

Darian Nwankwo, Ph.D.

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Summary

Computational scientist and machine learning researcher who ships and owns production systems end-to-end. PhD in computer science grounded in applied mathematics, numerical methods, and Bayesian optimization; named inventor on a patent and published researcher, with research internships at LinkedIn, AMD, IBM, and Adobe. Currently founding engineer of a live ML product, owning everything from the mathematical model to the production infrastructure. Equal parts rigorous researcher and 0-to-1 builder.

Technical Skills

Languages: Python, Julia, TypeScript/JavaScript, C++, SQL, Bash, R, MATLAB

ML & Decision-Making: Bayesian optimization, Gaussian processes, probabilistic ML, sequential decision-making under uncertainty (MDPs, rollout / approximate dynamic programming), uncertainty quantification, stochastic gradient estimation, variance reduction (QMC, control variates)

Scientific Computing & HPC: numerical analysis, matrix computations, numerical optimization, physics-informed and surrogate modeling, parallel and high-performance computing

Engineering & Infra: React/Next.js, FastAPI, SQLAlchemy, PostgreSQL, pandas/NumPy, Docker, CI/CD, cloud deployment (DigitalOcean)

Experience

Founding Engineer (Contract), ArcScore AI

Oct 2025 – Present

NIL athlete-valuation platform

Remote

- Architected and built the full product end-to-end as sole founding engineer (a Next.js/React/TypeScript front end, FastAPI back end, and provider-agnostic Python data pipeline), taking ArcScore from a rough MVP to a live, production-ready platform launched in June 2026.
- Designed the core valuation engine (Performance and Marketability Indices → ArcScore → NIL valuation) as one of three modeling leads (alongside PhDs in statistics and operations research), owning the mathematical model and its implementation, the company's primary intellectual property.
- Provisioned and hardened production infrastructure across ~10 managed services on DigitalOcean (App Platform, managed Postgres, Arq + Valkey job queue) with Clerk auth, Doppler secrets, and Sentry/PostHog observability; stood up CI/CD and separate staging and production environments.
- Scaled delivery by scoping and directing a 2-engineer contract pod to harden the Figma-based front end, reclaiming focus for the valuation model and backend; planned and drove the full roadmap in Linear.
- Built the engineering foundation at a company that has raised \$1M and signed deals with top-tier brands while still pre-revenue.

Graduate Researcher (PhD), Cornell University

Aug 2018 – Present

Advisor: David Bindel

Ithaca, NY

- Dissertation, *Practical Algorithms for Multi-Step Lookahead Bayesian Optimization*: three projects that together make non-myopic Bayesian optimization computationally practical.
- **Differentiable rollout**: developed trajectory-based rollout acquisition functions with adjoint-mode stochastic gradients whose cost is *independent of input dimension*, paired with variance-reduction techniques (quasi-Monte Carlo, common random numbers, control variates) for low-variance, gradient-based optimization of the acquisition function.
- **Adaptive horizons**: designed a horizon-scheduling framework that adapts lookahead depth per state based on marginal gain per unit compute.
- **Cost-aware rollout**: built acquisition policies that embed budget dynamics directly into the rollout, so evaluation cost shapes the lookahead itself.

Applied Research Intern, LinkedIn

Summer 2023

Applied Research team

Mountain View, CA

- Built a predictive model for a proprietary 9-figure hardware-allocation forecasting problem, improving performance **13.39%** over the existing methodology.

Scientific ML Research Intern, AMD Research

2022

Scientific Machine Learning

Austin, TX

- Developed uncertainty-quantification methods (Bayesian and ensemble) for ML surrogate models that accelerate expensive physics-based simulations, enabling on-the-fly detection of unreliable predictions.
- Co-invented a **patented** AI-acceleration method (US 2025/0005236 A1) and co-authored a NeurIPS 2022 ML4PS workshop paper showing physics-informed neural networks reduce model uncertainty while improving extrapolation accuracy.

Analog AI Research Intern, IBM Research

Summer 2021

Analog AI

San Jose, CA

- Researched local control of 2D-mesh routing for analog AI accelerators (*Making the (Data-)Trains Run on Time*).

Research Intern, Adobe Research

Summer 2018

Dialog Systems, NLP & ASR

Ithaca, NY

- Integrated voice and gesture commands to manipulate 2D images, combining speech recognition and natural-language understanding.

Selected Publications & Patent

- **Patent US 2025/0005236 A1:** *Device and Method for Accelerating Physics-Based Simulations Using Artificial Intelligence*. White, L., Nwankwo, D., Hora, G. (2025).
- Nwankwo, D., Bindel, D. *Differentiating Policies for Non-Myopic Bayesian Optimization*. arXiv preprint, 2024.
- Basu, K., et al. (incl. Nwankwo, D.). *Uncertainty Quantification Methods for ML-based Surrogate Models of Scientific Applications*. NeurIPS 2022, ML4PS Workshop.
- Nwankwo, D., Bindel, D. *Strategies for Non-myopic Bayesian Optimization*. INFORMS 2022 Annual Meeting (Flash Paper).

Education

Ph.D., Computer Science, Cornell University

Aug. 2026

Machine Learning; dissertation defended July 2026

Ithaca, NY

M.S., Computer Science, Cornell University

Advisor: David Bindel

Ithaca, NY

B.S., Computer Science, Morehouse College

Advisor: Shelby Wilson

Atlanta, GA