

Huiqi Deng

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Education

- 2015.9 - 2021.6 **Ph.D Applied Mathematics**, Sun Yat-Sen University, China
◦ **Advisor:** Prof. Guocan Feng
◦ **Thesis:** *Interpretable Machine Learning Towards Black-box Models*
- 2011.9 - 2015.6 **B.S. Applied Mathematics**, Central China Normal University, China

Research Experiences

- 2021.9 - Now **Shanghai Jiao Tong University**, Shanghai, China
◦ Postdoctoral Fellow
◦ Mentor: Prof. Quanshi Zhang
- 2019.12 - 2020.12 **Texas A&M University**, College station, USA
◦ Visiting Student
◦ Mentor: Prof. Xia Hu
- 2017.12 - 2018.12 **Hong Kong Baptist University**, Hong Kong
◦ Research Assistant under the supervision of Prof. PongChi Yuen
- 2016.10 - 2017.6 **Hong Kong Baptist University**, Hong Kong
◦ Research Assistant under the supervision of Prof. PongChi Yuen

Research Interests

- **Interpretable Machine Learning**
(1) *Semantic explanation*, to make human understand why a DNN makes a certain prediction; (2) *Mathematical explanation*, to investigate and explain the representation capacity of DNN.
- **Adversarial Robustness, Causal Learning**

Publications

- **Huiqi Deng**, Na Zou, Weifu Chen, Guocan Feng, Mengnan Du, and Xia Hu, "Mutual Information Preserving Back-propagation: Learn to Invert for Faithful Attribution," The 27rd ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD), 2021.
- **Huiqi Deng**, Na Zou, Mengnan Du, Weifu Chen, Guocan Feng, and Xia Hu, "A Unified Taylor Framework for Revisiting Attribution Methods," AAAI Conference on Artificial Intelligence (AAAI), 2021.
- **Huiqi Deng**, Weifu Chen, Qi Shen, Andy Jinhua Ma, Pong C.Yuen, and GuocanFeng, "Invariant subspace learning for time series data based on dynamic time warping distance," Pattern Recognition (PR), 2020.

- Qingxiong Tan, Andy Jinhua Ma, Mang Ye, Baoyao Yang, **Huiqi Deng**, and etc, "UA-CRNN: Uncertainty-aware convolutional recurrent neural network for mortality risk prediction," Conference on Information and Knowledge Management (CIKM), 2019.
- Grace Lai-Hung Wong, Andy Jinhua Ma, **Huiqi Deng**, and etc, "Machine learning model to predict recurrent ulcer bleeding in patients with history of idiopathic gastroduodenal ulcer bleeding," Alimentary pharmacology & therapeutics, 2019.
- **Huiqi Deng**, Weifu Chen, Andy Jinhua Ma, Qi Shen, Pong C. Yuen, and Guocan Feng, "Robust shapelets learning: transform-invariant prototypes," Chinese Conference on Pattern Recognition and Computer Vision (PRCV), 2018.
- Qingxing Tan, Andy Jinhua Ma, **Huiqi Deng**, Vincent Wai-Sun Wong, and etc, "A Hybrid Residual Network and Long Short-Term Memory Method for Peptic Ulcer Bleeding Mortality Prediction," AMIA Annual Symposium Proceedings (AMIA), 2018.

Preprints

- **Huiqi Deng**, Na Zou, Mengnan Du, Weifu Chen, Guocan Feng, and Xia Hu, "A General Taylor Framework for Unifying and Revisiting Attribution Methods," arXiv:2105.13841, 2021.
- **Huiqi Deng***, Qihan Ren*, Xu Chen, Hao Zhang, Jie Ren, and Quanshi Zhang, "Discovering and Explaining the Representation Bottleneck of DNNs," arXiv:2111.06236, 2021. (***Equal contribution**)
- Jie Ren, Mingjie Li, Qirui Chen, **Huiqi Deng**, and Quanshi Zhang, "Towards Axiomatic, Hierarchical, and Symbolic Explanation for Deep Models," arXiv:2111.06236, 2021.

Invited Talks

- **IJCAI 2021 tutorial**, <https://ijcai21xai.github.io/>
Topic: How to unify attribution explanations by interactions?
- **The Eighth Issue of "Artificial Intelligence Security and Privacy" Series Forum**
Topic: Unifying attribution explanations by game-theoretic interactions.
- **The nineteenth Annual Meeting of the Chinese Society of Industrial and Applied Mathematics**
Topic: Mutual information preserving back-propagation for faithful attribution.

Peer Reviewer

- Conferences: CVPR, AAAI, IJCAI, KDD, WSDM, etc
- Journals: TKDE, TNNLS, TSCVT, etc