

Languages + Frameworks

Python, MATLAB, C/++, R
Keras/TensorFlow
Scikit-Learn, Pandas, matplotlib
Spark, Hadoop, Kubernetes
SQL, MySQL, PostgreSQL
Git, Github, Docker, Jupyter
> 20 years coding
> 20 years in Linux environments

Models + Machine Learning Methods

Statistics, A/B Tests
Generalized Linear Models
Bayesian Inference, MCMC
NNs, CNNs, Autoencoders
Tests (t-, K-S, A-D, K-L Div.)
Decision Trees (Ensembles)
Gaussian Mixed Models
PCA, t-SNE, UMAP,
(H)DBSCAN
Survival Analysis

Broad Expertise

Communicating Science + Data
to Broad Audiences
Leader and Mentor
Computational Bio/Physics
Machine Learning
Collaborative Software
Engineering
Data visualization

Education

Ph.D. Physics // Dec 2019
University of Oregon
M.Sc. Physics // 2015
University of Oregon
B.Sc. Astrophysics // 2013
University of Oklahoma

Experience

Data Science Fellow, Insight Data Science, Remote May 2020 – pres

- Created SendingTemps.com, a site to provide expert rock climbing insights to novice and other climbers.
- Built PostgreSQL database by scraping 4.1M climb records from 8a.nu, 6K crag coordinates, and 15 years of NOAA daily weather data using Python.
- Engineered features and used XGBoost, transfer learning, and Bayesian optimization to predict prime climbing conditions using Pandas.

Data Science Consultant, Self Employed, Austin, TX 2020 – pres

- Created Markov chain Monte Carlo timeseries model for an international nurse sourcing organization to predict pipeline attrition and final hire dates, enabling quantification of risk and necessary asset reserve levels.
- Built inexpensive bare metal Kubernetes cluster enabling 24x speedup, 6x RAM increase.
- Deployed models via Docker containers to cluster for distributed Spark execution.

Biophysics Graduate Researcher, U. of Oregon, Eugene, OR 2014 – 2020

- Served as founding graduate student for the lab which required creativity in exploratory research, regular assessment of project viability, and establishing our collaborative team culture in a leadership role.
- Implemented machine learning models (DeepCell deep CNN in TensorFlow for cell segmentation) to create an automated training pipeline for the lab, improved accuracy on lab datasets by 8%, and reduced human interaction time by >100x.
- Built two servers for, implemented, and maintained a consumer scanner-based imaging scheduler built on SQL and C, which parallelized a common experiment, improving throughput by 32x, which directly enabled 3 projects.
- Managed & mentored 6 undergraduates, 2 as direct reports.
- Developed image processing algorithm in MATLAB, enabling the novel findings of granular jamming in swarming bacteria.
- Developed simulation and statistical analysis software to measure bulk mixing in bacteria based on Kolmogorov-Smirnov tests and Kullback-Leibler divergences.
- Presented 2x at APS March Meeting conference. Gave quarterly (17 total) research and journal club presentations in collaborative multi-lab group meetings.

Sole Programming Instructor, UO North Star Project, OR 2017 – 2019

- Designed and taught a 2 week, Python-based Intro to Programming course for STEM-interested incoming freshmen from underrepresented groups.
- Iterated/improved course design over 3 years and collaboratively developed the course, where students set up Python Jupyter notebooks in Docker containers, perform basic I/O, and calculate.
- Taught students to use Pandas and machine learning to model UCI Heart Disease dataset by reducing dimensionality with sklearn (PCA), and training SVM classifier.
- Live coded TensorFlow CNN to classify MNIST fashion data with 92% accuracy.
- Mentored 8 of these 36 students, with 100% STEM retention rate.

Astrophysics Research
Assistant, U. of Oklahoma,
Norman, OK **2011 – 2013**

Examined short-orbital (<150 min) white dwarf binary systems.

- Developed software in C to interpret & normalize raw light intensity vs. time data.
- Modeled relativistic doppler beaming and ellipsoidal orbital characteristics using a combo of DFTs, non-linear LS fits, and error analysis via Monte Carlo simulation.
- Personally generated all data and plots (Fortran, C) present in the peer-reviewed paper: *Limb-Darkening Coefficients for Eclipsing White Dwarfs*, A. Gianninas, **B.D. Strickland (Rhodeland)**, et al., 2013 – 54 citations

Below here is not on the 1-page resume, but is planning fodder and other things I could add to it.

Activities

Graduate Admissions Committee – 2017-2018

Recruitment Chair/Cochair – 2015-2018

SPICE camp – 2015-2019

SAILS camp – 2015-2019

Graduate Student ML group founding member/organizer – 2016-2019

Independent Data Science Consultant, Eugene, OR / Austin, TX **2020-**

Self employed. Develop and deliver actionable insights. Build effective compute solutions on premises or in the cloud.

- Designed, coded, and delivered Markov Chain Monte Carlo model to international nurse sourcing org. which predicts final hire dates, reducing investment uncertainty by >50%
- Built low budget multi-node bare metal Kubernetes cluster
- Deploy models to cluster for distributed Spark execution via Docker containers

Guest Lecturer

2017 – 2019

Wrote and delivered lectures on Neural Nets for UO's graduate Scientific Computing course.

- Derived basic feed-forward network, demonstrated effects of various non-linear activation function choices, and live-coded a network that learned generated data.
- Demonstrated basic CNN learning of MNIST dataset.
- Discussed and demonstrated the power of a basic Autoencoder.
- Bonus: Reduced dimensionality of MNIST set via t-SNE and demonstrated effectiveness of SVM.

List of concepts I can discuss easily and have worked with, to be included in specific job-targeting resumes:

Very comfortable:

t-SNE (t-Distributed Stochastic Neighbor Embedding)

PCA (Principal Component Analysis)

UMAP (Uniform Manifold Approximation and Projection)

Feed Forward NNs

CNNs

Backprop
SVMs (Support Vector Machines)
Keras/TensorFlow
SQL
K-S and A-D test, K-L divergence
Autoencoder

Comfortable:

LSTM
NLP (BERT, word2vec)
Pytorch
Spark

Alt. intro text: I've worked with a variety of people, from medical doctors to school district repair technicians. In each of these capacities I've built strong relationships through communication, always with an angle for science and data

Manage/mentor:

Stuart Bivens – PIV lab analysis of dense swarming bacterial fields
Jacob Searle – Emergence in collective path formation of leaf cutter ants
Matthew Kafker – Python simulation of bacterial scattering off pillars
Maria Dresser – Python simulation of bacterial scattering off pillars

Direct reports:

Will McNichols – Image processing pipeline to analyze growth rate and fractal dimension of high throughput plate-based bacterial swarming assay
Sophie – Curriculum development, reverse classroom management, Python course development