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RYAN E. CORKILL

PROFESSIONAL SUMMARY

Enthusiastic graduate student in data science with a focus on machine learning. Background in chemistry, particularly computational chemistry, with significant research experience underscored by publications in multiple high-impact journals. Recent work has focused on the development of machine learning models to accelerate the materials discovery process.

SKILLS

- Programming Languages: C++, Python, C, MATLAB
- Publication Preparation
- Research Project Design
- High-performance Computing
- Structural Optimization: DFT, *ab initio*, QM/MM
- Cheminformatics Libraries: RDKit, Indigo, CDK, ChemML
- Project Management: GitHub, Jupyter Notebook
- Eagerness to Learn New Technologies
- Lab Safety: Hazardous/Radioactive Waste Management
- Spectroscopy: UV/Vis, IR, NMR, EPR

WORK HISTORY

UNDERGRADUATE RESEARCH ASSISTANT 12/2016 to 05/2020
Virginia Tech Chemistry Department, Blacksburg, VA

- Employed both computational and synthetic methods to study molecule-based magnetic compounds
- Assisted in training fellow undergraduate researchers

ANALYTICAL R&D INTERN 05/2018 to 08/2018
Carlisle Construction Materials, Carlisle, PA

- Worked to develop and optimize a method for quantifying volatile organic compound (VOC) content in low-VOC formulated adhesives
- Gained thorough hands-on experience using gas chromatography for method development

GRADUATE TEACHING ASSISTANT 08/2020 to 12/2021
University Of South Carolina

- Instructed courses in General Chemistry and Physical Biochemistry
- Graded and managed hundreds of students that were new to the chemical sciences
- Assisted students in an advanced, senior-level Physical Biochemistry course

GRADUATE RESEARCH ASSISTANT 07/2020 to 12/2021
The University of South Carolina, Columbia, SC

- Conducted research in both a synthetic and theoretical capacity, with both directions leading to publications
- Developed machine learning models to accelerate the discovery of suitable materials for battery fabrication
- Employed data-mining techniques to find synthetic factors causing erroneous energy calculations in perovskites

EDUCATION

Virginia Tech, Blacksburg, VA - 08/2016 to 05/2020
Bachelor of Science, Chemistry, 05/2020, GPA: 3.2 (cumulative), 3.6 (upper-level coursework)

Honors:

- HyperCube Research Scholar (Spring 2017) – awarded for contributions made in computational research
- Dean's List (four-time)
- Copenhaver Research Scholar
- Recipient of Funding from DoE

Involvement:

- Dean's Leadership Council Mentor
- Undergraduate Research Assistant (2016 to 2020)
- Student Environmental Club (Community Engagement Officer)
- Society for the Advancement of Chemical Sciences (SACS) (Safety Officer)

Research:

- Synthetic method development, Data-driven materials design, structural optimization (DFT, QM/MM), data mining, spectroscopy

Relevant Coursework:

- *Computer Science:* Introduction to Programming, Object-Oriented Programming, Data Structures & Algorithms, Foundations of Engineering
- *Mathematics*: Calculus (I, II, multivariable), Differential Equations, Linear Algebra
- *Chemistry* (lectures and labs): Organic, Analytical, Inorganic, Thermodynamics, Quantum Mechanics
- *Other*: Physics for Engineers (I & II), Biochemistry, Instrumental Analysis, Catalysis, Mass spectrometry, Spectroscopy, Crystallography, Organometallics, Scientific Writing

PUBLICATIONS

King Jr, J.A., Houser, C.L., **Corkill, R.E.** and Yee, G.T., 2020. Synthesis and characterization of a family of molecule-based magnets containing methyl-substituted phenyltricyanoethylene acceptors. *Journal of Magnetism and Magnetic Materials*, *497*, p.165953.

Martin, C.R., Park, K.C., **Corkill, R.E.**, Kittikhunnatham, P., Leith, G.A., Mathur, A., Abiodun, S.L., Greytak, A.B. and Shustova, N., 2021. Photoresponsive Frameworks: Energy Transfer in the Spotlight. *Faraday Discussions*.

P. Kittikhunnatham, G. A. Leith, A. Mathur, J. K. Naglic, C. R. Martin, K. C. Park, K. McCullough, H. D. A. C. Jayaweera, **R. E. Corkill**, J. Lauterbach, S. G. Karakalos, M. D. Smith, S. Garashchuk, D. A. Chen, N. B. Shustova, *Angew. Chem. Int. Ed.* **2022**, *61*, e202113909; *Angew. Chem.* **2022**, *134*, e202113909.

TALKS GIVEN

Corkill, Ryan E. (2021, July 23). *Data-Driven Optimization of the Electrolyte Composition in Lithium-Sulfur Batteries for Enhanced Cyclability.* South Carolina EPSCoR State Conference.