

Jianuo Li

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Research interests: battery cell mechanics · nonlinear finite-element analysis · structural stability

EDUCATION

Northeastern University, Boston, MA Sep 2023 – May 2027 (expected)
B.S. Mechanical Engineering, Mathematics minor · GPA 3.983/4.00 · Tau Beta Pi · Dean's List, six semesters
Core ME courses: **Fluid Mechanics** (A) · **Dynamics** (A) · Mechanics of Materials (A) · Thermodynamics (A-)
Mathematics minor: Differential Equations & Linear Algebra (A) · Statistics & Stochastic Processes (A)
In progress, Fall 2026: ME Computation & Design (finite element methods) · Capstone Design 2

RESEARCH

Battery Mechanics Research, Northeastern University Jan – Jun 2026
Undergraduate Researcher · Advisor: Prof. Juner Zhu · ME 4991, in place of an industry co-op

- Built plane-strain Abaqus/Explicit models (CPE4R) of Li-ion jelly-roll cells with eight material layers across about 32 turns as distinct contacting continua, resolving hoop-stress buildup toward core buckling.
- Validated the modeling setup against published Cu hoop-strain values and verified mesh independence across three refinement levels (0.8% coarse-to-fine change).
- Automated the Abaqus workflow in Python (model rebuild, meshing, submission, extraction), running sweeps unattended for more than 24 h with a coding agent detecting and recovering failed jobs.
- Compared idealized spiral windings (Archimedean vs logarithmic; 9, 12, and 15 turns; $\mu = 0-0.3$; confined vs endpoint-bound): final-state Mises stress fell by 54–63% from 9 to 15 turns.

Mixed-Reality Multi-Drone Supervision Research, Northeastern University Jul 2026 – present
Undergraduate Researcher · Advisor: Prof. Yingzi Lin

- Developed a Unity 6 mixed-reality prototype targeting Meta Quest Pro: three head-referenced information panels in a passthrough scene for a simulated six-drone supervisory monitoring task.
- Defined the task structure: abnormal events, operator response steps, and logged data fields with acceptance criteria; now adding eye tracking ahead of a planned participant study.

PUBLICATION

Zou, J., Sun, J., and Li, J. “Turbulence-Explicit tangential stretching rate for characterization of AJHC Flames.” *Combustion and Flame* (accepted, 2026). Contribution: supporting data validation and analysis.

SELECTED PROJECTS

Constant Temperature and Humidity Chamber · senior capstone Summer 2026 – present

- Designing an acrylic constant-climate chamber (20–70 °C, 5–95% RH) for evaporation studies: compressor cooling, still-air plate heating, silica-gel/molecular-sieve dehumidification, ultrasonic humidification.

Multi-Engine Model Rocket Program · independent 2019 – 2023

- Designed and built about ten airframes, from a water rocket clearing 10 m to a multi-engine vehicle that flew to roughly 100 m, with a launch platform using belts, gears, and hydraulics.

PATENTS & SOFTWARE COPYRIGHT (CHINA)

Design Patent CN306237246S · multi-engine model rocket · granted, sole inventor	Dec 2020
Utility-Model Patent CN214276678U · wireless launch device · granted, sole inventor	Sep 2021
Software Copyright 2022SR0905915 · image transformation tool · registered, sole author	Jul 2022

SKILLS

Simulation and analysis: Abaqus/Explicit (layer-resolved contact, metal plasticity, energy-balance checks, Python scripting and job automation) · MATLAB post-processing · statistics (ANOVA, t-tests, regression)
Programming, CAD, and prototyping: Python · C++ · Unity 6 · Fusion 360 · AutoCAD · FDM 3D printing