JONATHAN BRUNTON

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EDUCATION

Imperial College London, London, England — November 2022
Master of Science in Environmental Data Science and Machine Learning — Classification: Merit (Top 25% of class, no GPA)
Purdue University, West Lafayette, IN — May 2021
Bachelor of Science in Planetary Science — GPA 3.70/4.00

- Academic Recognition: Presidential Scholarship, P & L Krishna Scholarship recipient, six-time Dean's List placement and six-time Semester's Honors recipient (Spring 2018- Fall 2020)

EMPLOYMENT

Atmospheric Data Scientist, U.S. Environmental Protection Agency/ORAU — October 2023-May 2025

- Performed model evaluation for the EPA's Community Multiscale Air Quality(CMAQ) scientific development team by developing ML workflows for investigating the impact of NWP meteorology (WRF) and other gridded inputs on CMAQ Ozone outputs with historical time series datasets. Presented base model results at CMAS Conference 2024.
- Customize model workflows, present results to support CMAQ developers, internal and external CMAQ user groups.
- Wrangled and processed large streams of atmospheric data, QA/QC scientifically relevant data.
- Developed notebook products for analyzing cloud-based CMAQ output data, utilizing AWS to access cloud-based data internally, and interfacing with the Atmospheric Model Evaluation Tool (AMET) SQL database.
- CMAQ Github Contributor; maintained documentation and lead developer of model's user guide website.

RESEARCH EXPERIENCE / APPLIED DATA SCIENCE SKILLS — Personal Website: Github Portfolio

"Developing screening tools to assess CO_2 storage", Imperial College London

- Developed an unsupervised network to extract the locations of faults from large, 3D seismic reflectivity volumes, primarily using image attribute extraction and KMeans clustering for semantic image segmentation and prediction.
- Coupled-analysis using Full-waveform Inversion to reveal velocity anomalies in the seismic volume, investigating the combination of this knowledge with the fault-extraction network to create an automated tool for screening subsurface regions for the ability to maintain the storage of fluids (i.e. carbon dioxide, natural gas).
- Final screening tool in form of Python Jupyter Notebook and accompanying data processing and visualization suite.

Research Assistant in Applied Data Science and Geospatial Modeling, Purdue University — May 2019-May 2021

- Conducted n-body simulations of solar system formation in a virtual Python HPC environment using generated data, processed model outputs to construct cratering histories, and compared to standard Monte Carlo interpretations.
- Aided in visualizing large lunar basin impact cratering studies using 3D multirheological shock-physics model tracers.
- Assisted in translating a Python-based quasi-geostrophic model for fluid/climate dynamics from a MATLAB version.

Skills in Computer Programming, Data Science/Machine Learning, Remote Sensing, & Laboratory

- Expert with Python's classic computational libraries (Numpy, Pandas, Scipy, Pyplot, Plotly); proficient with Python machine learning packages (SKLearn, Pytorch, TensorFlow, OpenCV, Keras) to develop neural networks and perform intermediate-to-advanced data classification, regressions, and assimilation tasks..
- Proficient with Python's suite of geospatial analysis libraries (GeoPandas, Shapely, Rasterio, GDAL).
- Seasoned in analyzing atmospheric, seismic, satellite and environmental datasets with a physical science background..
- Experienced implementing various deep-learning frameworks (Linear, Forest, FFNs, CNNs, CAEs, GANs, etc.) to complete both supervised and unsupervised machine-learning tasks, and validating model performance.
- Fluent with git for project version control, CI/CD, as well as automated testing and documentation.
- Familiar with C++ for computational programming, creating basic application interfaces. Familiar with R/RStudio.
- Experienced in SQL for data querying and management, leveraging Python to interface with SQL data servers.
- Experienced with building, stylizing, and deploying HTML documentation from markdown and code repositories.
- Highly comfortable with Windows, Linux, and Mac operating systems and programming in virtual, Cloud, and high-performance computing environments; adept at command line programming and deploying bash/C shell scripts.
- Foundational knowledge and training in utilizing remote sensing/Geographic Information Systems software, such as ArcGIS Pro, Google Earth Engine, IDL, ENVI, MASTER, CRISM, Petrel, & ERMapper.
- Foundational training in analyzing mineral, soil, water, and air samples through physical, chemical, and spectral interpretation in laboratory and field environments.

SCIENTIFIC EMPLOYMENT

Python Tutor, Self-Employed — April-Oct. 2023
Substitute Teacher, Scoot Education and KIPP Public Charter Schools, Austin, TX — Oct. 2022-April 2023
Undergraduate Teaching Assistant, Purdue University — Aug.-Dec. 2020