Spencer Hong

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Education

Cornell University – **Chemical Engineering Major** | – Dean's List (All Semesters)
Honors: Rawlings Cornell Presidential Research Scholar (Secured 8 semesters of research funding), Tau Beta Pi Inductee
Relevant Coursework: Chemical Product Design, Honors Organic & 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) Techno-economic Analysis of CO2 Reduction with Ethane
E. Cao, **S. Hong**, T. Hong, T. Liu, and D. Erickson, **Nature Conference** on Solar Fuels (China, 2019)

(Poster) Rapid Assessment of Chemical Toxicity Using Machine Learning and Combinatorial Quantitative-Structural Models
S. Hong at the **American Institute of Chemical Engineers Student National Conference** (Orlando, 2019)

(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)

Research Experience

May 2019 – Present
Erickson Research Group, Cornell University, Undergraduate Researcher
- Automated dip-coating of catalyst for carbon reduction reactor in the mechanical engineering group
- Contributed to the effort of a current X PRIZE Carbon finalist
- Co-author of a Nature Fuels presentation about techno-economic analysis of ethane dry reforming

Arduino | Python | Soldering | AutoCAD | Catalyst coating

July 2019 – Oct 2019
US Air Force Research Laboratory, Computational Researcher
- 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

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

March 2018 – September 2018
Brookhaven National Laboratory, US Dep. of Energy, Computational Researcher
- Characterized novel materials for nuclear waste applications using high performance computing
- Collaborated with experimental partners on X-ray diffraction fitting
- Fourth author of 12 on a publication under review in *Crystal Growth and Design*

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

November 2016 – Present
Clancy Research Group, Cornell University, Undergraduate Researcher
- Developed computational models for new solar cell materials with molecular dynamics and DFT
- Collaborated with experimental researchers to justify and support key experimental decisions
- Second author of a publication on *Computational Materials Science*, picked as Editor's Choice

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

Skills/Software

Computational: Python, Keras/TensorFlow, Scikit-Learn, Bash, MATLAB, Mathematica, Git, Orca, Lammps, LaTeX
Foreign Language: Korean (Native), English (Native), French (Limited)
Others: Raspberry Pi, Arduino, Bacterial Culturing, Western Blot

Awards

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