John Edmiston

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Experience

6/2019–present **Senior Data Scientist/Senior Engineer**, *MycoWorks*, Emeryville, CA.
Data systems architecture (greenfield). Backend/Frontend vertical SaaS design and implementation, distributed computing, hardware and system integration

- Designed and developed full stack architecture from scratch, and managed team of consultants to create in house MES system improve workflows and clean data streams, resulting in 30% increase in line worker time productivity and 225% increase in total batch capacity.
- Architected extension to above system to control PLC based devices, developed general code solution to connect any type of hardware with centralized data application/software communication system (cameras, sensors) using GCP Pub/Sub, Ignition, reducing manual processes, quantifying process exit criteria, and simplifying line-worker workflow.
- 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.

1/2019–6/2019 **Senior Data Scientist**, *Proteus Digital Health*, Redwood City, CA.
Data integration of medical systems, EHR records

- Integrated multiple disparate data feeds of patient lab records into common format for candiate selection for pharmaceutical product.

1/2018–1/2019 **Data Scientist**, *Hinge Health*, San Francisco, CA.
Product analytics, health care claims analysis, eligibility verification

- Kept up with rapidly changing backend to prepare member engagement reports, analyze inbound customer claims data, analyze production A/B experiments.
- By producing scalable data infrastructure, served as only member of data team through exponential growth phase (Series A→B).

10/2015–1/2018 **Structural Analyst**, *Lawrence Livermore National Laboratory*, Livermore, CA.
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 with custom automatic job management and monitoring via Python/Bash scripts to populate parameter space to understand structural sensitivity.

7/2013– 10/2015 **Postdoctoral fellow**, *Lawrence Berkeley National Lab*, Berkeley, CA.
Develop methods for coupling porous flow and geomechanics using a variety of numerical methods (finite element, finite volume, peridynamics)

- Read and translated academic research into simulation code applied to hydraulic fracturing simulation, developed in Fortran, C++, C, and Python, used parallelism via MPI/OpenMP. Worked from scratch, as well as supporting changes to legacy code, resulting in several academic publications.
- Managed and trained multiple student interns new to Python.

6/2012– 6/2013 **Project Engineer**, *Symplectic Engineering Corporation*, Berkeley, CA.
Developed meshless methods for high velocity impact simulation

- Developed in C++, Python, R&D work on SPH, MLSPH, and EFG methods, translated mathematical models from literature into simulation code.

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

- Wrote hybrid codes using Boost/Python to analyze and forward model single crystal structure into modeled diffraction images using several optimization techniques, quantified uncertainty on material parameter estimates for the first time.
- Theoretical and experimental work resulted in multiple academic publications.

Computer skills

Languages	Python, R, C++, C, MatLab, Mathematica, Labview, Fortran, PostgreSQL, SQLite, Javascript
Packages	Docker, NumPy, SciPy, Airflow, PETSc, MPI, OpenMP, VTK, Boost.Python, Scikit-learn, Pytest, Flask, SQLAlchemy, Celery, D3.js, VTK
Cloud	Heroku. GCP: GCE, Cloud SQL, Pub/Sub, Cloud functions, Logging
General methods	Parallel computing, machine learning, modeling physical systems, partial differential equations

Numerical modeling

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

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.

Masters thesis

Title *An Experimental Study of Piezoresistance in a Liquid Suspension*

Supervisor Yuri M. Shkel

Description An experimental configuration was developed from scratch to extract piezoresistive constitutive properties of a conductive composite suspension. A rheometer was used to measure oscillatory deformation information, and a resistance measurement of the material was taken using a custom pattern of interdigitated electrodes. The sensor was incorporated into a Wheatstone bridge and data was obtained using amplitude-modulated signal processing principles. The extracted sensor resistance was related to the resistivity of the material using an analytical derivation for the strain response and assumptions of material isotropy.

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*.