Sara Fridovich-Keil

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Education

University of California, Berkeley (EECS PhD candidate) 2018-pres.

- Advisor: Benjamin Recht GPA: 4.00
- Coursework: Randomness and Computation, Robust Statistics, Mathematics of Data Science, Convex Optimization Theory, Optimization Algorithms, Theoretical Statistics, Linear System Theory, Inverse Problems in Medical Imaging

Princeton University (Bachelor of Science in Electrical Engineering, *summa cum laude*) 2014-2018

- Advisor: Peter J. Ramadge GPA: 3.98
- Certificates (Minors): Applications of Computing, Robotics and Intelligent Systems

Publications

Preprints

- **S. Fridovich-Keil**, R. Gontijo Lopes, and R. Roelofs, "Spectral Bias in Practice: The Role of Function Frequency in Generalization," 2021.
- **S. Fridovich-Keil** and B. Recht, "Approximately Exact Line Search," 2020.

Conferences

- A. Yu*, **S. Fridovich-Keil***, M. Tancik, Q. Chen, B. Recht, and A. Kanazawa, "Plenoxels: Radiance Fields Without Neural Networks," *CVPR*, 2022.
- M. Tancik*, P. Srinivasan*, B. Mildenhall*, **S. Fridovich-Keil**, N. Raghavan, U. Singhal, R. Ramamoorthi, J. Barron, and R. Ng, "Fourier Features Let Networks Learn High Frequency Functions in Low Dimensional Domains," *NeurIPS*, 2020.
- V. Shankar, A. Fang, W. Guo, **S. Fridovich-Keil**, L. Schmidt, J. Ragan-Kelley, and B. Recht, "Neural Kernels Without Tangents," *ICML*, 2020.
- R. Roelofs*, **S. Fridovich-Keil***, J. Miller, V. Shankar, M. Hardt, L. Schmidt, and B. Recht, "A Meta-Analysis of Overfitting in Machine Learning," *NeurIPS*, 2019.
- **S. Fridovich-Keil** and P. J. Ramadge, "Contact Surface Area: A Novel Signal for Heart Rate Estimation in Smartphone Videos," *IEEE GlobalSIP*, 2018. Based on senior thesis.

Workshops

- R. Roelofs*, **S. Fridovich-Keil***, J. Miller, V. Shankar, M. Hardt, L. Schmidt, and B. Recht, "A Meta-Analysis of Overfitting in Machine Learning," *Understanding and Improving Generalization in Deep Learning (at ICML)*, 2019.
- **S. Fridovich-Keil** and B. Recht, "Choosing the Step Size: Intuitive Line Search Algorithms with Efficient Convergence," *OPT (co-located with NeurIPS)*, 2019. [full version]

Teaching

- Graduate Student Instructor, Computability and Complexity (Berkeley CS 172) Spring 2021
  - Hold two weekly (remote) discussion sections and office hours, prepare course content, grade exams
- Graduate Student Instructor, Statistical Learning Theory (Berkeley EECS 281) Fall 2019
  - Hold weekly office hours, prepare homework and exams, grade exams
- Teaching Assistant, Building Real Systems (Princeton ELE 302, "Car Lab") 2018
  - Assist students with designing and building circuitry and programming PID control
- McGraw Center Head Tutor, Mathematics (Princeton) 2015-2018
  - Tutor peers in multivariable calculus and linear algebra

Honors and Awards

- NSF GRFP 2019
- EECS Excellence Award, UC Berkeley 2018
- G. David Forney, Jr. Prize for communication sciences, systems, and signals at Princeton 2018

- Tau Beta Pi Prize for service to Princeton's School of Engineering and Applied Science 2018
- Barry M. Goldwater Scholarship 2016
- Shapiro Prize for Academic Excellence – awarded to top ~2% of each Princeton class 2015, 2016
- Society of Women Engineers Fran O'Sullivan Women in Lenovo Leadership Scholarship 2014

Invited Talks

- "Spectral Bias in Practice" at Shanghai Jiao Tong University, AI + Math Seminar December 2021
- "Spectral Bias in Practice" at Google Brain, Deep Phenomena Research Seminar November 2021
- "Spectral Bias in Practice" at Google Brain, Reliable Deep Learning Seminar November 2021
- "Fourier Features & Kernels: A First Step Towards Machine Learning in Medium Dimensions" at Aerospace Corporation, Data Science and AI Seminar August 2020

Provisional Patents

- Measuring Vital Signs via Video (EFS ID: 32565408) May 2018
- Measuring Heart Rate and Other Vital Signs via Video, Remotely and Near Real-Time (EFS ID: 29412038) June 2017

Outreach and Service

- Women in Computer Science and Electrical Engineering (WiCSE, Co-President) 2021-pres.
  - Support the community of women PhD students at Berkeley EECS
  - Outreach Co-Chair, 2019-2020: Organize mentoring for undergraduates and first-year PhD students, as well as lab tours and engineering activities for Girl Scouts
- Electrical Engineering Graduate Student Association (EEGSA, Officer) 2021-pres.
  - Survey students after the preliminary exam and report feedback to faculty
  - Start and maintain a collection of donated academic regalia students can borrow
- Organization of Jewish Graduate Students (OJGS, Co-President) 2019-pres.
  - Organize social events for Jewish graduate students, affiliated with Berkeley Hillel
- Bay Area Scientists in Schools (BASIS, Volunteer) 2018-pres.
  - Teach electrical engineering lessons to elementary school classes
- Princeton Engineering Education for Kids (PEEK, Co-Leader) 2014-2018
  - Lead hands-on engineering activities with students at local elementary and middle schools
- Engineering Council (ECouncil, President) 2015-2017
  - Oversee Princeton ECouncil committees and events, including annual Excellence in Teaching Awards based on student voting
- School of Engineering Interactor 2016-2017
  - Mentor incoming Princeton engineering students, and help them choose courses

Reviewing

- Invited reviewer for NeurIPS, ICML, ICLR
- Delegated reviewer for JMLR, ICRA, SIGGRAPH

Experiences

- Google Brain Research Internship & Student Researcher (Remote) 2021-pres.
  - Research on spectral bias of machine learning models
- Google Software Engineering Internship (Mountain View) 2018
  - Signal processing with sensor data as part of the Android team
- Google Software Engineering Internship (Mountain View) 2017
  - Project combining computer vision and graphics on the Geo team
- Microsoft Imagine Cup (World Finalist, team Pulse Pal) 2017
  - API to estimate heart rate and heart rate variability from a face video
- Junior Independent Research (Princeton University) 2016-2017
  - Algorithm to estimate heart rate from a face video, advised by Prof. Paul Cuff
- Google Engineering Practicum Internship (New York City) 2016
  - Designed and developed a desktop application for developer workflow
- Sophomore (Fall) Independent Work at Princeton University 2015

- Optimized efficiency of organic LED via refractive index tuning of MoO_3-PEDOT:PSS, advised by Prof. Barry Rand

- Project X Internship at Princeton University 2015
  - Grew and characterized thin-film ZnO, advised by Prof. Barry Rand

Skills

- Programming: I use Python and LaTeX regularly. In the past, I've used MATLAB, Java, C, JavaScript, Elm, R, Verilog, Mathematica, GLSL, and C++
- Languages: English (native), Spanish

Professional Societies

- Phi Beta Kappa (early induction) joined 2017
- Tau Beta Pi Engineering Honor Society, Sigma Xi Scientific Research Society joined 2016
- Society of Women Engineers joined 2014