Michael S. Miller

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Education

2015 – 2019 **Chemistry / Computer Science**
Bachelors in Science
California Institute of Technology

2019 – present **Chemistry**
PhD (in progress)
Stanford University

Relevant Classes

Chemistry: Inorganic Chemistry (2 terms), Quantum Physics (2 terms), Quantum Chemistry, Computational Chemistry, Spectroscopy, Statistical Mechanics (3 terms)

CS: Complexity Theory, Algorithms, Databases (3 terms), Machine Learning (3 terms), Natural Language Processing, Computer Vision, Functional Programming (2 terms), Parallel Programming

Math: Linear Algebra (2 terms), Multivariable Calculus, Differential Equations, Statistics

Skills

Chemistry: TeraChem, ASE, LAMMPS, ChemDraw, Maestro, VMD

Languages: Python, C, C++, CUDA, MySQL, C#, Java, Haskell, OCaml, Bash, Mathematica, Matlab, R, LaTeX

Other: Illustrator, Photoshop, InDesign, PowerPoint, Excel, Unity, Godot

Presentations

SURF Seminar Day
SURF Summer Research, Caltech — Fall 2018

SURF Seminar Day
SURF Summer Research, Caltech — Fall 2016

RISE Poster Presentation
RISE Summer Research, BU — Summer 2014

Work Experience

Graduate Student
Martinez Group, Stanford — Fall 2019 – present

- Helped with the development of TeraChem, a GPU-accelerated performance optimized electronic structure calculation code.
- Used HIP to make TeraChem hardware independent and capable of running with either AMD or Nvidia graphics cards.

John Stauffer Research Fellow
Miller Group, Caltech — Summer 2018

- Helped with the development of *entos*, a C++ computational chemistry package in development that implements Embedded Mean Field Theory (EMFT).
- Added Gaussian cubefile generation for visualization of electron densities.
- Created an interface to the Python chemistry library, ASE.

Software Development Intern
Tempus Inc. — Summer 2017

- Aggregated cancer data across counties and ages in the United States using Python.
- Helped migrate an in-house lab database to Quickbase.
- Wrote AWS Lambdas accessed by quickbase webhooks that automatically performed certain queries and table changes upon specific user-inputted updates.

SURF Research Fellow
Goddard Group, Caltech — Summer 2016

- Studied the effect of alloying silicon with boron carbide on its ductility using Jaguar Quantum Mechanics and ReaxFF (LAMMPS) simulations.
- Analyzed C_2B_{10} icosahedral cages and bond formation between them after shear stress due to hypervelocity impacts.
- Fitted ReaxFF force field to boron carbide system using a genetic algorithm.

RISE Summer Intern
Bravaya Group, BU — Summer 2014

- Analyzed long distance electrostatic interactions between chromophores and other parts of the KillerRed protein.
- Extracted data from completed MD simulations using TCL and analyzed it with Python.
- Found correlation between Vertical Electron Affinity and electrostatic potential on the chromophore.

TA Experience

General Chemistry
CHEM 31A — Stanford, Fall 2019

Statistical Mechanics
CHEM 173 — Stanford, Winter 2020

Relational Databases
CS 121 — Caltech, Fall 2016

Functional Programming
CS 4 — Caltech, Winter 2019