

HUANGJIE ZHENG

Statistics & Data Science Department , University of Texas at Austin
email: huangjie.zheng@utexas.edu homepage: <http://huangjiezheng.com/>

RESEARCH INTERESTS

General Interests: Bayesian Learning and Statistical Inference methods for probabilistic modeling with application to several domains, such as Deep Learning, Representation Learning, etc.

- Deep generative model, *e.g.* Generative Adversarial Network, Variational Autoencoder, *etc.*
- Representation Learning from high-dimensional data.
- Corresponding problems in relevant fields like computer vision, *etc.*

EDUCATION

University of Texas at Austin (UT) August 2019 - Present
PhD student in Statistics and Data Science.
GPA: 4.0/4.0

Shanghai Jiao Tong University (SJTU) March 2017 - March 2019
M.S. in Information Engineering (Sino-French Cooperative Education Program).
GPA: 3.87/4.0

Telecom ParisTech ENST September 2016 - March 2017
Grande Ecole Engineer Cycle in Data Science and Computer Networking.
Average Course Grade: A

Shanghai Jiao Tong University (SJTU) September 2012 - August 2016
B.S. in Information Engineering (Sino-French Cooperative Education Program).
GPA: 3.66/4.3

PUBLICATIONS

- [1] **H. Zheng**, L. Xie, T. Ni, Y. Zhang, Y. Wang, Q. Tian, E. K. Fishman, A. L. Yuille. Incorporating Multi-Phase Information for Medical Imaging Segmentation. [\[PDF\]](#)
- [2] **H. Zheng**, J. Yao, Y. Zhang, I. W. Tsang and J. Wang. Understanding VAEs in Fisher-Shannon Plane. AAAI Proceedings of the Thirty-Third AAAI Conference on Artificial Intelligence, 2019. [\[PDF\]](#)
- [3] **H. Zheng**, J. Yao, Y. Zhang and I. W. Tsang. Degeneration in VAE: in the Light of Fisher Information Loss, 2018. [\[PDF\]](#)
- [4] **H. Zheng**, Y. Wang, C. Han, F. Le, R. He and J. Lu. Learning and Utilizing Ontology with Machine Learning in Attack Detection. 17th IEEE International Conference On Trust, Security And Privacy In Computing And Communications/ 12th IEEE International Conference On Big Data Science And Engineering (Trust-Com/BigDataSE) 2018. (Oral Presentation) [\[Link\]](#)
- [5] **H. Zheng**, J. Yao, and Y. Zhang. Describing Geographical Characteristics with Social Images. MultiMedia Modeling. Springer International Publishing, 2017. (Oral Presentation) [\[Link\]](#)
- [6] T. Ni, L. Xie, **H. Zheng**, E. K. Fishman, A. L. Yuille. Elastic Boundary Projection for 3D Medical Imaging Segmentation. CVPR 2019 [\[PDF\]](#)
- [7] X. Chen, S. Chen, **H. Zheng**, J. Yao, K. Cui, Y. Zhang, I. W. Tsang. Node Attribute Generation on Graphs. (Under Review of TPAMI) [\[PDF\]](#)

RESEARCH EXPERIENCE

Bayesian Deep Learning, University of Texas at Austin

August 2019 - Present

PhD Student, advised by Prof. Mingyuan Zhou

- To prevent “over-pruning” and “posterior collapsing” in VAE models, we propose various encoding strategies and gradient estimators to make VAEs more robust and obtain tighter lower bound, as well as better latent code.
- We also propose to generalize the lower bound, and the novel encoding strategy can be applied to the generator in generative adversarial net (GAN), which provides a new way to combine VAEs and GANs.

Computational Cognition, Vision, and Learning, Johns Hopkins University

May 2018 - Dec 2018

Visiting Student, advised by Prof. Alan L. Yuille

- We investigate the problem of organ segmentation on multi-phase medical images. In this specific work, we study the abdominal CT scans that often have arterial phase and venous phase, which provide complementary information for the task.
- From the perspective of generative models, we explore the intrinsic gap between the ideal setting and the real world scenario, which often makes it difficult to use multi-phase knowledge.
- We propose a framework that combines knowledge transfer and segmentation to incorporate the useful information from both phases. Our model improves the segmentation result on two-phase and mono-phase data.
- This work is under review of AAAI 2019.

Cooperative Medianet Innovation Center, Shanghai Jiao Tong University

July 2015 - July 2018

Research Assistant, advised by Prof. Ya Zhang

- Research on Deep Bayesian Learning and generative model, specifically Variational AutoEncoder (VAE) in the perspective of information theory.
- Explore why the trade-off between representation learning quality and likelihood maximization exists in VAEs, and how to balance the trade-off effectively, through Modeling with Fisher information and Shannon entropy, and with the *Uncertainty Principle*.
- Research on two-stage combination of generative model and deep learning and find out how to learn hierarchical representation using topic model and low-level features extracted with deep learning based method.
- Propose an application in mining descriptive characteristics of a region from social images, using the learned representation.

SELECTED PROJECTS

Data Mining Contest

Spring 2017

Winner in contest of course “Data Mining” in Ecole Polytechnique, lectured by Prof. Michalis Vazirgiannis

- Graph mining and link prediction.

Group Theory Research

March 2015 - June 2015

Supervised by Prof. Alain Chilles

- Propose an algorithm to compute the cardinal of a finite group based on Schrier Lemma and relevant applications.

SELECTED HONORS AND AWARDS

Outstanding Graduates of Shanghai (Top 5% in Shanghai)	2019
National Scholarship for Graduate Students	2017
Excellent Teaching Assistant	2017
Outstanding Graduates of Shanghai (Top 5% in Shanghai)	2016
Excellent Undergraduate Thesis in SJTU (Top 1% in University)	2016
Meritorious Winner in Mathematical Contest in Modeling (MCM)	2015
Undergraduate-Entrance Bursary (Top 1% in Chinese University Entrance Exam)	2012