# Pan Zhou

*Ph.D. candidate*

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## Education

**National University of Singapore, Singapore** (I will graduate about Sep. 2019) Jan. 2017 - present

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

**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, meta learning analysis, 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.

**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.** Jianshu Li, **Pan Zhou**, Yunpeng Chen, etc., "How Can Auxiliary Tasks Help in Multi-task Learning? — A Task Similarity Boosted Approach," submitted to International Conference on Computer Vision (***ICCV***), 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)***, 2019.

**2.** Zebang Shen*, **Pan Zhou***, Cong Fang, Alejandro Ribeiro, "A Stochastic Trust Region Method for Non-convex Minimization," submitted to ***International Conference on Machine Learning (ICML)***, 2019. (*equal contribution)

**SDA** **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.

## Working Experience

**Research Engineer** employed by National University of Singapore, Singapore. Aug. 2016-Jan. 2017

Work: I analyzed the tensor data recovery and clustering by using low-rank tensor analysis and applied the proposed methods into image denoising, clustering and classification.

## 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++)

**Intern in Georgia Institute of Technology** Jun. 2018 - Sep. 2018

I worked with Huan Xu to develop a classifier-consistent adversarial defense network which learns to denoise the data by using dual adversarial learning and classifier-consistency based supervision to help detect the tiny adversarial noise in benign data. (PyTorch)

## 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), 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).