Yucheng Pan

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EDUCATION

Tsinghua University Sep. 2021 - Jun. 2025 (expected)
Department of Physics Beijing, China

- B.S. in Physics, **GPA: 3.87/4.00**

Princeton University May 2024 - Present
Department of Electrical and Computer Engineering Princeton, NJ, USA

- Summer Internship (Remote)

The University of Carolina at Chapel Hill Feb. 2024 - Present
Department of Statistics and Operations Research Chapel Hill, NC, USA

- Summer Internship (Remote)

INTERESTS AND SKILLS

Interests (Stat)	Deep Learning, Applied Statistics, Machine Learning, Data Science, Optimization
Interests (CS)	LLM Agents, Scalable Reinforcement Learning
Programming Languages	Python, R, LaTeX, C/C++, Mathematica, HTML, CSS, JavaScript

RESEARCH EXPERIENCE

Deception and Defense of LLM Agents May. 2024 - Present
Supervisor: Prof. Mengdi Wang (Princeton University) and Prof. Huazheng Wang (The Ohio State University)
· aaa

Generalization of LLM Agents Jun. 2024 - Present
Supervisor: Prof. Mengdi Wang (Princeton University) and Prof. Huazheng Wang (The Ohio State University)
· bbb

Orthogonal Audio Watermark Feb. 2024 - Present
Supervisor: Prof. Yao Li (The University of Carolina at Chapel Hill) and Prof. Minhao Cheng (The Pennsylvania State University)
· ccc

Nucleotide Sequences Based on Large Language Models Nov. 2023 - Present
Supervisor: Prof. Ke Deng (Tsinghua University)
· Processed corresponding datasets of amino acids and nucleotide sequences.
· Developing a model based on observed patterns to understand and predict nucleotide sequence compositions.
· Exploring artificial protein design by utilizing the identified patterns to enhance synthetic efficiency beyond natural biological sequences.
· Conducting experiments to verify the accuracy and effectiveness of the model in predicting nucleotide sequences and assess the efficiency of artificially designed proteins.

Enhancing Precision in Isotope Nuclear Radius Estimation through Statistical Analysis Sep. 2023 - Present
Supervisor: Prof. Ke Deng (Tsinghua University)
· Constructed and processed datasets comprising nuclear radius and isotope shift data across multiple spectra and isotopes.
· Employed multivariate regression analysis to derive theoretical frameworks and designed algorithms aimed at reducing estimation errors within these frameworks.

· Developed and implemented a novel program to test and validate the theoretical outcomes.
· **Paper in progress**.

JWST-Based Study of High-Redshift Universe Through Stellar Mass Function Jul. 2022 - Sep. 2023
Supervisor: Prof. Zheng Cai (Tsinghua University)
· To verify the challenge to the ΛCDM model
· Developed a set of data processing scripts applicable to various JWST(James Webb Space Telescope) observation fields, generating galaxy catalogs from raw images.
· Employed JWST CEERS and PRIMER field photometric data to select a series of high-redshift ($7.0 < z < 7.5$) galaxies with strong OIII + H_β emission lines.
· Utilized photometric data for SED fitting, generating galaxies stellar mass function and measuring the equivalent width of OIII + H_β emission lines.
· Validated the ΛCDM model with the generated physical quantities.

SCIENTIFIC TALKS

PLMs as Meta-function: Learning In-context Learning for Named Entity Recognition Dec. 2023
Oral Presentation, Tsinghua Text Analysis Symposium, Beijing

SELECTED COURSE PROJECTS

Large Language Models and Alignment Sep. 2024 - Present
· eee

Large Language Models and Alignment

Deep Learning Sep. 2024 - Present
· fff

Deep Learning

Deep Reinforcement Learning Mar. 2024 - Jun. 2024
· ddd

Machine Learning and Big-data Nov. 2023 - Dec. 2023
· **Objective**: Design and implement a deep learning model to predict the health condition of the Autonomous Underwater Vehicle.
· **Role**: Processed the data, designed and trained ANN, RNN and CNN models, and presented the results.

C++ Programming for Linux Jul. 2023
· **Objective**: Design and implement a simplified remote system administration of web servers.
· **Role**: Completed the implementation of the server and client.

Observational Astronomy Mar. 2023 - Jun. 2023
· **Objective**: Design and implement a data processing pipeline, complete a simplified project paper.
· **Role**: Selected the target objects, designed the spectra fitting pipeline and presented the results. Got A+.

EXTRA-CURRICULAR

- Implementing Object Detection Applications Using Ascend Elastic Cloud Servers Aug. 2023

SCHOLARSHIPS AND AWARDS

Scholarship for Outstanding Technological Innovation	2022
Friends of Tsinghua - Qianheng Huang Scholarship	2022
Scholarship for Academic Progress	2022
First Prize in Public Welfare and Social Innovation Track of Creative Competition for Freshmen of Tsinghua	2021
Second Prize in Healthcare and Medical Track of Creative Competition for Freshmen of Tsinghua	2021