Annastasia Haynie | PhD Candidate, Physics

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Relevant Skills

Python (NumPy, Pandas, SciPy, Scikit Learn, Matplotlib, Plotly, Seaborn, Dash, Jupyter, Snap ML) | C/C++ Data Analysis | Data Visualization | Mathematics | Statistics | GitHub | SQL/sqlite3 | Machine Learning | Scientific and Technical Writing | Communication & Presentation | Scientific Collaboration | Microsoft Office

Education

PhD, Physics
University of Southern California
08/2018 – 05/2024 (expected)

BS, Physics
University of South Carolina
08/2014 – 05/2018

Work Experience

Research and Analysis, Data Modeling, and Programming Experience

Gained as a USC-Carnegie Graduate Research Fellow

University of Southern California & Carnegie Theoretical Astrophysics Center

05/2019 – Present Los Angeles, CA

- Calibrated analytic model to numerical simulations using regression analysis to enhance accuracy by identifying and mitigating sources of error in other commonly used modeling techniques.
- Engineered numerical integration algorithms to expand existing simulation capabilities and increase accuracy by up to 33%.
- Leveraged results from analytic models and numerical simulations develop directions for data collection with the new generation of survey telescopes coming online in the next decade.
- Revised previously published theoretical models to reduce degeneracies and create distinction between 4 dominant regimes in parameter space.
- Authored 2 peer-reviewed papers published in The Astrophysical Journal as the primary researcher, with a third manuscript in progress. Co-authored 3 peer-reviewed papers, one published, two collaborations recently submitted.
- Presented research at 9 academic conferences both domestically and internationally.
- Won the Women in Science and Engineering Graduate Merit Award for outstanding research in May 2022.

Leadership and Mentorship Experience

- Instructed ~75 undergraduate students per semester as an Intro to Astronomy Laboratory Teaching Assistant for 3 semesters.
- Boosted student engagement by creating extra credit assignments that garnered ~80% participation each semester.
- Taught the Data Visualization workshop for the Carnegie Astrophysics Summer Student Internship program for 3 summers.
- Mentored 3 summer undergraduate interns in research best practices, technical writing, and science communication.
- Served as the President of the Graduate Association for Students in Physics for over 2 years during which time I arranged outreach and professional development opportunities, oversaw the peer-mentorship program, and spearheaded the initial effort to update the graduate course curriculum.

Personal Projects

Data Science and Machine Learning Experience

Gained through IBM Data Science & Data Engineering Professional Certificate Programs

Projects described below can be found in my portfolio.

- Developed, evaluated, and compared models using linear regression, decision tree, logistic regression, k-Nearest Neighbor, and support vector machine algorithms to determine rainfall in Australia.
- Trained a regression tree model to predict the tip amount for taxi rides in New York City (>3,000,000 rows of data).
- Built decision tree classifier and support vector machine models for detecting credit card fraud. (>2,000,000 rows of data).
- Queried relational databases to examine relationships between public school success, socioeconomic indicators, and crime rates in Chicago.
- Created a dashboard visualizing automobile sales during recession and non-recession periods between 1980-2023.