

Qiushi NIE

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Research interests: medical image analysis, medical image registration, deep learning

EDUCATION

Southern University of Science and Technology **Shenzhen, China**
Department of Computer Science and Engineering
Master's Degree in Electronic Science and Technology *09/2022- 06/2025(Expected)*

- Overall GPA: 3.68/4.0
- Relevant Courses: Advanced Artificial Intelligence, Advanced Algorithms, Intelligent Data Analysis, Brain Intelligence and Machine Learning

Southern University of Science and Technology **Shenzhen, China**
Department of Computer Science and Engineering
Bachelor of Engineering in Computer Science and Technology *09/2018- 06/2022*

- Overall GPA: 3.86/4.0 (ranking ~3%)
- Relevant Courses: Artificial Intelligence, Deep Learning

PUBLICATIONS

- [1] Nie, Q., Zhang, X., Hu, Y. et al. **Medical image registration and its application in retinal images: a review.** *Vis. Comput. Ind. Biomed. Art* 7, 21 (2024). <https://doi.org/10.1186/s42492-024-00173-8> (Accepted)
- [2] Nie, Q., Zhang, X., Chen, C. et al. **Reparameterized multi-scale transformer for deformable retinal image registration.** *Mach. Intell. Res.* (2024). <https://doi.org/10.1007/s11633-024-1525-1> (Accepted)
- [3] Zhang, X., Nie, Q., Xiao, Z., et al. **Dual-view pyramid pooling in deep neural networks for improved medical image classification and confidence calibration.** (2024) (Under Review, <https://arxiv.org/abs/2408.02906>)
- [4] Liu, J., Li S., Nie, Q., Zhang, X. **Multimedia Intelligent Computing.** (2024) (Manuscript under review)
- [5] Zhou, X., Hao, L., Nie, Q., et al. **A novel multi-focus fusion network for retinal microsurgery.** *2022 IEEE 19th International Symposium on Biomedical Imaging (ISBI)*. IEEE, 2022: 1-5. (Accepted)
- [6] Hu, Y., Dong, S., Gong, M., Nie, Q., Liu, J. **Self-Supervised Structure-Preserved Image Registration Framework for Multimodal Retinal Images.** *2023 6th International Conference on Information Communication and Signal Processing (ICICSP)*. IEEE, 2023: 134-138. (Accepted)

RESEARCH EXPERIENCES

iMED Research Group (SUSTech) **Shenzhen, China**

iMED is a research team led by Prof. Jiang Liu that focuses on artificial intelligence in ophthalmology. The team has exclusive medical big data resources and in-depth cooperation with well-known international and domestic hospitals and equipment manufacturers.

Leader | Advisor: Prof. Jiang Liu *09/2024- present*

- **Project: OCT 2D scan segmentation including lamina cribrosa (LC)**
 - Description: Developed an automated segmentation model for the LC region to enable faster annotations.
 - Current Progress: Proposed a segmentation model that outperformed the baseline model.

Co-First Author | Advisor: Dr. Xiaoqing Zhang *12/2023- 09/2024*

- **Project: Dual-view pyramid pooling in deep neural networks for improved medical image classification and confidence calibration**

Description

- Developed a novel pyramid pooling method Dual-View Pyramid Pooling (DVPP) for image classification.
- Reviewed and investigated the relationship of Spatial Pooling (SP) and the Cross-Channel Pooling (CCP).

Contribute

- Designed and implemented the proposed pooling methods.
- Led the entire experimental section, including comparison experiments and ablation studies.

Achievement

- The improved DVPP outperformed state-of-the-art pooling methods on six 2D/3D medical image classification datasets in terms of accuracy and confidence calibration.
- Submitted a paper [3] in the *IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)*, which is currently under review.

First Author / Advisor: Prof. Jiang Liu

08/2023- 03/2024

- **Project: Reparameterized Multi-scale Transformer for Deformable Retinal Image Registration**

Description

- Developed a hierarchical hybrid CNN and Transformer architecture for deformable retinal image registration.
- Proposed the reparameterized multi-scale spatial attention block to dynamically fuse multi-scale features.

Contribute

- Designed and implemented the proposed RMFormer.
- Conducted elaborate comparison experiments and ablation studies.
- Wrote and revised the main manuscript.

Achievement

- The proposed RMFormer demonstrated effectiveness on a 2D retinal dataset and a 3D MRI dataset.
- Published a paper [2] in *Machine Intelligence Research (MIR)*.

First Author / Advisor: Prof. Jiang Liu

11/2022- 02/2024

- **Project: Medical Image Registration and Its Application in Retinal Images: A Review**

Description

- Conducted a systematic review of medical image registration and application in retinal image registration.
- Provided a comparison between the retinal image registration methods and the general methods.

Contribute

- About 300+ literature research on medical image registration.
- Designed and organized the structure of the review.
- Wrote and revised the main manuscript.

Achievement

- Published a paper [1] in *Visual Computing for Industry, Biomedicine, and Art (VCIBA)*.

TEACHING EXPERIENCE

Teaching Assistant

03/2022-present

- **Course: Introduction to (Medical) Artificial Intelligence, Multimedia Information Processing**

- Scheduled TAs, marked assignments, and hosted information sessions for final projects.
- Gave lectures in English on AI platforms (Python, Scikit-Learn, and PyTorch).
- Gave lectures on state-of-the-art multimedia AI advancement (e.g., Segment Anything Model).
- Participated in writing the textbooks for these courses, including [4].

After-school Tutor

03/2019-06/2022

- **Course: Introduction to Computer Programming (Java), Introduction to Computer Science**

- Worked as an after-school tutor every semester from 2019 to 2022: gave extra lectures of the course every weekend and provided assistance to students' coursework.
- Responsible for review sessions every semester before the final exam to **1600+** students.

SKILLS

- **Programming Languages:** Proficient in Java and Python (NumPy, Scikit-learn, PyTorch, ...).
- **Other Tools:** Proficient in VSCode, PyCharm, LaTeX, PowerPoint, and Git.

HONORS&AWARDS

- The second prize of outstanding student scholarship in SUSTech **2018- 2020**
- The first prize of outstanding student scholarship in SUSTech **2020- 2021**
- The Outstanding Graduates Prize in the Department of Computer Science and Engineering, SUSTech **2022**
- The Top Ten Graduates Nomination Award in SUSTech **2022**
- The Star of iMED Award (for those who contributed most to my research group iMED) **2023**
- The Outstanding Teaching Assistant in SUSTech **2021- 2023**