WILLIAM YIK

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EDUCATION

University of Washington — *Seattle, WA*
Ph.D. Atmospheric Sciences, Advanced Data Science Option — Expected 2029

Harvey Mudd College — *Claremont, CA*
B.S. Mathematics and Computer Science, Emphasis in Environmental Analysis — 2024
Graduated with High Distinction, Honors in Mathematics

PUBLICATIONS

[5] **Yik, W.**, Sonnewald, M., Clare, M. C. A., Lguensat, R. (2023). Southern Ocean Dynamics Under Climate Change: New Knowledge Through Physics-Guided Machine Learning. *NeurIPS Workshop: Tackling Climate Change with Machine Learning*. https://arxiv.org/abs/2310.13916

[4] Hom, C., **Yik, W.**, Montañez, G. D. (2023). Finite-Sample Bounds for Two-Distribution Hypothesis Tests. *IEEE International Conference on Data Science and Advanced Analytics (DSAA)*. https://doi.org/10.1109/DSAA60987.2023.10302643

[3] **Yik, W.**, Silva, S. J., Geiss, A., Watson-Parris, D. (2023). Exploring Randomly Wired Neural Networks for Climate Model Emulation. *Artificial Intelligence for the Earth Systems (AIES)*. https://doi.org/10.1175/AIES-D-22-0088.1

[2] **Yik, W.**, Silva, S. J., Geiss, A., Watson-Parris, D. (2022). Exploring Randomly Wired Neural Networks for Climate Model Emulation. *NeurIPS Workshop: Tackling Climate Change with Machine Learning*. https://www.climatechange.ai/papers/neurips2022/36/paper.pdf

[1] **Yik, W.**, Serafini, L., Lindsey, T., Montañez, G. D. (2022). Identifying Bias in Data Using Two-Distribution Hypothesis Tests. *AAAI/ACM Conference on Artificial Intelligence, Ethics, and Society (AIES)*. https://doi.org/10.1145/3514094.3534169

RESEARCH EXPERIENCE

University of California, Davis — *Davis, CA*
Student Researcher, Computational Climate and Ocean Group — 2023 - Present

- Advisor: Maike Sonnewald
- Identifying and tracking Southern Ocean dynamics under climate change using neural networks

University of Southern California — *Los Angeles, CA*
Undergraduate Researcher, Atmospheric Composition and Earth Data Science Group — 2022 - Present

- Advisor: Sam Silva
- Exploring the utility of randomly wired neural networks for climate model emulation
- Investigating methods for enforcing fairness and equity in neural climate emulators

Lawrence Livermore National Laboratory — *Livermore, CA*
Clinic Project Team Member, Harvey Mudd College Clinic Program — 2023 - 2024

- Liaison: Robert Blake, Advisor: Naim Matasci
- Investigated empirical scaling of scientific machine learning emulators
- Designed software to conduct neural network scaling studies in parallel on high-performance computing clusters

NOAA Geophysical Fluid Dynamics Laboratory — *Princeton, NJ*
Research Intern, Ocean and Cryosphere Division — 2023

- Advisors: Maike Sonnewald, Stephen Griffies

- Applied deep ensemble learning methods for inferring subsurface ocean dynamics
- Improved the interpretability of models using explainable AI techniques such as layer-wise relevance propagation and Shapley additive explanations

Harvey Mudd College *Claremont, CA*
Undergraduate Researcher, AMISTAD Machine Learning Lab 2021 - 2023

- Advisor: George Montañez
- Implemented novel hypothesis tests to systematically identify bias in machine learning training data
- Derived mathematical finite-sample bounds for two-distribution hypothesis tests

Idaho National Laboratory *Idaho Falls, ID*
Research Intern, Energy Innovation Laboratory 2020

- Advisor: Christopher Zarzana
- Tested separation and content analysis methods for ligands and biomass using gas chromatography and pyrolysis
- Utilized liquid chromatography and mass spectrometry to accelerate ligand sample production

CONTRIBUTED TALKS AND POSTERS

[9] Ocean Sciences Meeting, *Talk: Explainable Machine Learning for Inferring Subsurface Ocean Dynamics*, 2024.

[8] NeurIPS Workshop: Tackling Climate Change with Machine Learning, *Poster: Southern Ocean Dynamics Under Climate Change: New Knowledge Through Physics-Guided Machine Learning*, 2023.

[7] American Geophysical Union Fall Meeting, *Talk: Enforcing Equity in Neural Climate Emulators*, 2023.

[6] IEEE International Conference on Data Science and Advanced Analytics, *Talk: Finite-Sample Bounds for Two-Distribution Hypothesis Tests*, 2023.

[5] Harvey Mudd College Student Symposium, *Poster: Explainable Machine Learning for Inferring Subsurface Ocean Dynamics*, 2023.

[4] NOAA Science and Education Symposium, *Talk: Explainable Machine Learning for Inferring Subsurface Ocean Dynamics*, 2023.

[3] NeurIPS Workshop: Tackling Climate Change with Machine Learning, *Poster: Exploring Randomly Wired Neural Networks for Climate Model Emulation*, 2022.

[2] Harvey Mudd College Student Symposium, *Poster: Exploring Randomly Wired Neural Networks for Climate Model Emulation*, 2022.

[1] AAAI/ACM Conference on Artificial Intelligence, Ethics, and Society, *Talk and Poster: Identifying Bias in Data Using Two-Distribution Hypothesis Tests*, 2022.

AWARDS AND HONORS

Computational Science Graduate Fellowship 2024
Department of Energy

Rampyari Bahethi Graduate Fellowship 2024
American Meteorological Society

Top Scholar Award 2024
University of Washington

Don Chamberlin Computer Science Research Award 2024
Harvey Mudd College

Graduate Research Fellowship (declined) 2024
National Science Foundation

Finalist, Hertz Fellowship 2024
Hertz Foundation

Finalist, Outstanding Undergraduate Researcher Award 2023
Computing Research Association

Ernest F. Hollings Undergraduate Scholarship 2022
National Oceanic and Atmospheric Administration

TEACHING EXPERIENCE

Harvey Mudd College *Claremont, CA*
Mathematics Academic Excellence Facilitator Aug 2022 - Present

- Courses: Differential Equations, Discrete Mathematics, Linear Algebra, Probability and Statistics, Calculus
- Nominated by faculty to hold weekly tutoring sessions for groups of 10-50 students
- Hosting weekly facilitator meetings to improve mentor and tutor sessions across the college

Harvey Mudd College *Claremont, CA*
Teaching Assistant Aug 2021 - Aug 2022

- Courses: Computability and Logic, Discrete Mathematics, Introduction to Computer Science
- Held weekly tutoring sessions for groups of 5-30 students and graded homework assignments

PROFESSIONAL ACTIVITIES

Journal Referee: Geophysical Research Letters

SKILLS

Programming Languages	Python, R, MATLAB, C++, Java, Haskell
Machine Learning/Data Science	Tensorflow, PyTorch, Scikit-learn, SciPy, NumPy, Pandas, Xarray
Software/Web Development	Git, Docker, Visual Studio Code, Eclipse, Flask, HTML, CSS