Ray Matsumoto

📞 (843) 475-8628 | ✉ ray.a.matsumoto@vanderbilt.edu | 🏠 http://www.raymatsumoto.com | rmatsum836

Education

Vanderbilt University
Nashville, TN

DOCTORATE OF PHILOSOPHY IN CHEMICAL AND BIOMOLECULAR ENGINEERING
May 2021

Clemson University
Clemson, SC

BACHELOR OF SCIENCE IN MATERIALS SCIENCE
December 2015

Experience

FIRST (Fluid Interface Reactions, Structure, and Transport) Center
Nashville, TN

GRADUATE RESEARCHER
January 2017 - Present

- Developed a computational screening workflow of 400+ novel electrolytes to run and analyze simulations on a computer cluster.
- Performed hypothesis testing to validate thermodynamic distributions of molecular simulations
- Implemented clustering algorithms with NumPy and multiprocessing packages that provided key findings in 2 journal articles
- Collaborated with other researchers to publish our findings through 10 peer-reviewed journal articles
- Gave oral presentations on research findings at 2 conferences

MoSDeF (Molecular Simulation and Design Framework)
Nashville, TN

DEVELOPER
January 2017 - Present

- Led graduate students in project to replicate previous work through the use of open-source software which was published in a peer-reviewed journal
- Setup and maintained continuous integration with Azure Pipelines
- Developed Cookiecutter templates to help users build their own Python packages
- Wrote unit tests which helped to achieve code coverage over 85%
- Wrote Docker files to ensure consistency across different hardware and operating systems

Skills

Python, Git, Continuous Integration, SciPy, Scikit-learn, Unix, SQL, Spark, Docker

Teaching Experience

Cummings Research Group
Nashville, TN

UNDERGRADUATE LAB ADVISER
January 2019 - Present

- Supervised 1 graduate and 3 undergraduate research projects in molecular dynamics and energy storage
- Created and presented interactive tutorials on Git, Python, and high-performance computing

Independent Projects

Phase-Separation

- Developed a workflow in Python that predicts phase separation of liquid mixtures through image processing, k-means clustering, and image analysis

MLB Pitch Classification

- Developed machine learning classification model to predict pitch types using data sets from MLB Statcast through the use of Pandas, Scikit-learn, and imbalanced-learn