Shaan Patel

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Education

University of Texas at Arlington

Ph.D. in ***Physics and Applied Physics*** 2025

- Published 7 publications and delivered research presentations at 3 physics conferences

M.S. in ***Physics***, GPA: 4.00 2025

Georgia Institute of Technology

B.S. in ***Physics***, Highest Honor 2019

Experience

Researcher, **Exoplanets/Exomoons and Habitability at UTA** 2021 – 2025

- Conducted 50,000+ numerical simulations in Python to investigate orbital dynamics, improving runtime efficiency by 80%
- Encoded mathematical formulations into executable code, enabling efficient large-scale numerical analysis and reducing computation time by 90%
- Analyzed and visualized large-scale datasets comprising millions of data points, identifying key dynamical patterns

Intern, **SuperCDMS Group at SLAC National Accelerator Lab** 2019

- Collaborated with the Cryogenic Dark Matter Search (CDMS) team to test wiring and readout electronics for the He-3/He-4 dilution refrigerator

Member**, Numerical Relativity Research Group at Georgia Tech** 2018 – 2019

- Simulated binary black hole systems on HPC clusters to support LIGO research and visualized resulting gravitational wave data

Group Leader**, Gravitational Waves Astrophysics Project** 2017 – 2018

- Led undergraduate research team in simulation and visualization of binary black hole systems
- Used VisIt to visualize black hole apparent horizons and create animations of their spiral and merger from simulation data

Projects

AuroraNet: Capstone Aurora Prediction Project

- Engineered an end-to-end ML pipeline that ingests and cleans raw space weather data, trains LSTM models, and deploys real-time predictions via an interactive dashboard

DefCoordML: NFL Play Prediction

- Developed ML models to predict NFL offensive plays (pass vs. rush) using historical game data
- Achieved 75% accuracy and 0.82 ROC AUC through feature engineering and model tuning

Skills

Languages

Python, SQL, Excel, HTML/CSS

Frameworks/Tools

PyTorch, Scikit-learn, NumPy, pandas, SciPy, matplotlib, seaborn, Linux Command Line, Git, Jupyter, LaTeX

Machine Learning Skills

Data Preprocessing, Feature Engineering, Hyperparameter Tuning, Model Training