Nicholas Z. Stern

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EDUCATION

Harvard University | Cambridge, MA | Dec 2019 | **M.S. in Data Science |** GPA: **4.0/4.0 |**
Related Coursework: *Data Science 1, Linear Models, Artificial Intelligence, Systems Development*

Brown University | Providence, RI | May 2018 | **B.S. in Astrophysics w/ Honors |** GPA: **3.81/4.0 |**
Related Coursework: *Computational Physics, Computer Systems, Matlab Programming, Statistical Inference, Quantum Mechanics, Differential Geometry, Cosmology, Partial Differential Equations, Linear Algebra*

RELEVANT WORK EXPERIENCE

Applied Computation Internship | ISCR Program | Lawrence Livermore National Laboratory | Summer 2018
- Trained random forest machine learning models to predict and avoid simulation failure from geometric data
- Identified redundancy in the original feature set and analyzed behavior of reduced feature models
- Explored alternate labeling schemes to improve model performance and generalizability

Astrophysics Honors Thesis | Brown University | Providence, RI | Sept 2017 – May 2018
- Explored method for detecting dark matter signatures from polar angle anisotropies in ionization yield
- Wrote in depth Monte Carlo simulations of nuclear recoils to characterize and remove background sources
- Implemented and validated a likelihood analysis that rejected any signal at the 90% confidence level

Design Physics Internship | HEDP Program | Lawrence Livermore National Laboratory | Summer 2017
- Designed ICF nuclear fusion simulations to test NLTE physics integration into multi-physics code
- Wrote Python visualizations of spectral data to analyze NLTE effects on radiation energy density and opacity
- Exposure to HPC, deep learning, ALE mesh algorithms, parallelization, and code efficiency methodologies

LUX Summer Research | Sanford Underground Research Facility | Lead, SD | Summer 2016
- Joined particle astrophysics research team onsite at the Large Underground Xenon dark matter experiment
- Documented and performed on site operations – reported in weekly ops meetings as Shift Manager
- Used LUX data to examine effects of cylindrical geometry and mean free path on neutron scatter populations

DATA SCIENCE & CODING PROJECTS

Spotify Playlist Recommendation | *Data Science 1* | Fall 2018
- Project goal: use Spotify playlist data to create recommendation system that suggests relevant tracks
- Implemented and compared kNN collaborative filtering, k-means clustering, and ALS matrix factorization
- Achieved 23% R-precision on hold out set w/ ALS factorization compared to baseline of 7% w/ kNN method

Reinforcement Learning for Stock Transactions | *Artificial Intelligence* | Fall 2018
- Project goal: develop RL agent that identifies best time to purchase stock within a given time frame
- Scraped daily stock price history from Yahoo! Finance and engineered an original Markov Decision Process
- Employed and analyzed Q-learning, as well as function approximation w/ linear weights + neural networks

Amazon Product Ratings | *Linear Models* | Fall 2018
- Project goal: explore driving factors for Amazon product ratings w/ categorically stratified review data
- Performed categorical comparisons w/ non-parametric tests to reveal excessive criticality of electronics
- Carried out textual feature engineering + sentiment analysis to identify significant character-based correlates

Automatic Differentiation Python Package | *Systems Development* | Fall 2018
- Project goal: make a user-friendly Python library that runs forward/reverse mode automatic differentiation
- Package computes derivatives quickly to machine precision by solving an explicit computational graph
- Finished product, entitled "Dotua" (autoD backwards), is well documented and installable through pip

AWARDS

- 2018 – Charles H. Smiley Award for Excellent Contribution to the Astronomy Program at Brown University
- 2018 – Induction to Sigma Xi | Scientific Honors Research Society
- 2018 – Outstanding Poster Presentation Award | LLNL Computation Directorate

SOFTWARE

- Advanced: Python | Matlab | LaTeX | Git | Bash
- Proficient: C | SQL | R