# Hao **Cheng**

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## **Sum**mary

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).

## **Edu**cation

### **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.

## **Wor**k Experience

### **Youtu Lab, Tencent** *Shanghai, China*

Reasercher *July. 2019 - current*

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

## **Res**earch 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 *under review* 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 *under review* 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*

# 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