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)
- Skill Progression: Modern & Advanced Programming Methods (Python/C++), Numerical Methods, Environmental (Geospatial) Data, Inversion & Optimization, Big Data Analytics, Deep Learning, Research Experience

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 a workflow for investigating the impact of gridded inputs on CMAQ Ozone outputs with historical data.
  - Presenter at CMAS Conference 2024; Delivered results and proposals internally
- 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.
- Consulted, presented internally on projects exploiting geospatial data with Python and machine learning techniques.
- CMAQ Github Contributor; maintained documentation and lead developer of model's user guide website.

RESEARCH EXPERIENCE / ENVIRONMENTAL DATA SKILLS　　　Project Portfolio: [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.

Undergraduate Research in Geophysical Modeling & Planetary Data Science, Purdue University
- 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
- Fluent in exploring, cleaning, and visualizing big data using Python (Numpy, Pandas, Scipy, Pyplot, Plotly), and 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..
- Experience 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.
- Familiar with git for project version control, CI/CD, as well as automated testing and documentation.
- Familiar with C++ to perform numerical methods, creating basic application interfaces. Familiar with R/RStudio.
- Self-taught in SQL for data querying and management, experience in using 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.
- Previously trained and comfortable with leveraging geologic and atmospheric remote sensing/Geographic Information Systems software, such as IDL, ENVI, MASTER, CRISM, ArcGIS, Petrel, & ERMapper.
- Explored mineral, soil, water, and air samples through physical, chemical, and spectral interpretation.

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