Xianbang Wang

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Education

IIIS, Tsinghua University
Pre-college Program Sep 2023 ∼ Now

The High School Affiliated to Renmin University of China
Middle School & High school Sep 2018 ∼ Now

Research interests

Deep Learning, Computer Vision, Reinforcement Learning, Algorithms.

Honors

Gold Medal
International Mathematics Olympiad (IMO) 2024

Gold Medal (9th Place)
Chinese Mathematics Olymiad (CMO) 2023 & 2024

Silver Medal
National Olymiad in Informatics (NOI) 2021 & 2022

17th Place in Open Contest
USA Computing Olympiad (USACO) 2022

Internships

Undergraduate Research in Computer Vision
Supervised by Prof. Kaiming He, MIT 2025.2 ∼ Now
Conduct research at deep visual generative models, including Diffusion Models, Flow Models and Normalizing Flows. Develop model codebases and workflows in Google TPU.

Tencent Spark Program
Tencent 2023 (Student) & 2024 (TA)
A 1-week program for high school students to experience the cutting-edge technologies in AI and quantum computing, and also the working environment. I was selected as the "challenge star" of quantum track in 2023 and a teaching assistant in medical AI track in 2024.

Projects

Randomized Techniques in Graph Algorithms
2024.10 `https://github.com/PeppaKing8/algdesign-project`

Project for the course *Algorithm Design* at IIIS, Tsinghua University, completed in a team of 2. This project receives 6 bonus points. Personal contribution includes:

- Study randomized algorithms in APSP, MST and Exact Matching.
- Implement and analyze the performance of a randomized APSP algorithm which incorporates fast matrix multiplication.
- Propose a NP-complete problem "Optimal Point Traversing Path", and design a randomized algorithm to solve a special case.

Customized Cloth-Fluid Simulation System Using C++ and CUDA
2024.10 ∼ 2024.12 `https://github.com/HACLINE/ACG_Project`

Project for the course *Advanced Computer Graphics* at IIIS, Tsinghua University, completed in a team of 2. This project is one of the top-3 projects on simulation track. Personal contribution includes:

- Implement the point-based cloth simulation method (XPBD) and the cloth-fluid coupling pipeline including collision detection, constraint solving and rendering. CUDA acceleration is utilized.
- Implement fully customized simulation: users can create and edit cloth and fluid objects.

Do LLMs Outperform Multi-task Learning Expert in Medical Report Generation?
2024.12 `https://github.com/Lyy-iiis/Crayon-new`

Project for the course *Natural Language Processing* at IIIS, Tsinghua University, completed in a team of 3. This project is selected for class oral presentation. Personal contribution includes:

- Examine the performance of LLMs on medical report generation tasks, showing the downside of fine-tuned LLMs compared with experts learning from scratch in domain-specific language tasks.
- Collaborate on designing the multi-task learning method.

Diffusion Policy Needs Careful Visual Extractor Design
2024.12 `https://github.com/PeppaKing8/EAIproject`

Project for the course *Embodied AI* at IIIS, Tsinghua University, completed in a team of 3. Personal contribution includes:

- Examine different visual extractors in Diffusion Policy, surprisingly observing the importance of the simplicity of the visual extractor (simple CNN without pooling and normalization works the best).
- Devise a new depth map preprocessing method to improve the quality of information captured of the visual extractor.

Skills

Programming Languages: Python, C/C++, Javascript.
Tools: PyTorch, Jax, MATLAB, Git, LaTeX.
Languages: English (Fluent), Chinese (Native).

Additional information

Transript at IIIS
All of the *professional* courses taken at IIIS is shown below.

Year-Semester	Course Title	Credit	Grade
2023-Autumn	Introduction to Computer Science	3	A
	Introduction to Programming in C/C++	2	A+
	Calculus A (1)	5	A
	Linear Algebra	4	A
2024-Spring	Mathematics for Computer Science and Artificial Intelligence	4	A+
	Calculus A (2)	5	A
	General Physics (1)	4	A−
	Abstract Algebra	4	A+
2024-Autumn	Advanced Computer Graphics	4	A
	Natural Language Processing	3	A+
	Machine Learning	4	A+
	Algorithm Design	4	A+
	Artificial Intelligence: Principles and Techniques	3	A
	Embodied AI	3	A
	General Physics (2)	4	A

Self-Studied/Audited courses

- Deep Learning. Instructor: Yi Wu, IIIS, Tsinghua University.
- CS285: Deep Reinforcement Learning. Instructor: Sergey Levine, UC Berkeley.
- 6.S978: Deep Generative Models. Instructor: Kaiming He, MIT.
- 6.4210: Robotic Manipulation. Instructor: Russ Tedrake, MIT.