Zhang Jinrui

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Education

Jilin University, Jilin, Changchun Expected Graduation: 2026
B.Sc. in Mathematics
Relevant Coursework: Real Analysis, Abstract Algebra, Optimal Control, Nonlinear Optimization

Research Interests

Machine Learning, Nonlinear Optimization, Geometric Deep Learning

Research Experience

Arbitrary-precision integer arithmetic March 2023 – June 2023
Supervised by Prof. Zhou Mingjun, Jilin University
By using NTT(Number Theory Transformation) and FFT(Fast Fourier Transformation), I implemented an arbitrary-precision integer multiplication algorithm in C++[2].
Learned and implemented ANN in C++ March 2023 – April 2023
Self-learned algorithms related to Deep Learning and Reinforcement Learning. And use C++ implemented autograd for matrix and realized a basic ANN[4].
Learned PINN May 2023 – July 2023
learned the PINN method and solved the burgers equations.[3, PINNwork2]
Differential Informed Auto-Encoder September 2023 – December 2024
By doing regression and Machine Learning on the phase space of the collected dataset to find the inner Differential equation dependencies.[5]
Summer Exchange at University of Alberta July 2025 – August 2025
Summer school at University of Alberta. Learned several topics and lectures. This git repository[1] has logged all what I have done during this exchange.

Technical Skills

Programming: C/C++, Python, MATLAB, LaTeX, CudaC++, FORTRAN
Engineering Software: CMake, git, Android Studio
Other: Algorithm Development, Data Analysis, Machine Learning, Software Engineering

Publications and Presentations

Differential Informed Auto-Encoder — arXiv:2410.18593

References

[1] Zhang Jinrui. exchange at uoa. `https://github.com/jerzha40/2025_exchange_at_universityofalberta.git`. Accessed: 2025-10-25.

[2] Zhang Jinrui. Ntt fast polynomial multiplication. `https://github.com/unjerry/firstattempt`. Accessed: 2024-10-21.

[3] Zhang Jinrui. Pinn by python. `https://github.com/unjerry/pinn_playground/blob/pinndemo/pinndemo/burgers.py`. Accessed: 2024-10-21.

[4] Zhang Jinrui. A simple ann made by c++. https://github.com/unjerry/firstattempt/blob/master/products/temporary/20230213_artificial_neural_network_test.cpp. Accessed: 2024-10-21.

[5] Jinrui Zhang. Differential informed auto-encoder, 2024.