

Vashisth Tiwari

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EDUCATION

University of Rochester

Bachelor of Science in Physics, Bachelor of Arts in Mathematics

Rochester, USA

Anticipated May-23

• Cum. GPA 3.98/4.00 | Physics Major GPA 4.00 /4.00

• **Classes:** Deep Learning, Probability & Handling of Large Datasets (Grad), Data Structures & Algos, Linear Algebra (Hons)

SKILLS

Languages: Python, Java, Mathematica, Solidity, SQL

Frameworks: TensorFlow, Keras, PyTorch, NumPy, Pandas, Scikit-Learn, Qiskit, SciPy

Presentations: American Astronomical Society, Young Mathematics Conference (premier conf. for undergrad. research)

EXPERIENCE

Mana Fund (Stealth startup working in crypto and artificial intelligence)

San Francisco, CA

Machine Learning & Research Intern

May-22 – Aug-22

- Wrote Jupyter notebooks to calculate expected yield of top leverage staking protocols by modelling the correlation between token prices and the risk in investments (by quantifying the deviations in the two tokens).
- Built transaction data pipeline based on the Graph protocol; prototyped smart contract decoder using python and solidity.

Blok Lab (Quantum Computing with Superconducting Qubits)

Rochester, NY

Undergraduate Research Assistant |Mentor: Dr Machiel Blok

Sep 2021 – Present

- Characterized the noise in a quantum computer by comparing the probability distributions of the lab data with the distributions from expected behavior from quantum and statistical physics.

Los Alamos National Laboratory

Los Alamos, NM

Undergraduate Intern |Mentor: Dr Malcolm Boshier

Jun-21 – Aug-21

- Discovered optimal laser pulse parameters for atom-interferometer using Mathematica and python to model the system and SciPy for high dimensional optimizations, improved the fidelity by 5% beyond current state-of-the-art parameters.

Dark Energy Spectroscopic Instrument (DESI)

Rochester, NY

Research Assistant |Mentor: Dr Segev BenZvi

Jan-20 – May 21

- Designed multi-class convolutional neural networks with TensorFlow, scikit-learn to find galaxies with supernovae in the spectral data with 95%+ accuracy, high precision.
- Developed data pre-processing techniques for noise-removal and network optimization.

Polymath Research Experience for Undergraduates

Online

Undergraduate Intern |Mentor: Dr Steven Miller

Jul-20 – Aug-20

- Contributed two proofs related to the bounds on the length of Zeckendorf Game, a game based on a number theory theorem.
- Verified these conjectures for large numbers using Mathematica and Python.

HONORS AND AWARDS

2022	National	Semi-Finalist Rhodes Scholarship, India
2022	National	Sigma Pi Sigma Honors Society Inductee
2021	University	Physics Honors Prize: Highest grade in the first two years of physics classes
2019	National	Next Genius Scholar (Full scholarship to attend the University of Rochester)

PROJECTS

- **PersonaLearn** (HackMIT, 2022) [[link](#)]: An education assistance tool (chrome extension) that uses GPT-3 and YouTube API that recommends best videos using a holistic custom ranking to reinforce to the topics the student found confusing.
- **"How good is your Pose?"** [[link](#)]: Built a CNN and modified ViTPose (Vision Transformer for Pose Estimation) to classify lifts and quantify lifting form to suggest improvements.

PUBLICATIONS

- [1] "High efficiency Bose-Einstein condensate splitting using tailored optical standing-wave pulses". Atoms ('22)
- [2] "Developing a Transient Identification Pipeline for DESI Using ML". In: American Physical Society Bulletin (2021).
- [3] "Winning Strategy for the Multiplayer and Multivalence Zeckendorf Games". arXiv:2009.03708 (2020).
- [4] "Bounds on Zeckendorf Games". arXiv:2009.09510 (2020).
- [5] "Extending Zeckendorf Theorem to a Non-constant Recurrence and the Zeckendorf Game on this Nonconstant Recurrence Relation". Fibonacci Quarterly, Vol. 58, Number 5 (2020).

LEADERSHIP AND ACTIVITIES

Society of Physics Students (SPS) |President (Previously Secretary)

Aug-21 – Present

- Started an initiative to promote physics among middle-schoolers; won outstanding chapter award (top 15% chapters nationally).

Advanced Electromagnetism (Fall '22), Waves & Modern Physics (Spring '21), Intro. to Programming (Spring '20) | TA

- Taught students fundamental concepts in office hours, assisted students with homework and projects, graded exams.