Vashisth Tiwari

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EDUCATION

Carnegie Mellon University — Pittsburgh, PA
MS in Artificial Intelligence Engineering — *Incoming Aug-23–Dec-24*

University of Rochester — Rochester, USA
Bachelor of Science in Physics, Bachelor of Arts in Mathematics — *Anticipated May-23*

- **Cumulative. 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)

EXPERIENCE

Blok Lab (Quantum Computing with Superconducting Qubits) — Rochester, NY
Undergraduate Research Assistant |Mentor: Dr Machiel Blok — *Sep-21 – 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.

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.

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

2023	National	Phi Beta Kappa Honors Society
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. [Submitted] *"High efficiency Bose-Einstein condensate splitting using tailored optical standing-wave pulses".* Atoms
2. [Link]*"Winning Strategy for the Multiplayer and Multivalence Zeckendorf Games*". Fibonacci Quart. 59,4, 308–318. (2021)
3. [Link] *"Extending Zeckendorf Theorem to a Non-constant Recurrence and the Zeckendorf Game on this Nonconstant Recurrence Relation".* Fibonacci Quarterly, Vol. 58, Number 5 (2020).
4. [Link] *"Developing a Transient Identification Pipeline for DESI Using ML".* In: American Physical Society Bulletin (2021).
5. [Link] *"Bounds on Zeckendorf Games*". arXiv:2009.09510 (2020).

SKILLS

Languages: Python, Java, Mathematica, Solidity, SQL
Frameworks: PyTorch, TensorFlow, Keras, NumPy, Pandas, Scikit-Learn, Qiskit, SciPy
Presentations: American Astronomical Society, Young Mathematics Conference (premier conf. for undergrad. research)

LEADERSHIP AND ACTIVITIES

- ***President, Society of Physics Students:*** Led outreach initiative for middle schoolers, won outstanding chapter award.
- ***Teaching Assistant: Advanced Electromagnetism, Waves & Modern Physics, Intro. to Programming***