Akash Piya

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Education

University of Chicago — Class of 2026

BS in Computer Science and Physics — *GPA: 3.9*

Relevant Coursework: Systems Programming, Machine Learning, Algorithms, Linear Algebra, Discrete Math, Quantum Mechanics, Advanced Electricity & Magnetism, Real Analysis

Honors: Eagle Scout, Jeff Metcalf Summer 2024 Award

Activities: Financial Markets Program, Maroon Capital, Society for Physics Students, AI@UChicago

Experiences

Machine Learning Engineer Intern — **Lowell, MA**

AION Biosystems — *June 2024 – August 2024*

- Building accurate advanced forecasting models for fever detection using proprietary models and PyTorch.
- Developing tools for synthetic data generation increasing overall model performance by 5%.

Biophysics Researcher — **Chicago, IL**

Vitelli Lab, James Franck Institute — *June 2023 – September 2023*

- Achieved 88% accurate ML model (VAE) to predict bacterial survival in chemical conditions from genomic data.
- Simulated the convection-diffusion equation and stochastic velocity turbulence using spectral solvers.
- Scripted parallel training of models and simulations using SLURM to command supercomputing cluster.
- Awarded James Franck Institute Fellowship for funded summer research.

Computational Physics Researcher — **Remote**

Tabatabai Lab, Seattle University — *March 2021 – July 2022*

- Altered the Ising Model, a tool to study phase transitions of spins on a lattice, with asymmetric interactions.
- Resulted in travelling spin domains whose speed are affected by temperature with a max at 0.5 sites/sweep.
- Responsible for initial and modified model simulations in Python, data analysis, and figure generation.
- Co-authored publication: Non-reciprocal interactions spatially propagate fluctuations in a 2D Ising Model

Robotics Software Developer — **Fairfax, VA**

George Mason University — *June 2021 – May 2022*

- Developed codebase for a swarm of robots to identify colored objects and place them in user-specified locations.
- Troubleshot robots for classroom use by fixing defective sensors, loose wires, and dysfunctional modules.

Projects

SchrodingerSim – Quantum Wavefunction Simulator | *C, Raylib, Physics, Simulation* — *June 2024*

- Simulates quantum wave function evolution in real time for any bounded 1-dimensional potential system.
- Parallelized for performance and includes eigenfunction visualization and option to draw arbitrary potentials.

DiffusionNet – Generative Model on MNIST Dataset | *Python, Pytorch, Generative AI* — *May 2024*

- Implemented a diffusion model and U-Net on a dataset of digits to generate novel, handwritten digits.
- Wrote a document with the mathematical derivations for corresponding di1usion paper.

GraviToy – Orbital Physics Engine | *Rust, Druid, Physics Simulation* — *December 2023*

- Interactive gravity simulator with features such as N-body systems, trajectory foresight, and blackholes

Skills

Programming Languages: Python, C, Rust, Java, C++, Mathematica

Technologies: SLURM, PyTorch, MLFlow, Valgrind, Git, SVN, Linux

Technical Skills: Simulation, Machine Learning, Data Analysis, High-Performance Computing