Hao **Cheng**

Researcher at Tencent Youtu Lab

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Summary

I am currently a researcher at Youtu Lab, Tencent. My job is to explore efficient learning algorithms and apply them on various applications. I am interested in weakly supervised learning (learning with imperfect information) and explainable neural networks (network understanding).

Education

JiLin University *JiLin, China*

B.S. in Electronic Science and Technology *Sep. 2012 - July. 2016*

- Got the first grade scholarship and won the first prize on the electronic design contest.

Chinese Academy of Sciences *Shanghai, China*

M.S. in Communication and Information Systems *Sep. 2016 - July. 2019*

- Studied the working mechanism of DNN and explored efficient training algorithms, supervised by Yanlin Geng.

Work Experience

Youtu Lab, Tencent *Shanghai, China*

Reasercher *July. 2019 - current*

- Designed automated labelling system in Person Re-identification task. The system saved millions for the company in the cost of labelling data.
- Designed automated training system in Content Audition task. The system can utilize lots of unlabelled data for efficient training.

Research Areas

(1) Weakly Supervised Learning

- Learning with noisy labels
- Learning with unlabeled data

Publication on the related topic

- **Hao Cheng***, Zhaowei Zhu*, Xingyu Li, Yifei Gong, Xing Sun, Yang Liu. Learning with instance dependent label nosie: A Sample Sieve Approach. ***ICLR2021*** (* **denotes equal contribution**)
- Huixiang Luo*, **Hao Cheng***, Yuting Gao, Ke Li, Mengdan Zhang, Fanxu Meng, Xiaowei Guo, Feiyue Huang, Xing Sun. On the Consistency Training for Open-Set Semi-Supervised Learning arxiv paper.

(2) Understandind Neural Networks

- Understanding the working mechanism of DNN via information bottleneck.
- Understanding how network filters affect DNN training. The observation leads to efficient training and efficient pruning.

Publication on the related topic

- **Hao Cheng**, Dongze Lian, Shenghua Gao, Yanlin Geng. Evaluating Capability of Deep Neural Networks for Image Classification via Information Plane ***ECCV2018***
- **Hao Cheng**, Dongze Lian, Shenghua Gao, Yanlin Geng. Utilizing Information Bottleneck to Evaluate Capability of Deep Neural Networks for Image Classification ***entropy2019***
- Fanxu Meng*, **Hao Cheng***, Ke Li, Zhixin Xu, Rongrong Ji, Xing Sun, Guangming Lu. Filter Grafting for Deep Neural Networks ***CVPR2020*** (**first co-author, corresponding author**)
- Fanxu Meng*, **Hao Cheng***, Ke Li, Huixiang Luo, Xiaowei Guo, Guangming Lu, Xing Sun. Pruning Filter in Filter ***NeurIPS2020*** (**first co-author**)
- **Hao Cheng***, Fanxu Meng*, Ke Li, Huixiang Luo, Xing Sun, Xiaowei Guo, Feiyue Huang, Guangming Lu. Filter Grafting for Deep Neural Networks: Reason, Method, and Cultivation arxiv paper.

(3) Other topics

- Self-Paced Learning
- Person Re-identification

Publication on the related topic

- **Hao Cheng***, Dongze Lian*, Bowen Deng, Shenghua Gao, Tao Tan, Yanlin Geng. Local to Global Learning: Gradually Adding Classes for Training Deep Neural Networks ***CVPR2019***
- Fengxiang Yang, Ke Li, Zhun Zhong, Xing Sun, **Hao Cheng**, Xiaowei Guo, Feiyue Huang, Rongrong Ji, Shaozi Li. Asymmetric Co-Teaching for Unsupervised Cross-Domain Person Re-Identification ***AAAI2020***
- Shizhen Zhao, Changxin Gao, Jun Zhang, **Hao Cheng**, Chuchu Han, Xinyang Jiang, Xiaowei Guo, Weishi Zheng, Nong Sang, Xing Sun. Do Not Disturb Me: Person Re-identification Under the Interference of Other Pedestrians ***ECCV2020***
- Enwei Zhang, Xinyang Jiang, **Hao Cheng**, Ancong Wang, Fufu Yu, Ke Li, Xiaowei Guo, Feng Zheng, Weishi Zheng, Xing Sun. One for More: Selecting Generalizable Samples for Generalizable ReID Model ***AAAI2021***

Presentation

Invited talk by Stan Z. Li of WestLake University on Mutual Information in Deep Learning. *Shanghai, China*

VIDEO SLIDES *Oct. 2020*

- Introduced the concept of mutual information
- Introduced the estimation of mutual information
- Introduced the application of mutual information

Invited talk by 机器之心 on learning with noisy labels and collaborative learning. *Shanghai, China*

VIDEO SLIDES *May. 2020*

- Introduced the concept of learning with noisy labels and its development
- Introduced the concept of collaborative learning and its development