

ALAN J. NAWOJ

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EDUCATION

Harvard University Cambridge, MA
Master of Science in Computer Science (GPA: 3.79/4.00) June 2004

Cornell University Ithaca, NY
Bachelor of Science in Electrical and Computer Engineering (GPA: 4.02/4.30), Summa Cum Laude May 2001
• **Honors:** Tau Beta Pi Engineering Honor Society · Eta Kappa Nu Electrical Engineering Honor Society

University of California, San Diego San Diego, CA
Advanced Post-Graduate Coursework (Continuing Education) 2026

- **ECE 273 (Convex Optimization):** Rigorous, proof-based mathematical optimization. Grade: **A** (Spring 2026)
- **Math 189 (Data Analysis & Inference):** Probability and statistical inference using R. Grade: **A+** (Summer 2026)

PROFESSIONAL EXPERIENCE

Beacon Mobile LLC (Acquired by Vontier Corporation, NYSE: VNT) San Diego, CA
Founder & Chief Executive Officer / System Architect 2015 – 2025 (Full-Time), 2009 – 2015 (Part-Time)

- **Exit & Scale:** Solo-founded and bootstrapped an automotive IoT and mobile software platform to a successful acquisition by Vontier/DRB; scaled backend to process millions of transactions across 3 continents for enterprise brands.
- **Architecture & Software Development:** Acted as sole System Architect for the entire hardware/software stack. Personally authored over 600,000 lines of source code spanning embedded firmware, cloud native microservices (APIs) on AWS, and mobile platforms (iOS, Android, Web).
- **IoT Engineering:** Designed and deployed hundreds of custom microcontroller-based IoT devices (Arduino, Raspberry Pi) with industrial sensor and I/O components to interface seamlessly with disparate legacy hardware configurations.
- **AI/Voice Innovation:** Conceptualized and built *VoiceWash*, the industry's first voice-activated car wash payment and hardware activation system utilizing Amazon Alexa Voice Skills and custom hardware APIs and devices.
- **Executive Leadership:** Directed global corporate scaling strategy and vision, legal, marketing, full P&L management, and cross-functional engineering teams. Authored complex technical onboarding videos to preserve operational continuity post-acquisition by Vontier Corporation (NYSE: VNT), an international leader in automotive technology.

Charles River Development (FinTech Analytics) Burlington, MA
Software Architect / Technical Team Lead 2009 – 2015

- Managed two engineering teams and developed core, high-performance algorithms (Java, C#) based on mathematical frameworks (e.g. Principal Component Analysis (PCA)) to assess portfolio risk for global financial institutions.

Deloitte Consulting Boston, MA
Software Architect / Technology Lead 2004 – 2009

- Architected custom Java/C# web applications for US and South African public sector clients; managed engineering teams, wrote core source code, and established foundational development frameworks used by subsequent projects.

Booz Allen Hamilton Rome, NY
Associate / Software Engineer 2001 – 2003

- Developed high-performance code in C for a custom data aggregation and analysis application used by multiple US defense intelligence agencies; maintained an active Top Secret Security Clearance.

PUBLICATIONS & PATENTS

- **Nawoj, A. J.** (2019). *Method for Managing Car Wash Membership Programs Using Unique Vehicle Identifiers from Connected Cars*. US Patent Application Publication No. US 2020/0226584 A1 (Filed Dec 2019). Sole inventor of edge-computing methodology leveraging vehicle telemetry data via external APIs and on-premise sensors for hardware activation and membership management at automatic car wash sites.
- Lorincz, K., Malan, D., Fulford-Jones, T., **Nawoj, A.**, Clavel, A., Shnayder, V., Mainland, G., Welsh, M., and Moulton, S. "Sensor Networks for Emergency Response: Challenges and Opportunities." *IEEE Pervasive Computing*, Vol. 3, No. 4, Oct–Dec 2004.

- **Nawoj, A. J.** “Energy Tradeoffs between Collection-Based Routing Protocols in Wireless Sensor Networks.” *Harvard University Technical Report* TR-03-04, Feb 2004.
- **Nawoj, A. J.** and Gorniak, M. J. “Ontology Development Challenges and Applications Using the DARPA Agent Markup Language (DAML).” *Air Force Research Laboratory Technical Report*, Sept 2003.
- **Nawoj, A. J.** “Parallel Processing in Java-based Web Applications.” *Deloitte Consulting Java Technology Group (JTG) Newsletter*, Edition JTGNL 21, Feb 2009.

SELECTED RESEARCH & ACADEMIC PROJECTS

Review: Momentum-Based Variance Reduction in Non-Convex SGD

UCSD ECE 273 · 2026

- Analyzed optimization bounds in non-convex stochastic gradient descent settings with a focus on the STochastic Recursive Momentum (STORM) algorithm which utilizes the concept of momentum for variance reduction.
- Formulated and tested a hypothesis that STORM may converge faster for loss function scenarios where high gradients are observed early on in the algorithm’s execution by applying an exponential forgetting factor (EFF) in the denominator of the adaptive learning rate component of STORM.
- Designed and ran numerous simulations of my proposed algorithmic variation to STORM with custom Python scripts for different constant values of the EFF and highlighted convergence rate performance with plots generated by matplotlib.
- Further modified my adjustment to the adaptive learning rate formula based on observations of my initial simulations by incorporating a time-varying exponential forgetting factor in the denominator and produced empirical results from my Python simulations that consistently outperformed the convergence rate of the original STORM algorithm within a standard epsilon stopping threshold value against a commonly used non-convex benchmark function.

Binomial Distribution Computational Analysis in R

UCSD Math 189 · 2026

- Completed a rigorous mathematical and C source code audit examining how the open-source R programming language computes binomial distribution probabilities with high precision for a very wide range of sample sizes despite the massive factorial calculations in the binomial probability mass function (PMF) and floating-point number limitations.
- Outlined a step-by-step mathematical derivation of current R binomial PMF logic with an explanation of the key floating-point logic limitations that were overcome by use of the Stirling’s approximation formula for factorials and the related Stirling’s approximation error function which can be computed with high precision via an asymptotic series.

TECHNICAL SKILLS

- **Hardware & Embedded Systems:** IoT Device Design, Microcontrollers (Arduino), Single-Board Computers (Raspberry Pi), Sensor Integration, Circuit/Hardware Prototyping
- **ML & Data Science:** TensorFlow, Scikit-learn, Predictive Modeling, Statistical Data Analysis, Neural Networks, Pandas, Matplotlib
- **Optimization & Scientific Computing:** Convex Optimization Modeling, Numerical Optimization, Monte Carlo Simulation, SciPy, NumPy, Applied Machine Learning, R
- **Programming Languages:** Python, C, Objective-C, C#, Java, Swift, PHP, SQL, JavaScript (React, Angular)
- **Systems & Infrastructure:** Linux/Unix, AWS (EC2, RDS, API Gateway), Enterprise System Architecture, Git

HONORS, AWARDS & ACHIEVEMENTS

Professional & Academic Honors

- **Invited Keynote Speaker**, ZS Associates Annual Conference 2025
Delivered keynote address titled “*Relentless: A Personal Journey of Commitment to Excellence.*”
- **Tech Startup Incubator**, CONNECT Springboard Accelerator 2018 – 2019
Accepted into and successfully completed the intensive CONNECT startup incubator program for my solo-founded, innovative hardware/software-based tech startup which I scaled to successful acquisition by a publicly traded company.
- **Professional Certifications**
Coursera DeepLearning.AI Stanford Online Machine Learning Specialization (3 Courses) 2025
Project Management Professional (PMP) 2009
- **Second Place Winner**, Harvard Entrepreneurial Contest (For-Profit Track), Harvard University 2004
- **Class Valedictorian** (Rank 1/281), AP Scholar with Distinction, Whitesboro High School 1997

Elite Athletic Achievements

- **Top USA Finisher**, World Marathon Challenge (7 Marathons, 7 Continents, 7 Days) [777runner.com] 2025
Placed 2nd Overall Male globally; secured individual male victories in Antarctica, Asia, and Europe.
- **Guinness World Record Holder**, Fastest Aggregate Marathon Times on 7 Continents 2014 – 2018

- **Overall Champion** (1st Place Finisher), Antarctica Marathon [en.wikipedia.org/wiki/Antarctica_Marathon] 2013
- **Global Endurance Athletics Portfolio** 2001 – Present
Completed 39 competitive global marathons thus far, including 5 Boston Marathons
Profiled in *Runner's World* and major broadcast networks (ABC, Fox, NBC)
- **Second Degree Black Belt**, Shaolin Kempo Karate 1996

COMMUNITY ENGAGEMENT & VOLUNTEERISM

- **Father Joe's Villages (San Diego):** Distribute hot meals to homeless populations in downtown San Diego.
- **Casas de Luz:** Help build simple residential homes for families in need in Tijuana, Mexico.
- **Entrepreneurial Mentorship:** Provide tactical engineering roadmap advisory, guidance, and scaling strategies to several early-stage technology entrepreneurs.