Yiquan Wang

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Education

National Base for Mathematical Research and Teaching Talents, Xinjiang University — Urumqi, Xinjiang
B.S. in Mathematics and Applied Mathematics — 2023.09 – 2027.06

Tsien Excellence in Engineering Program, Tsinghua University & X-Institute — Shenzhen, Guangdong
Joint Program, Zero One Scholar — 2024.06 – 2027.06

Institute of Neurological and Psychiatric Disorders, Shenzhen Bay Laboratory — Shenzhen, Guangdong
Visiting Student, Wen Yuan's Research Group — 2025.07 – 2025.09

Research Projects

National Undergraduate Innovation Training Program — 2025.04 – 2026.04
- **Project:** Copy Number Variation Conditional Diffusion Model: For Alzheimer's Disease Risk Assessment.
- This project aims to integrate copy number variation (CNV) features from whole-genome sequencing data with multi-dimensional clinical data such as metabolic indicators. Leveraging the success of diffusion models in processing high-dimensional simulation data and protein phenotype prediction, we will construct a comprehensive framework consisting of CNV feature encoding, genomic region attention, and conditional U-Net diffusion modules. This will simulate CNV distribution changes and evolutionary processes in the genome, analyze the specific role of CNV in regulating Alzheimer's disease pathways, and ultimately improve disease risk assessment and early intervention accuracy. Supervised by Prof. Kai Wei.

Chinese Academy of Sciences (CAS) Innovation Practice Training Program — 2024.11 – 2025.09
- **Project:** Extraction and Analysis of Global Heatwave Disaster Adaptation Elements Based on Multimodal BERT Model.
- This research uses a multimodal BERT model to integrate text, images, and structured data to precisely identify key factors affecting heatwave adaptation. The research results will provide solid theoretical and data support for formulating scientific global heatwave response strategies and enhance society's overall disaster adaptation capabilities. Supervised by Researcher Yong Ge.

Tsinghua University Tsien Excellence in Engineering Program ESRT — 2024.08-2025.10
- **Project:** From Signal to Symphony: Predicting Protein Function with a Deep Learning Fusion Model on Sonified Sequences.
- This research introduces a novel computational framework that translates protein sequence and structural information into musical encodings to predict function and guide protein design. The study systematically demonstrates the value of co-evolving both data representation and model complexity through a three-stage comparative analysis, achieving 90.44% accuracy. The framework was also integrated into a conditional diffusion model to guide the generative design of novel, structurally viable Green Fluorescent Protein (GFP) variants. Supervised by Prof. Kai Wei.

Provincial Undergraduate Innovation Training Program — 2024.03 – 2025.06
- **Project:** Research on the Generation Cyclability of Cartesian Product Graphs and Related Problems.
- This project mainly focuses on studying the generation cyclability of the n-th Cartesian product graphs of complete graphs. Currently, there are research results on the generation cyclability of n-th Cartesian product graphs of complete graphs with two vertices and three vertices. I mainly study the generation cyclability of n-th Cartesian product graphs of complete graphs with at least 4 vertices. Supervised by Prof. Eminjan Sabir.

Professional Experience

Beijing Frontier Research Center for Biological Structure, Tsinghua University   Beijing, China
Research Intern   2026.07 – Present
- Developed the Polypeptide Structure Database and engaged in protein and polypeptide design research.

Institute of Software, CAS & Huawei Mindspore Community   Remote
Open Source Intern   2024.09 – 2025.03
- Implemented a VGG19-based model for Pollock-style art generation, focusing on fractal and turbulent feature extraction and the creation of NFT-based digital labels. Featured on Huawei's official Wechat.

Selected Publications

[1] **Wang, Y.***, Cai, M., & Huang, T. Y. (2025). AI for disease prediction: Performance insights and key limitations. *Journal of Clinical Neuroscience, 138*, 111360.

[2] Wang, X., **Wang, Y.**, & Huang, T. Y. (2025). Crypto-ncRNA: Non-coding RNA (ncRNA) Based Encryption Algorithm. *ICLR 2025 Workshop*. (Co-first author).

[3] Wang, X., **Wang, Y.***, & Pan, J. (2025). Digital Art Creation and Copyright Protection in Pollock Style Using GANs, Fractal Analysis, and NFT Generation. *ICLR 2025 Workshop*. (Co-first author).

[4] Wang, X., Xu, L., **Wang, Y.***, Dong, Y., Li, X., Deng, J., & He, R. (2024). Octopus Inspired Optimization Algorithm: Multi-Level Structures and Parallel Computing Strategies. *arXiv preprint arXiv:2410.07968*.

[5] Wang, X., Wang, F., & **Wang, Y.** (2025). Dialogues between adam and eve: exploration of unknown civilization language by llm. *ICLR 2025 Workshop*.

[6] **Wang, Y.***, Zhang, J., & Chang, Y. (2024, November). A probability prediction model for flood disasters based on Multi-layer Perceptron. In *Journal of Physics: Conference Series* (Vol. 2905, No. 1, p. 012003). IOP Publishing.

[7] Wang, J., & **Wang, Y.*** (2024, September). Multi-stage Crop Planting Strategy optimization Model Based on PSO Algorithm. In *2024 3rd International Conference on Electronics and Information Technology (EIT)* (pp. 915-919). IEEE.

[8] **Wang, Y.**, Cai, M., Dong, Y., et al. (2025). From Signal to Symphony: Predicting Protein Function with a Deep Learning Fusion Model on Sonified Sequences (under review).

[9] **Wang, Y.**, Zhang, J., Chang, Y., et al. (2025). Boosting MOOCs Engagement through Graph Neural Network-Driven Social-Academic Recommendations. (under review).

[10] **Wang, Y.***, Wang, J., Huang, T. Y., et al. (2025). STGCN-LSTM for Olympic Medal Prediction: Dynamic Power Modeling and Causal Policy Optimization. (under review).

Awards & Honors

- **SynBio Challenges**: Silver Award   2025
- **The Mathematical Contest in Modeling (MCM)**: Honorable Mention   2025
- **Alibaba Cloud Tianchi University Student Competition**: National Finals, 17th Place   2024
- **APMCM Asia-Pacific Mathematical Modeling Competition**: National Third Prize   2024
- **"Alpha Egg Cup" National Go Championship**: 15th Place   2024
- **Xinjiang Youth Amateur Go Competition**: 53rd Place   2024
- **Hunan Province Spring Cup Go Competition**: 7th Place   2024
- **National Youth Intellectual Sports Meeting Go Competition**: 9th Place   2024
- **Xinjiang University Vulnerability Reporting Honor**   2023
- **"Tianshan Fixed Network Cup" Cybersecurity Skills Competition**: 7th Place, Xinjiang Region   2023

Academic Activities

Peer Reviewer:

- NeurIPS 2025 AI for Science Workshop
- ICLR 2025 Workshop on AI for Nucleic Acids
- ICLR 2025 Workshop on GenAI Watermarking
- ICML 2025 Workshop on AI for Math
- Mini-Reviews in Medicinal Chemistry
- Current Science
- F1000 Research

Academic Engagement:

- Tsinghua University-Peking University Center for Life Sciences Summer Camp — 2025.07
- Shenzhen Bay Laboratory / Shenzhen Medical Academy of Research and Translation Summer Research — 2025.07 – 2025.09
- Tsinghua University Tsien Excellence in Engineering Program – Zero One Scholar — 2024.06 – 2027.06
- AI Winter School, Brown University Department of Physics — 2025.01
- CAAI Artificial Intelligence and Technology Ethics Training Course — 2024.09 – 2024.12
- Fudan University Summer School of Mathematical Logic — 2024.08
- Jinan University Guangdong Thousand Villages Survey Project — 2024.08
- Wuhan University National Tianyuan Mathematics Center Discussion Class — 2024.03 – 2024.06

Website Development

- **Shenzhen X-Institute Course Website**: https://lingyi.wyqmath.cn/
- **Polypeptide Structure Database**: https://www.frcbs.tsinghua.edu.cn/cpdb/
- **Tong Wang Research Group**: https://tongwang.vercel.app/

Skills & Interests

Technical Skills: Python, C/C++, MATLAB, LaTeX, Linux, HTML/CSS/JavaScript
Research Interests: Artificial Intelligence, Deep Learning, AI for Science, Bioinformatics, Computational Biology, Mathematical Modeling, Neuroscience
Languages: Chinese (Native), English (Professional Working Proficiency)