

William Andrews

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EDUCATION

The College of William & Mary - GPA 3.8

B.S. in Computer Science and Mathematics

Williamsburg, VA

Sept. 2023 – Expected May 2027

RELEVANT COURSEWORK — GRADUATE CLASSES IN **Bold**

- Operating Systems – **Compiler Optimization** (upcoming) – **Advanced Computer Architecture** (upcoming)
- **Systems Programming** – Directed Study in High Performance Computing – Algorithms
- Honors Real Analysis – Graph Theory – Intermediate Linear Algebra – Abstract Algebra
- Advanced Multivariable Calculus – Probability (upcoming) – Intro to Numerical Analysis II (upcoming)

PROJECTS

Directed Study in High Performance Computing - C/C++, CUDA

Aug. 2025 – Present

The College of William & Mary

Williamsburg, VA

- Researching and implementing high-performance CPU/GPU algorithms with **C/C++**, **OpenMP**, and **MPI**, focusing on numerical kernels, memory/cache efficiency, and multi-threading.
- Implementing **SIMD** vectorized matrix operations in C using **AVX/AVX-512**; benchmarking against auto-vectorization; improving code for CPU data pipelining to increase cache and bandwidth performance.
- Performing systems-level performance tuning of C/C++ applications, targeting cache behavior and memory hierarchy.
- **Final Project:** Developed a high-performance 2D Jacobi and Gauss-Seidel solver in C++ for **Laplace PDEs**, implemented iterative stencils and parallelization to efficiently compute steady-state solutions on large grids.

Graph Theoretic Transit Routing Engine - C++, Docker

Aug. 2025

Personal Project

Alexandria, VA

- Created a Waze-inspired **routing engine** to explore open source shortest path computation methods.
- Implemented multiple shortest path algorithms and compared performance.
- Developed my own multi-threaded, bidirectional A*-based algorithm, reducing long distance computation times.
- Visualized graphs using GraphViz, deployed in a **Docker** containerized server using Flask.

Matroid Algorithm Optimization - C++

May. 2025 – Aug. 2025

Personal Project

Alexandria, VA

- Designed a **C++ framework** to solve matroids in **combinatorial optimization**.
- Implemented matroid greedy algorithms to find minimum spanning trees in regular and bipartite graphs, find the minimum basis for matrices, and solve abstract set systems.
- Generalized an algorithm to solve multiple unrelated and cross-disciplinary algebraic problems.

INTERNSHIP EXPERIENCE

Software Engineer Intern

Sept. 2024 – Present

DisinfoLab W&M

Williamsburg, VA

- Developed **Python** software tools using **Hugging Face transformer** models for sentiment analysis.
- Creating backend components and data-processing pipelines using Python.
- Maintaining containerized infrastructure on Linux systems.

SysOps Intern

Jan. 2025 – Present

Nova.org - Private Internet Service Provider

Remote

- Gaining experience with **Linux systems**, networking, and virtualization.
- Supporting deployment of open-source alternatives to mainstream cloud platforms.
- Assisting with integration of cPanel and related tools into existing virtual machine to improve service management.

SKILLS & TOOLS

Languages: C, C++, Python, Java.

Systems & HPC: Linux, OpenMP, SIMD (AVX/AVX-512), CUDA, MPI, Docker.

Topics: Algorithms, Operating Systems, HPC, Computer Architecture, Linear Algebra, Graph Theory, Real Analysis.