Name: Xiang Deng; **E-mail:** xdeng7@binghamton.edu; **Phone:** 607-232-4960

Education

State University of New York at Binghamton (08/2018 - present)
PhD Candidate in Computer Science; Advisor: Zhongfei (Mark) Zhang, IEEE Fellow
Estimated Graduation Dates: 05/2023

Shandong University
Master's degree in Computer Science and Technology (09/2015 - 06/2018)
Bachelor's degree in Software Engineering (09/2011- 06/2015)

Research Experience

Machine learning & Deep learning methods; Knowledge distillation & Classification & Model compression; Computer vision & GANs & Image enhancement; Robustness & Deep metric learning.

Work Experience and Projects

- **[05/2022 - 08/2022]: Research Intern at Meta (Facebook), CA, US.**
  Work Description: I am working at Meta Reality Lab on deep learning, image enhancement, and GANs.
- **[05/2021 - 08/2021]: Research Intern at JD.com, CA, US.**
  Work Description: I proposed and worked on project "Reducing Flipping Errors in Deep Neural Networks". We aim to reduce the bad flipping behavior of deep neural networks, i.e., from "correct" to "wrong", so that the performances of deep models can be substantially improved. This work has been accepted in AAAI'2022.
- **[08/2018 - 05/2022]:** Teaching Assistant at Binghamton University

Other Selected Projects:

(1) **"Deep Causal Metric Learning":** We study metric learning from a causality perspective and accordingly propose deep causal metric learning that pursues the true causality of the distance between samples, which is achieved through explicitly learning environment-invariant attention and task-invariant embedding based on causal inference.

(2) **"Personalized Education: Blind Knowledge Distillation":** We empirically and theoretically examine why small students underperform large teachers in KD, and propose a solution to make students outperform large teachers.

(3) **"Comprehensive Knowledge Distillation with Causal Intervention":** We propose to transfer both sample and class representations from a teacher model to a student model while using causal intervention to remove the bad biased knowledge, so that the student only keep the good knowledge from the teacher.

(4) **"Personalized Education: Blind Knowledge Distillation":** We propose to let the small student model interact with the large teacher model to find its own blind knowledge region (BKR) and enhance the student performance by letting the student learn the knowledge on its BKR from the teacher.

(5) **"Graph-Free Knowledge Distillation for Graph Neural Networks":** We study how to transfer knowledge from a pretrained graph neural network (GNN) to another one without any observable graph data. We propose to learn fake graph structure distribution for knowledge transfer by using multivariate Bernoulli distribution to model it.

(6) **"Learning with Retrospection":** We propose to use the information learned by the model itself in the past to generate sample-to-class similarities and then use them to assist the subsequent training. The generalization, calibration, and robustness of the model can thus be improved substantially.

Publications

08/2018 - present (Publications in PhD studies):

[1] **Xiang Deng**, Zhongfei Zhang, "Deep Causal Metric Learning", *Proceedings of the 39th International Conference on Machine Learning* **(ICML'2022).**

[2] **Xiang Deng**, Jian Zheng, Zhongfei Zhang, "Personalized Education: Blind Knowledge Distillation", *2022 European Conference on Computer Vision* **(ECCV'2022).**

[3] **Xiang Deng**, et. al., "Reducing Flipping Errors in Deep Neural Networks", *Proceedings of the 36th AAAI Conference on Artificial Intelligence* **(AAAI'2022).**

[4] **Xiang Deng**, Zhongfei Zhang, "Comprehensive Knowledge Distillation with Causal Intervention", *Proceedings of the 30th Conference on Neural Information Processing Systems,* December, 2021 **(NeurIPS'2021).**

[5] **Xiang Deng**, Zhongfei Zhang, "Learning with Retrospection", *Proceedings of the 35th AAAI Conference on Artificial Intelligence* **(AAAI'2021).**

[6] **Xiang Deng**, Zhongfei Zhang, "Graph-Free Knowledge Distillation for Graph Neural Networks", *Proceedings of the 30th International Joint Conference on Artificial Intelligence* **(IJCAI'2021).**

[7] **Xiang Deng**, Zhongfei Zhang, "Sparsity-Control Ternary Weight Networks", ***Neural Networks*****, 2021.**

[8] **Xiang Deng**, Zhongfei Zhang, "Is the Meta-Learning Idea Able to Improve the Generalization of Deep Neural Networks on the Standard Supervised Learning?", *Proceedings of the 25th International Conference on Pattern Recognition* **(ICPR'2020).**

[9] Zhihua Li, **Xiang Deng**, Xiaotian Li, Lijun Yin, "Integrating Semantic and Temporal Relationships in Facial Action Unit Detection", *Proceedings of ACM Multimedia* **(ACM MM'2021).**

08/2015-06/2018 (Publications in Master Degree):

[10] **Xiang Deng**, Chaoran Cui, et al., "Personalized Image Aesthetics Assessment", *Proceedings of the 26th ACM International Conference on Information and Knowledge Management* **(CIKM'2017).**

[11] **Xiang Deng**, Yuanjie Zheng, et al., "Graph Cut Based Automatic Aorta Segmentation with an Adaptive Smoothness Constraint in 3D Abdominal CT Images", *Neurocomputing,* **(Neurocomputing'2018).**

[12] **Xiang Deng**, Chaoran Cui, et al., "Automatic image cropping with a single fully convolutional network", *Proceedings of the 10th International Conference on Internet Multimedia Computing and Service* **(ICIMCS'2018).**

[13] Chaoran Cui, Huidi Fang, **Xiang Deng**, et al., "Distribution-oriented Aesthetics Assessment for Image Search", *Proceedings of the 40th International ACM SIGIR Conference on Research and Development in Information Retrieval* **(SIGIR'2017).**

[14] Huidi Fang, Chaoran Cui, **Xiang Deng**, et al., "Image Aesthetic Distribution Prediction with Fully Convolutional Network", *Proceedings of the 24th International Conference on Multimedia Modeling* **(MMM'2018).**

Professional Services

Conference Program Committee or Reviewer:

39th International Conference on Machine Learning (ICML), 30th Conference on Neural Information Processing Systems (NeurIPS), 2022 European Conference on Computer Vision (ECCV), 36th AAAI Conference (AAAI), 31st International Joint Conference on Artificial Intelligence (IJCAI), 25th International Conference on Pattern Recognition (ICPR), 8th IEEE International Conference on Data Science and Advanced Analytics (DASS).

Journal Reviewer:

IEEE Transactions on Circuits and Systems for Video Technology (TCSVT), IEEE Transactions on Multimedia (TMM), Journal of Computer Science and Technology (JCST), Journal of Electronic Imaging (JEI).

Coding Skills

Programming Languages: Python, Bash; Operating Systems: Unix, Linux, MacOS, Windows;
Machine/Deep Learning Frameworks: PyTorch, TensorFlow 1.

Awards and Honors

- Graduate Student Excellence Award in Research 2021-2022 (10-15 students at the University)
- Provost's Doctoral Fellowship in Binghamton University in 2019, 2020, 2021
- SIGIR Student Travel Award for CIKM'2017
- Excellent Graduate Students (master) and Academic Scholarship in Shandong University in 2016, 2017