

# BLAKE BORDELON

29 Oxford St. Pierce Hall 309 ◊ Cambridge, MA  
blake\_bordelon@g.harvard.edu ◊ 713-876-1914 ◊ blakebordelon.github.io

## EDUCATION

---

<b>Harvard University</b>	<i>July 2019 - Present</i>
Program: PhD in Applied Mathematics Advisor: Cengiz Pehlevan	GPA: 4.0/4.0
<b>Washington University in St. Louis</b>	<i>August 2015 - May 2019</i>
Majors: Systems Engineering and Physics. Minor: Computer Science	GPA: 4.0/4.0

## PREPRINTS

---

**Neural Networks as Kernel Learners: The Silent Alignment Effect** Atanasov\* Bordelon\*, Pehlevan 2021

**Capacity of Group-invariant Linear Readouts from Equivariant Representations**, Farrell\*, Bordelon\*, Trivedi, Pehlevan, 2021

**Learning Curves for SGD on Structured Features**, Bordelon, Pehlevan, 2021

**Rapid Feature Evolution Accelerates Learning in Neural Networks**, Shan\*, Bordelon\*, 2021

**Population Codes Enable Learning from Few Examples By Shaping Inductive Bias** Bordelon, Pehlevan, 2020

## JOURNAL PUBLICATIONS

---

**Spectral Bias and Task-Model Alignment Explain Generalization in Kernel Regression and Infinitely Wide Neural Networks**, Canatar, Bordelon, Pehlevan, *Nature Comms.* 2021.

**Dispersive optical model of Pb-208 generating a neutron-skin prediction beyond the mean field**, Atkinson, Mahzoon, Keim, Bordelon, Pruitt, Charity, and Dickhoff, *Phys. Rev. C*, 2020

**Pre-Synaptic Pool Modification (PSPM): A supervised learning procedure for recurrent spiking neural networks**, Bagley, Bordelon, Moseley, Wessel, *PLOS ONE*, 2020

## REFEREED CONFERENCE PRECEEDINGS

---

**Out-of-Distribution Generalization for Kernels**, Canatar, Bordelon, Pehlevan, *Neurips* 2021

**Efficient Online Inference for Nonparametric Mixture Models**, Shaeffer, Bordelon, Khona, Pan, Fiete *Uncertainty in Artificial Intelligence* 2021

**Spectrum Dependent Learning Curves in Kernel Regression and Wide Neural Networks**, Bordelon, Canatar, and Pehlevan, *International Conference of Machine Learning*, 2020.

## PRESENTATIONS

---

**SGD on Structured Features: Stability and Optimal Batch Size**, Deepmath 2021 (Talk)

**Neural Populations Learn from Few Examples through Code-Task Alignment**, Cosyne 2021.

**Statistical Mechanics of Generalization in Kernel Regression** Deepmath 2020 (Poster)

## AWARDS

---

NSF Simons Harvard Center Quantitative Biology Fellowship	<i>June 2021-2022</i>
McKelvey School of Engineering Valedictorian	<i>May 2019</i>
Nishi Luthra Senior Prize in Physics	<i>May 2019</i>

## TEACHING EXPERIENCE

---

Teaching Fellow for Neural Computation (Certificate of Distinction)  
Teaching Assistant for Engineering Math

*Fall 2020*  
*August 2017-May 2018*

## **PROGRAMMING LANGUAGES**

---

Strong Proficiency in Python (numpy, scipy, JAX, Pytorch, etc). Proficient in Matlab and C++.