Hrishabh Ayush

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Education

Cornell University, Ithaca, NY **Expected Graduation 2026**

B.A. in Computer Science and Mathematics; TATA Scholar in the College of Arts and Sciences *Major GPA: 4/4*

Relevant Coursework: Data Structures and Algorithms, Discrete Structures, Linear Algebra

Relevant Experience

Research in Astrophysics at Summer Science Program **Jun 2022 – Jul 2022**

Astrophysics Researcher at the University of Colorado Boulder *Boulder, CO*

- Attended a six-week residential summer program on a full scholarship.
- Computed the orbit of NEA 1981 QA and published astrometry-photometry data in Harvard Minor Planet Center.
- Completed 400 hours of work in numerical analysis and simulation in Python and image processing with AstroImageJ.

Excelerate Data Visualization Internship **Jun 2023 – Jul 2023**

Project Lead, Illinois Institute of Technology; Globalshala *Online*

- Performed data analysis on 12 Facebook campaigns using Excel and PowerBI; documented $8-12$ page report analysis on reach, unique link clicks, cost per click, etc.; attended meeting with Project Head twice a week.
- Recommended two non-performing campaigns to discontinue; outlined plans to improve return on investment (ROI) by 5% for 10 other campaigns.

Euler Circle - Math Research **Mar 2020 – Jul 2021**

Student *Online*

- Completed four undergraduate courses in mathematics: Ring Theory, Algebraic Geometry, Intermediate Number Theory, Real Analysis, and Complex Analysis.
- Wrote two expository papers on Principle Ideal Domains, Euclid Domains & Unique Factorization Domains, and Nevanlinna's Five Value theorem.

New York Math Circle Summer Program **Dec 2019 – Oct 2021**

Student $(2020, 2021)$*; Teaching Assistant for Linear Algebra* *Online*

- Attended College Bridge program on Game Theory and Number Theory Primes; shortlisted among 12 students.
- Collaborated on more than 200 Math Olympiad problems and published a 300 page solution book on Barycentric coordinates, Fields & Vector spaces.
- Assisted Instructor with crafting $6-8$ handouts in Linear Algebra course and answering students' questions during class.

Technical Skills and Awards

Languages/Database: Python, C++, JavaScript, HTML, CSS, SQL, Latex, Scientific computing
Libraries & Tools: Numpy, Matplotlib, Pandas, Git, TensorFlow, PyTorch, Scikit-Learn, Keras, Tkinter, Image processing
Awards: USAMO Qualification, AMC 12 Distinguished Honor Roll – Top 1% in the world, 2 times AIME Qualified, NTSE Scholar, KVPY Fellowship, Online Physics Olympiad High Honors, National Astronomy Olympiad, National Math Olympiad

Projects

Mean Reversion Trading Strategy for Yahoo Stocks | *Pandas, Numpy, Scikit, Matplotlib* **Sep 2023 – Oct 2023**

- Implemented Reversion trading algorithm on Yahoo Finance stocks to derive trading signals based on historical mean prices of stocks, aiming to consistently generate profits
- Computed and analyzed performance metrics, generated visualization charts on returns, drawdowns, and equity curves; refined actionable insights to optimize trading strategies that improved probability and risk-adjusted returns by 15%.

N **Planet Simulation in Space** | *Numpy, Matplotlib, Astropy, Astroquery* **Jul 2022 – Aug 2022**

- Leveraged 3-body gravitational computational problem to make a 100-body simulation using Object Oriented Programming (OOP) in Python.
- Enhanced vectorized operations and reduced gravity interactions to optimize algorithmic reduction, resulting in a 50% improvement in memory usage.

Leadership

Stem Horizons **Jun 2020 – Oct 2022**

Founder and Head of Directions

- Oversaw administration and coordinated with 21 members to produce detailed plans for online lectures and math talks.
- Organized GRAM-STEM Horizons Olympiad camp for middle and high school students from around the world; reached 5k+ views on 20 YouTube videos and live classes.
- Lectured live classes, wrote handouts; raised $500 for the Codebreakers - puzzle competition.