# Hanxin Wang

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# Summary

A Ph.D. student researching computer vision with extensive experience in foundation model adaptation and class incremental learning. Familiar with image classification, image segmentation, and activity recognition. Driven by a deep passion for acquiring new scientific skills.

Education
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University of Macau	Aug. 2024 - Present
Ph.D student in Computer Science	
Research Interests: Computer vision and machine learning, especially on enhan	ncing the robustness of founda-
tion models when adapting to downstream tasks with limited data.	
University of Electronic Science and Technology of China	Sep. 2021 - Jun. 2024

#### University of Electronic Science and Technology of China

*M.S.* in Information and Communication Engineering Research Interests: Computer vision and machine learning, especially the application of continual learning on activity recognition.

#### **Fuzhou University**

B.E. in the Internet of Things (Major) and Artificial Intelligence (Minor) Received postgraduate recommendation

# **Research Experience**

## Adversarially Regularized Tri-Transformer Fusion for Continual Egocentric Activity Recognition

University of Electronic Science and Technology of China Background:

- Existing continual learning methods hardly acquire discriminative multimodal representations of activity classes from different isolated stages.
- Previous work implicitly generates confused samples through a linear combination method, which has inherent limitations due to the randomness of interpolation.

Contribution:

- Extended the confusion mixup to a generalized adversarial architecture. This extension explicitly generates confusion samples via a learnable approach, further alleviating the confusion between the in and out-stage data in the feature space.
- The proposed method outperforms both SOTA unimodal and multimodal methods on existing multimodal continual learning benchmarks for egocentric activity recognition.

## **Confusion Mixup Regularized Multimodal Fusion Network for Continual Egocentric Activity** Recognition

University of Electronic Science and Technology of China Background:

• Existing continual learning methods ignore the dynamic change of multiple modalities' correlation and hardly learn discriminative representations for the sequentially isolated activity classes from different stages.

Contribution:

• Designed a dynamic expansion fusion architecture to ensure the data within each stage can learn the optimal multi-modal representation.

Mar. 2023 - Jul. 2023

Sep. 2017 - Jun. 2021

Aug. 2023 - Jan. 2024

- Introduced a confusion mixup regularized multimodal fusion network that can capture the dynamic change of correlation from different modalities and help alleviate the confusion between the in-stage data and outstage data in the feature space.
- The proposed method outperforms SOTA unimodal methods by 9.2% on the existing multimodal continual learning benchmark for egocentric activity recognition.

## Multi-modal Egocentric Activity Dataset for Continual Learning

University of Electronic Science and Technology of China Background: May. 2022 - Jan. 2023

- Continual multi-modal egocentric activity recognition is highly desirable in practical applications, however, it has not been thoroughly explored due to the lack of relevant datasets.
- Recently, the rapid development of wearable devices has made it easier to gather extensive collections of egocentric data.

Contribution:

- Collected multi-modal egocentric data with self-developed glass which contains synchronized data of video, accelerometer, and gyroscope for 32 types of daily activities.
- Proposed a benchmark model for multi-modal egocentric activity recognition and demonstrated the performance by evaluating the three modalities independently and in combination.
- Assessed the issue of catastrophic forgetting in continual multi-modal egocentric activity recognition and employed well-known continual learning strategies to address this problem.

## Skills

- Programming Languages: Python & Pytorch, C/C++ and common data structures.
- Language: Mandarin (Native); English (IELTS: 6.0), good reading and writing skills.
- Applications: Microsoft office (Word, Excel, Powerpoint, etc.).

# **Honors and Awards**

The 5 <sup>th</sup> Place in the campus women's group of Sichuan University Light Volleyball Com	mpetition May. 2023
The 3 <sup>rd</sup> Prize academic excellence scholarship of UESTC	Nov. 2022
Outstanding Graduates of Fuzhou University	Jun. 2021
Excellent Student Cadre of Fuzhou University	May. 2020
Provincial 3 <sup>rd</sup> Prize in National Undergraduate Electronic Design Competition	Sep. 2019
Fuzhou University Tiandixing Scholarship	May. 2019
Merit Student of Fuzhou University	May. 2018
The 1 <sup>st</sup> Prize comprehensive scholarship of Fuzhou University (three times)	Sep. 2017 - Jun. 2020

# **Publications**

- Shuchang Zhou<sup>†</sup>, Hanxin Wang<sup>†</sup>, Qingbo Wu<sup>\*</sup>, Fanman Meng, Linfeng Xu, Wei Zhang, Hongliang Li. Adversarially Regularized Tri-Transformer Fusion for continual multimodal egocentric activity recognition. Displays, 2025.
- Hanxin Wang<sup>†</sup>, Shuchang Zhou<sup>†</sup>, Qingbo Wu<sup>\*</sup>, Hongliang Li, Fanman Meng, Linfeng Xu, Heqian Qiu. Confusion Mixup Regularized Multimodal Fusion Network for Continual Egocentric Activity Recognition. ICCV Workshops, 2023.
- Linfeng Xu<sup>\*</sup>, Qingbo Wu, Lili Pan, Fanman Meng, Hongliang Li, Chiyuan He<sup>‡</sup>, **Hanxin Wang**<sup>‡</sup>, Shaoxu Cheng<sup>‡</sup>, and Yu Dai<sup>‡</sup>. Towards continual egocentric activity recognition: A multi-modal egocentric activity dataset for continual learning. IEEE Transactions on Multimedia, 2023. (<sup>‡</sup> Student Author)