Evan Gibson Smith

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Education

Worcester Polytechnic Institute, Worcester, MA
Master of Science, Electrical and Computer Engineering, May 2026, GPA: 4.00/4.00
Bachelor of Science, Electrical and Computer Engineering, May 2026, GPA: 4.00/4.00
Bachelor of Science, Computer Science, May 2026, GPA: 4.00/4.00

Publications

Peer-Reviewed / Submitted Manuscripts

Beck, C., **Smith, E.,** et al. "The CHASM-SWPC Dataset for Coronal Hole Detection & Analysis." *Astronomy & Astrophysics*, submitted. (joint first author)

Technical Reports

Smith, E., et al. "Uncovering the Bar Island Trail: Visitor Data Analysis and Recommendations." IQP Technical Report, WPI, 2024. Online

Smith, E., Davidson, K. "GAN-KAN: Kolmogorov Arnold Networks for Preventing Mode Collapse in GANs." Graduate Project Report, WPI, 2025. Online

Research Experience

StoMPP: *Stochastic Masked Partial Progressive Binarization*   May 2025 – Present

- A novel quantization and binarization technique for training neural networks without the straight-through estimator.
- Practical for deployment, stable across architectures and hyperparameters.
- Top-1 accuracy of 70.19% on CIFAR-100 with ResNet18, a less than 2 percentage point drop from full precision, using no extra regularization tricks while binarizing all layers, including first and last.
- Strong results on ImageNet under simple settings and without knowledge distillation or architecture tricks. ResNet18 achieves top-1 accuracy of 57.5% with binary weights, an 8.8% drop from 66.3%.

LENS: *Low Energy Neuromorphic Segmentation | WPI*   August 2025 – Present

- Designed custom FPGA architecture tailored for energy and inference time improvements for quantized and pruned SNNs for classification and segmentation.
- Preliminary results in simulation show over 10x energy improvement for MNIST classifier (96% accuracy) in INT8 on an unpruned network when compared to floating or fixed point approaches.
- Developing semantic segmentation specific model and architecture improvements for autonomous driving applications.

Novel Token Pruning Techniques for Multimodal LLMs | BASHLab, *WPI*   August 2025 – Present

- Developed and evaluated token pruning techniques using QUaRT block of RAVEN architecture.
- Benchmarking custom architecture against standard post-training pruning methods for unimodal and multimodal tasks.

Cyber Research Intern | Peraton Labs, *Bedford, NH*   June 2025 – August 2025

- Built a custom ML pipeline for hydrophone audio classification using embeddings and few-shot learning, reducing manual annotation time by 95%.
- Packaged as a Python package, with CLI tool (GUAM: General Underwater Audio Model), full documentation, and testing suite.
- Integrated analysis pipeline into a real-time PyQt5 GUI for spectrogram visualization and classification.
- Designed a custom YAML-based audio format with dynamic shards to handle memory constraints, including a

simple load/save API.

Coronal Hole Classification | Independent Study, *WPI*   October 2024 – May 2025
- Built publicly available dataset (1,400+ days) using custom annotation pipeline based on the segment anything model.
- Used dataset on progressively growing U-Net model for pixelwise coronal hole classification, improved IoU by 15%.

GAN Mode Collapse in Kolmogorov Arnold Networks | Generative AI, *WPI*   March 2025 – April 2025
- Formulated theoretically backed argument for KANs to improve mode collapse.
- Investigated KANs to mitigate GAN mode collapse on MNIST and CIFAR-10; conducted systematic experiments with vanilla GANs and Wasserstein GANs.

Undergraduate Research Assistant | Jacob Whitehill Research Group, *WPI*   May 2024 – June 2024
- Developed particle simulation in Java and Python analysis tools to optimize obstacle placement.
- Evaluated Bayesian Optimization against grid search across kernels, establishing feasibility for basis for further study.

Skills

Machine Learning / AI: PyTorch, Transformers, Scikit-learn, NumPy, Pandas, SciPy,
Hardware / Embedded Systems: FPGA, Altium, LTSpice, Cadence, Genus, Innovus
Programming / Scripting: Python, Java, C, SystemVerilog, SQL, Bash, Slurm
Visualization: Matplotlib, PyQt5, Manim, Plotly
Other Tools / Software: LaTeX, Git

Selected Projects

Talking LLaMa: Image-to-Poetry on Raspberry Pi | On Device Deep   February 2025 – May 2025
Learning, *WPI*
- Implemented end-to-end image-to-poetry generation pipeline on Raspberry Pi 5 through aggressive model compression.
- Applied magnitude pruning for ViT, post training pruning for Tacotron2 and HiFiGAN text-to-speech model, and LoRA for haiku-specific pruned LLaMA.
- Results 85 seconds to run on the Raspberry Pi 5, with 5W for 0.18s for the ViT Top 5 CIFAR-100 classification model, 7W over 16.16s for the LLaMA model, and 6.25W over 69s on the text-to-speech model.

Tiny Systolic Array Coprocessor | Advanced Digital Systems Design, *WPI*   November 2025 – December 2025
- Small systolic array coprocessor with Croc from RTL to fabrication on a 2um x 2um area for TSMC 180nm process.

Two-Stage Operational Amplifier Design | Analog Integrated Circuits   November 2024 – December 2024
Design, *WPI*
- Designed and simulated two-stage op-amp in 180nm CMOS, meeting all specifications within 10%: differential gain, common mode rejection ratio, input common-mode range, output swing, bandwidth, and power consumption.
- Performed stability analysis and compensation design in Cadence to achieve target phase margin.

Ring Oscillator Layout and Characterization | CMOS Fundamentals, *WPI*   September 2024 – October 2024
- Designed and laid out 75MHz ring oscillator with tapered buffer driver, achieving <2.5ns delay for 10pF load within 20um × 20um area constraint.
- Verified layout against DRC/LVS rules and characterized oscillation frequency within 10% of target specification.

Bananagrams Solver   November 2023 – January 2024
- Heuristic solver in Java using modified A*. [Online]

Teaching Experience

Electrical Engineering Teaching Assistant   March 2024 – December 2024

Mentored 100+ students in introductory circuits, assisting with lab work understanding, lab grading, and troubleshooting circuit design. Delivered lecture to class on phasor theory.

Honors & Awards

Honorable Mention, Computer Science Major Qualifying Project Provost Award, WPI, 2025
Outstanding Chapter Award, Upsilon Pi Epsilon, 2024 & 2025 (awarded to top-performing chapters nationally)
Charles O. Thompson Award for Academic Excellence, WPI, 2023

Leadership & Service

President, Upsilon Pi Epsilon   January 2025 – Present

Leading chapter operations, mentoring students for career development through resume builders, mock interviews, workshops, and student run career fairs.

Electrical Lead, Autonomous Underwater Vehicle Club   January 2025 – Present

Designing PCBs and electrical systems for an autonomous underwater vehicle; mentoring 15 members on electrical design, component selection, and place-and-route. Designing electrical system across 3 PCBs to handle telemetry, vehicle autonomy, robust safety mechanisms, and high current thruster control.

Student Advisory Board, ECE Department   August 2025 – Present

Representing student perspectives in departmental decisions, helping inform decisions such as mural design for department building, graduation PCB design, ways to increase interest in Electrical and Computer Engineering, and cultivating student success in their classes and careers.

Treasurer, Eta Kappa Nu Gamma Delta Chapter   May 2024 – Present

Managing finances and fundraising for Eta Kappa Nu, helped organize community events for Eta Kappa Nu and the wider ECE community.

Electrical Design Team, High Powered Rocketry Club   October 2023 – Present

Designed schematics and routing for PCB to control telemetry systems for a high-powered rocket, focusing on STM32 microcontroller and XBee radio.

Web Secretary, Upsilon Pi Epsilon   December 2023 – January 2024

Managed UPE website for events, member activity, and induction requirements, managed slides and activities for internal events, including elevator pitch workshops and destress events.