Henry Geerlings | Resume

1110 8th St – Golden, CO 80401 – USA

+1 (805) 754 6622 • henrygeerlings@gmail.com

Highly motivated materials scientist with an extensive background in mechanical metallurgy, computational modeling, and data processing. Seeking work beginning in August.

- Education -

Colorado School of Mines **Golden**
M.S. Materials Science, GPA - 3.7 *2016 - May 2018*

University of California **Berkeley**
B.S. Materials Science & Engineering, GPA - 3.2 *2011 - 2015*

- Experience -

Colorado School of Mines **Golden**
ADAPT Center Researcher *2016 - Current*
Developed high throughput image processing pipelines for characterizing powder morphology and defect structures in additively manufactured components measured with 3D micro X-ray CT.
Detailed achievements:
- Automated batch routines for scraping, analyzing, and feeding porosity data into predictive physical model of selectively laser molten (SLM) parts built with varying processing parameters.
- Developed shape descriptors for powder particle morphology investigations into virgin versus recycled additive powders.

Lawrence Berkeley National Laboratory **Berkeley**
Affiliate *Aug. 2015 - Dec. 2015*
Participated in a collaboration between the Materials Project and UC Berkeley for implementing defect-dislocation interaction energies into the Materials Project database.
Detailed achievements:
- Used existing elastic constants data from the database to feed into continuum model for interactions.
- Generated (interstitial) defect structures of varying supercell size and chemical species for DFT calculations using the "Python Materials Genomics" package.

Lawrence Berkeley National Laboratory **Berkeley**
Intern *June 2015 - Aug. 2015*
Coded and analyzed multiple searching algorithms for large scale materials optimization. Coupled with the Materials Project, this would allow on-the-fly materials screening using the Materials API for the computationally budget conscious.
Detailed achievements:
- Search methodologies included genetic algorithms and as well as more black box global optimization engines.
- Applications included water splitting materials (band gap/edge) and ductile intermetallics (bulk/shear modulus).

Chrzan Computational Materials Group **Berkeley**
Undergraduate Researcher *Jan. 2014 - Jan. 2015*
Performed molecular dynamics simulations of dislocations near the phase transformation temperature of pure titanium in order to characterize cold working effects.
Detailed achievements:
- Verified thermal expansion behavior of empirical potential model by comparing to experimental results.
- Visually mapped out multiple phases near the transition temperature using bond order parameters.

- Publications -

- Kappes, B., Moorthy, S., Geerlings, H., Stebner, A., Drake, D. (2017). Machine learning to optimize additive manufacturing parameters for laser powder bed fusion of Inconel 718. *9th International Symposium on Superalloy 718 and Derivatives*
- De Jong, M., Chen, W., Geerlings, H., Asta, M., and Persson, K. (2015). A database to enable discovery and design of piezoelectric materials. *Scientific Data* **2**, 1500053

- Computing -

OS: OS X, Ubuntu (Linux), Windows

Utility: Git, LaTeX, MS Office

Software: FEnICS, LAMMPS, Knime, Vesta, ParaView

Languages: Python, Matlab, Mathematica, R, Bash

- Training -

Materials Analysis:

Micro X-Ray Computed Tomography (μXCT)	*Research*
Scanning Electron Microscopy (SEM)	*Research*
Energy Backscatter Diffraction (EBSD)	*Research*
Focused Ion Beam (FIB)	*Research*
X-Ray Diffraction (XRD)	*Lab Course*
Metallography	*Lab Course*
Radiation Safety Training (EHS-470)	*LBNL*

- Coursework -

Materials Science and Engineering:

Materials Thermodynamics
Crystallography, Bonding, and Defects
Phase Transformations and Kinetics
Properties of Electronic Materials
Mechanical Behavior of Materials
Experimental Materials Science
Materials Characterization
Materials Production
Polymeric Materials
Corrosion

Mechanical Engineering and Other:

Fatigue and Fracture
Simulation of Advanced Manufacturing Processes
Engineering Analysis using FEM
Continuum Mechanics
Engineering Dynamics
Solid Mechanics
Heat Transfer
Computational Linear Algebra
Mathematics of Signals and Systems