

CHENGYANG HU

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Education

Shanghai Jiao Tong University | PhD. Candidate

Sep. 2021 – Present

Department of Computer Science and Engineering

Shanghai, China

- Major: Computer Science and Technology | GPA: **3.73**/4.0
- Supervisor: Prof. Lizhuang Ma | Laboratory: Digital Media & Computer Vision Laboratory (DMCV) [[Homepage](#)]
- Research Interests: Computer Vision, Face Anti-spoofing, Anomaly Detection, Foundation Model, AIGC

Xi'an Jiaotong University | Bachelor of Engineering

Sep. 2017 – June. 2021

School of Computer Science and Technology

Xi'an, China

- Major: Computer Science and Technology (Youth Program) | GPA: **3.93**/4.3
- Honorary graduate of Qian Xuesen Collage (Youth Program)

Tokyo Institute of Technology | Exchange Student

Sep. 2019 – Mar. 2020

Department of Computer Science

Tokyo, Japan

- Major: Computer Science | Program: Academic Course Access Program (ACAP, Japanese Course)
- Course (Grade): Artificial Intelligence (A), Computer Architecture (A), System Software (A), Control Theory (A).

Publications

Publications

- [1] **Hu, C.**, Zhang, K. Y., Yao, T., Ding, S., & Ma, L. (2024). Rethinking Generalizable Face Anti-spoofing via Hierarchical Prototype-guided Distribution Refinement in Hyperbolic Space. In Proceedings of the IEEE/CVF International Conference on Computer Vision.
- [2] **Hu, C.**, Chen, Y., Ran, Y., Zhang, S.-Y. & Ma, L. (2024). Adaptive Cross-resolution Representation Learning for Generalizable Face Anti-Spoofing. Communications in Information and Systems (CIS).
- [3] **Hu, C.**, Zhang, K. Y., Yao, T., Liu, S., Ding, S., Tan, X., & Ma, L. (2024). Domain-Hallucinated Updating for Multi-Domain Face Anti-spoofing. In Proceedings of the 38th Annual AAAI Conference on Artificial Intelligence.
- [4] **Hu, C.**, Cao, J., Zhang, K. Y., Yao, T., Ding, S., & Ma, L. (2022). Structure destruction and content combination for generalizable anti-spoofing. IEEE Transactions on Biometrics, Behavior, and Identity Science.
- [5] **Hu, C.**, Zhang, K. Y., Yao, T., Ding, S., Li, J., Huang, F., & Ma, L. (2021). An end-to-end efficient framework for remote physiological signal sensing. In Proceedings of the IEEE/CVF International Conference on Computer Vision.

Patents

- [1] Zhang, K. Y., **Hu, C.**, Yao, T., Yin, B., & Ding, S. (2024). An Image Generation Method and Related Apparatus, Chinese Patent, CN117409459A.
- [2] Zhang, K. Y., **Hu, C.**, Yao, T., Yin, B., & Ding, S. (2023). Face Anti-spoofing Methods, Devices, Electronic devices, Storage media and Program Products, Chinese Patent, CN116978131A.
- [3] Zhang, K. Y., **Hu, C.**, Yao, T., Yin, B., & Ding, S. (2023). A Data Processing Method, a Face Anti-spoofing Method, and Related Devices, Chinese Patent, CN116959066A.

Academic Experience

Cross-domain Face Anti-spoofing

Jan. 2021 – Present

Internship in Tecent, Youtu Lab

Shanghai, China

- Research on Face Anti-spoofing (FAS) tasks in cross-domain field including Domain Generalization Face Anti-spoofing (DG-FAS) and Multi-domain Face Anti-spoofing (MD-FAS).
- Exploring the effective way of feature alignment, including feature hallucination, multi-scale feature fusion, and prototype learning, to improve the robustness of different domain data.
- Our proposed methods indicate a state-of-the-art result in cross-domain benchmarks and we have published three papers and two patents and won an international competition with third prize.

AIGC for Face Anti-spoofing

May. 2023 – Present

Internship in Tencent, Youtu Lab

Shanghai, China

- Applying LoRA with Stable Diffusion to expand the FAS's data quantity, tackling the issue of the lack of data.
- Proposed framework could generate the data with different presentation attacks with the user input text prompts.
- Generated data obtain almost the same ability compared to real-world collected data in modeling training.
- The patent on utilizing LoRA to generate FAS's samples for training is being examined now.

Zero-shot Anomaly Segmentation

Aug. 2023 – Nov. 2023

Internship in Contemporary Amperex Technology (CATL)

Ningde, China

- Exploring the utilization of foundation model, Segment Anything (SAM) in Zero-shot Anomaly Segmentation (ZASA).
- Designing a novel Token-relation Exploration Module to explore the relationship among the feature tokens from SAM's encoder to provide a visual prompt to the decoder.
- This approach shows a promising result on wide-used benchmarks including MVTec-AD, VisA, SKDD2, and MTD. Also, this approach is first free of pre-defined text prompts with foundation models.
- This framework is applied to the real scenarios of CATL and obtains an accuracy above 90% for defect detection and the work is under-reviewed in ICML2024.

Action-Environment Behavior Representation Learning

June. 2023 – Present

Work in DMCV Lab

Shanghai, China

- We firstly propose a novel standpoint to research on video behavior representation learning through two important factors: action and environment.
- To explore the learning of these two factors, we focus on how existing modules, *e.g.* RGB, optical flow, skeleton, contribute the essential factor learning in behavior recognition.
- We have constructed a dataset named BEAR (Behaviors for Environment and Action Recognition dataset) with over 10K video clips from social media, the related work is under review in IJCAI2024.

Human Pose Estimation

Mar. 2019 – Aug. 2019

Open Research in Xi'an Jiaotong University

Xi'an, China

- Reimplementing OpenPose framework with Tensorflow to detect the multi-person pose (skeleton) in video frames.
- Deploying the OpenPose framework in hardware through quantization.

Awards

China Undergraduate Mathematical Contest in Modeling First Prize in Shaanxi Province	2018
Xi'an Jiaotong University Student Scholarship (Grade 3)	2018
Xi'an Jiaotong University Student Scholarship (Grade 2)	2019
Xi'an Jiaotong University Student Scholarship (Grade 2)	2020
Xi'an Jiaotong University Outstanding Graduates	2021
The 2nd Remote Physiological Signal Sensing (RePSS) Challenge Third Prize	2021

Activities

Teaching Assistant For Computer Graphics

Feb. 2022 – June. 2022

- Completed course check-in, Q&A, designing and collection of assignments.
- Assisted the professor with assignment evaluation and provided guidance of final projects.

Skills

Languages: English (CET-6 532, TOFEL 84), Japanese (JLPT-N2), Mandarin (Native)

Technologies: Python, C++, PyTorch, Tensorflow

Supervisor Information

Lizhuang Ma

lzma@sjtu.edu.cn

Professor

Shanghai Jiao Tong University & East China Normal University

- Research Interest: Computer Vision, Computer Graphics, Artificial Intelligence Application.
- Director of "Digital Media and Computer Vision Laboratory" and Vice President of the Institute of Artificial Intelligence at Shanghai Jiao Tong University.
- The recipient of National Outstanding Youth Foundation and first-class member of China National Hundred Thousand Ten Thousand Talent Plan.
- He has published over 300 papers and has undertaken more than 30 major research projects.