YILAN ZHANG

Beihang University, Beijing

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RESEARCH INTERESTS

Biomedical Image Analysis, Multimodal Learning, Content-Based Image Retrieval, Text-to-Image Synthesis, Computational Pathology

EDUCATION

Master in Beihang University   Sep 2021 – Dec 2023
*Pattern Recognition and Intelligent Systems, **Ranking: 3/140, GPA:3.84(4)***

Bachelor in Beihang University   Sep 2017 – Jun 2021
*Control Science and Engineering, **Ranking: 7/83, GPA:3.76(4)***

SELECTED PUBLICATIONS (ONLY FIRST AUTHOR)

Prototypical Information Bottlenecking and Disentangling for Multimodal Cancer Survival Prediction
Under Review, The Twelfth International Conference on Learning Representations (ICLR), 2024
Yilan Zhang, Yingxue Xu, Jianqi Chen, Fengying Xie, and Hao Chen.

ECL: Class-Enhancement Contrastive Learning for Long-tailed Skin Lesion Classification
International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI), 2023, STAR Award
Yilan Zhang, Jianqi Chen, Ke Wang and Fengying Xie

TFormer: A throughout fusion transformer for multi-modal skin lesion diagnosis
Computers in Biology and Medicine (CBM), 2023
Yilan Zhang, Fengying Xie and Jianqi Chen

Dermoscopic image retrieval based on rotation-invariance deep hashing
Medical Image Analysis (MedIA), 2022
Yilan Zhang, Fengying Xie, Xuedong Song, Yushan Zheng, Jie Liu, and Juncheng Wang

A rotation meanout network with invariance for dermoscopy image classification and retrieval
Computers in Biology and Medicine (CBM), 2022
Yilan Zhang, Fengying Xie, Xuedong Song, Hangning Zhou, Yiguang Yang, Haopeng Zhang, and Jie Liu

Early Diagnosis Model of Mycosis Fungoides Based on Intelligent Analysis of Dermoscopic Images
Medical Journal Of Peking Union Medical College Hospital (Rhhz Test), 2021
Zhaorui Liu, **Yilan Zhang (Co-first author)**, Fengying Xie, and Jie Liu

PROJECTS & RESEARCH

Research Intern in HKUST SMART Lab   May 2023 – Oct 2023
Research – Pytorch

- Learn the algorithms related to computational pathology. Use information theory to solve the information redundancy problem in pathways and histology data, and design models to decouple modality-common information and modality-specific information for survival prediction.

Algorithm Intern in Biomap   Nov 2022 – May 2023
Project – Algorithm Design – Python & Docker & Perl

- Learned semantic segmentation and instance segmentation algorithms. Designed single-cell analysis algorithms for phagocytosis evaluation to replace traditional FACS experiments that with low throughput, high labor, and time costs.
- Reconstructed and optimized D-I-TASSER algorithm for protein structure prediction.

Research on Zero-Shot Harmonization   Jun 2022 – Present

Personal Research – Pytorch

- Proposed a zero-shot image harmonization algorithm based on Stable Diffusion, aiming at the problem that the current methods have a heavy demand for large datasets.

Research on Multi-modal Skin Lesion Diagnosis   Apr 2022 – Mar 2023

Personal Research – Pytorch

- Proposed a pure transformer, TFormer, for multi-modal skin lesion diagnosis. A "divide and conquer" strategy is adopted to tackle fusions between image modalities (clinical image and dermoscopy image) and metadata modality.

Dermoscopy Image Classification and Retrieval Systerm   Nov 2020 – Mar 2023

Project – Algorithm Design – Pytorch   *(Collaborating with Peking Union Medical College)*

- Utilized EfficientNet and other networks to implement the early diagnosis of mycosis fungoides and inflammatory dermoscopy images, and explored the clinical auxiliary effect of the model by comparing with diagnosis results of dermatologists.
- Proposed a rotation-invariance deep hashing network in view of the skin lesion target without the main directions in images. The retrieval results reach SOTA both on ISIC 2019 dataset and an Asian dermoscopy dataset.
- Proposed a rotation meanout network to extract rotation-invariant features which can be flexibly embedded in CNNs. The method does not change the network structure or increase the parameters.
- Proposed a class-enhancement contrastive learning algorithm to tackle the long-tailed issue in skin datasets.

SELECTED HONORS

National Scholarship, Ministry of Education of China	Sep 2022
Postgraduate Excellent Academic Innovation Achievement Award of Beihang University	June 2023
Excellent graduate student of Beihang University	Dec 2022
Second Prize of "Lee Kum Kee Astronautics Scholarship", Beihang University	Nov 2021
Outstanding Graduates of Beihang University	Jun 2021
Special Prize of "Outstanding Academic Performance", Beihang University	Dec 2020
Finalist Winners of the International Mathematical Contest in Modeling (MCM), COMAP	May 2020
Outstanding Volunteer of Beihang University	Dec 2019
Special Prize of "Social Practice Scholarship", Beihang University	Dec 2019

EXTRACURRICULAR

Employment Practice Department of the Graduate Student Association   Nov 2021 – Jun 2022

Member – Committed to hold activities such as job sharing lectures

Education Support Department of Bluesky Volunteers' Association of BUAA   Nov 2018 – Jun 2020

Deputy Director – Responsible for organization of volunteer services

College Student Rural Volunteering Summer Program   Nov 2017- Aug 2018

Volunteer, Team Leader – Held a summer camp for rural children in charge of an 18-people team