# Yuezhe **Yang**

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**Bio.** I am currently an undergraduate student at the School of Artificial Intelligence, Anhui University. My research is dedicated to the application of artificial intelligence in medical imaging.

**Research interests.** My research work covers a range of topics, including : **Computer Vision & Computer Graphics, Medical Image Processing, Deep Learning & Machine Learning** . Currently, I am particularly interested in various deep learning techniques (e.g., CNN, ViT, NeRF, Diffusion, 3DGS, etc.) and their applications in medical imaging modalities such as ultrasound, CT, PET, and skin lesion imaging.

## Education

Sep 2022 – **Bachelor of Engineering**, *Anhui University*(211/Double First-Class), Hefei
Major in **Artificial Intelligence**
*Advisor :Prof. Zhe Jin*
GPA : 3.93/5.0 | Rank : 6/262
**Lecture :** High-level Language Programming (97) ; Data Structures and Algorithms (95) ;
Python Programming (97) ; Algorithm Analysis and Design (98) ; Fundamentals of Digital Electrical Technique (99) ;
Probability Theory and Mathematical Statistics A (99) ; Functions of Complex Variable (98) ;
**Lab :** Experiments in High-level Language Programming (97) ; Experiments in Database Principles (98) ;
Experiments in Data Structures and Algorithms (98) ; Experiments in Digital Electrical Technique (98) ;
Experiments in Python Programming (96) ; Experiments in Object-oriented Programming (99) ;

## Publications

∗ Co-first author, † Corresponding author (supervisor). More details available on the homepage.

- Zhu, K.*, **Yang, Y.***, Chen, Y.*,†, Feng, R., Chen, D., Fan, B., ... & Wang, X. (2025). EM-Net : Effective and morphology-aware network for skin lesion segmentation. *Expert Systems with Applications, 127668.*
- **Yang, Y.***, Chen, Y.*, Dong, X.†, Zhang, J., Long, C., Jin, Z., & Dai, Y. (2025). An annotated heterogeneous ultrasound database. *Scientific Data, 12(1), 148.*
- **Yang, Y.**, Cai, W., Yang, D., Dong, Y., Ruan, Q., Dong, X.†, Jin, Z. (2025). Depth-Aware Gaussian Splatting with Propagation Properties for Ultrasound Rendering. *Submit to BMVC.*
- Dong, Y.*, Liu, M.*, Feng, J.*, **Yang, Y.***, Dai, Y., Jin, Z.† (2025). Federated Learning-Based Virtual Dual-Energy CT Generation from Single-Energy CT for Gout Detection. *Submit to Digital Health.*
- **Yang, Y.**, Yang, B., Wang, Y., He, Y., Dong, X.†, Jin, Z. (2025). Explicit and Implicit Representations in AI-based 3D Reconstruction for Radiology : A Systematic Review. *ArXiv, Submit to Medical Image Analysis.*
- **Yang, Y.**, Guo, Y., Cai, W., Ruan, Q., Wang, S., Dong, X.†, Jin, Z., Dai, Y. (2025). Auto-US : An Agent for Ultrasound Video Diagnosis Using Video Classification Framework and LLMs. *Submit to npj artificial intelligence.*
- **Yang, Y.**, Liu, Y., Wang, L., Dong, X.†, Jin, Z. (2025). Abnormality-aware Prompting for Test-Time Adaptation in Breast Ultrasound Segmentation. *Submit to NeurIPS.*
- Dong, X.†, **Yang, Y.**, Lü, X., Wang, L., Zhang, H., Chen, Y., Zhang, D., Jin, Z. (2024). PET image reconstruction method based on prior image and PET image 3D perception method. *National Invention Patent*, CN118411435A. (Under substantive examination)
- **Yang, Y.**, Dong, X., Cai, W., Yang, D., Jin, Z. (2025). 3D Gaussian model generation and rendering method for low-dose PET image processing. *National Invention Patent*, CN119625190A.

## Skills

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| Machine & Deep Learning : | *Experienced in developing deep learning models, with a theoretical and practical grounding in key machine learning concepts. Capable of applying these skills to solve problems in computer vision.* |
| Programming Frameworks : | *Proficient in Python and C++, with extensive experience in* **PyTorch** *for deep learning applications. Skilled in CUDA programming for GPU-accelerated computation.* |
| Mathematics Knowledge : | *Strong foundation in calculus and linear algebra, along with advanced understanding of convex optimization, machine learning theory, and deep learning fundamentals.* |
| Computer Vision & Graphic : | *Solid background in computer vision, with experience in implementing algorithms and frameworks. Knowledgeable in computer graphics, including foundational concepts and applications.* |

## Projects & Experiences

Dec. 2023 – Mar. 2025

**International Brain Science and Engineering Research Center, Anhui University, Research Intern**

- **Project Supervisor :** Dr. Xingbo Dong.
- **Research Work :** Focused on domain generalization and medical image reconstruction across multiple modalities including ultrasound, PET, and skin lesion imaging. Key projects include : (1) Developing a morphology-aware network to address domain shift in skin lesion segmentation; (2) Designing an abnormality-aware prompting mechanism to improve generalization in breast ultrasound segmentation; (3) Applying Gaussian Splatting for 3D ultrasound reconstruction; (4) Building a large-scale heterogeneous ultrasound database; (5) Developing a multimodal intelligent agent system for ultrasound diagnosis.
- **Key Contributions :** As **first/co-first author**, authored 7 high-quality research papers (2 published in JCR Q1 journals, 5 under review), and filed 2 national invention patents. As project leader, led the development of "DeepPET"—a low-radiation, high-quality imaging device, which received Outstanding Award in the National College Students Innovation and Entrepreneurship Program, Gold Award in the Anhui Province International Student Innovation Competition, and was recognized as the "Innovation Star" of Anhui University.

Deep Learning | Domain Generalization | Ultrasound Imaging | Image Reconstruction

Jul. 2025 – Oct. 2025

**Vision and Learning Lab, University of Alberta, Research Intern**

- **Project Supervisor :** Prof. Li Cheng.
- **Research Work :** Focused on tackling challenges in CT imaging under extreme conditions. Designed cutting-edge 3D reconstruction algorithms to handle clinical constraints such as low-dose, limited-angle, and high-noise CT scans, enabling high-quality image restoration.
- **Key Contributions :** Developed a novel reconstruction algorithm combining physical priors and data-driven approaches, significantly improving clarity and detail retention in CT imaging under extreme scenarios. Currently finalizing evaluation with the goal of publishing as **first author** in top-tier journals or conferences in the field.

3D Reconstruction | CT Imaging | Extreme Conditions | Deep Learning

## Languages

English : CET-4
CET-6

## Honors & Awards

- 2024 : **The National Scholarship.** *(Top 0.4% nationwide, Highest Undergraduate Honors)*
- 2025 : Undergraduate CSC Government Scholarship for Study Abroad. *(Only 30 recipients nationwide)*
- 2024 : China International College Students' Innovation Competition, Higher Education Track, Anhui Province Gold Award.
- 2025 : "Innovation Star" Team Award, Anhui University. *(Only one team selected in the school)*
- 2024 : 15th Lanqiao Cup National Software and Information Technology Professional Talent Competition, C/C++ Programming University Group A, Anhui Province Second Prize.
- 2024 : College Students' Innovation Competition, Anhui University Gold Award.
- 2024 : College Students' Innovation Competition, Anhui University Silver Award.
- 2024 : 14th "Challenge Cup" University Student Entrepreneurship Competition, Anhui University Bronze Award.
- 2023 : First-Class Academic Excellence Award, Anhui University.
- 2024 : Mentor for Freshmen, Class of 2024, Anhui University.
- 2024 : Third Prize, Academic and Scientific Association Award, Anhui University.
- 2023–2025 : Actively participated in on-campus and off-campus volunteer services and social practice activities.

## Interests

Sports : Cycling, Swimming, Hiking, City Walk.
Arts : Photography, Movies, Short Videos, Anime.
Misc : Travel, Video Games.