Jake **Blackburn**

Software Engineering · Machine Learning & AI

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Education

College of William and Mary

Williamsburg, VA

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

Expected Graduation: Spring 2026

- curriculum focused on **software engineering**, **machine learning/AI**, and **neuroscience**
- **Major GPA: 3.76** (cumulative: 3.63)
- **Awards:** Dean's list (Spring 2023, Fall 2023, Spring 2024, Spring 2025)
- **Relevant coursework:** Algorithms, Software Development, Programming Languages, Computer Organization, Intro to Machine Learning, Neural Networks, Software Engineering, Multivariable Calculus, Probability and Statistics

Skills

Languages Python, C/C++, Rust, and Javascript (advanced proficiency). Java, Typescript, SQL, LaTeX (basic proficiency)

Concepts data structures & algorithms, software development, full stack web development, machine learning

Other Git / Github, Linux / Unix, NeoVim, shell scripting, RegEx, computer hardware

Projects & Experience

ML / AI

Independent Research Projects

- **Perceptual Style Transfer:** Developed **Neural Style Transfer** models utilizing VGG19 Feature Extraction that implement the **Transformer** architecture to learn artistic styles from small image datasets and apply them to any image. Built mature **PyTorch** training pipeline with streamlined configuration, modular architecture, automated metrics logging, and a web-based tool for visualizing VGG activations using **Flask**.
- **Rust Tensor:** Created custom Tensor type from scratch in **Rust** implementing core **Linear Algebra** operations to build machine learning algorithms including **Linear Regression**, the **Perceptron**, and multi-layer **Neural Networks**.
- **Rust Perceptron:** Implemented the Perceptron machine learning algorithm in **Rust** to perform binary classification on synthetic data. Migrated from an earlier **C** implementation.
- **Art Price Model:** Final project of Intro ML class. Written in **Python**, the project uses **Transfer Learning** with a basic **Neural Network** to predict the price of an artwork based on an image alone. Includes a formal research report on intentions, hypotheses, and methodology, as well as results and limitations.

REACH National Organization

Remote

Freelance Web Developer (full stack)

July 2023

- Designed and Implemented simple, responsive, and affordable landing page in only 3 weeks using **Next.js / React**, and **Firebase**.
- Gathered valuable experience working closely with a team, being involved in a scrappy startup, and coordinating remotely to deliver a full stack web app that continues to funnel college aged social media influencers into the REACH network. – `https://reachnatl.com`

Other

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**.
- **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**. – `https://digital-gallery-e0130.web.app`
- **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**.