Xingjian "Nicholas" Lyu

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Education

Harvard University Cambridge, MA
A.B. Degree in Physics. GPA: 3.89/4.0 Expected May 2025
Selected coursework: Quantum Computation and Information, Computational Learning Theory, Theoretical Computer Science, Compilers, Systems Programming, General Relativity.

Undergraduate Research

Harvard University
Undergraduate Researcher Oct 2023-Nov 2024

- Advisor: Kaifeng Bu.
- "Fermionic Gaussian Testing and Non-Gaussian Measures via Convolution", first author.
- "Displaced Fermionic Gaussian States and their Classical Simulation", first author.

Semeghini Lab in Applied Physics
Undergraduate researcher April 2022 – Oct 2024

- Spearheaded the design and implementation of a control system for cutting-edge quantum computing systems, currently operational in Harvard's Yb-Rb and Atom Array 2 groups.
- Designed a acousto-optic modulator (AOM) double-pass system, using Toptica 399nm laser to empower 2D and 3D magneto-optical traps and Zeeman slowing for ytterbium atoms.
- Designed a micron-resolution length measurement apparatus using interference from a 1064nm laser, used to probe the critical optical path for precise control of atoms.
- Utilized COMSOL Multiphysics to simulate the compensation ability of electrodes, informing the final design to best minimize the Stark shift of atoms.

Extracurricular Activities

Kaggle Cambridge, United States
Competitions Master 2019-2022

- Developed full-stack machine learning solutions in global competitions.
- Competitions Master status, representing the top percentile of 218,360 global participants.

Teaching Positions

Harvard University
Teaching Assistant, *Physics 151: Mechanics* Oct 2023-Nov 2024

Technical Skills

Computational Libraries: COMSOL Multiphysics, National Instruments, PyTorch, JAX
Programming Languages: C++, Ocaml, Rust, Python
Software Engineering: full-stack compilers and systems development