Adam Jacuch

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EDUCATION

Stony Brook University   Stony Brook, NY
Bachelor of Science in Computer Science   *Exp. May 2029*
- **GPA:** 3.93 / 4.0 (Core: 4.0)
- **Relevant Coursework:** Differential Equations (current), Calculus III, Linear Algebra, Systems Programming (current), Scripting Languages (current), Data Structures.
- **Honors:** Dean's List, Presidential Scholarship

RESEARCH & EXPERIENCE

Undergraduate Researcher (AI Systems)   Sep 2025 – Present
CRIZM VIP Team (Stony Brook University)   *Stony Brook, NY*
- Co-founded a Vertically Integrated Project (VIP) team focused on integrating Large Language Models into educational workflows.
- Architecting a low-latency RAG pipeline using quantization techniques to run local models on consumer hardware.

Research Assistant (Machine Learning).   Sep 2023 – Jun 2025
Stony Brook University (Mentored by Prof. Alex Doboli)   *Stony Brook, NY*
- Developed a novel masked language model architecture focused on extreme compression for edge deployment.
- Achieved a **500x reduction in parameter count** compared to DistilBERT while retaining **70% accuracy** on sentence classification tasks.
- Developed a novel first-order fine-tuning algorithm using **latent-space k-means clustering** for semantic batching and stochastic parameter perturbation to stabilize convergence.

Lead Programmer (VEX Robotics) | *Autonomous controls and systems for competitive robotics* Sep 2025 – Present

SELECTED PROJECTS

ResLM: High-Performance Linear Recurrence | *PyTorch 2.0, Systems Optimization*   Jan 2026 – Present
- Architected a 130M parameter Gated Linear Recurrent (GLR) model that injects a parallel scan directly into SwiGLU blocks.
- Achieved **15.1 Perplexity** on WikiText-103, demonstrating convergence competitive with the **SmolLM2-135M baseline (14.9 PPL)** while eliminating quadratic attention complexity.
- Implemented a **chunked parallel scan** using `torch.compile` fusion, matching SmolLM2's **40,000 tok/s throughput** on consumer hardware without custom CUDA kernels.
- Authored technical report analyzing the architecture through WikiText-103 perplexity, TinyStories logical consistency, and Multi-Query Associative Recall (MQAR).

GoNet: Deep Learning Library from Scratch | *Golang, Low-Level Optimization*   Nov 2025 – Dec 2025
- Built a neural network library from first principles in Go without external ML frameworks.
- Implemented a basic Ahead-of-Time (AoT) Autograd engine with support for Multilayer Perceptrons and SGD.

TECHNICAL SKILLS

Languages: Python, C++, Go, C   **Frameworks:** PyTorch, CUDA, NumPy   **Concepts:** SSMs, Linear Attention, torch.compile   **Tools:** Git, Linux

AWARDS & LEADERSHIP

ICSC Finalist (Competitive Programming)   2025
Selected Finalist   *Stony Brook, NY*
- Placed as a finalist in the International Computer Science Competition out of thousands of participants. Solved complex algorithmic challenges in C++ under strict time constraints.

Competitive Swimming   2015 – Present
NYS Top 20 Ranking   *New York*
- Ranked Top 20 in New York State for 100-yard Breaststroke (57.82s). Maintained rigorous training schedule while upholding a 102 GPA (High School).

President   2023 – 2025
St. Anthony's Coding Club   *New York*
- Mentored 30+ students in algorithmic thinking and organized events to boost engagement.