Pan Zhou

Ph.D. candidate

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Education

National University of Singapore, Singapore (I will graduate in Oct, 2019)   Aug. 2016 - present

Ph.D candidate (supervisors: Jiashi Feng and Shuicheng Yan)

Georgia Institute of Technology   Jun. 2018 - Sep. 2018

Intern (supervisor: Huan Xu)

Peking University, China   Sep. 2013 - Jun. 2016

M.S. in Computer Science (supervisors: Zhouchen Lin and Chao Zhang)

China University of Geosciences (Wuhan), China   Sep. 2009 - Jun. 2013

B.S. in Computer Science

Research Interests

DL   Deep learning theory and applications, including generalization and optimization performance analysis of deep networks, meta learning, adversarial learning, fast algorithm design, etc.

OPT   Efficient algorithm design for noncovex/convex special/general problems.

SDA   structural data analysis, including subspace clustering and its applications in tensor data recovery and clustering, etc.

Publications

DL   **1. Pan Zhou** and Jiashi Feng, "Understanding Generalization and Optimization Performance of Deep CNNs,"*International Conference on Machine Learning (ICML)*, 2018.

2. Pan Zhou and Jiashi Feng, "Empirical Risk Landscape Analysis for Understanding Deep Neural Networks," *International Conference on Learning Representations (ICLR)*, 2018.

3. Pan Zhou, Yunqing Hou and Jiashi Feng, "Deep Adversarial Subspace Clustering,"*IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2018.

4. Jianshu Li, **Pan Zhou**, Yunpeng Chen, etc., "Task Relation Networks," *IEEE Winter Conf. on Applications of Computer Vision (WACV)*, 2019.

OPT   **1. Pan Zhou**, Xiaotong Yuan, and Jiashi Feng, "Efficient Stochastic Gradient Hard Thresholding," *Neural Information Processing Systems (NIPS)*, 2018.

2. Pan Zhou, Xiaotong Yuan, and Jiashi Feng, "New Insight into Hybrid Stochastic Gradient Descent: Beyond With-Replacement Sampling and Convexity, " *Neural Information Processing Systems (NIPS)*, 2018.

3. Pan Zhou, Xiaotong Yuan, and Jiashi Feng, "Faster First-order methods for stochastic non-convex optimization on Riemannian manifolds," *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2019.

4. Hu Zhang, **Pan Zhou**, Yi Yang and Jiashi Feng, "Generalized Majorization-Minimization for Non-Convex Optimization," *International Joint Conference on Artificial Intelligence (IJCAI)*, 2019.

SDA   **1. Pan Zhou** and Jiashi Feng, "Outlier-Robust Tensor PCA,"*IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2017.

2. Pan Zhou, Canyi Lu, Zhouchen Lin, and Chao Zhang, "Tensor Factorization for Low-Rank Tensor Completion," *IEEE Transactions on Image Processing (TIP)*, 2017.

3. Pan Zhou, Zhouchen Lin, and Chao Zhang, "Bilevel Model Based Discriminative Dictionary Learning for Recognition," *IEEE Transactions on Image Processing (TIP)*, 2016.

4. Pan Zhou, Zhouchen Lin, and Chao Zhang, "Integrated Low Rank Based Discriminative Feature Learning for Recognition,"*IEEE Trans. on Neural Networks and Learning Systems (TNNLS)*, 2015.

5. **Pan Zhou**, Cong Fang, Zhouchen Lin, Chao Zhang, and Edward Chang, "Dictionary Learning with Structured Noise," *Neurocomputing*, 2017.

6. Cong Fang, Zhengyu Zhao, **Pan Zhou**, and Zhouchen Lin, "Feature Learning via Partial Differential Equation with Applications to Face Recognition," *Pattern Recognition (PR)*, 2017.

▬▬ Preprints

DL **1.** **Pan Zhou**, Hu Zhang, Yi Yang, Jiashi Feng, and Huan Xu, "Classifier-consistent Adversarial Defence Networks," submitted to *International Conference on Computer Vision (ICCV)*, 2019.

2. **Pan Zhou**, Xiaotong Yuan, Jiashi Feng, Shuicheng Yan, "Meta Learning balabalabalabalabalabala," submitted to *Neural Information Processing Systems (NIPS)*, 2019.

3. Jianshu Li, **Pan Zhou**, Yunpeng Chen, etc., "How Can Auxiliary Tasks Help in Multi-task Learning? ——A Task Similarity Boosted Approach," submitted to *ACM Multimedia (ACMMM)*, 2019.

4. Jianfeng Zhang, Xuecheng Nie, Hongsong Wang, **Pan Zhou**, and Jiashi Feng, "Human Pose balabalabalabalabalabalabalabalabala," submitted to *Neural Information Processing Systems (NIPS)*, 2019.

OPT **1.** **Pan Zhou**, Xiaotong Yuan, Jiashi Feng, and Shuicheng Yan, "Near-Optimal Riemannian Stochastic First-order Algorithm," (long version of our AISTATS) submitted to *IEEE Trans. on Pattern Analysis and Machine Intelligence (TPAMI, Minor Revision)*, 2019.

2. Zebang Shen*, **Pan Zhou***, Cong Fang, Alejandro Ribeiro, "A Stochastic Trust Region Method for Nonconvex Minimization," https://arxiv.org/pdf/1903.01540.pdf, submitted to *Neural Information Processing Systems (NIPS)*, 2019. (*equal contribution)

SDA **1.** **Pan Zhou**, Canyi Lu, Jiashi Feng, and Shuicheng Yan, "Tensor LRR for Data Recovery and Clustering," submitted to *IEEE Trans. on Pattern Analysis and Machine Intelligence (TPAMI)*, 2018.

2. Canyi Lu, **Pan Zhou**, "Exact Recovery of A New Tensor Robust Principal Component Analysis," submitted to *IEEE Trans. on Pattern Analysis and Machine Intelligence (TPAMI)*, 2019.

▬▬ Internship Experiences

Intern of Handwriting Recognition Group of the Research Institute of Samsung   Jul. 2014 - Sep. 2014

Work: to improve handwriting recognition rate, I researched and implemented latest technologies of deep learning. During this period, I implemented low-rank decomposition of the parameter matrix of DBM, dropout strategy, Gaussian-Bernoulli Restricted Boltzmann Machine, activation functions including Sigmoid, ReLu, and Maxout. (Python, Theano, C++)

▬▬ Honors and Awards

1. **Microsoft Research Asia Fellowship Award** (11 Ph.D. students in Asia).   Sep. 2018

2. **Award for Scientific Research** in Peking University.   Sep. 2015

3. **Model Student of Academic Records** in Peking University.   Sep. 2014

4. Second prize in **2011 China Robot Contest** (5%), which is supported by "Chinese Ministry of Science and Technology" and "RoboCup Committee of China".   Aug. 2011

5. Third prize in **China National Mathematical Modeling Contest** in Hubei contest district.   Dec. 2011

6. **National Scholarship** in China University of Geosciences (Wuhan) .   Nov. 2010

▬▬ Academic Service

journal refereeing IEEE Trans. on Pattern Analysis and Machine Intelligence (**TPAMI**), International Journal of Computer Vision (**IJCV**), IEEE Trans. on Image Processing (**TIP**), IEEE Trans. on Neural Networks and Learning Systems (**TNNLS**), IEEE Trans. on Knowledge and Data Engineering (**TKDE**), IEEE Trans. on Circuits and Systems for Video Technology (**TCSVT**), IEEE Signal Processing Letters (**SPL**).

conference refereeing International Conference on Machine Learning (**ICML**, 2019), Neural Information Processing Systems (**NIPS**, 2019 and 2018), Association for Uncertainty in Artificial Intelligence (**UAI**, 2019), IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**, 2019 and 2018), International Conference on Computer Vision (**ICCV**, 2019), Association for the Advancement of Artificial Intelligence (**AAAI**, 2019), Asian Conference on Computer Vision (**ACCV**, 2018).