HUANGJIE ZHENG

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RESEARCH INTERESTS

General Interests: Machine Learning and Inference Model with application to Computer Vision, Multimedia Information Understanding using probabilistic modeling.

- Deep generative model like Generative Adversarial Network, Variational Autoencoder, *etc.*

- Learning representations from high-dimensional data.

- Corresponding applications like cross-domain knowledge adaptation, medical imaging research, *etc.*

EDUCATION

Shanghai Jiao Tong University (SJTU)   March 2017 - March 2019(expected)
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. (Oral Presentation) [PDF]

[3] **H. Zheng**, J. Yao, Y. Zhang and I. W. Tsang. Degeneration in VAE: in the Light of Fisher Information Loss, 2018. arXiv preprint arXiv:1802.06677. (Prepared for submission in IEEE TNNLS) [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]

RESEARCH EXPERIENCE

Computational Cognition, Vision, and Learning, Johns Hopkins University   May 2018 - Present
Visiting Student, advised by Prof. Alan L. Yuille

· Investigate segmentation on multi-phase medical images: the abdominal CT scans often have arterial and venous phases, which contain complementary information in segmenting organs.
· In a view of generative model, explore the intrinsic gap between ideal and real world scenario that causes difficulty in using multi-phase knowledge.
· Propose a framework that combine knowledge transfer and segmentation to incorporate useful information from both phases to improve segmentation. The trained model can also perform on the mono-phase datasets.
· This work is preparing for CVPR 2019.

Cooperative Medianet Innovation Center, Shanghai Jiao Tong University   March 2017 - July 2018
Research Assistant, advised by Prof. Ya Zhang

· Reserch 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.*

Telecom ParisTech INFRES/IC2 Group   September 2016 - March 2017
Research Assistant, advised by Prof. Talel Abdessalem and co-advised by Prof. Ya Zhang

· Research on Deep Bayesian Learning and deep matrix factorization and implement the latent representation that can model the correlation between user and item to build an effective recommender system.

Cooperative Medianet Innovation Center, Shanghai Jiao Tong University   July 2015 - August 2016
Undergraduate Research Assistant, advised by Prof. Ya Zhang

· 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

Machine Learning based Ontology for Cyber Security   Fall 2017
Project in course "Big Data and Security", supervised by Prof. Ruan He and Prof. Jialiang Lu

Propose an automatic method for ontology representation learning, which benefits automatic cyber attack detection. *(Accepted in IEEE TrustCom 2018)*

[Data Mining Contest]   Spring 2017
Winner in contest of course "Data Mining", lectured by Prof. Michalis Vazirgiannis

· Predict missing links in a citation network.

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

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

SELECTED EXTRA-CIRRUCULAR ACTIVITIES

Teaching Assistant of Data Structure	Spring 2018
Teaching Assistant of C programming language	Fall 2017
Teaching Assistant of Data Structure	Spring 2017
Cognitive Internship of 4G program in China Mobile	Spring 2014