

EDUCATION	Stanford University	Stanford, CA
	<i>Ph.D. Computational and Mathematical Engineering</i>	2020 - 2025 (<i>expected</i>)
	<i>M.S. Computational and Mathematical Engineering</i>	2017 - 2020
	Brown University	Providence, RI
	<i>Sc.B. Applied Mathematics</i>	2013 - 2017
	<i>A.B. Computational Biology</i>	2013 - 2017
UNDER REVIEW	<ol style="list-style-type: none"> 1. Cl��mentine Domin��*, Nicolas Anguita*, Alexandra M. Proca, Lukas Braun, Daniel Kunin, Pedro A.M. Mediano, Andrew Saxe. <i>From Lazy to Rich: Exact Learning Dynamics in Deep Linear Networks</i>. arXiv. 	
PUBLICATIONS	<ol style="list-style-type: none"> 1. Daniel Kunin*, Allan Ravent��s*, Cl��mentine Domin��, Feng Chen, David Klindt, Andrew Saxe, Surya Ganguli. <i>Get rich quick: exact solutions reveal how unbalanced initializations promote rapid feature learning</i>. Neural Information Processing Systems (NeurIPS) 2024. Spotlight. arXiv. 2. Feng Chen*, Daniel Kunin*, Atsushi Yamamura*, Surya Ganguli. <i>Stochastic Collapse: How Gradient Noise Attracts SGD Dynamics Towards Simpler Subnetworks</i>. Neural Information Processing Systems (NeurIPS) 2023. arXiv. 3. Daniel Kunin*, Atsushi Yamamura*, Chao Ma, Surya Ganguli. <i>The Asymmetric Maximum Margin Bias of Quasi-Homogeneous Neural Networks</i>. International Conference on Learning Representations (ICLR) 2023. Spotlight. arXiv. 4. Daniel Kunin*, Javier Sagastuy-Brena*, Lauren Gillespie, Eshed Margalit, Hidenori Tanaka, Surya Ganguli, Daniel L.K. Yamins. <i>The Limiting Dynamics of SGD: Modified Loss, Phase Space Oscillations, and Anomalous Diffusion</i>. Neural Computation 2023. arXiv. 5. Chao Ma, Daniel Kunin, Lei Wu, Lexing Ying. <i>Beyond the Quadratic Approximation: the Multiscale Structure of Neural Network Loss Landscapes</i>. Journal of Machine Learning Research 2022. arXiv. 6. Hidenori Tanaka, Daniel Kunin. <i>Noether's Learning Dynamics: The Role of Kinetic Symmetry Breaking in Deep Learning</i>. Neural Information Processing Systems (NeurIPS) 2021. arXiv. 7. Daniel Kunin*, Javier Sagastuy-Brena, Surya Ganguli, Daniel L.K. Yamins, Hidenori Tanaka*. <i>Neural Mechanics: Symmetry and Broken Conservation Laws in Deep Learning Dynamics</i>. International Conference on Learning Representations (ICLR) 2021. arXiv. 8. Hidenori Tanaka*, Daniel Kunin*, Daniel L.K. Yamins, Surya Ganguli. <i>Pruning neural networks without any data by iteratively conserving synaptic flow</i>. Neural Information Processing Systems (NeurIPS) 2020. arXiv. 9. Daniel Kunin*, Aran Nayebi*, Javier Sagastuy-Brena*, Surya Ganguli, Jonathan M. Bloom, Daniel L.K. Yamins. <i>Two Routes to Scalable Credit Assignment without Weight Symmetry</i>. International Conference on Machine Learning (ICML) 2020. arXiv. 10. Daniel Kunin*, Jonathan M. Bloom*, Aleksandrina Goeva, Cotton Seed. <i>Loss Landscapes of Regularized Linear Autoencoders</i>. International Conference on Machine Learning (ICML) 2019. Oral. arXiv. 	

PROJECTS	Seeing Theory: a visual introduction to probability and statistics	
	<i>Online textbook of fundamental concepts in probability and statistics</i>	2015 - 2018
	<ul style="list-style-type: none"> • Created seeing-theory.brown.edu while an undergraduate along with three others. • Over three million views and more than a million unique users worldwide. • Won a Webby Award for best education website in 2018. 	
AWARDS AND HONORS	CPAL Rising Star Award Conference on Parsimony and Learning	2024.01
	<ul style="list-style-type: none"> • Cohort of sixteen exceptional early-career researchers. 	
	Open Philanthropy AI Fellowship Open Philanthropy	2022.09
	<ul style="list-style-type: none"> • Cohort of eleven promising machine learning researchers selected across institutions. Full graduate stipend and tuition is covered for up to three years. 	
	Stanford Data Science Scholar Stanford University	2020.01
	<ul style="list-style-type: none"> • Cohort of graduate students selected for using data science in their research. Half my stipend and tuition is covered for two years. 	
INTERNSHIPS	Harvey A. Baker Fellowship Brown University	2017.05
	<ul style="list-style-type: none"> • Awarded annually to outstanding members of the graduating class to aid them in undertaking graduate study at the university of their choice. 	
	Royce Fellowship Brown University	2016.06
	<ul style="list-style-type: none"> • Supports Brown undergraduates as they carry out independent engaged research projects of their own design. 	
	NTT Research Sunnyvale, CA	2021.06 - 2021.09
	<ul style="list-style-type: none"> • Researched the physics of intelligence with Hidenori Tanaka. 	
TEACHING	Broad Institute of MIT and Harvard Cambridge, MA	2018.06 - 2018.09
	<ul style="list-style-type: none"> • Developed a deep learning model for matrix factorization. • Researched loss landscapes of linear autoencoders with regularization. 	
	Course Assistant Stanford, CA	2018.09 - 2019.03
	<ul style="list-style-type: none"> • Course assistant for Andrew Ng's Deep Learning course CS230. • Created the weekly discussion sections and educational tutorials. 	
	Co-Instructor Santa Barbara, CA	2023.09 - 2023.12
	<ul style="list-style-type: none"> • Co-taught UCSB's ECE-3: Python Programming for Science & Engineering. 	
TALKS AND WORKSHOPS	• KITP Deep Learning Program. Participant. Santa Barbara, CA.	2023.11
	• IAIFI Summer Workshop. Presented plenary talk. Boston, MA.	2023.08
	• Princeton ML Theory Summer School. Participant. Princeton, NJ.	2023.06
	• ICLR 2023. Presented spotlight talk. Kigali, RWND.	2023.05
	• Sparsity in Neural Networks. Presented poster. Virtual.	2021.07
	• Physics \cap ML. Presented talk. Virtual.	2021.02
	• ML and the Physical Sciences workshop. Presented poster. Virtual.	2020.12
	• DeepMath workshop. Presented poster. Virtual.	2020.11
	• Institute for Advanced Study. Presented spotlight talk. Princeton, NJ.	2019.10
	• ICML 2019. Presented oral talk. Long Beach, CA.	2019.06
	• Models, Inference and Algorithms. Presented talk. Cambridge, MA.	2019.02
	• OECD. Presented paper on data literacy. Paris, FR.	2017.10