Taihong Xiao

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Homepage	https://prinsphield.github.io
Research Interests	Computer Vision, Machine Learning, Deep Learning and Numerical Optimization

Educations

2015.09-2018.07
Department of Information Sciences, School of Mathematical Sciences, Peking University
M.S. in Computer Vision, Deep Learning, Machine Learning   GPA: 90/100, Rank: 1/34

2013.06-2013.08
Department of Mathematics, University of California, Berkeley
Summer Session C.   GPA: 3.6/4.0

2011.09-2015.07
Taishan College, Shandong University
B.S. in Mathematics and Applied Mathematics.   GPA: 88.02/100, Rank: 4/14

Publications and Patents

2018
DNA-GAN: Learning Disentangled Representations from Multi-Attribute Images
Taihong Xiao, Jiapeng Hong and Jinwen Ma
International Conference on Learning Representations **(ICLR)**, Under Review
[OpenReview] [ArXiv] [GitHub]

2017
Low-Rank Tensor Decomposition Using ℓ_p-norm Optimization on the Matrix Manifold
Taihong Xiao and Jinwen Ma
Journal of Computational and Applied Mathematics, Under review

2017
GeneGAN: Learning Object Transfiguration and Attribute Subspace from Unpaired Data
Shuchang Zhou, Taihong Xiao, Yi Yang, Dieqiao Feng, Qinyao He and Weiran He
British Machine Vision Conference **(BMVC)**, **Oral**
[ArXiv] [Slide] [GitHub]

2017
IQNN: Training Quantized Neural Networks with Iterative Optimizations
Shuchang Zhou, He Wen, Taihong Xiao and Xinyu Zhou
International Conference on Artificial Neural Networks **(ICANN)**
[Paper]

2017
An Integrated Learning Framework for Pedestrian Tracking
Taihong Xiao and Jinwen Ma
International Conference on Intelligent Computing **(ICIC)**, **Oral**
[Paper] [Slide] [GitHub] [Video]

2017.09 CN Patent
A Head-detection Based Face Tracking Method
Taihong Xiao, Shuchang Zhou and Yuchao Pan
Chinese Patent, CN201710253546.5, In Process

Research Experience

2017.01-2017.11
Research Intern. Megvii (Face++) Inc. Beijing   Advisor: Dr. Shuchang Zhou

▶ Face Attributes Transfiguration   I proposed a cross-domain image translation method named GeneGAN to achieve generate multi-modal images of a certain attribute. I participated most of experiments using our proprietary MegDL framework, and reproduce them using TensorFlow. This paper was published in BMVC 2017 for an oral presentation.

▶ Quantized Neural Networks   I participated the research of compressing and accelerating neural networks. We proposed an multi-bit quantization algorithm that iteratively solves for optimal scaling factor to reduce quantization errors. Besides, I did experiments of iterative training using TensorFlow. This paper was published in ICANN 2017.

2016.01-present   **Research Assistant. School of Mathematical Sciences and Key Laboratory of Mathematics and Its Applications, Peking University.**   Advisor: Prof. Jinwen Ma

▶ Disentangled Representations   I proposed DNA-GAN for learning disentangled representations from multi-attribute images. The annihilating operation could prevent from trivial solutions and the iterative training strategy overcame the difficulty of training on unbalanced datasets. This paper was under review at ICLR 2018.

▶ Tensor Decomposition   I proposed a low-rank tensor decomposition method via ℓ_p-norm optimization on matrix manifolds. Theoretically, I proved that the optimal solution to our ℓ_p-norm variational form is equivalent to the matrix SVD in the two-way case, and in the higher-order case, the obtained tensor decomposition is just the diagonal tensor SVD if the tensor is diagonally decomposable. This paper was submitted to JCAM and currently under review.

▶ Pedestrian Tracking   I proposed an integrated framework for pedestrian tracking. The core of our method was an efficient switching mechanism between detection frames and non-detection frames, which was able to overcome vast variations, distractions from similar person and occlusions. This paper was published in ICIC 2017 for an oral presentation.

2016.09-2017.01   **Teaching Assistant. Advanced Math B. Peking University**
Gave weekly exercise classes and graded homework.

2014.09-2015.01   **Teaching Assistant. Mathematical Analysis I. Shandong University**
Gave part of lectures and graded homework.

Open Source Projects

2017.12   AI Plays WeChat Jump Game. (1k stars)
2017.11   TensorFlow Implementation of DNA-GAN.
2017.05   TensorFlow Implementation of GeneGAN.
2017.01   Matlab Implementation of my paper An Integrated Framework for Pedestrian Tracking.

Honors and Awards

2015-2017   National Scholarship, Peking University (**for 3 consecutive years**, about $(1\%)^3$)
2016   Excellent Academic Performance Award, Peking University
2015   Outstanding Thesis Award in Shandong Province
2013   National Encouragement Scholarship, Shandong University (about 10%)
2013   Second-Class Scholarship for Outstanding Students, Shandong University
2013   Second Prize in China Undergraduate Mathematical Contest in Modeling, Shandong
2010   Third-class Award of China National Mathematics Olympiad, Jiangxi
2008   Second-class Award of the National Applied Physics Competition

Skills and Interests

Programming   Adept at Linux, Python, Matlab, LaTeX, TensorFlow, Pytorch, Caffe, Opencv, C

Math   Solid background in mathematics, machine learning, numerical optimization

Tests   CET-6: 574, TOEFL: 101, GRE: 321 (aw: 4.0), GRE Math Subject: 910 (97%)

Interests   Calligraphy, Piano, Basketball, Ping-Pong, Billiards