

YIZHONG RICHARD HU

Cambridge, MA

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EDUCATION

Harvard John A. Paulson School of Engineering and Applied Sciences **Aug 2024 – Ongoing**
Cambridge, Massachusetts
Ph.D. in Applied Mathematics

Brown University **Sep 2020 – May 2024**
Providence, Rhode Island
Sc.B. Applied Mathematics – Computer Science, A.B Physics

PUBLICATIONS

Chuin Wei Tan, Marc L. Descoteaux, Mit Kotak, Gabriel de Miranda Nascimento, Seán R. Kavanagh, Laura Zichi, Menghang Wang, Aadit Saluja, **Yizhong R. Hu**, Tess Smidt, Anders Johansson, William C. Witt, Boris Kozinsky, Albert Musaelian (2025). *High-performance training and inference for deep equivariant interatomic potentials*, *Preprint*, [arXiv:2504.16068](https://arxiv.org/abs/2504.16068).

RESEARCH EXPERIENCES

School of Engineering and Applied Sciences, Harvard University **Jun 2025 – Ongoing**
Cambridge, Massachusetts
Research Assistant

Division of Applied Mathematics, Brown University **May 2023 – May 2024**
Providence, Rhode Island
Undergraduate Research Assistant

Department of Physics **Sep 2021 – Aug 2022**
Providence, Rhode Island
Undergraduate Research Assistant

TEACHING

COMPSCI 2050: High Performance Computing for Sci & Eng **Jan 2026 – May 2026**
Boston, Massachusetts
Teaching Fellow

CSCI 1951X: Formal Proof and Verifications **Aug 2023 – Dec 2023**
Providence, Rhode Island
Undergraduate Teaching Assistant

AWARDS

Jerome L. Stein Memorial Award for Undergraduate Excellence in Applied Mathematics **Apr 2024**
Brown University

Wolfram Award **Jan 2023**
Hack at Brown

Karen T. Romer Undergraduate Teaching & Research Awards (UTRA) **Jul 2022**
Application of Machine Learning in Dark Matter Particle Searches, awarded \$1200

PROJECTS

Statistical Mechanics on Random Graphs **Summer 2023 – Spring 2024**

- Investigated annealed pressure of Spin Glass models on sparse random graphs. Advised by Prof. Kavita Ramanan
- Proved that annealed pressure of certain discrete, pairwise models on random regular bipartite graphs is equivalent to the Bethe prediction through a cavity equation

- Proved that annealed pressure of certain discrete, pairwise, next-neighbor models on a regular random graph is equivalent to the Bethe prediction through a cavity equation
- Made significant progress on continuous interactions

SINDy-PETS: A Flexible Physics-Informed and Probabilistic MBRL Architecture May 2023

- Devised a novel Model-Based Reinforcement Learning algorithm combining Symbolic Identification of Nonlinear Dynamics (SINDy) and Probabilistic Ensembles with Trajectory Sampling (PETS), called SINDy-PETS
- Proposed two methods of combination: Residual Correction and Opinion Input

RELATED COURSEWORK

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|---|--|
| • Applied ODEs, Applied PDEs | • Reintegrating AI |
| • Information Theory | • Quantum Mechanics, Statistical Mechanics |
| • Numerical Optimization | • Advanced Scientific Computing: Numerical Methods |
| • Graph Theory | • High Performance Computing for Sci & Eng |
| • Recent Applications of Probability and Statistics | • Symmetry and its Application to Machine Learning |
| • Machine Learning | |

SKILLS

Languages: Python, C, C++, \LaTeX , Lean, Racket, Pyret, JavaScript

Developer Tools: VS Code, Linux, Git, GitHub, OpenMP, MPI, Kokkos

Libraries: Numpy, Scipy, Matplotlib, TensorFlow, PyTorch

Interests: Symmetry and Invariance, Numerical Methods, Probability Theory, Optimization, Dynamical systems and Stability