

# XIAOMAN ZHANG

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## RESEARCH INTEREST

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Artificial Intelligence for Healthcare, Multi-modal Representation Learning

## EDUCATION

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**Shanghai Jiao Tong University** *Sept. 2019 – Present*

- Ph.D. in Information and Communication Engineering, Wu Honored Ph.D Class
- Advisors: Weidi Xie, Ya Zhang, Yanfeng Wang

**University of Science and Technology of China** *Sept. 2015 - July 2019*

- B.S. in Electronic and Information Engineering, School of the Gifted Young

## RESEARCH EXPERIENCE

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**Shanghai Artificial Intelligence Laboratory**, Research Intern *Sept. 2019 – Present*

Conducting research on multimodal representation learning, developing foundation model for healthcare.

- **Constructed three large-scale multimodal datasets.**
  - PMC-OA, a medical dataset with 1.65M image-text pairs, sourced from academic papers.
  - PMC-VQA, a medical dataset of 227k VQA pairs from 149k images, for instruction tuning.
  - MedMD, a medical dataset comprising 16M 2D and 3D images with textual descriptions.
- **Open-sourced three visual-language models.**
  - PMC-CLIP, a CLIP-style model trained on PMC-OA with contrastive learning.
  - MedVInT, a generative model with visual instruction tuning on PMC-VQA.
  - RadFM, a multimodal foundation model for radiology trained on MedMD.

## PUBLICATIONS

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\* denotes equal contribution.

1. **Xiaoman Zhang**, Chaoyi Wu, Yanfeng Wang, Ya Zhang, Weidi Xie. “Knowledge-enhanced visual-language pre-training on chest radiology images”, *Nature Communications* (2023).
2. **Xiaoman Zhang**, Weidi Xie, Chaoqin Huang, Ya Zhang, Xin Chen, Qi Tian, and Yanfeng Wang. “Self-supervised tumor segmentation with sim2real adaptation”, *IEEE Journal of Biomedical and Health Informatics* (2023).
3. Chaoyi Wu\*, **Xiaoman Zhang**\*, Yanfeng Wang, Ya Zhang, Weidi Xie. “K-Diag: Knowledge-enhanced disease diagnosis in radiographic imaging”, *In: Medical Image Computing and Computer Assisted Interventions Big Task Small Data Workshop* (2023).
4. Chaoyi Wu, **Xiaoman Zhang**, Yanfeng Wang, Ya Zhang, Weidi Xie. “MedKLIP: Medical knowledge-enhanced language-image pre-training in radiology”, *In: International Conference on Computer Vision* (2023).

5. Weixiong Lin\*, Ziheng Zhao\*, **Xiaoman Zhang**, Chaoyi Wu, Yanfeng Wang, Ya Zhang, Weidi Xie. “PMC-CLIP: Contrastive language-image pre-training using biomedical documents”, *In: Medical Image Computing and Computer Assisted Intervention* (2023).
6. **Xiaoman Zhang**, Shixiang Feng, Yuhang Zhou, Ya Zhang, and Yanfeng Wang. “SAR: Scale-aware restoration learning for 3d tumor segmentation”, *In: Medical Image Computing and Computer Assisted Intervention* (2021).

## MANUSCRIPTS IN SUBMISSION/REVIEW

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1. Chaoyi Wu\*, **Xiaoman Zhang**\*, Ya Zhang, Yanfeng Wang, and Weidi Xie. “Toward generalist medical foundation model for radiology”, *arXiv:2308.02463*, (2023).
2. **Xiaoman Zhang**\*, Chaoyi Wu\*, Ziheng Zhao, Weixiong Lin, Ya Zhang, Yanfeng Wang, and Weidi Xie. “PMC-VQA: Visual instruction tuning for medical visual question answering”, *arXiv:2305.10415*, (2023).
3. Chaoyi Wu\*, Weixiong Lin\*, **Xiaoman Zhang**, Ya Zhang, Yanfeng Wang, and Weidi Xie. “PMC-LLaMA: Towards building open-source language models for medicine”, *arXiv:2304.14454*, (2023).
4. Chaoyi Wu\*, Weixiong Lin\*, Jiayu Lei, Lisong Dai, Haoyun Jiang, Chaoyi Wu, **Xiaoman Zhang**, Yao Zhang, Jiangchao Yao, Weidi Xie, Yanyong Zhang, Yuehua Li, Ya Zhang, Yanfeng Wang. “UniBrain: Universal Brain MRI Diagnosis with Hierarchical Knowledge-enhanced Pre-training”, *arXiv:2309.06828*, (2023).

## INVITED TALKS

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<b>Knowledge-enhanced Medical Multi-modal Foundation Models</b> <i>SyncedTech</i>	<i>July 2023</i>
<b>Knowledge-enhanced Visual-language Pre-training on Chest Radiology Images</b> <i>SenseTime Smart Health</i>	<i>June 2023</i>

## HONORS AND AWARDS

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<b>National Scholarship for Graduate Students, SJTU</b>	2023
<b>Innovation Scholarship in School of the Gifted Young, USTC</b>	2018
<b>Cyrus Tang Scholarship, USTC</b>	2015 – 2018
<b>Sakura Science Plan, USTC</b>	2017
<b>The First Prize Scholarship, USTC</b>	2016

## REFEREES

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