**Hai Jiang**
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**Admission Committee**
*Technical University of Munich*
*Department of Computer Science*
*Decision Sciences and Systems*

January 21, 2025

To whom it may concern,

I am writing to express my keen interest in the PhD position at your university. My academic background and research experience have equipped me with the skills and knowledge necessary for advanced study in this position.

My journey began with a strong foundation in Computer Science and Mathematics, leading me to pursue a Master's degree in Computational Mathematics in 2019, following a Bachelor's degree in Information Security in China. For my Master's project, I focused on Generative Adversarial Networks (GANs) of Deep Learning (DL), specifically for handwriting style imitation. In this project, I developed a GANs-based model to replicate individual handwriting styles, focusing on emulating the handwritten Chinese characters of Shiing Shen Chern from a dataset of around 220 characters. This experience provided me with hands-on expertise in GANs, data preprocessing, manuscript analysis, and code replication, culminating in my Master's thesis, *"GANs based Personal Style Imitation of Chinese Handwritten Characters."*

After completing my degree, I joined a research group at Sun Yat-sen University focused on Computer-aided diagnosis, where I worked as a Research Assistant on several impactful projects. These included diagnosing Placenta Accreta Spectrum Disorders, predicting metastasis in Sentinel Axillary Lymph Nodes in breast cancer, and assessing responses to Neoadjuvant Chemotherapy via MRI. Through these projects, I gained further expertise in Python, PyTorch, and TensorFlow, along with experience in manuscript research and scientific writing.

My long-term goal is to build a career in academia, contributing to the meaningful implementation of innovative solutions through the integration of Computer Science and Mathematics. The cutting-edge and interdisciplinary nature of this PhD program, combined with the expertise and accomplishments of the research team, aligns seamlessly with my academic and professional aspirations, as well as my personal interests. This position represents an excellent opportunity to advance toward my goals, and I am eager to join an environment that fosters intellectual rigor, collaboration, and access to the resources needed to achieve my ambitions.

I am confident that I am a strong candidate for this position within your research group. The focus on Machine Learning and Game Theory closely aligns with my interests and expertise. I am particularly passionate about developing AI/ML algorithms and advancing fundamental theories to support research in this area. My interdisciplinary background, programming skills, and research experience uniquely position me to excel in and make meaningful contributions to the challenges and demands of this PhD opportunity.

I am enthusiastic about the opportunity to join your research community and contribute actively while continuing to develop my expertise. Thank you for considering my application, and I look forward to discussing how my background, skills, and goals align with your program.

Sincerely,

**Hai Jiang**

# Hai Jiang

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## Education

**09.2019–07.2022** **Master of Science in Computational Mathematics**, ***Nankai University (NKU)***, **China**

**Thesis** *GANs based Personal Style Imitation of Chinese Handwritten Characters.*

**Advisors** Prof. Yunhua Xue, Prof. Chunlin Wu

**Related Courses** Approximation Theory and Methods, Numerical Optimization, Convex Analysis, Variational Analysis, Real Analysis, Functional Analysis, Matrix Computation, Foundations of Measure Theory and Probability, Numerical Solutions of Partial Differential Equations, and more.

**Cumulative GPA** 3.06/4.00

**09.2014–07.2018** **Bachelor of Engineering in Information Security**, ***Lanzhou University (LZU)***, **China**

**Thesis** *Improved Upper Bounds of Roman Domination Number in Maximal Outerplanar Graphs.*

**Advisor** Prof. Zepeng Li

**Related Courses** Discrete Mathematics, Operating Systems, Data Structures, C and C++ Programming Lab, Java Programming Lab, Database Theory and Lab, Computer Organization and Design, and more.

**Cumulative GPA** 4.15/5.00

## Research Experience

**11.2022–07.2024** **Research Assistant**, *Computational Medical Imaging Laboratory*
School of Computer Science and Engineering, Sun Yat-sen University, China

**Project** China Department of Science and Technology Key Grant, focused on Breast Cancer, aims to develop models with clinical interpretability and generalization.

**Advisors** Prof. Yao Lu, Dr. Ting Song

**Task Focus** Placenta Accreta Spectrum Disorders, T2-WI MRI, Prenatal Diagnosis, Multi-class classification.

**Experience and Skills** Literature research, data preprocessing, model building (programming), research paper writing.

**Publication** Submitted to ISBI 2025 and accepted: *"Anatomy-guided Multitask Learning for MRI-based Classification of Placenta Accreta Spectrum and its Subtypes."*

**12.2023–01.2024** **Research Assistant**, *Computational Medical Imaging Laboratory*
School of Computer Science and Engineering, Sun Yat-sen University, China

**Project** National Natural Science Foundation of China, focused on Breast Cancer, aimed to develop a prediction model for the Chinese female population mainly with FFDM and US.

**Advisors** Prof. Yao Lu, Dr. Xiang Zhang

**Task Focus** Breast Cancer, Dual-Energy CT, Sentinel Lymph Nodes, Metestatic status, Multi-class classification.

**Experience and Skills** The first comprehensive research experience involved conducting literature reviews, designing experiments, writing research papers, and working with the TensorFlow and Keras frameworks.

**Publication** Submitted to MICCAI 2024 and revised for submission to the Journal of *Medical Physics*: *"DECT-Based Space-Squeeze Method for Multi-Class Classification of Metastatic Lymph Nodes in Breast Cancer."*

**01.2022–06.2022** **Research Student**, *Image Analysis Team*
School of Mathematical Sciences, Nankai University, China

**Task** ADMM model from the manuscript *"Deep ADMM-Net for Compressed-Sensing MRI."*

**Supervisors** Prof. Chunlin Wu, Prof. Yunhua Xue

**Focus** Compressed-sensing Theory, Iterative Equations, Neural Networks, MRI reconstruction.

**Experience and Skills** The second programming experience involved proving mathematical equations and applying Deep Learning techniques. I reproduced the iterative mathematical equations using C++, Python, and PyTorch.

**01.2021–04.2021** **Research Student**, *Image Analysis Team*
School of Mathematical Sciences, Nankai University, China

**Task** ROF-model from the manuscript *"Nonlinear Total Variation Based Noise Removal Algorithms."*

**Supervisor** Prof. Yunhua Xue

**Focus** Image Restoration, Denoise, PDE, Total-Variation Penalty.

**Experience and Skills** My initial project experience included proving mathematical equations and using both C++ and Python to develop the ROF model.

## Other Work Experience

### Funding

**Proposal Writing** Accepted; National Key Research and Development Program of China [No. 2023YFE0204300].

**Report Writing** Succeeded; Finished three Completion Reports and three Progress Reports; National Natural Science Foundation of China [No. 81971691, 12126610]; R&D Program of Pazhou Lab (Huangpu) [No. 2023K0606].

### Specification

**Patent** 1 Patent Application Specification; under review.

**Device** 1 Medical Device Application Specification; succeeded.

### Teaching Experience

**Courses** Calculus; Mathematical Analysis

**Thesis** *Breast Cancer Classification Method Based on Dual-Energy CT Images*

## Language Proficiency

**Mandarin** Native

**English** Professional Level: IELTS 6.5; CET6 476/710; CET4 544/710

**Cantonese** Intermediate

## Skills

**Technical** Python, PyTorch, Tensorflow + Keras, LaTeX, Git, C/C++, MATLAB

**GitHub repository** `https://github.com/pigejianghai/projects`

**Other** Linux (Ubuntu), Microsoft Office, Adobe Photoshop

## Interest

Artificial Intelligence, Mathematics, Physics

## Awards

**2014 – 2018** Four-time recipient of the Third-Class Merit Scholarship for Academic Excellence at LZU.

**2019 – 2022** Three-time recipient of the Third-Class Merit Scholarship for Academic Excellence at NKU.

## References


### Prof. Yunhua Xue

Associate Professor in Computational Mathematics at Nankai University

**Address** 94 Weijin Road, Nankai District, Tianjin, P.R. China 300071

**E-mail** yhxue@nankai.edu.cn

### Prof. Yao Lu

Professor of Medical Image Analysis at Sun Yat-sen University

**Address** Xingang West Road, Haizhu District, Guangzhou, Guangdong, China

**E-mail** luyao23@mail.sysu.edu.cn


## Publications


[1] **Hai Jiang** et. al. "Anatomy-Guided Multitask Learning for MRI-Based Classification of Placenta Accreta Spectrum and Its Subtypes." *IEEE International Symposium on Biomedical Imaging (ISBI)*, 2025.

[2] Jiawei Pan, Zilong He, Yue Li, Weixiong Zeng, Yaya Guo, Lixuan Jia and **Hai Jiang** et. al. "Atypical architectural distortion detection in digital breast tomosynthesis: a multi-view computer-aided detection model with ipsilateral learning." *Physics in Medicine & Biology* 68, no. 23 (2023): 235006.