Henry Geerlings | Resume

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A motivated engineering student with an emphasis in material mechanics and computational modeling. Experience in molecular dynamics, finite element method, and numerical analysis.

Education

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

Experience

Lawrence Berkeley National Laboratory **Berkeley**
Affiliate *Aug. 2015 - Current*
Participating in a collaboration between the Materials Project and UC Berkeley for implementing defect-dislocation interaction energies into the Materials Project database.
Detailed achievements:
- Using existing elastic constants data from the database to feed into continuum model for interactions.
- Generating (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.

Computing

OS: Windows, OS X, Ubuntu (Linux)
Technical: FEnICS, Comsol, Lammps, VMD, ParaView
Utility: Git, Virtualenv, LaTeX, MS Office
Languages: Python, Bash, Matlab

Publications

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

Coursework

Materials Science and Engineering:

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:

Simulation of Advanced Manufacturing Processes
Engineering Analysis using FEM
Continuum Mechanics
Engineering Dynamics
Solid Mechanics
Heat Transfer

Engineering:

Computer Programming with MATLAB
Methods of Engineering Analysis
Engineering Thermodynamics

Extracurricular

Societies: ACerS, AIST, ASM, TMS

Hobby: Woodturning, backgammon