(301) 910 - 7618
aaron.m.stahl@gmail.com

Aaron M. Stahl

LinkedIn:// aaronmstahl
Github:// astahl3

Computational research scientist with over ten years of professional experience, including six years advancing two pioneering research domains within the field of physics. Skilled in programming, analytical modeling, machine learning, and parallel & distributed computer (HPC). Excels at developing systematic approaches to making sense of information.

EXPERIENCE

RESEARCH AFFILIATE   APR 2024 — PRESENT
Georgia Institute of Technology | Atlanta, GA

- Created market sentiment classification architecture for large social media datasets using (1) a fine-tuned finBERT model, and (2) OpenAI API endpoint completion (GPT-3.5 Turbo) in Python.
- Built AI-driven investment classification model, generating trade signals from a network model trained on vectorized social media passages, concatenated network metrics, and time-series data for underlying market securities.

GRADUATE RESEARCH SCIENTIST   AUG 2018 — MAY 2024
School of Physics, *Georgia Institute of Technology* | Atlanta, GA
Selected Awards: Herbert P. Haley Fellowship, Georgia Tech Quantum Alliance Fellowship (x2)

Computational Plasma Physics

- Programmed highly-parallelized, 3-D computational models in C++ to study plasma dynamics and magnetospheric physics; authored original, peer-reviewed research articles in leading space physics journal.
- Applied advanced statistical techniques (e.g., minimum variance analysis, multivariate regression) to large, multi-dimensional datasets to extract key features of moon-plasma interaction dynamics using Python.
- Translated broad scientific research goals into quantitative questions that could be answered by combining computational model results with empirical data (e.g., *in situ* spacecraft time-series measurements).

Computational Quantum Physics

- Created novel deep learning model of stacked convolutional neural networks to accurately reconstruct sparsely sampled low-energy quantum states using supervised learning with Python and TensorFlow
- Leveraged tensor network methods to create several novel algorithms for reconstructing quantum wavefunctions from small, random samplings of the state coefficients using Matlab and Python.
- Employed original tensor algorithms to extract new properties about the scaling behavior of entanglement entropy and information density in locally interacting quantum systems on finite 1-D and 2-D lattices.

UNDERGRADUATE RESEARCH ASSISTANT   AUG 2016 — MAY 2018
School of Physics, Joint Quantum Institute, *University of Maryland* | College Park, MD

- Generated computational models to perform circuit simulations in LTSPICE and built novel apparatuses for a laboratory experiment studying controllable disorder in ultracold quasi-2D Bose gasses.
- Designed and constructed original, bespoke circuitry to levitate quantum condensates during imaging procedures; device facilitated data production for several peer-reviewed publications.
- Programmed numerical implementation of the Gross-Pitaevskii equation for disordered systems in Matlab.

CO-FOUNDER   OCT 2012 — AUG 2014
Steelfire Investments, LLC | Bethesda, MD

- Founded investment firm anchored in cutting-edge academic research on the optimal implementation and management of ultra low-cost, equal-weighted, index-oriented portfolios.
- Implemented portfolio construction protocols, data pipeline using industry tools / APIs (e.g., Datastream).

ANALYST   OCT 2008 — SEP 2011
Strategic Investment Group, LLC | Rosslyn, VA

- Performed quantitative and qualitative analysis on performance and risk management metrics for institutional portfolios and endowment funds. Built new vintage-year weighted benchmarking scheme for PE portfolios.
- Created an automated, real-time data analytics pipeline for informing daily futures trading activity. Resulting product was adopted across all client portfolios and recognized via annual company-wide "Brilliant Alpha" award.

CO-FOUNDER, DIRECTOR OF RISK MANAGEMENT   NOV 2007 — MAY 2008
Undergraduate Student Investment Fund, *University of Southern California* | Los Angeles, CA
- Co-founded inaugural Undergraduate Student Investment Fund at USC, contributed to initial capital campaign, and designed the fund's portfolio management framework and roles.
- Programmed quantitative model for the fund's completion portfolio, used regression techniques with the Fama-French 3-Factor model to the minimize fund's tracking error with respect to benchmark S&P 500.

EDUCATION
PhD in Physics, Georgia Institute of Technology   est. May 2024
BS in Physics, University of Maryland - College Park   May 2018
BA in Business, University of Southern California   May 2008

SKILLS
PROGRAMMING LANGUAGES: Python • C • C++ • Matlab • SQL
DEV. TOOLS: NumPy • SciPy • Matplotlib • MPI • OpenMP • OpenAI API • TensorFlow|Keras
DEV. SUPPORT: Git • Conda • Jupyter • Spyder • Linux | MacOS | Windows • Bash • GPT 3.5 | 4
MATH: Vector calculus • ODEs | PDEs • Linear algebra • Tensor methods • Probability • Statistics
OTHER: Excel | VBA • PowerPoint • Teams • SharePoint • LaTeX • Bloomberg | Datastream | FactSet

RECENT PUBLICATIONS

[1] **Aaron Stahl**, Peter Addison, Simon Sven, and Lucas Liuzzo. "A Model of Ganymede's Magnetic and Plasma Environment During the Juno PJ34 Flyby". In: *Journal of Geophysical Research: Space Physics* 128.12 (2023), e2023JA032113.

[2] Peter Addison, C. Michael Haynes, **Aaron Stahl**, Lucas Liuzzo, and Sven Simon. "Magnetic Signatures of the Interaction Between Europa and Jupiter's Magnetosphere During the Juno Flyby". In: *Geophysical Research Letters* 51.2 (2024), e2023GL106810.

[3] Lucas Liuzzo, Quentin Nénon, Andrew Poppe, **Aaron Stahl**, Sven Simon, and Shahab Fatemi. "On the Formation of Trapped Electron Radiation Belts at Ganymede". In: *Geophysical Research Letters* 52.2 (2024), 2024GL109058.

[4] **Aaron Stahl** and Glen Evenbly. "Reconstruction of Randomly Sampled Quantum Wavefunctions using Tensor Methods". In: *arXiv preprint arXiv:2310.01628* (2023).