SHANGQIAN GAO

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EDUCATION

University of Pittsburgh, Pittsburgh, USA   *January 2018 - Present*
Ph.D candidate, Department of ECE
Major in Electronic and Computer Engineering
Advisor: *Prof.* Heng Huang

Northeastern University, Boston, USA   *September 2015 - May 2017*
M.S., Department of Engineering
Major in Computer System Engineering

Xidian University, Xian, China   *August 2011 - June 2015*
B.S., School of Electronic Engineering
Major in Electronic Engineering

RESEARCH EXPERIENCE

Data Science lab, University of Pittsburgh, Pittsburgh, PA, USA   *January 2018 - Present*
Research Assistant
Advisor: *Prof.* Heng Huang

· Research project(s):
Network Pruning. I design novel algorithms for pruning neural networks to reduce the computational and storage costs of deep neural networks. In our works, network pruning is formulated as a constrained optimization problem, and it is solved by using differentiable gates. I further enhance the algorithm by including a performance maximization process. In addition, my colleagues and I also try to approach this problem by using probabilistic relaxation of the discrete optimization problem. Related research results are published in CVPR 20, 21, and ICCV 21.

Cross-modal Learning. I also work on designing novel algorithms for cross-modal compression and cross-modal adversarial attacks. The cross-modal compression is achieved by structurally weight sharing. My colleagues and I also designed adversarial attack methods in black-box and white-box scenarios. Related research results are published in CVPR 19, NeurIPS 19, and ICCV 21.

Zeroth-order Gradient Methods. I participate in designing novel algorithms for zeroth-order gradient methods. I also study the effectiveness of these zeroth-order gradient methods by applying them to black-box adversarial attacks. Related works are published in IJCAI 19 and JMLR.

Policy Gradient Methods. I participate in designing novel algorithms for policy gradient methods. We improve vanilla policy gradient by using momentum techniques with importance sampling or hessian information. The related research result is published in ICML 20.

JD Digits (now JD Tech), Mountain View, CA, USA   *June 2019 - December 2019*
Research Intern
Advisor: *Dr.* Bin Gu

· Research project(s): Design semi-supervise learning algorithms for predicting customer credit score. We also try to overcome the class imbalance problem for semi-supervise learning.

SMILE lab, Northeastern University, Boston, MA, USA   *October 2016 - March 2017*
Research Assistant
Advisor: *Dr.* Yu Kong

· Research project(s): Design novel algorithms for action prediction (predict the result by only observing partial actions) via memory networks. The research result of this project is published in AAAI 18.

RECENT PUBLICATIONS

(* indicates equal contribution or co-first author)

1. **Shangqian Gao***, Yanfu Zhang*, Heng Huang, "Exploration and Estimation for Model Compression." Proceedings of the IEEE/CVF International Conference on Computer Vision. 2021.

2. **Shangqian Gao***, Chao Li*, Cheng Deng, Wei Liu, Heng Huang, "Adversarial Attack on Deep Cross-Modal Hamming Retrieval." Proceedings of the IEEE/CVF International Conference on Computer Vision. 2021.

3. Bin Gu, Xiyuan Wei, **Shangqian Gao**, Ziran Xiong, Cheng Deng, Heng Huang, "Black-Box Reductions for Zeroth-Order Gradient Algorithms to Achieve Lower Query Complexity." Journal of Machine Learning Research (JMLR), accepted to appear.

4. **Shangqian Gao**, Feihu Huang, Weidong Cai, Heng Huang, "Network Pruning via Performance Maximization." CVPR 2021: 9270-9280.

5. Feihu Huang, **Shangqian Gao**, Jian Pei, Heng Huang, "Momentum-Based Policy Gradient Methods." ICML 2020: 4422-4433.

6. **Shangqian Gao**, Feihu Huang, Jian Pei, Heng Huang, "Discrete Model Compression With Resource Constraint for Deep Neural Networks." CVPR 2020: 1896-1905.

7. Chao Li, **Shangqian Gao**, Cheng Deng, De Xie, Wei Liu, "Cross-Modal Learning with Adversarial Samples." NeurIPS 2019: 10791-10801.

8. Feihu Huang, **Shangqian Gao**, Songcan Chen, Heng Huang, "Zeroth-Order Stochastic Alternating Direction Method of Multipliers for Nonconvex Nonsmooth Optimization." IJCAI 2019: 2549-2555.

9. **Shangqian Gao**, Cheng Deng and Heng Huang, "Cross Domain Model Compression with Structured Weight Sharing." CVPR 2019: 8973-8982.

10. **Shangqian Gao***, Yu Kong*, Bin Sun, and Yun Fu. "Action prediction from videos via memorizing hard-to-predict samples." AAAI 2018: 7000-7007.

SERVICES

- NeurIPS Reviewer: 2020, 2021
- CVPR Reviewer: 2020, 2021, 2022
- ICLR Reviewer: 2022
- KDD Reviewer: 2020
- AAAI PC member: 2019, 2020, 2021, 2022

SKILLS

- Programming: Python, Lua, $C^{\#}$, Java, Matlab, OpenCV, Linux
- Deep Learning: Pytorch, Tensorflow, Torch, Caffe, Keras