Kevin A. Silberberg

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EDUCATION

University of California, Santa Cruz — Santa Cruz, CA

Master of Science in Scientific Computing and Applied Mathematics — 2024 - 2025

- **Introduction to High Performance Computing**: History, motivation, and practice of designing and deploying modular parallel algorithms, performance modeling, debugging, and unit testing through direct use of MPI and on-node parallelism using OpenMP on UCSC supercomputers.
- **Numerical Methods for the Solution of Differential Equations**: Numerical analysis of differential equations for engineering applications, including spectral methods, boundary value problems, and computational algorithm development.
- **Numerical Linear Algebra**: Implementation and application of numerical linear algebra algorithms including matrix decompositions, iterative solvers, and SVD-based methods using LAPACK/BLAS in C.
- **Fundamentals of Uncertainty Quantification**: Computational methods for propagating uncertainties in systems governed by differential equations, including polynomial chaos expansions, stochastic Galerkin methods, Monte Carlo sampling, and statistical analysis of random processes.
- **Advanced Methods in Applied Mathematics**: Analytical solutions of ODEs and PDEs, asymptotic analysis, dimensional analysis, and calculus of variations for the optimization of functionals.

Bachelor of Science in Applied Mathematics, Statistics — 2021 - 2024

- **Research Programming in the Life Sciences**: Biological data manipulation, string, and bioinformatics algorithms using industry standard software development practices in Python.
- **Mathematical Modeling I & II**: Applied mathematics capstone series focusing on model construction, solution methods (analytical and numerical), critical analysis, and professional written/oral presentation of results.
- **Introduction to Scientific Machine Learning**: Mathematical foundations and computational implementation of machine learning for scientific applications, including system identification, dimensionality reduction (SVD, PCA), sparse regression, Koopman theory, physics-informed neural networks, and neural ODEs using PyTorch.
- **Programming Abstractions**: Software development in Python focusing on structuring software in terms of objects, endowed with primitive operations.

Fresno City College — Fresno, CA

Associates of Science in Biology — 2017 - 2020

- **Programming Concepts & Methodology**: Problem solving, algorithm development, procedural and data abstraction using C++; program design, coding, debugging, testing, and documentation.

EXPERIENCE

University of California, Santa Cruz — Santa Cruz, CA

Atmos Lab, Graduate Student Researcher — Jun 2024 - Sep 2024

- Obtained Remote Pilot Certification under the FAA's Small UAS Rule (Part 107).
- Mentored 6 undergraduate researchers while developing experimental methods for the collection of methane samples and mathematical tools for system identification.
- Conducted vertical transects using quadcopter drones to collect air samples downwind of dairy farms which was used to create a mathematical model of methane emissions.
- Researched sensor-free methods to infer wind velocity from the recorded flight data of rotorcraft drones.

CAMINO, Undergraduate Researcher — Jun 2022 - Sep 2022

- Collaborated with team members to plan meals and prepare gear for field missions at 14 different sites in the Sierra Nevada Mountains.
- Conducted bird count surveys and collected biological samples (vegetation, feathers, blood, stool) from alpine birds for genomic and isotopic analyses.
- Independently researched the impact of invasive trout on alpine bird populations using historic trout data using **ArcGIS**; performed hypothesis testing and statistical data analysis with **R**.
- Presented research findings at the Ecology and Evolutionary Biology Seminar.

Teaching Assistant, Mathematical Modeling I — Jan 2025 - Mar 2025

- Graded assignments and provided feedback for 32 students while conducting bi-weekly discussion sections and office hours.

United States Navy Lemoore, CA

Aviation Machinist's Mate, 2nd Class Sep 2013 - Sep 2017

- Led a team of 7 maintenance technicians in executing 5,964 maintenance actions supporting 75 military aircraft across multiple squadrons, ensuring 3,685 accident-free flight hours and the completion of 1,327 successful missions.
- Designed and delivered comprehensive on-the-job training programs that qualified 7 technicians in advanced maintenance procedures. Developed technical competency standards and performance evaluation metrics.
- Coordinated and facilitated 45 hours of professional development training, directly contributing to 8 team members earning promotions through enhanced technical qualifications and leadership assessments.
- Served dual roles by ensuring regulatory compliance and safety standards while managing daily operations of aircraft maintenance as work center manager.

TECHNICAL SKILLS

- **Programming**: Julia, Python, FORTRAN, C, C++
- **Tools**: Git, Linux, Bash, Emacs, Makefile, Docker
- **HPC**: MPI, OpenMP, SLURM, HDF5, NetCDF
- **Documentation**: Quarto, Latex, Markdown, Github Pages, Jupyter Notebooks
- **Data Visualization**: Makie.jl, GNUplot, matplotlib, Plotly
- **Numerical Libraries**: Numpy, Scipy, Pytorch, LAPACK, BLAS

HONORS & AWARDS

Next Generation Scholars in Applied Mathematics 2023-2025

Teaching Assistant Excellence Award 2025

Dean's Honors: Spring ('23), Fall, Winter, and Spring Quarters 2023-2024