Zhiming Zhou

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Education

- **Shanghai Jiao Tong University.** — **Shanghai, China**
  Ph.D. in Computer Science. — *Sep. 2014 - Jun. 2020*
  Advisor: Prof. Yong Yu.
- **Shanghai Jiao Tong University.** — **Shanghai, China**
  B.S. in Computer Science (ACM Class). — *Sep. 2010 - Jun. 2014*
  Advisor: Prof. Hongtao Lu.

Research Interest

My current research mainly focuses on generative adversarial networks (GANs). I'm also familiar with first-order optimization and optimal transport. I worked on computer graphics in the early years of my Ph.D., focused on surface reflectance acquisition.

I have a broad interest in machine learning and deep learning and prefer fundamental research. Currently, I'm particularly interested in the optimization and generalization of deep neural networks and GANs. As a long-term goal, I'd like to contribute to artificial general intelligence.

Publications

- **Lipschitz Generative Adversarial Nets.**
  - *Zhiming Zhou*, Jiadong Liang, Yuxuan Song, Lantao Yu, Hongwei Wang, Weinan Zhang, Yong Yu, Zhihua Zhang.
  - The Thirty-sixth International Conference on Machine Learning (ICML, 2019).
  - We study the cause of training instability of GANs and propose Lipschitz GANs as a general solution.
- **AdaShift: Decorrelation and Convergence of Adaptive Learning Rate Methods.**
  - *Zhiming Zhou**, Qingru Zhang*, Guansong Lu, Hongwei Wang, Weinan Zhang, Yong Yu.
  - The Seventh International Conference on Learning Representations (ICLR, 2019).
  - We study the cause of the non-convergence of Adam and accordingly propose to resolve it via temporal shift.
- **Activation Maximization Generative Adversarial Nets.**
  - *Zhiming Zhou*, Han Cai, Shu Rong, Yuxuan Song, Kan Ren, Weinan Zhang, Jun Wang, Yong Yu.
  - The Sixth International Conference on Learning Representations (ICLR, 2018).
  - We study how class labels improve GANs' training and propose a better method for using class labels in GANs.
- **Sparse-as-Possible SVBRDF Acquisition.**
  - *Zhiming Zhou*, Guojun Chen, Yue Dong, David Wipf, Yong Yu, John Snyder, Xin Tong.
  - ACM Transactions on Graphics (TOG) - Proceedings of ACM SIGGRAPH Asia, 2016.
  - We significantly reduce the number of images required for spatially-varying surface reflectance acquisition.
- **Guiding the One-to-one Mapping in CycleGAN via Optimal Transport.**
  - Guansong Lu, *Zhiming Zhou*, Yuxuan Song, Kan Ren, Yong Yu.
  - The Thirty-Third AAAI Conference on Artificial Intelligence (AAAI, 2019).
  - We show the bijection established by CycleGAN can be arbitrary and propose to control it via optimal transport.
- **Unsupervised Diverse Colorization via Generative Adversarial Networks.**
  - Yun Cao, *Zhiming Zhou*, Weinan Zhang, Yong Yu.
  - The European Conference on Machine Learning (ECML, 2017).
  - We take advantage of the property that cGANs do not need pair-wised data to achieve diverse conditional output.
- **Optimizing an Inverse KL Divergence for Converting RDF Triples into High-Quality Natural Languages.**
  - Yaoming Zhu, Juncheng Wan, *Zhiming Zhou*, Liheng Chen, Lin Qiu, Weinan Zhang, Xin Jiang, Yong Yu.
  - The 42nd International Conference on Research and Development in Information Retrieval (SIGIR, 2019).
  - We propose a method for optimizing inverse KL divergence with an application in converting RDFs to text.
- **Learning to Design Games: Strategic Environments in Deep Reinforcement Learning.**
  - Haifeng Zhang, Jun Wang, *Zhiming Zhou*, Weinan Zhang, Ying Wen, Yong Yu, Wenxin Li.
  - The 27th International Joint Conference on Artificial Intelligence (IJCAI, 2018).
  - We learn to design challenging games via RL and identify a dual MDP between environment and agent.
- **Improving Unsupervised Domain Adaptation with Variational Information Bottleneck.**
  - Yuxuan Song, Lantao Yu, Zhangjie Cao, *Zhiming Zhou*, Jian Shen, Shuo Shao, Weinan Zhang, Yong Yu.
  - The 24th European Conference on Artificial Intelligence (ECAI, 2020).
  - We propose to force the feature extractor to ignore task-irrelevant factors via variational information bottleneck.

- **Towards Efficient and Unbiased Implementation of Lipschitz Continuity in GANs.**
  - *Zhiming Zhou*, Jian Shen, Yuxuan Song, Weinan Zhang, Yong Yu.
  - Technical report. arXiv preprint arXiv:1904.01184.
  - We identity the potential issues in existing Lipschitz implementations and accordingly propose revisions.
- **Large-Scale Optimal Transport via Adversarial Training with Cycle-Consistency.**
  - Guansong Lu*, *Zhiming Zhou**, Jian Shen, Cheng Chen, Weinan Zhang, Yong Yu.
  - Technical report. arXiv preprint arXiv:2003.06635.
  - We propose an end-to-end framework for large-scale optimal transport and study the effect of cycle-consistency.
- **Quantifying Exposure Bias for Neural Language Generation.**
  - Tianxing He, Jingzhao Zhang, *Zhiming Zhou*, James Glass.
  - Technical report. arXiv preprint arXiv:1905.10617.
  - We quantify exposure bias for language models and show that it is not as significant as it is presumed to be.

Research Experiences

- **Group Leader at APEX Lab.** — **Shanghai, China**
  Computer Vision Group, Advisor: Prof. Yong Yu. — *Aug. 2016 - Jun. 2020*
  Working on GANs, optimization, optimal transport, etc.
- **Visiting Student at Peking University.** — **Beijing, China**
  Machine Learning Lab, Advisor: Prof. Zhihua Zhang. — *Nov. 2018 - Feb. 2019 & Jul. 2019 - Sep. 2019*
  Working on convergence, optimization and generalization of GANs.
- **Intern at Microsoft Research Asia.** — **Beijing, China**
  Internet Graphics Group, Mentors: Dr. Yue Dong and Dr. Xin Tong. — *Apr. 2015 - Jul. 2016*
  Working on appearance acquisition with sparse inputs.
- **Intern at Microsoft Research Asia.** — **Beijing, China**
  Internet Graphics Group, Mentor: Dr. Xin Tong. — *Sep. 2013 - Feb. 2014*
  Working on gaze correction for remote video conferences with Kinect.
- **Student at Institute of Intelligent Human-Computer Interaction.** — **Shanghai, China**
  Intelligent Computing and System Lab, Advisor: Prof. Hongtao Lu. — *Jun. 2012 - Aug. 2013*
  Working on action recognition with local feature embedding.

Honors and Awards

- Top 33% Reviewer for the thirty-seventh International Conference on Machine Learning, ICML 2020.
- Excellent Ph.D. Student Scholarship (Top 1%). Shanghai Jiao Tong University. 2019.
- Excellent Intern Award. Microsoft Research Asia. 2016.
- Excellent Intern Award. Microsoft Research Asia. 2014.
- The First Prize in National Olympiad in Informatics in Provinces (NOIP). Jiangxi Province, China. 2009.