

Bing Cao, Ph.D Candidate

CONTACT INFORMATION	IDEA Lab https://www.med.unc.edu/bric/ideagroup/ University of North Carolina at Chapel Hill	Phone: +1 5715238371 Email: bcao.xidian@gmail.com
RESEARCH INTERESTS	Computer Vision , Especially on Image Reconstruction (e.g. cross-modality medical image reconstruction), Image Classification , and Image Recognition (e.g. matching viewed/composite/forensic sketches to face photos, and matching near-infrared/thermal-infrared images to visible light face images).	
EDUCATION EXPERIENCES	May. 2019 -- May. 2020 (Expected) Researcher Scholar in Medical Image Analysis University of North Carolina at Chapel Hill Chapel Hill, USA Adviser: Dinggang Shen, http://shen.web.unc.edu Sep. 2016 -- Jun. 2020 (Expected) Ph.D. Candidate in Intelligent Information Processing School of Electronic Engineering Xidian University, Xi'an, China Adviser: Xinbo Gao, http://see.xidian.edu.cn/faculty/xbgao/ Sep. 2015 -- Jun. 2016 M.S. Candidate in Pattern Recognition and Intelligent System School of Electronic Engineering Xidian University, Xi'an, China Adviser: Xinbo Gao, http://see.xidian.edu.cn/faculty/xbgao/ Sep. 2011 -- Jun. 2015 Bachelor in Electrical Engineering and Automation School of Electronic Information Engineering Hebei University, Baoding, China	
PUBLICATIONS	[1] Bing Cao , Han Zhang, Nannan Wang, Xinbo Gao, Dinggang Shen, "Auto-GAN: Self-Supervised Collaborative Learning for Medical Image Synthesis," <i>Proceedings of the 32ed AAAI Conference on Artificial Intelligence (AAAI-20)</i> , February 7-12, 2020, New York, New York, USA. [2] Bing Cao , Nannan Wang, Xinbo Gao, Jie Li, Zhifeng Li "Multi-Margin based Decorrelation Learning for Heterogeneous Face Recognition," <i>Proceedings of the 28th International Joint Conference on Artificial Intelligence (IJCAI-19)</i> , August 10-16, 2019, Macao, China. [3] Bing Cao , Nannan Wang, Jie Li and Xinbo Gao, "Data	

Augmentation-Based Joint Learning for Heterogeneous Face Recognition," *IEEE Transactions on Neural Networks and Learning Systems (IEEE TNNLS)*, 2018.

- [4] **Bing Cao**, Nannan Wang, Xinbo Gao, Jie Li, "Asymmetric Joint Learning for Heterogeneous Face Recognition," *Proceedings of the 34th AAAI Conference on Artificial Intelligence (AAAI-18)*, February 2-7, 2018, New Orleans, Louisiana, USA.

RECENT AWARDS

- President Scholarship of Xidian University
- AAAI Student Scholar Award
- National Scholarship from Ministry of Education
- The Bronze Prize of the 18th National Annual Conference of Science and Technology for Scientists Innovation and Entrepreneurship Competition
- Outstanding Student, Xidian University

Projects

- **“Intelligent Eyes” (2017)**, this is a software system covering dynamic face recognition and heterogeneous face recognition. I am responsible for the design and implementation of the recognition algorithm. I design a Bayesian-based joint learning method to optimize the intra-class covariance matrix and inter-class covariance matrix of cross-modality face images collected from different devices. This work is now used in Tencent AI Lab and Intellifusion.
- **“Nir-Vis Real-time identification System” (2018)**, this is a real-time identification system that is insensitive to light. The captured near infrared images are identified from the visual face photos. Our software can identify someone and track the activity routes. I design a decorrelation learning method to reduce the redundant information between Siamese networks. I finish this work cooperating with Tencent AI Lab.
- **“Cross-modality Image Translation” (2019)**, this project aims at generating the missing modality from available modalities. It can be used in multiple scenarios, such as medical modality translation, face expression generation, different season synthesis, and so on. I take an auto-encoder network as the “teacher” to guide the generative direction of decoder network. A multi-branch encoder network is proposed to fuse multiple available modalities.

PATENTS

- [1] Xinbo Gao, **Bing Cao**, et al., "Asymmetric Learning Based Heterogeneous Face Recognition Method," Chinese Patent Pending, No. 201810023591.2, 2018.

SKILLS

Proficient in PyTorch; Python, Matlab
Familiar with MXNet, Caffe, TensorFlow; Java, C/C++