LONGHUI YU

PhD Applicant

(+86) 15521443439 | yulonghui@stu.pku.edu.cn | longhui-yu.github.io

"Do something really practical and valuable."

Research Interests

My research mainly focuses on reliable and efficient machine learning against distributions shifts, especially for the label distribution shifts. To explore a robust machine learning model, I have conducted several projects on Continual Learning, Long-tailed Learning, Semi-supervised Learning, Neural Collapse, and Out-of-Distribution Detection. Meanwhile, I also pay attention to the practical application of deep learning. I have conducted research on Autonomous Driving, Object Detection, Cross-modal Retrieval, Nerf, and Vector Font Synthesis.

For my Ph.D research, I am highly interested in **Human-centric/Data-centric AI, Trustworthy AI, AI for Healthcare, Implicit 3D Representation**.

Education Backgrounds

Peking University — *China*

M.E. In Computer Science — *Sep. 2020 - June. 2023*

- Supervisor: Prof. Yuesheng Zhu.
- Co-Supervisor: Dr. Weiyang Liu & Dr. Lanqing Hong.

South China University of Technology — *China*

B.E. In Automation — *Sep. 2016 - June. 2020*

- Research Award: The First Prize of National Smart Car Competition.
- GPA: 3.80/4.00.

Publications & Preprints

Continual Learning by Modeling Intra-Class Variation

Transactions on Machine Learning Research (TMLR)

Longhui Yu, Tianyang Hu, Lanqing Hong, Zhen Liu, Adrian Weller, Weiyang Liu — *Oct. 2022*

- We model the representation variation for old-class and diversify the collapsed gradients.
- All positive Reviews. **LINK**

Generalizing and Decoupling Neural Collapse via Hyperspherical Uniformity Gap

In Submission (ICLR 2023)

Weiyang Liu*, Longhui Yu*, Adrian Weller, Bernhard Schölkopf — *Oct. 2022*

- We decouple Neural Collapse into minimal intra-class variability and maximal inter-class separability and unify them via hyperspherical uniformity.
- Positive Reviews & Valuable work.

Dual-Curriculum Teacher for Domain-Inconsistent Object Detection in Autonomous Driving

BMVC 2022

Longhui Yu, Yifan Zhang, Lanqing Hong, Fei Chen, Zhenguo Li — *Dec. 2021*

- We propose the dual-curriculum strategy to help existing semi-supervised object detection methods learn autonomous driving data efficiently and effectively.

Multi-Teacher Knowledge Distillation for Incremental Implicitly-Refined Classification

ICME 2022 (Oral)

Longhui Yu, Zhenyu Weng, Yuqing Wang, Yuesheng Zhu — *Oct. 2021*

- We propose Multi-Teacher Knowledge Distillation to help existing incremental learning methods better maintain super-class knowledge.

Memory Replay with Data Compression for Continual Learning

ICLR 2022

Liyuan Wang*, Xingxing Zhang*, Kuo Yang, Longhui Yu, Chongxuan Li, Lanqing Hong, Shifeng Zhang, Zhenguo Li, Yi Zhong, Jun Zhu — *Oct. 2021*

- We propose to utilize compressing methods to reserve the memory buffer effectively.
- We further propose a DPP-based method to determine the optimal compression rate.

MaskNeRF: Masked Neural Radiance Fields for Sparse View Synthesis

In Submission (CVPR 2023)

Shoukang Hu, Kaichen Zhou, Longhui Yu, Lanqing Hong, Tianyang Hu, Gim Hee Lee, Zhenguo Li — *Oct. 2022*

- We found the different optimization difficult of different pixels and further propose two kinds of mask to learn the hard-optimized pixels.

DeepVecFont-v2: Exploiting Transformers to Synthesize Vector Fonts with Higher Quality *In Submission (CVPR 2023)*

Yuqing Wang, Yizhi Wang, Longhui Yu, Yuesheng Zhu, Zhouhui Lian *Aug. 2022*

- We explore the potentials of Transformer to synthesize vector fonts with higher quality.

Focal-Global Distillation and Augmented Shortcut for Incremental Transformer-based Fine-grained Cross-modal Retrieval *In Submission (CVPR 2023)*

Hanlin Li, Longhui Yu, Yusheng Tao, Yuqing Wang, Zhenyu Weng, Yuesheng Zhu *Aug. 2022*

- We first propose the focal and global distillation to resist the catastrophic forgetting in the incremental fine-grained cross-modal retrieval.

Professional Services

Reviewer CVPR 2023, ACML 2022, BMVC 2022

Honors & Awards

2020	**Outstanding Graduate**, The Outstanding Graduate of South China University of Technology	*China*
2019	**The First Prize**, The 14th National University Students' Smart Car Competition	*China*
2019	**Scholarship**, The Scholarship of South China University of Technology	*China*
2018	**Scholarship**, The Scholarship of South China University of Technology	*China*
2017	**Scholarship**, The Scholarship of South China University of Technology	*China*