Xinglu Wang

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Education

- **Zhejiang University** — **HangZhou**
  Information Engineering, Master — *Sep. 2018 - June 2021*
  Cum. GPA: $90.75/100$
  TOEFL: 102 (Reading 29; Listening 28; Speaking 22; Writing 23)
- **Zhejiang University** — **HangZhou**
  Information Engineering, B.Eng. — *Sep. 2014 - June 2018*
  Cum. GPA: $90.21/100(3.93/4.0)$ Rank: $7/174$

Experience

- **Harmonized Multi-exit Learning** — **Data Science & Engineering Research Center, ZJU**
  Master Thesis — *Dec. 2019 - Sep. 2020*
  - Adaptive inference task aims at adaptively allocating less computation budget on easy samples and scrutinizing the hard ones with more budget. Multi-exit Learning is a representative approach for adaptive inference. However, jointly optimizing the multi-exit is challenging, since the different exits may interfere.
  - A gradient deconfliction training method is introduced. Compared to naive SGD optimization that is blind to multiple gradients from exits, the proposed method resolved the conflicts by gradient projection, and consistently boost the performance of all exits. The paper [1] is in the proceedings of IEEE ICIP20.
  - It is a common practice to introduce the self-distillation loss in multi-exit learning. We extend this loss to a more general form, dense self-distillation loss. A harmonized weighting scheme is proposed for learning to harmonize the relation between exits via bilevel optimization. The paper [2] is submitted to AAAI21.
  - The proposed algorithm is evaluated on the large-scale ImageNet dataset, leveraging the computation power of cloud TPU. Contribute to pytorch/xla by reporting a bug.
- **Face Recognition for Surveillance** — **Huawei Technologies Co., Ltd, HangZhou**
  Algorithm Engineer Intern — *Oct. 2018 - Oct. 2019*
  - Face Recognition for Surveillance is challenging, due to its low-quality images and discrepancy between document and surveillance images. Various novel methods are explored and reproduced, including 1). Adaptive angular loss, additive negative angular loss. 2). hard example mining, label denoising by co-teaching. 3). Architecture search by SinglePath NAS. The source code is released at luzai/InsightFace_Pytorch. The project is finished with an *excellent* rating.
  - Participate in lightweight Face Recognition Challenge of ICCV19 workshop, achieve 12th rank in iqiyi-light track, via cleaning the training data by the Iteratively Training and Refining method and removing the outlier frames of the test video.
  - Crawl the face images of 800K celebrities, cleanse the top 450k identities, and produce a clean subset with 128k identities and 8.9M images. Conduct experiments in the semi-supervised setting, and improve by Unknown Identity Rejection Loss.
- **Person Re-identification** — **Data Science & Engineering Research Center, ZJU**
  Undergraduate Thesis — *Oct. 2017 - June 2018*

- From sampling training data, feature extraction, loss design in the training phase to post-procession in the testing phase, I analyze each component of Person ReID and summarize the experiments into the technical blog.
- Based on the model analysis, SE attention mechanism and center loss are introduced to greatly improve the performance
- Contribute to KaiyangZhou/deep-person-reid, by proposing a Cython module that accelerate the evaluation process by 20 times. It has become a basic building block for many Person ReID projects.
- Contribute to bearpaw/pytorch-classification, by fixing a bug about the depth of ResNet layer. The pull request is of great significance for a fair comparison, since this repo is widely used in Computer Vision literature.

○ **Optimization for Machine Learning** **ZJU**
Teacher Assistant *Mar. 2018 - May 2018*

- Design courseworks and projects, including "CNN from scratch", and "Adversarial example in SVM".
- Explain the assignments and supplement the lecture in the practice session. Answer questions patiently and comprehensively. Gain recognition and praise from students.

○ **Insight of Neural Network** **MMLab, CUHK**
Summer Intern *July 2017 - Sep 2017*

- Inspired by the Phase Transition in Statistical Physics, we aim to find the salient statistic that indicates the convergence and generalization ability of Neural Network
- Polarity Transition Rate is proposed to measure the activity of each layer in the network.
- Propose sample and channel orthogonality indicator. While maintaining orthogonality, the feature map in the sample and channel dimension tends to have a low rank. Adding full-rank regularization terms during training is harmful to model generalization.
- Other characteristics are explored, such as the relationship between samples of different quality and the dynamics of neuron activity means, and whether sparsity still exits in a modern network.

Honors

Scholarships

- First-Class Scholarship for Outstanding Students
- First-Prize, Scholarship for Outstanding Merits
- Zhejiang Daily&Alibaba New Media Scholarship
- First Prize, National Talents Training Base
- First Prize, Research and Innovation Scholarship

Prizes

- Meritorious Winner, Interdisciplinary Contest in Modeling, Consortium for Mathematics and Its Application (ICM)
- 1^{st} Prize, Zhejiang University Mathematical Contest in Modeling

Publications

[1] Wang, Xinglu and Li, Yingming, 2020, October. Gradient Deconfliction-Based Training For Multi-Exit Architectures. In *Proceedings of the 27th IEEE International Conference on Image Processing (ICIP)*, (pp. 1866-1870). IEEE.

[2] Wang, Xinglu and Li, Yingming, 2021, February. Harmonized Dense Knowledge Distillation Training for for Multi-Exit Architectures. Accepted by *the 35th AAAI Conference on Artificial Intelligence*.