), Beijing, China *August 2015 - June 2018*
M.Eng in Microelectronics, GPA: 3.0/4.0, Advisor: Zuochang Ye
Thesis Topic: Statistical Learning in Semiconductor Modeling

Tsinghua University (THU), Beijing, China *August 2011 - June 2015*
B.Eng in Electrical Engineering, GPA: 85/100

RESEARCH PROJECTS

Block Stochastic Gradient Descent (SGD)
Advisor: David Keyes, Hatem Ltaief, Peter Richtarik at KAUST
The project aims to link SGD with high performance matrix computation. The block version of SGD takes fewer iterations but longer computation time because of matrix inverse operations. In this project, we use GPU to execute matrix operations in batch mode, and we precompute the matrix inverse operations before iteration starts in order to shorten the computation time of SGD. The preliminary results show we get performance improvement compared to CPU version of block SGD.

Asychronous Stochastic Gradient Descent
Advisor: Torsten Hoefler, Tal Ben-Nun at ETH
The goal is to achieve an optimal tradeoff between allreduce operation's efficiency and convergence during the multi-node training purpose of a deep neural network. FFlib2, a fully asynchronous library is used for this purpose. LibLSB in SPCL is also utilized to establish performance modeling.

Multivariate Rational Regression in Semiconductor Device Modeling
Advisor: Zuochang Ye at THU
We use mutlivariate rational regression to fit the current voltage characteristic curve of new semiconductor devices for fast modeling. The new model gives better performance than traditional regression models.

PUBLICATIONS

1. **Hong Y.**, H.Ltaief, M.Ravasi, L.Gatineau, D.Keyes. Accelerating Seismic Redatuming Using Tile Low-Rank Approximations on NEC SX-Aurora TSUBASA. Supercomputing Frontiers and Innovations (Journal) [Link]
2. H.Ltaief, **Hong Y.**, J.Cranney, D.Gratadour, D.Keyes. Meeting The Real-Time Challenges of Ground-Based Telescopes Using Low-Rank Matrix Computations. Proceedings of the International Conference For High Performance Computing, Networking, Storage and Analysis 2021 (SC 21) [Link]
3. **Hong Y.**, E.Houcine, N. Doucet, H.Zhang, J.Cranney, H.Ltaief, D.Gratadour, F.Rigaut, D.Keyes. Stochastic Levenberg-Marquardt for Solving Optimization Problems on Hardware Accelerators. 27th International European Conference on Parallel and Distributed Computing (Euro-Par 2021) [Link] Video: [Link]

4. H.Zhang, J.Cranney, N. Doucet, **Hong Y.**, H.Ltaief, D.Gratadour, F.Rigaut, D.Keyes. Predictive learn and apply: MAVIS application - learn. ADAPTIVE OPTICS SYSTEMS VII 2020 [Link]
5. J.Cranney, N. Doucet, H.Zhang, **Hong Y.**, H.Ltaief, D.Gratadour, F.Rigaut, D.Keyes. Predictive learn and apply: MAVIS application - apply. ADAPTIVE OPTICS SYSTEMS VII 2020 [Link]
6. Mao Y., Ashry I., Hveding F., Bukhamsin A., **Hong Y.**, Ng, T. K., & Ooi, B. S. Simultaneous Distributed Acoustic and Temperature Sensing Using a Multimode Fiber. IEEE Journal of Selected Topics in Quantum Electronics. [Link]
7. Peng H., Jin W., **Hong Y.**, Hao W., Shuo S. & Xiangliang Z. LSDDL: Layer-wise Sparsification for Distributed Deep Learning. The 26th ACM SIGKDD Conference on Knowledge Discovery and Data Mining. (Under Review)
8. **Hong Y.**, Ling C., & Ye Z. (2018, April). End-to-end soccer video scene and event classification with deep transfer learning. In 2018 International Conference on Intelligent Systems and Computer Vision (ISCV) (pp. 1-4). IEEE. [Link]
9. **Hong Y.**, Ma D., & Ye Z. (2018). Multivariate rational regression and its application in semiconductor device modeling. Journal of Semiconductors, 39(9), 094010. [Link]

COMMUNITY SERVICES

1. Reviewer of academic conferences
   - IEEE Cluster Conference 2019 [Link]
   - The Platform for Advanced Scientific Computing Conference (PASC) 2020 [Link]
   - ISC High Performance 2020 [Link]
2. President of Student Chapter of Association for Computing Machinery (ACM) at KAUST

HONORS & AWARDS

- KAUST Ph.D. Fellowship
- 2^{nd} Place in KAUST Winter Enrichment Program Personalized Medicine Mobile App Development
- Tsinghua-NUS-IBS Asian Entrepreneurship and Innovation summer program (AIEIP)
- Attend Open Geneva Hackathon as a representative of Tsinghua University (about $5000)
- Tsinghua-UCSD Future Global Leadership Program (about $5000)

WORK EXPERIENCE

Morgan Stanley, Shanghai June 2017 - Sept 2017
Algorithm Engineer

Log Web App development: Developed the Log Web App as a part of electronic trading system of Morgan Stanley for trading log recording. The App enables trader to obtain real time market data, visualization of latency of several exchanges and life view of orders and debug efficiently. Javascript, C++, Hobbes,Web Socket is used.

Baidu Map, Beijing Sept 2016 - Jan 2017
Algorithm Engineer

Online Data Analysis tool and Map Data Anti-crawling model: Designed raw data acquisition tool from Redis database and SVM and KNN model for Online (Lighttpd) web server log analysis and crawling behavior judgment. The accuracy reached above 95%. C++ and Python is used.