Jonathan S. Brown

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PROFESSIONAL EXPERIENCE

Insight Data Science Fellow, Insight — Sept 2019 – Present

- Mined match data from the video game Dota2 to extract features reflecting user play style and sentiment with the goal of reducing player churn by making the game more accessible to uninformed players.
- Trained **logistic regression** and **XGBoost** machine learning models to predict match outcomes based on a tailored set of features derived from match and player data comprising hundreds of thousands of matches.
- Deployed a web-based application (www.dotainsights.com) with **Django**, **NGINX**, and **Gunicorn** that features current player-base metrics, an interactive draft simulator and hero recommender, and dynamic pages detailing the characteristics of individual characters and in the game.

Postdoctoral Scholar, UC Santa Cruz — Aug 2018 – Aug 2019

- Wrote several modules for a Python based spectroscopic reduction pipeline with continuous, incremental releases, resulting in a fault tolerant workflow tailored for rapid, consistent, and **reproducible analysis**.
- Deployed a web-based application with **Django**, **MySQL**, and **Apache** to automatically archive, explore, and retrieve spectroscopic data taken from a variety of telescopes, which enabled reproducible science via the curation of documented, quality-controlled, and accessible datasets comprising tens of thousands of images.
- Developed and deployed a web-based framework and **REST API** to coordinate many-telescope follow-up searches for optical counterparts to gravitational wave sources with the vision of facilitating community wide follow-up while minimizing duplication.
- Built a framework for estimating transient detection probabilities by combining data from gravitational wave detectors, galaxy catalogs, and state-of-the-art kilonova models into a probability distribution using **kernel density estimation** and sampling mock events from the distribution.

Graduate Student Researcher, The Ohio State University — Aug 2013 – July 2018

- Performed observation, reduction, and analysis of spectroscopic and photometric observations of galaxies and explosive transient events using **Python**, **IDL**, and **SQL**.
- Characterized the physical properties of rare astrophysical phenomena by connecting imaging data, spectroscopic data, and intuitive models via **non-linear regression** and **MCMC** techniques.
- Enabled the accurate measurement of key physical properties of hundreds of thousands of galaxies by developing **empirical, data-driven, non-parametric models** based on features in spectroscopic data.
- Leveraged a variety of datasets from heterogenous astronomical surveys to investigate the relative rates of various transient phenomena as a function of host galaxy demographics.

EDUCATION

Ph.D. in Astronomy, The Ohio State University — July 2018
M.S. in Astronomy, The Ohio State University — July 2016
B.S. w/ Highest Honors in Astrophysics, University of Michigan — May 2013
B.S. in Interdisciplinary Physics, University of Michigan — May 2013

TECHNICAL SKILLS

Software: Python, IDL, SQL, Git, LaTeX
Packages (highly experienced): NumPy, SciPy, AstroPy, Pandas, Scikit-learn, Matplotlib
Packages (working knowledge): Keras (TensorFlow/PyTorch), TesseractOCR, OpenCV, Seaborn, Bokeh
Database and web: Django, MySQL/Postgres, Apache, NGINX, Gunicorn, JavaScript
Cloud platforms: Digital Ocean, Google Cloud/APIs, GitHub, AWS