Jake **Blackburn**

Software Engineering · Machine Learning

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About Me

TLDR: Im an aspiring software engineer interested in **Machine Learning** and **Neuroscience**. After I graduate from the **College of William and Mary** with a degree in **Computer Science (ML / AI track)** and a **Biochemistry** minor, I hope to do AI research and development, learning what I can from modern neuroscience to deepen my understanding of intelligence in general and inform experimentation with innovative models.

Education

College of William and Mary

Williamsburg, VA

B.S. in Computer Science w/ Concentration in ML/AI, and a minor in Biochemistry

Graduating Spring 2026

- curriculum focused on **Software Engineering**, **Machine Learning**, and **Neuroscience**
- **Major GPA: 3.76** (cumulative: 3.63)
- **Awards:** Dean's list (Spring 2023, Fall 2023, Spring 2024, Spring 2025)
- **Relevant coursework:**
  - **Neural Networks Class Project:** Lead a small team working on data wrangling, model training, and documentation for the **pose estimation** component of a novel computer vision system to monitor brown bear populations for *Kenai National Wildlife Refuge*.
  - **SWE Class Project:** Worked in programming teams using **SCRUM** to develop a tool for survey analysis with **Python/Django** and **Docker**, also created and presented a technical demo & tutorial for **weights and biases**.

Projects & Experience

ML / AI

INDEPENDENT RESEARCH PROJECTS

- **Perceptual Style Transfer:** Developed **Neural Style Transfer** models implementing the **CNN** architecture using **PyTorch** and trained via *Perceptual* loss based on features extracted from **VGG19**. designed and deployed a demo website using **FastAPI**, **Docker** and **Google Cloud**.
- **Skyrim Alchemy Monte Carlo:** Wrote a tool for simulating *ESV: Skyrim*'s alchemy system with **Python** and **Numpy**, Calculated metrics for realistic ingredient value using a **Monte Carlo Simulation** w/ **Pandas**, and deployed the alchemy sim + data analysis report to a website using **Docker**, **Django**, and **Railway**.
- **Rust ML:** Created custom Tensor type *from scratch* in **Rust** implementing core **Linear Algebra** operations to build machine learning algorithms including **Linear Regression**, **Perceptron**, and **Backpropagation** for simple feed-forward **Neural Networks**.

Other Projects

SIDE PROJECTS

- **Image Editor:** Built low level image editor CLI-tool with a real-time edit previewer demonstrating **Memory Safety**, **Smart Pointers** and **Concurrency** in **Rust**. Migrated from an older **Python** implementation, achieving significant performance improvement.
- **Battle Sim:** Created a performance-optimized battle simulation game with **C++**, and **SDL2**.
- **Pyroxide:** Built a basic interpreter for a Python-like language, with inspiration from C/Rust. Written in **Rust**, mainly as an experiment with **Claude Code**, and emphasizing a "Documentation Driven Development" AI-based workflow.
- **Digital gallery:** Developed and deployed a mock e-commerce website where users can sign in and purchase famous works of art from history. Uses **Vue.js, Firebase, Google Cloud Functions, Express,** and **Stripe**.
- **Network Ad-Blocker:** Assembled and configured a **Raspberry Pi** with a headless **Debian** installation, to blacklist ad-serving domains from a local network with a custom DNS server built on **Pi-Hole** & **unbound**.

Skills

Programming Languages	Python, C/C++, Rust, and Javascript (intermediate/advanced). Java, Typescript, SQL (basic)
ML tools / Packages	TensorFlow, PyTorch, Numpy, Pandas, Matplotlib, Scikit, FastAPI, Weights & Biases
Other	Git & Github, Linux, NeoVim, Docker