

Dylan Jacobs

(503) 704-4583 • djacobs2@swarthmore.edu • 500 College Ave, Swarthmore PA, 19081

Portfolio: <https://dylan-jacobs.github.io/>

GitHub: <https://github.com/dylan-jacobs/>

LinkedIn: <https://www.linkedin.com/in/dylan-t-jacobs/>

SUMMARY

General Engineering (electrical focus) and Applied Mathematics Double-Major at Swarthmore College with experience in embedded systems, machine learning, computational fluid dynamics, and numerical methods. My research experience comprises low-rank, structure-preserving numerical PDE solvers for plasma simulations, as well as synthesis and characterization of thermoelectric nanomaterials. I am motivated to make lasting contributions to both the computational and experimental sides of engineering research, especially in embedded systems, robotics, and physics-informed neural networks.

EDUCATION

Swarthmore College

B.S. General Engineering (Electrical focus) & B.A. Applied Mathematics

GPA: 3.98/4.00

Relevant Coursework: Electronic Circuit Applications, Digital Signal Processing, Electrodynamics, Computer Vision, Data Structures & Algorithms, Partial Differential Equations, Numerical PDEs, Statistical Signal Processing

Swarthmore, PA

Expected May 2027

SKILLS

Technical: SPICE, PCB Design, CAD, Fusion360, Soldering, Embedded systems, Numerical PDEs

Programming/Software: Python, MATLAB, Arduino, C/C++, LaTeX, Git, TensorFlow, PyTorch, OpenCV

Languages: Spanish (Fluent)

RESEARCH AND WORK EXPERIENCE

US Naval Research Laboratory – Power Electronics Division

Plasma Synthesis and Materials Characterization Research Intern

Advisor: Dr. Benjamin Greenberg

- Developed inductively coupled plasma (ICP) reactor to synthesize nanoparticles; conducted plasma experiments.
- Minimized reflected power in ICP by tuning the RF matching network using Smith chart; mitigated RF EMI.
- Designed and ran atomic-layer-deposition (ALD) experiments to determine how dose parameters affect ALD coatings.
- Used scanning electron microscopy & energy-dispersive spectroscopy to characterize ALD nanomaterial compacts.

Washington, DC

May 2026 – Aug 2026

US Naval Research Laboratory – Power Electronics Division

Advanced Materials Intern & Research Assistant

Advisor: Dr. Benjamin Greenberg

- Measured thermal diffusivity and specific heat of thermoelectric semiconductors using laser flash analysis (LFA).
- Designed and built Arduino-controlled LN₂ dispenser with closed-loop thermocouple monitoring to automate LFA experiments, including a GUI and data-logging interface to the lab computer.
- Developed experiments to improve the lab's measurement procedure for IR-transparent and high-resistance samples.

Washington, DC

May 2025 – Aug 2025

Swarthmore College NaSCaRS Lab

Research Assistant

Advisor: Dr. Joseph Nakao

Swarthmore, PA

Jan 2024 - present

- Utilizing principles of computational fluid dynamics and numerical methods to develop high-order accurate PDE solvers for kinetic & fluid plasma models in MATLAB.
- Current project: low-rank Arbitrary Lagrangian-Eulerian method for solving advection-diffusion equations in C++.
- Co-authored [paper](#) on low-rank, structure-preserving solver for Vlasov-Fokker-Planck kinetic-ion fluid-electron model.
- Presented at 2025 SIAM NNP conference, 2024 & 2025 *Sigma Xi* Swarthmore poster sessions.

TEACHING EXPERIENCE

Swarthmore College

Teaching Assistant for Electrical Circuit Analysis

Swarthmore, PA

Aug 2025 – Dec 2025

- Led tutoring, problem-solving, and review sessions for Swarthmore engineering students.
- Helped students develop problem-solving strategies, as well as foundations in mathematics, electrical engineering, and signal processing to solve challenging circuit analysis problems.

Swarthmore College

Mathematics Tutor

Swarthmore, PA

Aug 2026 – present

- Tutoring Swarthmore mathematics students in a wide range of courses, from Calculus I, II, III to Differential Equations, to Real Analysis.

PROJECT EXPERIENCE

Convolutional Neural Network for Hand-Drawn Image Classification: [project link](#)

May 2026

- Designed and trained a CNN to classify 250 object categories, deployed it online for real-time evaluation using ONNX.

Component-Wise Kalman Filter Model for Smartphone Battery Drain

Jan 2026

Mathematical Competition in Modeling (MCM)

- Developed a battery state-space model with Kalman filtering using a system of ODEs, combined with Coulomb-Counting and battery Equivalent Circuit Model (ECM), to predict smartphone battery time-to-empty given time-varying operating and use conditions.

Analog Circuit and PCB Design

Aug 2025 – Dec 2025

- Designed and fabricated PCBs in Fusion360 combining MOSFETs, sensors, actuators, op-amps, comparators, and audio amplifiers across four projects: [audio equalizer](#), [temp-controlled fan](#), [light-optimizing solar panel](#), [regulated DC power supply](#).

AI Python Stock Trading

Feb 2025

- Trained neural network on technical indicators to trade stocks using Alpaca API, [link](#)

Generative Adversarial Network (GAN)

Feb 2023

- Image-generating model trained on web-scraped art, [link](#)

PUBLICATIONS

1. J. Nakao, **D. T. Jacobs**, and W. Taitano, "An adaptive and conservative low-rank IMEX solver for the hybrid ion Vlasov-Fokker-Planck and fluid electron system." *Submitted.*, 2026

SCHOLARSHIPS AND AWARDS

Tau Beta Pi Engineering Honors Society	<i>Feb 2026</i>
Clearfield ASHE Scholarship, <i>American Society of Highway Engineers</i>	<i>Apr 2026</i>
Delaware Valley Engineers Undergraduate Scholarship, <i>Delaware Valley Engineers Society</i>	<i>Feb 2025</i>
Donna Prentice Memorial Scholarship, <i>American Society of Civil Engineers</i>	<i>Feb 2024</i>
National Merit Scholarship	<i>Apr 2023</i>
Global Seal of Biliteracy (Spanish)	<i>2022</i>

ABSTRACTS AND PRESENTATIONS

1. **D. T. Jacobs**, Benjamin Greenberg. Plasma Synthesis and Scanning Electron Microscopy Characterization of Nanomaterials, *Sigma Xi Poster Session 2026*, Swarthmore, PA. September 25, 2026, poster
2. J. Nakao, **D. T. Jacobs**, W. Taitano. An Implicit, Low-Rank Solver for 1D2V Vlasov-Fokker-Planck Equation in Cylindrical Coordinates. *SIAM NNP 2025*, State College, PA. November 1, 2025, poster
3. **D. T. Jacobs**, Benjamin Greenberg. Laser Flash Analysis Characterization of Thermoelectric Nanomaterials, *Sigma Xi Poster Session 2025*, Swarthmore, PA. September 26, 2025, poster
4. **D. T. Jacobs**, J. Nakao. A Robust, Third-Order Accurate Solver for the 1D1V Vlasov-Poisson Equation, *Sigma Xi Poster Session 2024*, Swarthmore, PA. September 27, 2024, poster