# Hao ZHENG

E-mail: zheng.h.ad@m.titech.ac.jp

## Educational Background

***2021.04 — Present*** ***Tokyo Institute of Technology*** ***Artificial Intelligence*** ***Ph.D.***

Research field：Few-shot learning, Transfer learning, and regularization methods

**2019.09 — 2020.11** ***The Chinese University of Hong Kong*** ***Computer Science*** ***M.Sc***

Main curriculum: Data mining, Machine learning, HCI system

***2015.09 — 2019.06*** ***Nanjing University of Science and Technology*** ***Automation*** ***B.E.***

Main curriculum: Digital image processing, Calculus, Probability and Statistics

Graduation Project：Face anti-spoofing (Outstanding Graduation Project)

## Publication

· **Hao Zheng*,** Runqi Wang*, Jianzhuang Liu, Asako Kanezaki. Cross-Level Distillation and Feature Denoising for Cross-Domain Few-Shot Classification. (**Accepted by ICLR 2023**, first author)

· Runqi Wang*, **Hao Zheng***, Xiaoyue Duan, Jianzhuang Liu, Yuning Lu, Tian Wang, Songcen Xu, Baochang Zhang. Few-Shot Learning with Visual Distribution Calibration and Cross-Modal Distribution Alignment. (**Accepted by CVPR 2023**, co-first author)

· **Hao Zheng**, Qiang Zhang, Asako Kanezaki. DAC: Disentanglement-and-Calibration Module for Cross-Domain Few-Shot Classification. (Accepted by IEEE Access)

· **Hao Zheng**, other anonymous authors. SEFAR: SparsE-FeAture-based Regularization for Fine-tuning on Limited Downstream Data. (Submitted to ICLR 2024）

· Yuchen Che, **Hao Zheng**, Asako Kanezaki. COPRA: Confidence-weighted Partial Reconstruction and Alignment for Category-level 6D Object Pose Estimation. (Submitted to ICRA 2024)

## Partial Research Experience

***Few-Shot Classification Based on Distilling Pretrained Models:***

· To address the significant domain gap, we propose a cross-layer feature distillation approach that allows the student model to integrate the prior knowledge of the pre-trained model better.

· To mitigate overfitting, we propose Feature Denoising, which adaptively sparsifies features without introducing additional parameters.

· On the EuroSAT dataset, there is an improvement of 9.38% (1-shot) and 3.82% (5-shot). **This paper is accepted by ICLR 2023**.

· In subsequent experiments, including scenarios such as Simulation-to-Reality, CLD can consistently accelerate network convergence and improve performance.

***Few-Shot Classification Based on Multimodal Large Models：***

· To address imperfect alignment between CLIP's image and text features, we introduce Vision-Language Prototype (VLP) to assist in cross-modal alignment.

· To mitigate overfitting, we propose a method of grouped data augmentation that extends the number of data pairs.

· In order to remove the classification-irrelevant information, we design Selective Attack, which adds perturbation to the classification-irrelevant parts to reduce their impact on the classification results.

· We conduct experiments on 11 datasets and achieve the SOTA performance. **This paper is accepted by CVPR 2023.**

***Self-Distillation-Based Regularization for Fine-tuning on limited data:***

· We leverage the results generated by sparse features to self-distill the results produced by complete features. It can significantly enhance the performance of many fine-tuning methods when there is a limited amount of downstream data available. This work is submitted to ICLR 2024.

## Provided Service

NeuIPS 2023 Reviewer
ICLR 2024 Reviewer
ICRA 2024 Reviewer

## Honor

Tokyo Institute of Technology JASSO Scholarship
Tokyo Institute of Technology TSUBAME Scholarship