NIMA ALIZADEH

Green Card Holder (U.S.)
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SUMMARY

Materials Engineer with a Ph.D. in Polymer and Fiber Engineering and 7+ years of experience supporting product development through advanced polymer formulation, materials testing, and process optimization. Proven track record solving technical challenges across aerospace, automotive, and electronics sectors. Skilled in scaling materials from lab to manufacturing, performing root cause analysis, and collaborating with cross-functional teams to meet reliability, quality, and performance targets.

EDUCATION

Auburn University

· Ph.D. & M.S., Polymer and Fiber Engineering (**GPA**: 3.93/4.0) Jan. 2017 - May 2021
Ph.D. Thesis: Acrylic-polyurethane based graft-interpenetrating polymer networks for high-performance applications.
M.S. Thesis: Crosslinkable 3D printing inks for biomedical applications.

University of Tehran

· B.Sc., Polymer Engineering Sept. 2011 - Feb. 2016
Thesis focus: Nano-biocomposites: properties, manufacturing processes, and applications in environmentally friendly packaging and agriculture.

WORK/RESEARCH EXPERIENCE

Periodic Labs Mar. 2026 - Present
Materials Lab Specialist (Contract)

· Operate advanced characterization and synthesis instruments including MPMS alongside LABMAN automation systems, executing up to 50 powder-based experiments per day to generate training data for a next-generation materials discovery LLM.
· Collaborate with scientists and engineers bridging computational simulation and real-world experimentation, performing instrument calibration, SOP development, and QC protocols to ensure data integrity.

Independent Consulting & Professional Development Aug. 2024 - Mar. 2026
Materials Scientist – AI-Driven Solutions and Technical Consulting

· Delivered freelance consulting services in advanced polymers, manufacturing, and materials development, providing technical problem-solving and strategic insights for early-stage projects and R&D teams.
· Supported development of AI/ML tools for materials science by performing expert data labeling, quality assurance, and real-world validation.

Saint-Gobain Jan. 2024 - Jul. 2024
Senior Research Engineer I

· Developed advanced and sustainable polymer systems for sealing and insulation with over 30% improvement in thermal stability, wear resistance, and mechanical flexibility for aerospace and automotive applications.
· Supported material selection and testing from concept to process optimization, collaborating with cross-functional teams on design validation and application-specific testing.
· Executed hands-on processing (extrusion, molding) and mechanical testing, contributed to FMEA discussions, and documented technical reports to guide scale-up decisions.

University of California, Santa Barbara Jun. 2021 - Sept. 2023
Postdoctoral Scholar, ***Materials Department***

· Developed DLP 3D printing resin with post-print surface modification using multilayer polymer electrolytes to enable tailored surfaces for electronics, biomedical devices, sensors, and metal ion capture.
· Led synthesis and validation of block copolymer materials for thin film patterning, in direct collaboration with Tokyo Electron, to support process integration and material qualification for semiconductor manufacturing.
· Developed test methods, performed root cause analysis on material failures, and optimized deposition and surface treatment workflows using analytical tools such as AFM, XPS, FTIR, and UV-Vis, among others.

Auburn University Jan. 2017 - May 2021
Graduate Research Assistant, ***Center for Polymers and Advanced Composites***

- Developed high-performance polyurethane-based graft interpenetrating polymer networks with 150% improvement in fracture toughness and stable performance across 25+ thermal cycles, enabling transparent, high-impact materials for composites, structural adhesives, and thermal management systems.
- Formulated and tested DIW 3D printing inks with tunable rheology, crosslinking, and dimensional stability; demonstrated functional parts with controlled architecture for biomedical and mechanical applications.
- Developed and tested polymer processing methods including compression molding, extrusion, and additive manufacturing; evaluated material performance through mechanical and thermal testing aligned with ASTM standards.
- Collaborated with internal and external partners to troubleshoot instrumentation, optimize experimental design, and ensure reproducibility and data integrity across multiple testing platforms.

TECHNICAL SKILLS

Materials Characterization: DMA, Tensile, Rheometry, Block-on-Ring, DSC, TGA, UV-Vis, FTIR, NMR, XPS, XRD, SEM, MPMS, AFM, Ellipsometry, Instrument Troubleshooting

Polymer Processing: Polymer Synthesis, Formulation, Injection Molding, Extrusion, Compression Molding, 3D Printing (SLA, DLP, FDM, DIW), Spin Coating

Technical Software: ChemDraw, Mnova NMR, TA Universal Analysis, DataGraph, LaTeX, AutoCAD, Adobe Photoshop

Programming: Python, MATLAB, C++

CERTIFICATIONS

- **Machine Learning Specialization**, Coursera – Stanford University and DeepLearning.AI, Andrew Ng, Jul. 2026.
  Supervised and unsupervised learning, neural networks, recommender systems, and reinforcement learning, implemented in Python.
- **Additive Manufacturing Specialization**, Coursera – Arizona State University, Dhruv Bhate, Aug. 2025.
  Polymer and metal AM processes including material extrusion, stereolithography, laser sintering, and powder bed fusion, with design for additive manufacturing.
- **Battery Technologies Specialization**, Coursera – Arizona State University, Arunachala Nadar Mada Kannan, Jul. 2025.
  Battery chemistries (Zn, Ni, Li), cell design, manufacturing and packaging, battery management systems, and EV applications.

PUBLICATIONS/CONFERENCES

Full list available on my website:

- **N. Alizadeh**, R. Broughton, M. Auad, "Graft semi-interpenetrating polymer network phase change materials for thermal energy storage", *ACS Applied Polymer Materials* **2021**, *3* (4), 1785-1794.
- **N. Alizadeh**, E. Triggs, R. Farag, M. Auad, "Flexible acrylic-polyurethane based graft-interpenetrating polymer networks for high impact structural applications", *European Polymer Journal* **2021**, *148*, 110338.
- **N. Alizadeh**, S. Bird, R. Mendez, K. Jajam, A. Alexander, H. Tippur, M. Auad, "Chapter 11 - Synthesis and characterization of high performance interpenetrating polymer networks with polyurethane and poly(methyl methacrylate). In *Unsaturated Polyester Resins*", S. Thomas, M. Hosur, C. Chirayil, Eds., Elsevier: **2019**, pp 243-255.

LEADERSHIP & ENGAGEMENT

- **Scientific Journal Reviewer**: Serving as scientific reviewer of manuscripts for high-impact scientific journals including Journal of Applied Polymer Science, Materials Letters, Polymers, and others.
- **President**, Auburn University Graduate Student Council, May 2019 - May 2020: Served as Auburn's Graduate Student Representative with 4000 graduate students on the Graduate Council and the Faculty Senate.

HONORS AND AWARDS

- **Three Minute Thesis (3MT) Finalist**, Auburn University, Nov. 2019 and Nov. 2020: Selected as finalist in Auburn's university-wide 3MT competition.
- **Finish in 5 Runner-Up**, Auburn University Council of Engineering Graduate Students, Mar. 2019: Awarded runner-up in the 5-minute research presentation competition.