

YILAN ZHANG

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RESEARCH INTERESTS

Medical Image Analysis, Multi-modal Fusion, Biological Image Processing, Content Based Image Retrieval, Text-to-Image Synthesis

EDUCATION

Master in Beihang University

Sep 2021 – Present

Pattern Recognition and Intelligent Systems, *Ranking: 2/32, GPA:3.84*

Bachelor in Beihang University

Sep 2017 – Jun 2021

Control Science and Engineering, *Ranking: 7/83, GPA:3.76*

PUBLICATIONS

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

(Besides, two papers related to Image Harmonization and Contrastive Learning are under review but not displayed online.)

PROJECTS & RESEARCH

Algorithm Intern in Biomap

Nov 2022 – Present

Project – Algorithm Design – Python & Docker & Perl

- Designed single cell analysis algorithms for phagocytosis evaluation to replace traditional FACS experiments that with low throughput, high labor and time costs.
- Reconstructed 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 System

Nov 2020 – Mar 2023

Project – Algorithm Design – Pytorch

- 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

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

TECHNICAL SKILLS

Languages: Python, C++ , Matlab, Perl, etc

Packages: Pytorch, OpenCV

EXTRACURRICULAR

Employment Practice Department of the Graduate Student Association of the College	Nov 2021 – Jun 2022
<i>Member</i>	<i>Beihang University</i>

- Actively participate in the organization and publicity works of major events.
- Committed to hold activities such as job sharing lectures, enterprise visits, and mock interviews for the students nearing graduation.

Education Support Department of Bluesky Volunteers’ Association of BUAA	Nov 2018 – Jun 2020
<i>Deputy Director</i>	<i>Beihang University</i>

- Have a more than 500 hours of volunteer service certification
- Responsible for organization of volunteer services.

Youth University Science Camp of China	Jul 2019 – Aug 2019
<i>Volunteer, Student Counselor</i>	<i>Beihang University</i>

- Organize middle school students to participate in scientific and technological practice activities and visit laboratories.

College Student Rural Volunteering Summer Program	Aug 2018
<i>Volunteer, Team Leader</i>	<i>Bluesky Volunteers’ Association of BUAA</i>

- Held a summer camp for rural children as the team leader in charge of an 18-people team.
- Responsible for reading, art and game courses for children in the first and second grades of elementary school.