Taihong Xiao

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Homepage	https://prinsphield.github.io
GitHub	https://github.com/Prinsphield
Research Interests	Computer Vision, Deep Learning, Machine 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 **ELEGANT: Exchanging Latent Encodings with GAN for Transferring Multiple Face Attributes**
Taihong Xiao, Jiapeng Hong and Jinwen Ma
European Conference on Computer Vision **(ECCV)**, submitted
[ArXiv] [GitHub]

2018 **DNA-GAN: Learning Disentangled Representations from Multi-Attribute Images**
Taihong Xiao, Jiapeng Hong and Jinwen Ma
International Conference on Learning Representations **(ICLR)**, Workshop Track
[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

► **Multiple Face Attribute Transfer.** I proposed the ELEGANT model for transferring multiple face attributes. The model overcomes three limitations existing in many other methods: 1) failing to do image generation by exemplars; 2) unable to deal with multiple face attributes simultaneously; 3) bad quality of generated images, such as images of low-resolution or with lots of artifacts.

► **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 accepted to ICLR 2018 workshop track.

► **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 the tensor SVD if the tensor is orthogonally decomposable in the higher-order case. This paper was under review at JCAM.

► **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

2018.03 Pytorch Implementation of ELEGANT.

2017.12 AI Plays WeChat Jump Game. (Over 1.2k stars and 400 forks)

2017.11 TensorFlow Implementation of DNA-GAN.

2017.05 TensorFlow Implementation of GeneGAN.
2017.01 Matlab and Caffe Implementation of ILFPT.

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