Tao Huang

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EDUCATION

Huazhong University of Science and Technology, Wuhan, Hubei province, China

- B.E. in Computer Science and Technology — Sep 2016 – Jun 2020
  - GPA: 3.2 / 4.0
  - Outstanding Graduate award (top 10%, the highest honor for undergraduate students in HUST)
  - Outstanding Graduate Thesis award (10/364, 3%)

PUBLICATIONS

CONFERENCES

[1] S. You*, T. Huang*, M. Yang*, F. Wang, C. Qian, and C. Zhang, "Greedynas: Towards fast one-shot nas with greedy supernet," in *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*, pp. 1999-2008. 2020.

RESEARCH EXPERIENCE

SenseTime, Beijing, China

- Neural Architecture Search — Aug 2019 – Present
  - Research on one-shot neural architecture search methods: weight-sharing heuristic methods & differentiable methods.
  - One paper[1] was accepted to CVPR2020 as one of the co-first authors, which aims to train a better weight-shared supernet by greedily shrunking the search space from all paths to those potentially-good paths.
  - Proposed a differentiable NAS method named TopoNAS, which explicitly learns the topology for differentiable NAS (DARTS), and enjoys significant efficiency improvement on obtained architectures, the paper was released on arXiv.
  - One paper about quantum architecture search(QAS) was released on arXiv. Our QAS implicitly learns a rule that can well suppress the influence of quantum noise and the barren plateau.
  - Proposed a one-shot NAS method, which models the search space into a Monte Carlo tree based structure, and significantly improves the search efficiency and performance. The paper was submitted to CVPR2021.
- Channel Pruning — Aug 2019 – Present
  - Proposed an auxiliary network to directly optimize the network to target FLOPs using the weights of filters.
  - Proposed a method to train channels equally in channel number search supernets, and evolutionary algorithm is used to sample best channel settings.

Horizon Robitics, Beijing, China

- Knowledge Distillation — May 2019 – Aug 2019
  - Proposed a k-round mimic method on object detection, which increases $\sim$ 2% mAP of student MobileNetV2 0.5X on MSCOCO dataset. Other backbones (e.g., MobileNetV1, ResNet) also gain the increasements using our method.

PROJECT EXPERIENCE

SenseTime, Beijing, China

- Researcher, Mobile Intelligence Business Group, — Jul 2020 – Present
- Research Intern, Mobile Intelligence Business Group, — Aug 2019 – Jul 2020
  - Maintain the autoML framework of our team, which can bring NAS and pruning methods to any pytorch-based project as a plugin, e.g., we performed NAS on face verification, object detection and face attributes tasks.
  - Applied NAS to face verification task on large-scale industrial datasets, which significantly improves the performance.

Horizon Robotics, Beijing, China

- Computer Vision Research Intern, AIoT Team, — May 2019 – Aug 2019
  - Development of object detection framework: anchor-free detection method, detection in traffic scene.
  - Research on knowledge distillation methods for face alignment, object detection.

Dian Group in HUST, Wuhan, Hubei province, China

- Team Leader of Real-time Face Detection & Alignment Project, AI Group, — Nov 2018 – May 2019
  - Develop Android APP to inference face detection, tracking and 106-point landmark models on mobile devices.
  - Research on model acceleration (e.g., knowledge distillation, model pruning) and facial landmark (e.g., multi-task learning, loss function, augmentation).
  - Our proposed model archieves 5 ms / image inference speed on Huawei Mate20 Pro.
- Core Member of Beibei Intelligent Customer Service Project, AI Group, — Feb 2018 – Nov 2018

  This project comes from Beibei Group Company, Beibei is the bigest mother-baby E-commerce platform in China. The task aims to find an optimal answer based on classification of customer questions.
  - Research and development on text classification and data augmentation, etc.

3D Printer Team in HUST, Wuhan, Hubei province, China

- Group Leader, Embedded Control Group, — Jan 2017 – Jan 2019
  - Develop control algorithms for 3DP/FDM 3D printers.

AWARDS & SCHOLARSHIPS

- Outstanding Graduate award, Huazhong University of Science and Technology — Jun 2020

- Outstanding Graduate Thesis award, Huazhong University of Science and Technology — Jun 2020
- The First Prize of National College Student Connected Smarter System Innovation Competition, China — Jul 2018
- Third Class Prize, ‘Challenge Cup’ Competition, Provincial — 2018
- First Class Prize, ‘Challenge Cup’ Competition, HUST — 2018

SKILLS Deep Learning, Computer Vision, Android Development, Embedded Development.