

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, Interactive ML, AI for Healthcare, Implicit 3D Representation**.

Education Backgrounds

Peking University

M.E. IN COMPUTER SCIENCE

China

Sep. 2020 - June. 2023

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

South China University of Technology

B.E. IN AUTOMATION

China

Sep. 2016 - June. 2020

- Research Projects: Robotics and Intelligent Car.
- GPA: 3.80/4.00.

Publications & Preprints

Continual Learning by Modeling Intra-Class Variation

In Submission (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. Rating: 8663

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,

Oct. 2021

YI ZHONG, JUN ZHU

- 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

YUQING WANG, YIZHI WANG, LONGHUI YU, YUESHENG ZHU, ZHOUHUI LIAN

In Submission (CVPR 2023)

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

HANLIN LI, LONGHUI YU, YUSHENG TAO, YUQING WANG, ZHENYU WENG, YUESHENG ZHU

In Submission

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

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