Aryan Malhotra

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EDUCATION

RUTGERS – NEW BRUNSWICK Expected May 2028
Physics* & *Computer Science double major
Mathematics minor
GPA – 3.94

- Admitted to Rutgers–NB **Honors College** (Top ~4% of Incoming Class); **Dean's List**: Fall 2024
- Relevant coursework: Honors Physics I, Honors Physics II, HP Lab I, HP Lab II, Calc. II, Calc III, Intro' Linear Algebra (MATLAB), Intro' CS, Computational Physics

EXPERIENCE

Particle Data Analysis & Interpretation | C++, ROOT, Remote Servers, Bash Scripting Dec 2024 – Present

- Conducted detailed particle collision data analysis from CERN's experiments, utilizing CERN ROOT (C++ software) to interpret graphs and extract particle properties
- Will conduct displaced vertex analysis and Long Lived Particle research to contribute to the potential extrapolation of the Standard Model

PROJECTS

Particle Simulations | Julia, Makie.jl, Visualization Techniques, Git Jun 2024 – Aug 2024

- Developed VSEPR.jl, an interactive 3D VSEPR model capable of visualizing over 1 million customizable molecular geometries simulated in real-time, with integration of the NIH element database using plotting tools/packages in Julia – a scientific computing language
- Applied advanced visualization techniques to illustrate physics/chemistry concepts & particle dynamics

Human-Interactive Robot | Python, Arduino, Text/Speech API, Hardware Design Dec 2022 – Jan 2023

- Designed and built DAVIS, a robot capable of basic voice command recognition, communication, and mechanical movement in accordance, to create an engaging user experience
- Integrated Python backend with Arduino scripts via Bluetooth for real-time voice command transcription, input processing, and movement control, placing 1st out of 15 in Senior Design Projects

EXTRACURRICULARS

STAR (Space Technology Association Rutgers) | Predictive Modelling, CNN, Regression Sep 2024 – Present

- Using a Deep Learning model to extract fluid data and developing a computer vision algorithm for an active control system to mitigate fluid sloshing in satellite applications, as part of the *Payload Subteam*

RRPL (Rutgers Rocket Propulsion Lab) | CAD Modelling, Rocket Dynamics Simulations Sep 2024 – Present

- Assisting with daily tasks such as documenting and researching propulsion systems, and currently optimizing finocyl designs for rockets using NOMAD to achieve target thrust curves, as part of the *Propulsion Subteam*
- Contributed to launch-day operations, including a class N motor testing with the "Purple Haze" propellant formula during a field event in Upstate New York

RAS (Rutgers Astronomical Society) | Image Stacking, Post-Processing, Planetary Imaging Sep 2024 – Present

- Participating in weekly astronomy and astrophotography sessions, capturing images of celestial bodies and refining skills in telescope handling and digital imaging techniques, as part of the *Astrophotography group*

Science Communication & Outreach | DaVinci Resolve, Manim, Content Creation July 2023 – Present

- Mastered and utilized tools including DaVinci Resolve for video editing and Manim (Python library) and a custom Julia library to create animations, facilitating learners to understand complex topics, on channel *Almost A Physicist*

SKILLS

- LANGUAGES: Python, C++, Java, Julia, SQL, Mathematica, MATLAB, Markdown, LaTeX
- TOOLS: VS Code, SolidWorks, Git; Arduino, Oscilloscope
- LIBRARIES & FRAMEWORKS: Pytorch, NumPy, SciPy, Makie.jl, Manim, Qiskit, ROOT
- SOFT SKILLS: Leadership, Communication, Time Management, Teamwork, Project Management