Yuenan HOU

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Profile

I am a 4th-year Ph.D candidate at the Department of Information Engineering, the Chinese University of Hong Kong. I am studying in the Multimedia Lab, supervised by Prof. Chen Change Loy and Prof. Xiaoou Tang. My Google Scholar Citation is **161** and h-index is **5**. My research interest mainly lies in **model compression**, e.g., **knowledge distillation** and **network pruning**.

Education

08/2017 – present
Hong Kong, China

the Chinese University of Hong Kong
Doctor of Philosophy, Information Engineering
Supervisor: Prof. Chen Change Loy and Prof. Xiaoou Tang

09/2013 – 07/2017
Nanjing, China

Nanjing University
Bachelor of Engineering, Automation
Supervisor: Prof. Chunlin Chen and Prof. Xianzhong Zhou
GPA: 4.72 / 5, Rank: 1 / 28

Publications

1. Network Pruning via Resource Reallocation
submitted to International Conference on Computer Vision (ICCV), 2021
Yuenan Hou, Zheng Ma, Chunxiao Liu, Zhe Wang, Chen Change Loy

2. Patchwise Contrastive Distillation for Generative Adversarial Networks
submitted to International Conference on Computer Vision (ICCV), 2021
Yuenan Hou, Xinge Zhu, Chen Change Loy

3. Inter-Region Affinity Distillation for Road Marking Segmentation
IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2020, acceptance rate: 22.1% (1470/6656)
Yuenan Hou, Zheng Ma, Chunxiao Liu, Tak-Wai Hui, Chen Change Loy

4. Learning Lightweight Lane Detection CNNs by Self Attention Distillation
International Conference on Computer Vision (ICCV), 2019, acceptance rate: 25.0% (1077/4304)
Yuenan Hou, Zheng Ma, Chunxiao Liu, Chen Change Loy

5. Learning to Steer by Mimicking Features from Heterogeneous Auxiliary Networks
AAAI Conference on Artificial Intelligence (AAAI, Oral), 2019, acceptance rate: 16.2% (1150/7095)
Yuenan Hou, Zheng Ma, Chunxiao Liu, Chen Change Loy

6. A Novel DDPG Method with Prioritized Experience Replay
IEEE International Conference on Systems, Man, and Cybernetics (SMC), 2017
Yuenan Hou, Lifeng Liu, Qing Wei, Xudong Xu, Chunlin Chen

7. Categorical Relation-Preserving Contrastive Knowledge Distillation for Skin Lesion Classification
submitted to International Conference on Medical Image Computing and Computer Assisted Intervension (MICCAI), 2021
Xiaohan Xing, **Yuenan Hou**, Hang Li, Yixuan Yuan, Hongsheng Li, Max Q.-H. Meng

Internships

04/2020 – 05/2020
Hong Kong, China

SenseTime
Research Intern
Team leader: Dr. Zhe Wang
Research direction: knowledge distillation and network pruning in 3d detection
Contribution:
(1) Design an efficient algorithm to obtain substantial performance gains with minimum cost under specific latency and memory constraint
(2) Propose a novel group sparsity constraint to general channel pruning algorithms to meet the special requirement of FPGA boards on channel numbers
(3) Write two patents regarding the proposed inverse pruning algorithm and group sparsity constraint which is applicable to general pruning approaches

03/2017 – 05/2017
Hong Kong, China

SenseTime
Research Intern
Team leader: Dr. Chunxiao Liu and Dr. Zheng Ma
Research direction: reinforcement learning in autonomous driving
Contribution:
(1) Design a DQN-based algorithm to accomplish steering control of autonomous vehicles in the simulator
(2) Write two patents and make slides on introducing reinforcement learning

Projects

2021 – 2022

GAN Compression
- Propose a novel distillation approach, i.e., patchwise contrastive distillation (PCD), to efficaciously convey the rich structural knowledge between generative adversarial networks
- Achieve impressive distillation results on CycleGAN, Pix2pixGAN and GauGAN
- Remarkably outperform previous distillation algorithms on GAN compression

2020 – 2021

Network Pruning
- Present a simple yet effective channel pruning algorithm to produce a desired slim model via reallocating resources on a well-established backbone model
- Achieve appealing results in ImageNet with ResNet-18, ResNet-50 and MobileNetV2

2019 – 2020

Road Marking Segmentation
- Present a novel knowledge distillation approach, i.e., Inter-Region Affinity KD (IntRA-KD), which can transfer ‘knowledge’ on scene structure more effectively from a teacher to a student model
- Achieve SOTA performance in three large-scale benchmarks, i.e., ApolloScape, CULane and LLAMAS
- Open source the PyTorch-based codebase to expedite related research projects

2018 – 2019 **Lane Detection**

- Present a novel knowledge distillation approach, i.e., Self Attention Distillation (SAD), which allows a model to learn from itself and gains substantial improvement without any additional supervision or labels
- Achieve SOTA performance in three lane detection benchmarks, namely, TuSimple, CULane and BDD100K
- Build a light-weight and high-performance lane detection system which has **790**+ stars, **300**+ forks (https://github.com/cardwing/Codes-for-Lane-Detection)
- Released codebase is **widely used by prestigious academic and industrial community**, e.g., MIT, CMU and Huawei, and **Rank 2nd** in the **most popular lane detection code** in paperswithcode (https://paperswithcode.com/task/lane-detection)

2017 – 2018 **Steering Control**

- Considerably improve the accuracy and robustness of our steering angle predictive model by distilling multi-layer knowledge from multiple heterogeneous auxiliary networks
- Set new SOTA in three steering angle prediction benchmarks, i.e., Udacity, Comma.ai and BDD100K

2016 – 2017 **Robotic Grasping**

- Propose a prioritized experience replay method for the DDPG algorithm, where prioritized sampling is adopted instead of uniform sampling
- Achieve impressive results in the classic task of OpenAI Gym

Awards

09/2020 **Rank 1st in ApolloScape Lane Segmentation Challenge**
Baidu
1 / 104, the "Codes-for-IntRA-KD" entity,
Challenge URL: http://apolloscape.auto/leader_board.html

2017 **Postgraduate Scholarship**
the Chinese University of Hong Kong

2017 **Zhenggang Scholarship**
Nanjing University, top 1%

2017 **Special award for undergraduate thesis**
Nanjing University, top 1%

2017 **Outstanding graduates**
Nanjing University, top 15%

2016 **Mathematical Contest in Modeling (MCM), Meritorious Winner**
the Consortium for Mathematics and Its Application (COMAP), top 13%

2015 **Liao's Scholarship**
Nanjing University, top 1%

2014 **National Scholarship**
Nanjing University, top 1%

Patents

1. 训练神经网络的方法以及装置 (申请号: CN202010152855.1)
发明人: **侯跃南** ; 马政 ; 刘春晓 ; 吕健勤

2. 神经网络的训练方法、横向控制方法、装置、设备及介质 (申请号: CN201810845656.1)
发明人: **侯跃南** ; 吕健勤 ; 马政 ; 刘春晓

3. 网络训练方法、操作控制方法、装置、存储介质和设备 (申请号: CN201711004078.0)
发明人: 马政 ; 刘春晓 ; **侯跃南** ; 张伟 ; 吕健勤

4. 一种基于深度强化学习的机器人自适应抓取方法 (申请号: CN201610402319.6)
发明人: 陈春林 ; **侯跃南** ; 刘力锋 ; 魏青 ; 徐旭东 ; 朱张青 ; 辛博 ; 马海兰

5. 一种基于深度强化学习的六足机器人实时步态规划方法 (申请号: CN201710763223.7)
发明人: 唐开强 ; 刘佳生 ; 洪俊 ; 孙建 ; **侯跃南** ; 钱勇 ; 潘东旭

Academic Service

1. Conference reviewer of CVPR2021, AAAI2021

2. Journal reviewer of TIP, Neurocomputing, IET, TGRS, JSTARS

3. Invited talk at Sun Yat-sen University, "Improving Deep Network Performance via Model Compression", 2020

Teaching Experience

2020 – 2021	**Teaching assistant of Introduction to Cyber Security (IERG4130)**
2020 – 2021	**Teaching assistant of Information Infrastructure Design Lab (IERG3800AB)**
2018 – 2019	**Teaching assistant of Introduction to Internet of Things (IERG4230)**
2017 – 2018	**Teaching assistant of Introduction to Internet of Things (IERG4230)**