

EDUCATION

Lehigh University , PA, USA <i>Ph.D.</i> in Industrial and Systems Engineering	Sept.2019 – Dec.2023
University of Illinois at Urbana-Champaign , IL, USA <i>M.S.</i> in Statistics	Sept.2017 – May.2019
Sichuan University , Chengdu, China <i>B.S.</i> in Mathematics with honors (concentration in Statistics)	Sept.2013 – Jun.2017

INTERNSHIP

Adobe	May.2023 – Now
<i>Position: Machine Learning Engineer Intern Manager: Jie Zhang & Jun He</i>	San Jose, CA
<ul style="list-style-type: none"> Benchmarked personalized ranking algorithms based on implicit feedback data from Adobe's products Developed a multi-objective optimization framework to improve the current ranking algorithms to accommodate the diverse needs of business partners Applied the multi-objective optimization method to Adobe's production data to not only improve the ranking lists' quality (with hit@k metric increased from 8% to 20%) but also improve the ranking lists' diversity (with the diversity score increased by at most 43%) 	
Salesforce Research	May.2022 – Aug.2022
<i>Position: Research Intern Manager: Zeyuan Chen & Ran Xu</i>	Palo Alto, CA
<ul style="list-style-type: none"> Conducted research in personalized Federated Learning to tackle data heterogeneity with the class imbalance Developed a unified and extensible framework to test the state-of-the-art Federated Learning algorithms Published the work at AAAI 2023 conference and filed it as a non-provisional patent 	
Anheuser-Busch InBev	Jan.2018 – May.2019
<i>Position: Data Scientist Intern Supervisor: Shang-Jen Yang & Hector Hernandez</i>	Urbana, IL
<ul style="list-style-type: none"> Provided analytics and benchmarks of farmer production performance for global agronomist and procurement teams to improve barley productivity Revised machine learning algorithms with agronomists' on field knowledge to formulate a global barley production environment model that accounts for complex weather and soil systems Developed predictive models to suggest optimal management packages that help growers to hit highest barley yield Designed Smart Barley UI/UX prototype in Rshiny to dynamically visualize analytic results, like growers' production performance and highest yield management packages, and delivered it to agronomist teams 	

SELECTED PUBLICATIONS [\[Full List\]](#)

Federated Learning

Tackling Data Heterogeneity in Federated Learning with Class Prototypes [Link]	2023
<i>Collaborators: Zeyuan Chen, Junnan Li, Shelby Heinecke, Lichao Sun, and Ran Xu</i>	Accepted by AAAI'23
<ul style="list-style-type: none"> Proposed a novel method to tackle data heterogeneity with the class imbalance in personalized Federated Learning by combining the uniformity and semantics of class prototypes Developed a unified and extensible framework to test the state-of-the-art Federated Learning algorithms 	
Memory-adaptive Depth-wise Heterogenous Federated Learnings [Link]	2023
<i>Collaborators: Kai Zhang, Hongyi Wang, Eric Xing, Xun Chen, Lichao Sun</i>	arXiv preprint
<ul style="list-style-type: none"> Proposed a memory-adaptive depth-wise training paradigm to tackle devices heterogeneity with a particular focus on edge devices that has varying memory capabilities Conducted experiments on computer vision tasks and outperformed state-of-the-art algorithms by 5%~10% 	
Local-Global Knowledge Distillation in Heterogeneous Federated Learning [Link]	2021
<i>Collaborators: Lichao Sun et. al.</i>	Accepted by <i>IEEE Transactions on Computers</i>
<ul style="list-style-type: none"> Proposed a new learning algorithm (FedGKD) to address the data heterogeneity in federated learning via the knowledge distillation and proved FedGKD's sub-linear convergence rate Conducted extensive experiments on various CV and NLP datasets to valid the FedGKD's superior performance compared with five state-of-the-art methods 	

Structured Sparse Optimization

A Variance-Reduced Proximal Stochastic Gradient Method with Support Identification Guarantees [\[Link\]](#) 2023

Collaborators: Guanyi Wang, Franke E. Curtis, and Daniel P. Robinson

Accepted by *AISTATS'23*

- Proposed a stochastic algorithm for minimizing a class of composite functions with the structured sparse solutions by utilizing variance reduction and support identification; the novel variance reduction technique does not need either any full gradient evaluation or storages of past stochastic gradients
- Derived the complexity bound on identifying the solution support
- Conducted extensive experiments to suggest the theoretical complexity bound predicts the algorithm's performance well

Inexact Proximal Gradient Methods with the Certified Support Identification Property [\[Link\]](#) 2022

Collaborators: Daniel P. Robinson

arXiv preprint

- Proposed adaptive termination conditions for inexact proximal gradient subproblems by monitoring reduction in the function value and optimality measure
- Proved the algorithm's certified ability to find a stationary point with structured sparsity patterns
- Conducted extensive experiments to validate algorithms' support identification property and its superior performance over the state-of-the-art inexact proximal gradient algorithms

A Subspace Acceleration Method for Minimization Involving a Group Sparsity-Inducing Norm [\[Link\]](#) 2022

Collaborators: Daniel P. Robinson and Frank E. Curtis

Accepted by *SIAM Journal on Optimization*

- Proposed a new optimization paradigm (GroupFaRSA) for minimizing a class of composite functions with the structured sparse solutions by utilizing support identification, domain decomposition, and subspace acceleration techniques
- Proved GroupFaRSA's super-linear local convergence rate
- Conducted extensive numerical experiments on solving large scale group- ℓ_1 regularized logistic regression and linear regression problems to validate GroupFaRSA's superior performance over four state-of-the-art methods

SERVICE

Reviewer

- Conference
 - Artificial Intelligence and Statistics (AISTATS)
 - International Conference on Computer Vision (ICCV)
 - Special Interest Group on Knowledge Discovery and Data Mining (SIGKDD)
 - International World Wide Web Conference (WWW)
- Journal
 - Mathematical Programming (MP)
 - Journal of Scientific Computing (JOTA)
 - Optimization Letters (OPTL)

Conference Sessions Organizer

- MOPTA Conference: Bethlehem, PA, USA, August 2023: Nonlinear and Stochastic Optimization Algorithms