Yuezhe **Yang**

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Bio. I am currently an undergraduate student at the School of Artificial Intelligence, Anhui University. I am also a member of the Anhui Provincial International Joint Research Center for Advanced Technology in Medical Imaging. 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 : 3.97/5.0 | **Rank** : 5/263
	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

> Zhu, K., **Yang, Y.(Co-first)**, Chen, Y., Feng, R., Chen, D., Fan, B., Liu, N., Li, Y., and Wang, X.. "EM-Net : Effective and Morphology-aware Network for Skin Lesion Segmentation."*Expert Systems with Applications.*(Revisions)

> **Yang, Y.**, Chen, Y., Dong, X., Zhang, J., Long, C., Jin, Z., Dai.,Y.. "An Ultrasound Dataset in the Wild for Machine Learning of Disease Classification." *Scientific Data.* (Revisions)

> Dong, X.(Advisor), **Yang, Y.**, Lv, X., Wang, L., Zhang, H., Chen. Y., Zhang, D., and Jin, Z.. "PET Image Reconstruction Method and 3D Perception Method Based on Prior Images."*Invention Patents*, CN118411435A. (Under Substantive Examination)

☰ Skills

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	High-Precision Skin Lesion Segmentation Model for Dermoscopic Images, Principal Investigator

> **Project Description :** Developed a high-precision model to segment skin lesions in dermoscopic images, which are vital for diagnosing skin diseases. The model combines CNN and Vision Transformer (ViT) architectures to capture both spatial and local features, enhancing accuracy in identifying lesion boundaries. A non-convex optimization function improves boundary delineation, while a domain-adaptive adversarial learning strategy boosts generalization across different datasets. Tested on datasets like ISIC, PH^2, PAD-UFES-20, and the University of Waterloo skin cancer database, our model achieved high accuracy and strong generalization performance.

> **Key Contributions :** Authored the paper "EM-Net : Effective and Morphology-aware Network for Skin Lesion Segmentation" as the **first author**, to be submitted to the **Expert Systems with Applications (Revisions) (Elsevier Ltd, JCR Q1)**.

> : Link to Project on Github.

`Deep Learning` `Domain Generalization` `Skin Lesion Segmentation` `Morphology Aware`

May 2024	**Ultrasound Dataset for Disease Classification in the Wild, Principal Investigator**
	> **Project Description :** Created a large, publicly accessible ultrasound dataset to improve machine learning models for disease classification in ultrasound images. Ultrasound is widely used for diagnosing internal structures, but factors like operator variability, noise, and limited field of view make consistent diagnosis challenging. Our dataset includes 1,833 anonymized ultrasound images from diverse sources and covers 13 types of anomalies, enabling better benchmarking of disease classification models across varied environments. This resource aims to support advancements in AI-assisted ultrasound diagnostics.
	> **Key Contributions :** Authored the paper "An Ultrasound Dataset in the Wild for Machine Learning of Disease Classification" as the **first author**, to be submitted to the **Scientific Data (Revisions) (Springer Nature, JCR Q1)**.
	> : Link to Project on Github.
	Machine Learning Ultrasound Dataset Heterogeneous Public

Jan 2024	**Intelligent Brain PET Imaging with Low Radiation and High Image Quality, Principal Investigator**
	> **Project Description :** Developed DeepPET, a novel PET image reconstruction method combining physical modeling with deep learning to improve image quality while significantly reducing radiation dose. Our approach enhances reconstruction speed and reduces sensor requirements, lowering costs. By employing generative models, DeepPET converts low-count images to high-count, artifact-free images, advancing PET imaging efficiency for early diagnosis and reliable clinical use.
	> **Key Contributions :** Secured a **National-level Grant** as the **Principal Investigator** through the China College Students' Innovation and Entrepreneurship Project. Led the team as the **Project Leader** to win the **Gold Award** in the Anhui Province division of the China International College Students' Innovation Competition. Contributed as a **Core Developer** in the application for a **Invention Patent** "PET Image Reconstruction Method and 3D Perception Method Based on Prior Images" .
	> : Link to Project on Github.
	Positron Emission Tomography Low Cost Reconstruction Noise Reduction

Aug 2024	**3D Gaussian Splatting-Based Ultrasound Image Rendering Method, Principal Investigator**
	> **Project Description :** Developed a high-fidelity ultrasound image rendering method based on 3D Gaussian splatting. This approach enables rapid ultrasound image rendering and achieved state-of-the-art performance across multiple datasets.
	> **Key Contributions :** Authored a paper as the **first author** on this method, with preliminary completion expected by December.
	3D Vision Ultrasound Image Processing Perspective Generation Voxel Rendering

🔠 Languages

English :	CET-4
	CET-6

🔨 Honors & Awards

> 2024 : **The National Scholarship.** *(Top 0.4% nationwide, Highest Undergraduate Honors)*

> 2024 : China International College Students' Innovation Competition, Higher Education Track, Anhui Province Gold Award.

> 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 Awards.

> 2024 : College Students' Innovation Competition, Anhui University Silver Awards.

> 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.

💡 Interests

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