Julien Brenneck

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EDUCATION

University of Massachusetts Amherst

PhD in Mathematics (Dropped out!) — Sep 2021 – Oct 2022

M.S. in Applied Mathematics — May 2021

B.S. in Mathematics and Computer Science (Double Major) — Jan 2019

- Major GPA: 3.98 / 4.0

EXPERIENCE

NeuralFrame (Medical Data Startup)

Senior Engineer — May 2024 – Present

- Lead backend development (2-5 people) and AI features (mainly summarizing with RAG).
- Built SOC2 secure data pipelines for dozens of hospitals, including the VA.
- Main product (Cancer Registry) saw market-share grow from two to ten percent.

Software Engineer — Nov 2022 – May 2024

- Rebuilt all test infrastructure, leading to large decrease in support costs.
- Built and maintained modern web backends in FastAPI, unifying legacy Flask microservices.

UMass Amherst, Nanoelectronics Theory and Simulation Laboratory

Research Assistant — May 2017 – Oct 2022

- Developed FEAST-type contour based eigensolver algorithms (included in Intel MKL).
- Independently developed novel nonlinear eigenvalue algorithm outperforming previous techniques.
- Built high performance, highly parallel solvers using Fortran, Julia, and Python.

UC Berkeley / Lawrence Berkeley National Laboratory, Materials Science

Research Assistant (SULI Program) — May 2018 – Sep 2018

- Conducted literature review on machine learning methodology in materials informatics.
- Designed experiments with materials data to highlight methodological breakdown of ML models.
- Worked on job optimization in a compute pipeline/framework for supercomputer workflows in Python.

Art of Problem Solving

Grader (Python and Math Olympiad) — Dec 2015 – Jun 2017

AWARDS

Outstanding Undergraduate Course Assistant — 2017

- For work as TA for Compsci 121: Introduction to Programming at UMass Amherst (awarded twice).

Scholastic Art and Writing National Gold Medal — 2014

- For work in generative computer graphics.

SKILLS

Python, Julia, Haskell, JS/TS, Nix/NixOS, FORTRAN, LaTeX, SQL
Numerical Algorithms, High Performance Compute, Parallel & Concurrent Programming

PUBLICATIONS

An Iterative Method for Contour-Based Nonlinear Eigensolvers [arXiv]

- First author — a highly parallel iterative algorithm, all code is open source (Fortran/Julia).

Rocketsled: A Software Library for Optimizing High-Throughput Computational Searches — 2019

- Second Author — a modern computational pipeline enabling ML optimization for supercomputer workflows.

POSTERS

Cross-Validation Methodology in Materials Science [pdf] — 2018

- Showcasing the importance of methodology with high dimensional data such as in materials science.

Bayesian Hyper-Parameter Optimization for Neural Networks [pdf] — 2018

- Presenting my graduate work designing experiments to study optimization techniques (TensorFlow).

TALKS

Iteration for Contour-Based Nonlinear Eigensolvers [pdf] — 2020

- Gave a technical overview of my novel nonlinear eigenvalue algorithm.
- Presented at CERFACS Sparse Days 2020 and at SIAM Annual meeting 2021.