## William Hofgard

LinkedIn Stanford, CA		whofgard@stanford.edu (303) 818-8145
EDUCATION	<b>Stanford University</b> Stanford, CA Master of Science, Electrical Engineering Advisor: John Duchi Expected Graduation April 2025	GPA: 4.09/4.00
	<b>Stanford University</b> Stanford, CA Major: Bachelor of Science with Honors, Mathematics Minor: History	
	June 2024, with Distinction	GPA: 4.15/4.00
PUBLICATIONS	Hofgard, W. (Oct 2024). <i>Convergence Guarantees for Neural Network-Based Hamilton-Jacobi Reachability</i> . To appear at NeurIPS '24 Workshop on Data-Driven, Differentiable Simulations, Surrogates, and Solvers (D3S3).	
	ATLAS Collaboration. (2022). Measurement prospects of Higgs boson pair production in the $b\bar{b}\gamma\gamma$ final state with the ATLAS experiment at the HL-LHC. ATLAS Public Note.	
	• Performed physics analysis and extrapolation studies for the publication in addi- tion to writing several drafts and producing publication plots	
	• Acted as one of two contact editors during the drafting and revision processes, presented publication drafts and ongoing research multiple times to the ATLAS Upgrade Physics and Higgs Diboson Searches Working Groups	
EXPERIENCE	Lawrence Livermore National Laboratory	Jun 2024 – Present
	<ul> <li>Control &amp; Optimization - Graduate Researcher</li> <li>Worked under Andrew Mastin and Jean-Paul Watson on improving algorithms and convergence guarantees for large-scale combinatorial optimization problems relevant to power systems</li> </ul>	
	• Performed novel research in spectral graph theory, investigating spectral proper- ties of graph Laplacians arising in combinatorial optimization	
	<ul> <li>University of Michigan, Mathematics REU Ann Arbor, MI Undergraduate Researcher</li> <li>Worked with Prof. Asaf Cohen to prove two novel vergence of deep learning-based numerical methods for problems (MFCPs), and provided a JAX implementat based method for solving high-dimensional, nonlinear</li> </ul>	Jun 2023 – May 2024 results concerning the con- or solving mean field control tion of a new deep learning- r PDE
	• Presented research in a long-form talk, and currently lication	preparing a paper for pub-
	<ul> <li>Western Interstate Energy Board (WIEB)</li> <li>Denver, CO</li> <li>Shultz Energy Fellow</li> <li>Worked with researchers across the Western Interconnon the grid caused by changing temperature and presenter of temperature of temperature and presenter of temperatu</li></ul>	May 2022 – Sep 2022 nection to model the impacts cipitation trends
	• Built open-source machine learning frameworks based on XGBoost that planners, load forecasters, and utilities will use to analyze risk posed to generation and	

SLAC National Accelerator Laboratory Stanford, CA

transmission by climate change throughout the Western United States

### Undergraduate Researcher

- Under the ATLAS Collaboration, performed high energy physics analysis of the prospects of the Higgs Diboson Search at the Large Hadron Collider in light of planned upgrades to the ATLAS Detector
- Collaborated closely with scientists from across the ATLAS Collaboration, presenting findings and projections to a variety of groups within the organization, including the conveners of the ATLAS Upgrade Physics Working Group

#### Department of Mathematics Distinguished Service Award Jun 2024

• Recognized by the Stanford Department of Mathematics for my "outstanding contributions to the department, their fellow students, and the University as a whole"

#### Stanford Alumni Association Award of Excellence May 2024

• Received an award recognizing members of the senior class who "demonstrate a sincere commitment to the university through involvement, leadership and extraordinary Stanford spirit"

#### J.E. Wallace Sterling Award for Scholastic Achievement Apr 2024

• Received one of Stanford's most selective recognitions of a student's overall academic performance, awarded to the top 25 seniors in the School of Humanities and Sciences

May 2023

Apr 2022

## Phi Beta Kappa

• Elected as one of 37 juniors to Stanford's Phi Beta Kappa chapter

## Shultz Energy Fellow

• Selected as one of four undergraduate Shultz energy fellows at Stanford to receive funding for a public service fellowship in the energy sector

Hofgard, W., Sun, J., & Cohen, A. (May 2024). Convergence of the Deep Galerkin Method for the Mean Field Control Problem. Submitted to SIMODS.

Hofgard, W. (Jun 2023). Approximating Solutions of Hamilton-Jacobi-Bellman Equations with Semidefinite Programming. Research and poster presented at the Spring 2023 final presentation session for EE 364B.

Hofgard, W. (Aug 2022). Peaktemp. Open-source Python package for modeling the impact that different CMIP6 climate scenarios have on the Western grid published to the Python Package Index (PyPI).

#### LEADERSHIP & Course Assistant, Partial Differential Equations (Math 220A) Fall 2024 TEACHING

• Held weekly office hours, wrote solutions for homework problems, and graded homeworks and exams for Stanford's graduate course on the theory and applications of partial differential equations, taught by Prof. Jonathan Luk

## Grader, Theory of Partial Differential Equations (Math 173) Spring 2024

• Graded homework assignments for Stanford's advanced undergraduate course on the theory of partial differential equations

#### Course Assistant, Convex Optimization I (EE 364A) Winter 2024

• Held weekly office hours, answered student questions about concepts in convex analysis and optimization, and wrote homework and exam questions for Stanford's graduate course on convex optimization, taught by Prof. Stephen Boyd

#### Peer Tutoring Coordinator, Stanford Math Department 2021 - 2024

• Manage 16 paid student tutors employed by the Stanford math department to provide tutoring support to students in a variety of introductory math courses

## SELECTED **PROJECTS &**

HONORS &

AWARDS

# PREPRINTS

• Tutor students in single and multivariable calculus, linear algebra and matrix theory, and ordinary/partial differential equations

## Sector Lead, Stanford Data and Mapping for Society 2020 – 2023

- Coordinated data science projects with government and non-profit partners, including the U.S. Office of Naval Research and The Nature Conservancy
- Led a team to visualize global capital flows between investment banks and carbonemitting infrastructure projects for the Stanford Climate of Infrastructure Project

SKILLS
 Languages : Python, C++, C, Julia, Java, R, Matlab, JavaScript
 Tools/Frameworks : PyTorch, JAX, TensorFlow, XGBoost, ROS, CVXPY, Mathematica, Node.js, statsmodels, PostGIS, Git, Leaflet
 General : Machine Learning, Convex Optimization, Nonlinear Optimization, Statistical Inference and Modeling, Data Structures, Object Oriented Programming, Spatial Data Science, Data Analysis and Visualization

COURSEWORK Mathematics: Probability Theory (Math 230A, 230B), Real Analysis & Linear Algebra (Math 61CM), Theory of Differential Equations (Math 63CM), Measure Theory & Fourier Analysis (Math 172), Theory of PDEs (Math 173, Math 256A), Functional Analysis (Math 175, Math 205B), Group and Ring Theory (Math 120), Representation Theory (Math 122), Numerical PDEs (Math 226), Algebraic Topology (Math 215A), Machine Learning Theory (Math 276), Numerical Linear Algebra (CME 302)

**Optimization & Control**: Convex Optimization I (EE 364A), Convex Optimization II (EE 364B), Convex Analysis (EE 364M), Optimal & Learning Based Control (AA 203)

**Computer Science**: Programming Abstractions (CS 106B), Machine Learning (CS 229), Cryptography (CS 255), Principles of Robot Autonomy (CS 237A), Randomized Algorithms & Probabilistic Analysis (CS 265)

Miscellaneous: Applied Statistics (Stats 305A), Statistical Learning (Stats 315A), Decision Making Under Uncertainty (CS 238), Intro to Electrical Engineering (ENGR 40M), Statistical Mechanics of Learning & Computation (AppPhys 229)