Spencer Hong

Chemical Engineer | Computational Researcher

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Education

Cornell University, College of Engineering – **Chemical Engineering Major** (2020 Graduation)
GPA: 3.72/4.00 – Dean's List (All Semesters)
Honors: Rawlings Cornell Presidential Research Scholar (Secured 8 semesters of research funding)
Relevant Coursework: Computational Optimization, Honors Organic and Physical Chemistry, Microchemical/ Microfluidic Systems

Publications

How well do implicit solvation models represent intermolecular binding energies in organic-inorganic solutions? (Editor's Choice)
B. A. Sorenson, **S. S. Hong**, H. Herbol, and P. Clancy; Comp. Mat. Sci., `https://doi.org/10.1016/j.commatsci.2019.109138`

Structural characterization of copper hexacyanoferrates using XRD and EXAFS complemented by first-principles calculations
S. Gill, M. Topsakal, A. Rouff, **S. Hong**, D. Sprouster, M. Elbakhshwan, C. Cabaud et al.; J. Crys. Grow. Des. *Under Review* (2019)

Dielectric of solvent mixtures: using antisolvents to control complexation in perovskite precursor solutions
B. A. Sorenson, U. L. Yoon, **S. S. Hong**, X. Deng, J. J. Choi, and P. Clancy; *In Draft* (2019)

Computational study of radioactive cesium capture in copper hexacyanoferrate structures for nuclear energy production
S. Hong, M. Topsakal, and S. Gill; United States Department of Energy Report; **Published in-Agency** (2018)

Conference Presentations

(Poster) Developing efficient QSAR models using bayesian optimization for predictive toxicology and drug design
S. Hong at the Chief Scientist Summit, United States Air Force Research Laboratory (Dayton, 2019)

(Oral) Assessing solvation models in atomic-scale simulations of solvent-assisted lead halide perovskite complexation
S. Hong at the **National Undergraduate Research Conference** (Oklahoma City, 2018)

(Poster) Computational study of radioactive cesium capture in copper hexacyanoferrate structures for nuclear energy waste
S. Hong at the Joint Meeting of **American Physics Society** and **Japanese Nuclear Society** (Hawaii, 2018)

Professional Experience

May 2019 – Present
US Air Force Research Laboratory, Predictive Toxicology Intern
- Developed a comprehensive Python package to predict toxicity based on chemical structure
- Able to predict oral toxicity for 43,000 compounds with 85% accuracy
- Benchmarked and tested machine learning models using TensorFlow and Scikit-Learn
- Adapted bayesian optimization for hyperparameter tuning
- Able to work in a US Air Force base, obtain a CAC, and follow all security protocols

Python | Bash | TensorFlow | Git | Docker | Jupyter Notebook | Keras

March 2018 – September 2018
US Dept. of Energy: Brookhaven National Laboratory, Computational Researcher
- Characterized novel materials for nuclear waste applications using high performance computing
- Led the computational team to coordinate and collaborate on simulation codes
- Communicated technical details to the Laboratory administration for funding proposals

Python | Bash | High-Perforamnce Computing | SLURM | Quantum Espresso | VASP | Git | LaTeX

November 2016 – Present
Clancy Research Group, Cornell University, Undergraduate Researcher
- Responsible for computational modeling of new solar cell materials
- Collaborated with experimental researchers to justify and support key experimental decisions
- Programmed in Python to model and simulate solution processing of lead-halide perovskites
- Discovered a modeling representation that was 100 times faster to run without losing accuracy
- Employ Nudged Elastic Band method to study the transition state of a Michael Addition reaction

Python | Bash | NBS | Orca (DFT) | Molecular Dynamics | R | LaTeX

Skills/Software

Programming/Scripting	Python, Keras/TensorFlow, Scikit-Learn, Java, Bash, MATLAB, Mathematica, Git, LaTeX
Foreign Language	Korean (Native), English (Native), French (Limited)
Others	Raspberry Pi, Arduino, Docker, Bacterial Culturing, Western Blot

Awards

American Physics Society Scholarship	Received Travel and Research Grant from **American Physics Society**
2nd Place in Cornell Creative Sprint	Designed, prototyped and presented a new **food packaging** product to investors
Scholarship Finalist	Presented Technical Research Presentation for **Procter & Gamble Management**
Best Paper in AIChE Northeast Regional	Coauthored the winning paper about **mathematical modeling** of refrigeration cycle