

Kachinga Silwimba

DATA SCIENTIST | MACHINE LEARNING & HPC SPECIALIST | EARTH SYSTEM MODELING & BIG DATA ANALYSIS EXPERT | GEOSPATIAL ANALYSIS EXPERT

5855 South Elk Way, 80016, Aurora, CO, USA

☎ (+1) 208-831-0244 | ✉ kachingasilwimba@u.boisestate.edu | 📱 kachingasilwimba | 🌐 kachinga-silwimba

Summary

Innovative and results-driven Data Scientist with over four years of experience leveraging machine learning, high-performance computing (HPC), and geospatial analysis to solve complex environmental and scientific challenges. Proficient in Python, TensorFlow, and PyTorch, with a proven ability to reduce computational overhead, improve predictive accuracy, and deliver impactful insights. Published author and presenter at international conferences with a strong commitment to advancing climate data science through interdisciplinary collaboration.

Technical Skills

Programming & Scripting	Python, R, MATLAB, Java, Bash, Scala, PySpark, Linux, SQL
Machine Learning & AI	TensorFlow, PyTorch, Keras, Scikit-learn, Deep Learning, Generative AI, Large Language Models
Big Data & Cloud Computing	Hadoop, Spark, AWS, Google Cloud, GPU Acceleration, HPC clusters
Climate & Scientific Tools	GIS, Xarray, Dask, NetCDF, Zarr, CLM5, WRF, CDO, NCO
Data Management & MLOps	DVC, GitHub version control, Docker, Singularity, CI/CD pipelines
Data Visualization & Analysis	Matplotlib, Cartopy, Holoviews, Plotly, Tableau, Microsoft Office suite
Software Eng. & HPC Opt.	Slurm job scheduling, memory management, load balancing, containerization for HPC environments
Model Interpretability	SHAP, Sobol, Fourier Sensitivity Analysis

Work Experience

Boise State University

Boise, ID

GRADUATE RESEARCH ASSISTANT

Aug. 2021 – Present

- Build end-to-end Python data pipelines (pandas, Xarray, Dask) with GPU acceleration to reduce model-simulation data processing time by 50%.
- Apply Evidential Deep Learning for uncertainty quantification (UQ) to improve prediction error by ~20%; document methods for reproducibility.
- Design and productionize Self-Organizing Maps (SOM) and Empirical Orthogonal Functions (EOF) workflows for spatiotemporal pattern discovery and classification, improving validation metrics by ~30%.
- Lead cross-functional collaborations and implement MLOps practices (Docker, Git, MLflow) to deliver versioned, containerized, and traceable experiments.
- Integrate domain knowledge into model architectures to enhance simulation fidelity and decision support.
- Publish peer-reviewed work and present to technical and non-technical audiences at international venues, translating complex results into actionable insights.

NSF National Center for Atmospheric Research (NCAR)

Boulder, CO

CISL VISITING SCHOLAR (CVP)

Sep. 2025 – May 2026

- Serve in the Computational and Information Systems Laboratory (CISL) Visitor Program (CVP) to develop an evidential Community Land Model (CLM) emulator supporting Ph.D. research.
- Develop uncertainty-aware machine learning approaches for model emulation with an emphasis on calibration, validation, and scalable deployment.
- Coordinate cross-institutional milestones and knowledge transfer between NCAR and Boise State University.

William Averette Anderson Fund for Hazard & Disaster Mitigation Education & Research

USA

WILLIAM AVERETTE ANDERSON FUND (BAF) FELLOW

Sep. 2024 – Present

- Engage in structured training on dissertation design, experimental design, grant/proposal development, scholarly publishing, and community-engaged research.
- Build professional networks with researchers and practitioners via national conferences, workshops, and mentorship.
- Expand knowledge of region-specific hazards and emerging practices through presentations and peer exchange at professional development events.

NSF National Center for Atmospheric Research (NCAR)

USA

ADVANCED STUDY PROGRAM GRADUATE RESEARCH FELLOW

Mar. 2024 – Jun. 2024

- Assessed Community Land Model (CLM) v5 parameters using adaptive learning techniques, improving computational efficiency by 25%.
- Executed large-scale simulations on HPC systems and analyzed high-dimensional outputs to inform land-surface model refinements.
- Applied statistical methods and experimental design principles to model evaluation, enhancing prediction skill and reliability.
- Collaborated across disciplines to integrate advanced statistical techniques into evaluation pipelines.

Education

Boise State University (BSU) PH.D. IN COMPUTING (DATA SCIENCE MAJOR) • Research Focus: Artificial intelligence for earth system modeling with emphasis on uncertainty estimation and interpretability.	Boise, ID Expected Fall 2025
African Institute for Mathematical Sciences (AIMS) M.Sc. IN MATHEMATICAL SCIENCES (CLIMATE SCIENCE MAJOR) • Thesis: Evaluation of CMIP5 and CMIP6 Models for Simulating Precipitation Extremes in Southern Africa.	Kigali, Rwanda Aug. 2020 – Jul. 2021
Copperbelt University B.Sc. IN PHYSICS • Senior Project: Developed a Mechanical Valve Releasing Mechanism Utilizing Harmonic Motion Principles for Efficient Fluid Control.	Kitwe, Zambia May 2015 – Oct. 2019

Leadership & Extracurricular Activities

SIAM (Society for Industrial and Applied Mathematics) BSU Chapter VICE PRESIDENT • Increased member engagement by 30% through innovative chapter initiatives. • Organized seminars and workshops featuring industry experts, connecting students with professionals.	Boise, ID Apr. 2024 - May 2025
LEAP (Learning the Earth with Artificial Intelligence and Physics) LEAP TIER 2 MEMBER • Collaborated on projects integrating physical models with AI for improved climate projections. • Evaluated models against observational data, ensuring scientific integrity and improved prediction reliability.	NYC, NY Jan. 2024 – Present
SIAM (Society for Industrial and Applied Mathematics) BSU Chapter FINANCIAL OFFICER • Managed a \$5,000+ annual budget, ensuring financial transparency and efficiency. • Secured 20% additional funding through grants and sponsorships.	Boise, ID Dec. 2021 – Dec. 2023
CUPS (Copperbelt University Physics Society) CO-FOUNDER & PROJECT COORDINATOR • Launched and led physics seminars, competitions, and outreach programs, engaging over 200 students and increasing participation by 40%. • Partnered with faculty and external stakeholders to secure resources for successful event implementation.	Kitwe, Zambia May 2016 – Oct. 2019

Certificates & Awards

AWARDS		
2024	Bill Anderson Fund Fellow (2024) , William Averette Anderson Fund	USA
2024	ASP GVP Fellow , NSF NCAR Advanced Study Program Graduate Student	Boulder, Co
2024	SIAM Travel Award (AN24) , Annual General Meeting Conferences	Spokane, WA
2024	SIAM Travel Award (MDS24) , SIAM Conference on Mathematics of Data Science (MDS24)	Georgia, AT
2021	Graduate Merit-Based Gem Scholarship , Financial Aid and Scholarships	Boise, ID
2021	Graduate Assistantship , Boise State University Grant Funding	Boise, ID
2021	AIMS Masters Scholarship , Mastercard Foundation Graduate Scholarship	Kigali, Rwanda
2015	Government Scholarship on National Merit , Copperbelt University Undergraduate Scholarship	Kitwe, Zambia
CERTIFICATES		
2024	NASA Open Science Certificate , NASA’s Transform to Open Science (TOPS)	USA
2024	Responsible Conduct of Research , CITI Program	USA
2024	LEAP Momentum Bootcamp in Climate Data Science , LEAP	Manhattan, NY
2023	LeaderShape , LeaderShape Summer Institute	Cascade, ID
2022	CLM5 Point Simulations , NSF NCAR Comunity Land Model version 5 training certificate	USA
2022	WRF Tutorial Training , NSF NCAR Weather Research and Forecasting Model (WRF) training certificate	USA
2020	IBM Machine Learning , IBM Digital - Nation	USA