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CONTACT INFORMATION	Decision Intelligence Lab DAMO Academy, Alibaba (US) Group	E-mail: kunyuan827@gmail.com Cellphone: (+86)13140810278 Google Scholar [Citation Page]
RESEARCH INTERESTS	Theory and Algorithms in Optimization, Machine Learning, and Signal Processing	
EDUCATION	University of California, Los Angeles , Los Angeles <i>Ph.D. in Electrical and Computer Engineering</i> • Advisor: Professor Ali H. Sayed	2014 – 2019
	University of Science and Technology of China , Hefei <i>M.S. in Electrical Engineering</i> • Advisor: Professor Qing Ling	2011 – 2014
	Xidian University , Xi'an <i>B.E. in Electrical Engineering</i>	2007 – 2011
ACADEMIC AWARDS	IEEE Signal Processing Society Young Author Best Paper Award One of the most prestigious awards in the signal processing society	2017
	Distinguished Paper Award in International Consortium of Chinese Mathematicians	2017
EXPERIENCE	DAMO Academy, Alibaba (US) Group , Bellevue, USA Research Scientist	Aug. 2019 – Present
	Microsoft Research , Redmond, USA <i>Research Intern</i>	Jun. 2018 – Sep. 2018
	École Polytechnique Fédérale de Lausanne (EPFL) , Lausanne, Switzerland <i>Visiting Researcher</i>	Jan. 2018 – Jun. 2018
PREPRINTS	α indicates alphabetical listing of authorships.	
	B. Ying, K. Yuan , H. Hu, Y. Chen, and W. Yin, “Bluefog: Make Decentralized Algorithms Practical for Optimization and Deep Learning”, <i>arXiv:2111.04287</i> , 2021.	
	S. A. Alghunaim ^{α} and K. Yuan ^{α} , “A Unified and Refined Convergence Analysis for non-convex Decentralized Learning”, <i>Submitted to IEEE Transactions on Signal Processing, also available at arXiv 2110.09993</i> , 2021.	
	Y. Li ^{α} , X. Liu ^{α} , J. Tang ^{α} , M. Yan ^{α} , K. Yuan ^{α} , “Decentralized Composite Optimization with Compression”, <i>arXiv:2108.04448</i> , 2021	
	K. Yuan and S. A. Alghunaim. “Removing Data Heterogeneity Influence Enhances Network Topology Dependence of Decentralized SGD”, <i>Submitted to Journal of Machine Learning Research, also available at arXiv 2105.08023</i> , 2021.	
JOURNALS	S. A. Alghunaim, E. K. Ryu, K. Yuan , A. H. Sayed, “Decentralized Proximal Gradient Algorithms with Linear Convergence Rates”, <i>IEEE Transactions on Automatic Control</i> , 2020	

- K. Yuan**, W. Xu, and Q. Ling. “Can Primal Methods Outperform Primal-dual Methods in Decentralized Dynamic Optimization?”, *IEEE Transactions on Signal Processing*, 2020.
- K. Yuan**, S. A. Alghunaim, and B. Ying, and A. H. Sayed. “On the Influence of Bias-Correction on Distributed Stochastic Optimization”, *IEEE Transactions on Signal Processing*, 2020.
- L. Cassano, **K. Yuan**, and A. H. Sayed. “Multiagent Fully Decentralized Value Function Learning with Linear Convergence rates”, *IEEE Transactions on Automatic Control*, 2020.
- X. Mao, **K. Yuan**, Y. Hu, Y. Gu, A. H. Sayed, and W. Yin. “Walkman: A Communication-Efficient Random-Walk Algorithm for Decentralized Optimization”, *IEEE Transactions on Signal Processing*, 2020.
- S. A. Alghunaim, **K. Yuan**, and A. H. Sayed, “A Proximal Diffusion Strategy for Multiagent Optimization with Sparse Affine Constraints”, *IEEE Transactions on Automatic Control*, 2019.
- B. Ying, **K. Yuan**, and A. H. Sayed. “Dynamic Average Diffusion with Randomized Coordinate Updates”, *IEEE Transactions on Signal and Information Processing over Networks*, 2019.
- K. Yuan**, B. Ying, J. Liu, A. H. Sayed, “Efficient Variance-Reduced Learning for Fully Decentralized On-Device Intelligence”, *IEEE Transactions on Signal Processing*, 2018.
- B. Ying, **K. Yuan**, and A. H. Sayed. “Supervised Learning under Distributed Features”, *IEEE Transactions on Signal Processing*, 2018.
- K. Yuan**, B. Ying, X. Zhao, A. H. Sayed, “Exact Diffusion for Distributed Optimization and Learning – Part I: Algorithm Development”, *IEEE Transactions on Signal Processing*, 2018. (**200+ Citations together with Part II**)
- K. Yuan**, B. Ying, X. Zhao, A. H. Sayed, “Exact Diffusion for Distributed Optimization and Learning – Part II: Convergence Analysis”, *IEEE Transactions on Signal Processing*, 2018.
- B. Ying, **K. Yuan**, V. Stefan, and A. H. Sayed. “Stochastic Learning Under Random Reshuffling with Constant Step-sizes”, *IEEE Transactions on Signal Processing*, 2018.
- T. Wu, **K. Yuan**, Q. Ling, W. Yin, and A. H. Sayed. “Decentralized Consensus Optimization with Asynchrony and Delays”, *IEEE Transactions on Signal and Information Processing over Networks*, 2017. (**100+ Citations**)
- K. Yuan**, B. Ying, and A. H. Sayed, “On the Influence of Momentum Acceleration on Online Learning”, *Journal of Machine Learning Research*, 2016.
- K. Yuan**, Q. Ling, and W. Yin, “On the Convergence of Decentralized Gradient Descent”, *SIAM Journal on Optimization*, 2016. (**460+ Citations**)
- K. Yuan**, Q. Ling, and Z. Tian, “A Decentralised Linear Programming Approach to Energy-Efficient Event Detection”, *International Journal of Sensor Networks*, 2015.
- W. Shi, Q. Ling, **K. Yuan**, G. Wu, and W. Yin, “On the Linear Convergence of the ADMM in Decentralized Consensus Optimization”, *IEEE Transactions on Signal Processing*, 2014. (**660+ Citations**)
- K. Yuan**, Q. Ling, and Z. Tian, “Communication-efficient Decentralized Event Monitoring in Wireless Sensor Networks”, *IEEE Transactions on Parallel and Distributed Systems*, 2014.

* indicates equal contributions.

X. Ma, M. Qin, F. Sun, Z. Hou, **K. Yuan**, Y. Xu, Y. Wang, Y. K. Chen, R. Jin, Y. Xie, “Effective Model Sparsification by Scheduled Grow-and-Prune Methods”, *International Conference on Learning Representations (ICLR)*, 2022. (**CCF Rank A**)

K. Yuan*, Y. Chen*, X. Huang*, Y. Zhang, P. Pan, Y. Xu, and W. Yin, “DecentLaM: Decentralized Momentum SGD for Large-batch Deep Training”, *International Conference on Computer Vision (ICCV)*, 2021. (**CCF Rank A**)

X. Huang*, **K. Yuan***, X. Mao, and W. Yin, “Improved Analysis and Rates for Variance Reduction under Without-replacement Sampling Orders”, *Neural Information Processing Systems (NeurIPS)*, 2021. (**CCF Rank A**)

B. Ying*, **K. Yuan***, Y. Chen*, H. Hu, P. Pan, W. Yin, “Exponential Graph is Provably Efficient for Decentralized Deep Training”, *Neural Information Processing Systems (NeurIPS)*, 2021. (**CCF Rank A**)

Y. Chen*, **K. Yuan***, Y. Zhang, P. Pan, Y. Xu, and W. Yin, “Accelerating Gossip SGD with Periodic Global Averaging”, *International Conference on Machine Learning (ICML)*, 2021. (**CCF Rank A**)

S. Alghunaim, **K. Yuan**, A. H. Sayed, “A Linearly Convergent Proximal Gradient Algorithm for Decentralized Optimization”, *Neural Information Processing Systems (NeurIPS)*, 2019. (**CCF Rank A**)

K. Yuan, Z. Wu, Q. Ling, “A Byzantine-resilient Dual Subgradient Method for Vertical Federated Learning”, *IEEE International Conference on Acoustic, Speech and Signal Processing (ICASSP)*, 2022.

K. Yuan, S. Alghunaim, B. Ying, and A. H. Sayed, “On the Performance of Exact Diffusion over Adaptive Networks”, *IEEE Conference on Decision and Control (CDC)*, 2019.

W. Xu, **K. Yuan**, W. Yin, Q. Ling, “On the Comparison between Primal and Primal-Dual Methods in Decentralized Dynamic Optimization”, *Asilomar Conference on Signals, Systems, and Computers*, 2019.

Y. Liu, **K. Yuan**, G. Wu, Z. Tian, Q. Ling, “Decentralized Dynamic ADMM with Quantized and Censored Communications”, *Asilomar Conference on Signals, Systems, and Computers*, 2019.

L. Cassano, **K. Yuan**, A. H. Sayed, “Distributed value-function learning with linear convergence rates”, *European Control Conference (ECC)*, 2019.

K. Yuan, B. Ying, and A. H. Sayed, “COVER: A Cluster-based Variance Reduced Method for Online Learning”, *IEEE International Conference on Acoustic, Speech and Signal Processing (ICASSP)*, 2019.

S. A. Alghunaim, **K. Yuan**, A. H. Sayed, “Dual Coupled Diffusion for Distributed Optimization with Affine Constraints”, *IEEE Conference on Decision and Control (CDC)*, 2018.

K. Yuan, B. Ying, A. H. Sayed, “Efficient Variance-Reduced Learning over Multi-agent Networks”, *European Signal Processing Conference (EUSIPCO)*, 2018.

B. Ying, **K. Yuan**, A. H. Sayed, “An exponentially convergent algorithm for learning under distributed features”, *IEEE Data Science Workshop (DSW)*, 2018.

B. Ying, **K. Yuan**, A. H. Sayed, “Convergence of variance-reduced learning under random reshuffling”, *IEEE International Conference on Acoustic, Speech and Signal Processing (ICASSP)*, 2018.

S. A. Alghunaim, **K. Yuan**, A. H. Sayed, “Decentralized exact coupled optimization”, *Annual Allerton Conference on Communication, Control, and Computing (Allerton)*, 2017

K. Yuan, B. Ying, X. Zhao, A. H. Sayed, “Exact Diffusion Strategy for Optimization by Networked Agents”, *European Signal Processing Conference (EUSIPCO)*, 2017

B. Ying, **K. Yuan**, S. Vlaski, A. H. Sayed, “On the Performance of Random Reshuffling in Stochastic Learning”, *Information Theory and Applications Workshop (ITA)*, 2017

K. Yuan, B. Ying, S. Vlaski, A. H. Sayed, “Stochastic Gradient Descent with Finite Samples Sizes”, *IEEE International Workshop on Machine Learning for Signal Processing*, 2016

K. Yuan, B. Ying, and A. H. Sayed, “On the Influence of Momentum Acceleration on Online Learning”, *IEEE International Conference on Acoustic, Speech and Signal Processing (ICASSP)*, 2016.

B. Ying, **K. Yuan**, A. H. Sayed, “Online Dual Coordinate Ascent Learning”, *European Signal Processing Conference (EUSIPCO)*, 2016.

K. Yuan, Q. Ling, W. Yin, A. Ribeiro, “A Linearized Bregman Algorithm for Decentralized Basis Pursuit”, *European Signal Processing Conference (EUSIPCO)*, 2013.

W. Shi, Q. Ling, **K. Yuan**, G. Wu, W. Yin, Linearly Convergent Decentralized Consensus Optimization with the Alternating Direction Method of Multipliers, *IEEE International Conference on Acoustic, Speech and Signal Processing (ICASSP)*, 2013.

SOFTWARES

MindOpt: An Industrial-Level Optimization Solver Suite

Aug. 2019 – Present

MindOpt is an industrial-level solver suite for mathematical optimization problems. It is independently developed by Decision Intelligence Lab, Alibaba DAMO Academy. It provides linear, nonlinear, and integer programming solutions to users. MindOpt linear programming is among the fastest solvers worldwide. [official website]

- Contributor to the first-order optimization algorithms in MindOpt; built first-order optimization modules that help MindOpt Simplex solver break the world record and top the prestigious Mittelman benchmark list in December 2020. [Benchmark list] [News]
- Contributor to the Parallel Interior Point Method in MindOpt.

BlueFog: A Decentralized Framework for Optimization and Deep Learning

2021

Decentralized optimization algorithms are low-communication-overhead alternatives to traditional distributed algorithms using a center to conduct global average. However, the lack of an easy-to-use and efficient software package has kept most decentralized algorithms merely on paper. BlueFog is the first python library for straightforward, high-performance implementations of diverse decentralized algorithms. It is open source at <https://github.com/Bluefog-Lib>. BlueFog was invited to give keynote lectures in the US East Coast Optimization Meeting 2021 and China Symposium on Machine Learning 2020.

- Contributor to the development of decentralized algorithms utilized in BlueFog.
- Contributor to the tutorial for BlueFog.

TEACHING	UCLA	EE113	Digital Signal Processing	Fall 2019
	UCLA	EE113	Digital Signal Processing	Fall 2018
	UCLA	EE113	Digital Signal Processing	Fall 2017
	UCLA	EE210A	Adaptation and Machine Learning	Winter 2017
	UCLA	EE113	Digital Signal Processing	Fall 2016
	USTC	EE202	Sparse Optimization	Summer 2013