

ALAN NGUYEN PHAM

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Ph.D. Candidate | Soft Robotics | Modular Pneumatics | AI-Assisted Computational Design

PROFILE

Mechanical engineering Ph.D. candidate with NASA L'SPACE, Sandia, NSF NRT, and WPI soft-robotics experience. Builds ambitious physical systems, turns vague behavior goals into testable mechanisms, teaches 90+ student groups, and keeps work clean, organized, and reliable under pressure.

CORE STRENGTHS

Fast learning | Communication | Clean work | Procedure discipline | Reliable execution | Teamwork
Safety awareness | Troubleshooting | Training/teaching | Documentation/inventory

SELECTED EXPERIENCE

Graduate Researcher - Soft Robotic Surfaces & Modular Pneumatics | WPI | Aug 2023-Present

- Lead research on monolithically printed Sarrus/PneuNet cells for morphing sheets, continuum bodies, object transport, crawling/rolling locomotion, and traveling-wave surfaces.
- Drove AI-assisted WaveVis development by defining target overhang/wave behavior, lattice sampling, connector/linkage constraints, UI flow, and output metrics for mechanism selection and CAD decisions.
- Developing FluxCell: scalable pneumatic-mechanical cells with shared inlet pressure, seal-when-uncoupled air connections, EPM/valve concepts, and manufacturable assembly strategy.

Soft Robotics Graduate Researcher - Project SELENE | NASA L'SPACE | Aug 2025-Present

- Lead CAD, 3D-printing, assembly, and test planning for a modular cable-driven soft robotic arm for terrain navigation and sample collection.
- Guide undergraduates, coordinate with NASA technical mentors, and keep fabrication decisions, tasks, and evaluation plans organized.

Graduate Research Intern - Nonlinear Dynamics | Sandia National Labs | Jun-Aug 2025

- Built analytical, MATLAB multibody, and finite-element submodels of an electromechanical ratcheting mechanism with contact, friction, springs, shock, and vibration.
- Ran parameter sweeps separating physical response from solver/modeling sensitivity; presented results for defensible setup choices before full-assembly studies.

Teaching Assistant - Stress Analysis, Statics, CAD | WPI | Aug 2023-Present

- Lead weekly sessions and office hours for 90+ student groups; explain difficult material clearly, patiently, and step-by-step.
- Prepare hands-on activities with professors and teaching teams; keep rooms organized and useful across mixed skill levels.

Hardware Research Assistant - Medical Robotics | WPI CMT Lab | Aug-Dec 2023

- Fabricated and assembled low-cost open-source actuation hardware for concentric tube continuum robots using sourced parts, BOMs, and guided build instructions.
- Integrated hardware with MATLAB kinematics and optical-tracking tests while coordinating sourcing, fabrication, and assembly across WPI facilities.

EDUCATION & RECOGNITION

Ph.D. Candidate, Mechanical Engineering - Worcester Polytechnic Institute, expected 2027 | M.S., Mechanical Engineering - CSU Long Beach, 2022 | B.S., Mechanical Engineering - Cal Maritime, 2019
NSF NRT FORW-RD Fellowship, 2024 | WPI Intercollegiate Soft Robotics Competition, 1st Place, 2024 | Accepted IMAC 2025 paper with Sandia NOMAD team | Public outputs: Sarrus, WaveVis, FluxCell

PRACTICAL SKILLS

3D printing; CAD; prototype assembly; pneumatics/airflow routing; pressure/force/displacement testing; soldering; hand tools; equipment setup; troubleshooting; BOM/inventory tracking; documentation; clean lab/shop habits; safety procedures; team training; people-facing instruction; AI-assisted technical iteration; MS Office. **Activities:** WPI Philharmonic Orchestra (1st violinist); WPI Video Game Orchestra; WPI Tennis Club. **Availability:** Flexible part-time; evenings/weekends available upon request.