John Edmiston

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Summary

Experienced in writing code to solve practical problems, and creating data products. I enjoy solving system level problems holistically and writing integration tests which save you.

Experience

12/2021– present — **Staff Data Scientist, Tech Lead**, *Iterative Scopes*, San Francisco, CA.

- Trained and deployed CNN to separate confounding videos from clinical trial recruitment pipeline, enabling 2/3 fewer manual interventions with 2% funnel loss using PyTorch, Docker, AWS Lambda, Batch.
- Guided and implemented the architecture of a real-time cloud based video inference application, doubling data throughput and fully utilizing the GPU.
- MLOps contributions including unit and integration testing, CI/CD via Jenkins, Github actions, Terraform, smoothing deployment processes into multiple products, and enabling model evaluation at scale.

6/2021– 12/2021 — **Staff Data Scientist**, *Store No 8(Walmart)*, San Francisco, CA.

- Prototyped several data product POCs, including a nutrition product to score health of food choices based on shopping basket and USDA guidelines,

6/2019– 05/2021 — **Senior Data Scientist**, *MycoWorks*, Emeryville, CA.
Established foundations for data systems architecture and workflow application product lead. Backend/Frontend vertical SaaS design, UX/UI, and implementation including distributed cloud computing, hardware and system integration.

- Designed and developed full stack architecture from scratch, and managed team of consultants to create custom MES system improve workflows and clean data streams, resulting in 30% increase in worker time productivity and 225% increase in capacity.
- Built extension of above system to control PLC based devices in automated factory, developed general code solution to flexibly connect multiple types of hardware with centralized system (cameras, sensors) using GCP Pub/Sub, Ignition.
- Developed suite of data democratization tools via Google sheets data feeds, Plotly dashboards, automatic reports, and ability to investigate individual production histories via single click Google slides preparation, increasing data visibility throughout the company and enabling new R&D questions to be investigated.
- Developed and deployed machine learning pipeline to classify sheet quality with custom features extracted from image subdomains using OpenCV, SciPy, GCP Pub/Sub and Compute Engine, producing a clean and unbiased data stream characterizing our product.

| 1/2019– | **Senior Data Scientist**, *Proteus Digital Health*, Redwood City, CA. |
| 6/2019 | ○ Integrated data feeds of patient lab records from multiple health care systems into a common format, to improve the efficiency of manual processes resulting in reaching out to product candidates. |

| 1/2018– | **Data Scientist**, *Hinge Health*, San Francisco, CA. |
| 1/2019 | ○ Built multiple data products while absorbing body blows from rapidly changing backend sources to prepare member engagement reports, analyze inbound customer claims data to report ROI, monitor product team's A/B experiments, enabling sales revenue growth, maintaining customer relationships, while being the only member of the data team. |

| 10/2015– | **Structural Analyst**, *Lawrence Livermore National Laboratory*, Livermore, CA. |
| 1/2018 | Pre and post processing for high accuracy FEM simulations |

- ○ Built and analyzed numerical models for high fidelity simulation of hypervelocity impacts and energetic materials
- ○ Wrote Python scripts via CUBIT to enabled flexible meshing of complex CAD based components and structures for high velocity impact simulation.
- ○ Managed HPC simulations on Linux clusters using custom job management and monitoring via Python/Bash scripts; Populated parameter space to understand sensitivity of structures to damage.

| 7/2013– | **Postdoctoral fellow**, *Lawrence Berkeley National Lab*, Berkeley, CA. |
| 10/2015 | R&D on methods for coupling porous flow and geomechanics, used a variety of numerical PDE solution methods (finite element, finite volume, peridynamics) |

- ○ Translated academic publications into code for hydraulic fracturing using novel combination of methods, developed from scratch.
- ○ Developed in C++, C, and Python, with parallelism via MPI/OpenMP.

| 6/2012– | **Project Engineer**, *Symplectic Engineering Corporation*, Berkeley, CA. |
| 6/2013 | R&D on meshless methods for high velocity impact simulation |

- ○ Evaluated SPH, MLSPH, and EFG methods for fit and performance in impact simulation by developing from scratch (C++). Came up with novel method for node stabilization.

| 4/2009– | **Lawrence Scholar**, *Lawrence Livermore National Laboratory*, Livermore, CA. |
| 5/2012 | Developed techniques for synchrotron X-ray diffraction image analysis; modeling framework for continuum plasticity of single crystals based on material symmetry |

- ○ Wrote hybrid codes from scratch using Boost/Python to analyze and forward model single crystal structure into diffraction images using several optimization techniques; quantified uncertainty on material parameter estimates for the first time.

Computer skills

| Languages | Python, C++, C, R, MatLab, Mathematica, Labview, Fortran, PostgreSQL, SQLite, Javascript |

Packages	PyTorch, Docker, NumPy, SciPy, Airflow, PETSc, MPI, OpenMP, VTK, Boost.Python, scikit-learn, Pytest, Flask, SQLAlchemy, Celery, ZeroMQ, Terraform, CloudFormation
Cloud	Heroku, GCP: GCE, Cloud SQL, Pub/Sub, Cloud functions, AWS: EC2, Batch, DynamoDB, ECR, SQS, Lambda, Step functions
General methods	Parallel computing, modeling physical systems, partial differential equations
Machine Learning	Supervised learning workflows, classification, regression, and performance tuning based on product requirements

Numerical modeling

- Meshless methods and simulation: Peridynamics, SPH, MLSPH, EFG, MLPG, PDE, ODE
- Finite Element Method, Finite Fourier Transforms, Finite Volume Method, Spectral Analysis
- Optimization, weighted least squares, model calibration, uncertainty analysis

Projects

- Insight Health Data Science bootcamp (2017): conceptualized and developed product for motion capture system applied to gait assessment, expanding from blog post on object tracking to multiple objects with instrumentation architecture. Demo at https://gaitanalyzer.info.

Doctoral thesis

Title	*Recent Advances in Continuum Plasticity: Phenomenological Modeling and Experimentation Using X-ray Diffraction*
Supervisors	David J. Steigmann and George C. Johnson
Description	Two aspects of plasticity in single crystals are examined. First, a modeling approach based on classical phenomenological ideas (e.g., a formulation consistent with material symmetry as opposed to the a decomposition of plastic flow onto slip systems) is suggested to model plastic flow. We include a detailed constitutive framework and calibrate the model to data. Second, improvements to synchrotron X-ray diffraction experimentation are described. We include uncertainty analysis of lattice strain measurements using high-energy monochromatic X-ray diffraction and develop a forward model to quantify intragranular misorientation generated as a result of plastic flow. Analysis of experimental data from a tension test of a Titanium polycrystal are presented to support these topics.

Education

2006–2012	**PhD**, *University of California, Berkeley, Mechanical Engineering*.
2004–2006	**MS**, *University of Wisconsin, Madison, Mechanical Engineering*.
1999–2004	**BS**, *University of Minnesota, Minneapolis, Mechanical Engineering*.