Matt Daunt

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SUMMARY

Technically focused, math loving, physics instructing **PhD candidate at NYU**. Over 8 years experience writing mathematical code in python for data driven models and physics based simulators. Experienced with writing generalizable models that maximize information on measurements. Interested in using math to find to solutions to difficult real world problems.

SKILLS

- Proficient with Python, Unix systems and computer clusters SLURM through research experience.
- Comfortable with math model techniques (frequentist and Bayesian), MCMC, physics based forward modeling, data-driven models (linear, non-linear, and layered deep networks), optimization algorithms, differential equation solvers, parallel processing, differentiable programming.
- Experienced with Python packages like JAX, scipy, scikit learn, pandas, Pytorch, jupyter. Also comfortable writing C code from experience in undergraduate projects.
- Worked with data pipelines for optical systems in astrophysics and material science research.
- Comfortable explaining physics and math concepts to people outside the field through teaching experience.

RELEVANT EXPERIENCE

Graduate School of Arts and Science, NYU, New York, NY

- *Graduate Research Assistant - Exoplanets, Statistics* Sep 2019 – Present
  - Wrote data-driven package, jabble, using JAX that fits spectral templates and radial velocities to high-resolution, ultrastabilized stellar spectra.
  - Simulated spectra for high-resolution spectrographs with combinations of theoretical models of the star and atmosphere, and instrument effects. Utilized JAX and parallelized functions.
  - Supervisor: Dr David Hogg
- *Teaching Assistant* Sep 2020 – May 2021, Sep 2024 – Present
  - Taught physics labs for undergraduate non-major students, General Physics I & II, 3 semesters
  - Teaching assistant and grader, the Universe, 1 semester, Introductory Physics II, 1 semester

College of Environment, Forestry, and Natural Sciences, NAU, Flagstaff, AZ

- *Physics Research Affiliate - Theoretical Condensed Matter* Jun 2018 – Sep 2019
  - Simulated the bandstructure, absorption and effective permittivity of hyperbolic semiconductor metamaterials using C code.
  - Supervisor: Dr Inès Montaño
- *Undergraduate Researcher - Theoretical Condensed Matter* Jan 2018 – May 2018
  - Simulated decryption-proof photon communication with python.
  - Supervisor: Dr Inès Montaño
- *Undergraduate Researcher - Statistics* Aug 2017 – May 2018
  - Determined expected value, and variance of betting game Othello through both simulation in MATLAB, and theoretical approach.
  - Supervisor: Dr Roy St Laurent

North Academic Success Center, Flagstaff, AZ

- *Lead Math and Physics Tutor* Sep 2015 – May 2018

EDUCATION

New York University, New York, NY Sep 2019 – Exp Sep 2025

- PhD in Physics

Northern Arizona University, Flagstaff, AZ Aug 2014 – May 2018

- B.S. in Physics
- B.S. in Mathematics

VOLUNTEER

Graduate Physics Organization for Research, Culture, and Education; CCPP Rep, facilitate meetings, time-keep, on-board new members, generate turn out for events.