Sarah Gomez

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Education

University of California Berkeley Berkeley, Ca

Master of Science in Software Engineering and Molecular Science *Aug. 2023 – May. 2024*

Coursework: *Software Engineering, Computer Science, Machine Learning, Data Structures & Algorithms, Data Science, Scientific programming, Parallel Computing, Computational Quantum Chemistry, Systems Behavioral Neuroscience, Cellular Biochemistry, Molecular and Cellular Biology, Organic Chemistry II, Genetics*

Pace University New York, NY

Bachelor's of Science in Behavioral Neuroscience | Minor in Chemistry & Psychology *Feb. 2020 – May. 2023*

Honors: *Deans list, CSTEP Scholar*

Experience

Deep Learning Research Intern – Neuroscience Applications *Jan. 2024– May 2024*

University California San Francisco *San Francisco, Ca*

- Designed and trained a Deep Neural Network (DNN) to predict tau protein aggregation in Alzheimer's, achieving a Mean Squared Error (MSE) of 0.098 on test and validation datasets.
- Applied debugging techniques such as seeding random states, stratified k-fold cross-validation, dropout layers, and weight decay, improving model generalization and stability.

Utilized: *Python, Pandas, Numpy, SciKit-Learn, Pytorch, Github Actions, Jupyter, Markdown*

Projects

High-Performance Parallel Computing for Large-Scale Matrix Operations Feb. 2024

- Partnered with a research team to implement parallelized matrix multiplication and decomposition algorithms, optimizing computational efficiency on the NERSC supercomputer at Berkeley using OpenMP, MPI, and CUDA.
- Conducted scalability analysis on multi-core and GPU architectures, achieving a 4.7x speedup over baseline serial implementations, demonstrating significant improvements in high-dimensional matrix computations

Utilized: *C++, OpenMP, MPI, CUDA, NumPy, Jupyter, GitHub*

Geographical Variations in COVID-19 Mortality Prediction Sept. 2023 – Dec. 2023

- Collaborated with a research partner to develop a predictive model analyzing 137,700+ data points from the National Center for Health Statistics, identifying the impact of age and comorbidities on COVID-19 mortality across U.S. states.
- Implemented Lasso, Linear, and Logistic Regression models, reducing MSE from 1.16M to 0.116 through feature selection and PCA, significantly improving model generalization.

Utilized: *Python, Pandas, NumPy, SciKit-Learn, PyTorch, Jupyter, Markdown, GitHub Actions*

Neural Network-Based Molecular Energy Prediction on Savio Nov 2023 - Dec 2023

- Developed and trained Artificial Neural Networks (ANNs) to predict conformational energies of organic molecules (H, C, N, O), achieving a lowest training RMSE of ~0.81.
- Explored skip-layer ResNet architectures to enhance model convergence and optimize generalization for molecular energy predictions

Utilized: *Python, PyTorch (TorchANI), NumPy, Jupyter, Slurm, Savio*

Awards & Leadership Affiliations

Independent Research in Biology Poster Award	May 2023
Dyson College Leadership Award	May 2023
Setter Leadership Award for New Club Organization of the Year | NSC	May 2023
French Modern Languages Award	Jan. 2021
Nu Rho Psi Honor Society | Co-Founder & Head Committee Organizer	Apr. 2023 - May 2023
Neuroscience Club (NSC)| Co-Founder | President	Nov. 2021 - May 2023
National Society of Student Leaders (NLS)| Social Events Chair | Vice President	Mar. 2021 - Jan 2023

Technical Skills

Programming Languages: Python, C++, SQL, MakeFile | **Languages**: Spanish, French (B1)
Frameworks: Pandas, PyTorch, TensorFlow, NumPy, CUDA, OpenMP, MatplotLib, Seaborn, Linux
Developer Tools: Github/Gitlab, Linux, Slurm, Visual Studio
Office Skills: Microsoft Office, Google Suite, Apple Distinguished Certified, Windows