

Reading Materials

Textbooks

Optimization

1. Amir Beck, First-Order Methods in Optimization, SIAM, 2017. Chapters 1-6,8-10, 15.

Or Chapter 1-6 plus:

Pavel Dvurechensky, Shimrit Shtern, Mathias Staudigl, First-Order Methods for Convex Optimization, EURO Journal on Computational Optimization 9 (2021) 100015.

Machine Learning

2. Ulisses Braga-Neto, Fundamentals of Pattern Recognition and Machine Learning, Springer, 2020.

3. (If finding 2 too difficult) Christopher M. Bishop, Pattern Recognition and Machine Learning, Springer, 2006. Chapters 1-7.

Papers

Implicit DNNs

1. Xingyu Xie, Qiuhaio Wang, Zenan Ling, Xia Li, Guangcan Liu, and Zhouchen Lin, *Optimization Induced Equilibrium Networks: An Explicit Optimization Perspective for Understanding Equilibrium Models*, IEEE Trans. Pattern Analysis and Machine Intelligence, accepted. [[pdf](#)]

2. Mingjie Li, Yifei Wang, Yisen Wang, and Zhouchen Lin, *Unbiased Stochastic Proximal Solver for Graph Neural Networks with Equilibrium States*, ICLR 2023. [[pdf](#)][[supplementary material](#)]

3. Mingjie Li, Yisen Wang, and Zhouchen Lin, *CerDEQ: Certifiable Deep Equilibrium Model*, ICML 2022: 12998-13013. [[pdf](#)]

DNN Training Algorithms

4. Jia Li, Mingqing Xiao, Cong Fang, Yue Dai, Chao Xu, and Zhouchen Lin, *Training Neural Networks by Lifted Proximal Operator Machines*, IEEE Trans. Pattern Analysis and Machine Intelligence, 44(6):3334-3348, 2022. [[pdf](#)]

5. Zhengyang Geng, Xin-Yu Zhang, Shaojie Bai, Yisen Wang, and Zhouchen Lin, *On Training Implicit Models*, NeurIPS 2021. [[pdf](#)][[supplementary material](#)]

Optimization Algorithms

6. Risheng Liu, Shichao Cheng, Yi He, Xin Fan, Zhouchen Lin, and Zhongxuan Luo, *On the Convergence of Learning-Based Iterative Methods for Nonconvex Inverse Problems*, IEEE Trans. Pattern Analysis and Machine Intelligence, 42(12): 3027-3039 (2020). [[pdf](#)]

7. Fanhua Shang*, Yuanyuan Liu*, James Cheng, Zhi-Quan Luo, and Zhouchen Lin, *Bilinear Factor Matrix Norm Minimization for Robust PCA: Algorithms and Applications*, IEEE Trans. Pattern Analysis and Machine Intelligence, 40(9): 2066-

2080 (2018). [[pdf](#)][[supplementary material](#)]

8. Huan Li and Zhouchen Lin, *Restarted Nonconvex Accelerated Gradient Descent: No More Polylogarithmic Factor in the $O(\epsilon^{-7/4})$ Complexity*, ICML 2022: 12901-12916. [[pdf](#)]

Subspace Clustering

9. Canyi Lu, Jiashi Feng, Zhouchen Lin*, Tao Mei, and Shuicheng Yan, *Subspace Clustering by Block Diagonal Representation*, IEEE Trans. Pattern Analysis and Machine Intelligence, 41(2): 487-501 (2019). [[pdf](#)]

Adversarial Learning

10. Yifei Wang, Yisen Wang, Jiansheng Yang and Zhouchen Lin, *Reparameterized Sampling for Generative Adversarial Networks*, ECML/PKDD 2021. [[pdf](#)]
[[Supplementary Material](#)]

DNN Design

11. Huan Li, Yibo Yang, and Zhouchen Lin, *Optimization Algorithm Inspired Deep Neural Network Structure Design*, ACML 2018. [[pdf](#)]