

Devansh Matham

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EDUCATION

CUNY–The City College of New York

Masters in Science, Physics

New York, NY

Expected: Dec 2027

Texas Christian University (Dean's Transfer Scholarship)

Bachelors in Science, Physics

Mathematics Minor

Fort Worth, TX

May 2025

Relevant Coursework - Computational Physics, C++, Statistical Mechanics, Quantum Mechanics, Partial Differential Equations, Scientific Analysis & Modelling, Electrodynamics, Discrete Mathematics, Mathematical Proofs

WORK AND RESEARCH EXPERIENCE

Metropolitan Transportation Authority (MTA)

Data Science Intern

New York, NY

June 2026 - Aug 2026

- Modernized legacy Oracle procedures into **Spark SQL** and **Python**, and integrated them into **Apache Airflow** ETL pipelines processing approximately **80,000** operational records per day.
- Validated ATS (Automatic Train Supervision) operational and reporting data workflows using **Trino** to analyze train-level discrepancies, ensuring stable upstream data-ingestion.
- Evaluated **graph-tool** as a C++ backend replacement for NetworkX to improve graph **computational efficiency** of the MTA's transit ridership model.
- Developed and executed graph-tool validation tests on **Apache Spark** deployed on **Kubernetes**.

Texas Christian University, Department of Physics and Astronomy

Research Assistant - [Parallel Computing and ML in Biophysics](#)

Fort Worth, TX

Apr 2025 - Dec 2025

Advisor: Dr. Hana Dobrovolny

- Leveraged **CUDA** to harness **NVIDIA GPU's** to accelerate agent-based model (ABM) simulations of viral spread
- Enhanced ABM's by integrating stochastic cell-to-cell fusion processes, advancing understanding of cellular dynamics in virus-host interactions.
- Implemented **graph neural networks** to study spatial heterogeneity of syncytial cells through analysis of topological features.

Raman Research Institute, Department of Light and Matter Physics

Visiting Internship - [Data Analysis for Atomic Physics](#)

Bangalore, India

Jun 2024 - Jul 2024

Advisor: Dr. Saptarishi Chaudhuri

- Investigated the trapping of sodium and potassium atoms at ultra-cold temperatures using optical dipole traps and THORLABS equipment.
- Tested lasers through characterization of their physical properties using **MATLAB** to continue accurate experimentation, ensuring precise trapping performance for atoms.
- Utilized **Python** to extract image matrices of a laser beam to computationally assess the accuracy of a gaussian fitted spatial profile, and discovered a misalignment on the scale of millimeters.

Texas Christian University, Department of Physics and Astronomy

Research Assistant - Materials Science Characterization

Fort Worth, TX

Sep 2023 - Apr 2025

Advisor: Dr. Yuri Strzhemechny

- Implemented components for an **ultrahigh vacuum** (UHV) characterization chamber, enabling cathodoluminescence spectroscopy of nanomaterials.
- Studied nanosize crystals in zinc oxide and gallium oxide, and led a study of their preparation techniques.
- Conducted surface spectroscopy (**Scanning Electron Microscopy, FTIR, Raman, PL**) to analyze nanocrystalline oxides.

HONORS AND AWARDS

- Best Undergraduate Presenter at Texas Section APS Meeting, University of Houston, *May 2025*
- Outstanding Undergraduate Poster Award at Texas Section APS Meeting, Southern Methodist University, *October 2024*
- Best Physics Undergraduate Poster Presentation at TCU Student Research Symposium, *April 2024*
- Dean's Transfer Scholarship TCU, *May 2023 - \$50,000*

SKILLS

Languages: Python, C++, SQL

Frameworks & Libraries: PyTorch, NetworkX, CUDA

Data Engineering & Tools: Apache Airflow, Apache Spark, Power BI, Git