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, arXiv preprint available: 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-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
  - Writing and revising the main manuscript

  Achievement
  - The proposed RMFormer demonstrates 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
  - Provide 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
  - Writing and revising 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**
  - Scheduling TAs, marking assignments, and hosting information sessions for final projects.
  - Lecture given 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**
  - Working 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***