Liuyi Yao

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EDUCATION

Ph.D. Sep. 2015 - present, Computer Science and Engineering, University at Buffalo, Buffalo, NY

Advisors: Prof. Aidong Zhang & Prof. Jing Gao

B.S. Sep. 2011 - Jun. 2015, Statistics, Nanjing University, Nanjing, China

RESEARCH INTERESTS

I have board interests in Data Mining and Machine Learning. I am particularly interested in Causal Inference especially for analyzing causal effects with representation learning. I am also interested in temporal data analysis and its applications in healthcare.

PUBLICATIONS

Liuyi Yao, Sheng Li, Yaliang Li, Jinduo Liu, Mengdi Huai, Aidong Zhang and Jing Gao. *Concept-Level Model Interpretation From the Causal Aspect.* Under review.

Liuyi Yao, Sheng Li, Yaliang Li, Mengdi Huai, Jing Gao, and Aidong Zhang. *SCI: Subspace Learning Based Counterfactual Inference for Individual Treatment Effect Estimation.* Under review.

Liuyi Yao, Zhixuan Chu, Sheng Li, Yaliang Li, Jing Gao, Aidong Zhang. *A Survey on Causal Inference.* ArXiv preprint arXiv:2002.02770.

Sheng Li, **Liuyi Yao**, Yaliang Li, Jing Gao and Aidong Zhang, *Representation Learning for Causal Inference* (Conference Tutorial), the Thirty-Fourth AAAI Conference on Artificial Intelligence, (AAAI 2020).

Jinduo Liu, Junzhong Ji, Guangxu Xun, **Liuyi Yao**, and Mengdi Huai, Aidong Zhang, *EC-GAN: Inferring Brain Effective Connectivity via Generative Adversarial Networks.* Proceedings of the Thirty-Fourth AAAI Conference on Artificial Intelligence, (AAAI 2020), New York, USA, February 7-12, 2020.

Jinduo Liu, Junzhong Ji, **Liuyi Yao**, and Aidong Zhang, *Estimating Brain Effective Connectivity in fMRI Data by Non-stationary Dynamic Bayesian Networks.* IEEE International Conference on Bioinformatics and Biomedicine, (BIBM 2019), San Diego, USA, November 18-21, 2019. (Acceptance rate: 18%)

Liuyi Yao, Sheng Li, Yaliang Li, Mengdi Huai, Jing Gao, and Aidong Zhang. *ACE: Adaptively Similarity-preserved Representation Learning for Individual Treatment Effect Estimation.* Proceedings of the 19th IEEE International Conference on Data Mining (ICDM 2019), Beijing, November 8-11, 2019. (Acceptance rate: 18.5%)

Liuyi Yao, Sheng Li, Yaliang Li, Hongfei Xue, Jinggao, and Aidong Zhang. *On the Estimation of Treatment Effect with Text Covariates.*Proceedings of the Twenty-Seventh International Joint Conference on Artificial Intelligence (IJCAI 2019), Macao, China. (Acceptance rate: 90/397=17.9%)

Mengdi Huai, Hongfei Xue, Chenglin Miao, **Liuyi Yao**, Lu Su, Changyou Chen, and Aidong Zhang. *Deep Metric Learning: The Generalization Analysis and an Adaptive Algorithm.*Proceedings of the Twenty-

Seventh International Joint Conference on Artificial Intelligence (IJCAI 2019), Macao, China. (Acceptance rate: 90/397=17.9%)

Liuyi Yao, Sheng Li, Yaliang Li, Mengdi Huai, Jing Gao, and Aidong Zhang. *Representation Learning for Treatment Effect Estimation from Observational Data.* Advances in Neural Information Processing Systems 31 (NeurIPS 2018), Montral, Canada, December 3-8, 2018. (Acceptance rate: 1011/4856=20.8%)

Liuyi Yao, Yaliang Li, Yezheng Li, Hengtong Zhang, Mengdi Huai, Jing Gao, Aidong Zhang. *DTEC: Distance Transformation Based Early Time Series Classication.* Proceedings of the 2019 SIAM International Conference on Data Mining (SDM 2019), Calgary, Canada. (Acceptance rate: 90/397=22.7%)

Liuyi Yao, Lu Su, Qi Li, Yaliang Li, Fenglong Ma, Jing Gao and Aidong Zhang. *Online Truth Discovery on Time Series Data.* Proceedings of the 2018 SIAM International Conference on Data Mining (SDM 2018), San Diego, CA, USA, May 2018, pp. 162–170. (Acceptance rate: 86/374=23%)

Yaliang Li, **Liuyi Yao**, Nan Du, Jing Gao, Qi Li, Chuishi Meng, Chenwei Zhang, Wei Fan. *Finding Similar Medical Questions from Question Answering Websites.* ArXiv preprint arXiv:1810.05983

RESEARCH EXPERIENCE

IBM Research
Summer Intern, May. 2019 - Aug. 2019
Center for Computational Health
Disease Progression Modeling. The goal of disease progression modeling is to infer the disease state for every patient and explore how the disease evolves. We designed a deep model with the interpretable structure, which hybrids the advantages of HMM and RNN.

University at Buffalo
Research Assistant, Sept. 2017 - present
Department of Computer Science and Engineering

(1) **Representation Learning for Causal Effect Estimation**. Causal effect is the quantitative measure of how variable X affects variable Y. To infer the causal effect, we designed several representation-learning based methods. By learning a better representation of all confounders, we can more accurately estimate the corresponding values of variable Y when setting variable X to different values.

(2) **Early Time Series Classification**. The goal of early time series classification is to classify the time series as early as possible while preserving the accuracy. We designed a distance-transformation based time series classification with earliness-aware regularization and a new classification criterion to alleviate the issues of misclassification at the early stage and classification delay.

(3) **Truth Discovery on Time Series Data**. The objective of truth discovery is to detect the true information from multiple conflicting sources without any supervision. We designed an online truth discovery method for time series data which imposes the time series analysis component to enhance the multi-source truth discovery.

PROGRAMMING LANGUAGES

Python, Matlab, R, Java, C/C++, SQL.

PROFESSIONAL SERVICE

Reviewer: IJCAI 2020

External Reviewer: CIKM 2019; KDD 2019; BIBM 2018; ICDM 2018; ICBK 2017; ICTAI 2016

Conference Volunteer: NeurIPS 2018