Eric Perkerson

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Skills

- **Programming:** *General Programming:* Python, Julia, Mathematica, Matlab, R. *Data and Machine Learning Libraries:* Python.SciPy Stack (Pandas, Scikit-Learn, Matplotlib), Julia.Flux. *Other Languages:* SQL, Bash, LaTeX, HTML.
- **Software:** *Operating Systems:* GNU/Linux, Windows, Mac OS. *Version control:* Git.
- **Mathematics:** *Pure Math:* linear algebra, calculus, convex/non-convex optimization, functional analysis, real analysis, complex analysis, compressive sensing, partial differential equations, combinatorial topology. *Computer Science:* data structures & algorithms. *Statistics:* Bayesian data analysis, econometrics, time series analysis, statistical regression, nonparametric data analysis, statistical learning theory, causal inference. *Machine Learning:* supervised and unsupervised learning, classification, clustering, regression, sparsity-based techniques, computer vision.
- **General:** Public speaking, mathematics education, college teaching.

Education

- **Mathematics, Ph.D. (2019) and B.S. (2013)** — Athens, GA
  University of Georgia — 2019
- **Economics, M.A. (2014) and A.B. (2013)** — Athens, GA
  University of Georgia
  Awards: Outstanding Achievement in Economics — 2014

Work

- **C2 Education:** *Teacher* — 2020 – Present
  – Taught math, statistics, physics, and computer science for students from 4th grade to college in a 3-on-1 setting, including math for the SAT/ACT.
- **University of Georgia:** *Graduate Teaching Assistant* — 2013 – 2019
  – Taught as an instructor of record for first year mathematics courses with complete control and autonomy of class assignments, structure, and grading. Additionally worked as a teaching assistant for upper-level and graduate mathematics courses.
  – *Instructor of record:* Differential Calculus, Integral Calculus, Precalculus, Mathematics of Decision Making (includes topics from Graph Theory, Discrete Mathematics, Operations Research).
  – *Teaching Assistant:* Graduate Real Analysis, Probability, Sequences of Series, Differential Calculus, Integral Calculus.
- **Federal Reserve Bank of Atlanta:** *Programing and Data Internship* — 2013
  – Data cleaning and data integrity using MySQL, Python, and Mathematica. Worked with financial data on Eurodollar futures and options.
  – Focused on repairing a corrupted database with tens of millions of entries using techniques from math and finance to identify outliers and corrupted data.

Research

- **Learning with Noise, Sparse Errors, and Missing Data:**
  - Successfully defended PhD dissertation on mathematical aspects of machine learning in contexts with heavily corrupted data.
  - Focused on applications in computer vision, including feature-track clustering in video, facial recognition, and manifold learning.
  - Wrote codebase for numerical experiments in Julia using the Flux deep-learning library for using and training neural networks.
  - Extended the orthogonal greedy algorithm and the proximal forward-backward splitting algorithm to more general algorithms for solving problems in these domains.
- **Singular Level Curves of Harmonic Functions:**
  - Wrote software for computing a discrete harmonic conjugate function to the solution of a partial differential equation.
  - Generated visualizations on large triangulations and Voronoi tessellations with over 10,000 triangles.
  - Optimized functions in Mathematica by writing procedural-style code, sometimes improving speed by a factor of 10^8 over computation over code using built-in Mathematica functions.
  - Published results in *Singular Level Curves of Harmonic Functions, Conformal Mappings and Emerging Applications to Shape Recognition of Planar-domains*, with Sa'ar Hersonsky, Int'l Conf. Image Proc., Comp. Vision, and Pattern Recognition (2019), 85–88.