

# 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.A. 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

RESEARCHER

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.

## 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 noise: A Sample Sieve Approach *under review* (\* denotes equal contribution) [arxiv paper](#).
- 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*.

### (2) Understanding 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. DGD: Densifying the Knowledge of Neural Networks with Filter Grafting and Knowledge Distillation **under review** [arxiv paper](#).

### (3) Other topics (not have much interest any more)

- 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

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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

## Extracurricular Activity

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I used to dance as a leader in college. I also like playing basketball and billiards.

China

Sep. 2012 - current