

JOHN A. BLACKBURN

MY PREFERRED NAME IS JAKE

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EDUCATION

College of William and Mary

B.S. Computer Science, concentration in Machine Learning / AI

Williamsburg, VA

September 2021 – May 2026

- **Major GPA: 3.84** (3.75 cumulative)
- **Minor:** Biochemistry
- **Awards:** Dean's List (6x)
- **Relevant Courses:** Software Engineering, Neural Networks, Data Mining, Topological Data Analysis, Biochemistry, Neurobiology

SIGNIFICANT PROJECTS & ACHIEVEMENTS

Kenai National Wildlife Refuge

Williamsburg, VA

Volunteer Machine Learning Consultant

October 2025 – January 2026

- Led a small team of 7 classmates working on **data preprocessing**, **model training**, and consulting for the pose estimation component of a novel computer-vision system for automatically identifying brown bears in hundreds of hours of footage.
- Developed and trained an experimental pose-estimation model using **Python** with **PyTorch** and Deeplabcut.
- Reported our results, compiled detailed documentation, and provided suggestions for future work for the Kenai researchers on behalf of the team.

Survey Analysis Toolkit - Software Engineering Capstone

Williamsburg, VA

Project MVP / Developer

September 2025 – December 2025

- Worked in a programming team using the **SCRUM** methodology to develop a toolkit for survey analysis and open-coding with **Python**, **Django**, and **Docker**.
- Took on a leadership role within the team: initiating discussion, effectively communicating about complex features, and coordinating development asynchronously to meet our deadlines.
- Awarded 'Project MVP' for outstanding work on the project.

INDEPENDENT PROJECTS IN MACHINE LEARNING AND DATA SCIENCE

Macrograd

Python

Machine Learning Project

June - July 2026

- Implemented a from-scratch automatic differentiation engine with n-dimensional tensors in raw Python (no numpy) based on Andrei Karpathy's 'Micrograd' and trained a classification model on a synthetic dataset.
- Published with a jupyter notebook for demonstration and a written explanation of autograd & tensor programming concepts.

ESV: Skyrim Alchemy Monte Carlo

Python

Data Science Project

Oct 2025 - June 2026

- Developed an efficient toolkit for emulating *ESV: Skyrim's* alchemy mechanic with **Python**, **pandas** and **numpy**.
- Designed experiments including Monte Carlo simulations to yield actionable gameplay insights.
- Deployed a website allowing users to utilize the toolkit including a useful way to browse the dataset, and presented results of experiments made with **Django**, and **Docker**.

Perceptual Style Transfer

Python

Machine Learning Project

July 2025 - October 2026

- Trained several Neural Style Transfer models implementing the CNN architecture with **PyTorch**, using and building upon a transfer learning approach developed in [Johnson et al., 2016](#).
- Published a website allowing users to upload and stylize images using **FastAPI** and **Docker**, hosted on Google Cloud.

OTHER PROJECTS (see website / github for more details)

Strike / Strikedown

Zig

Superset of Markdown with greater typographic flexibility, with a built in HTML renderer and live-preview server.

June - July 2026

RustML

Rust

From-scratch linear algebra and machine learning library implementing neural networks for the iris task.

February 2025 - December 2025

Image Editor

Rust

Low level cli-based image manipulation program.

January 2025 - June 2025

Battle Sim

C++

Battle simulation game with roguelike game mechanics (VA collegiate game jam 2025 & 2026).

April 2025 & 2026

CERTIFICATIONS & SKILLS

Programming Languages: Python, C/C++ (advanced), Javascript/Typescript, Rust, Java (intermediate), Zig, Lua, SQL (basic)

ML & Data Science Tools: PyTorch, Tensorflow, Numpy, CUDA, Gudhi

Certifications: CompTIA Linux+

Other: Git/GitHub, Linux, Docker, NeoVim, Claude Code