

# William Andrews

703-501-4428 | wtandrews@wm.edu | GitHub Portfolio | wtandrews.science

## 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-LEVEL CLASSES IN **Bold**

- Operating Systems – **Compiler Optimization** (upcoming) – **Advanced Computer Architecture** (upcoming)
- **Systems Programming** – Directed Study in High Performance Computing – Algorithms
- Honors Elementary Analysis – Graph Theory – Intermediate Linear Algebra – Abstract Algebra
- Advanced Multivariable Calculus – Probability (upcoming) – Network Systems (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 CPU data pipelines for cache and bandwidth performance.
- Optimizing C/C++ code for cache locality, memory bandwidth, and multi-thread scaling.
- Final Project: Develop a high-performance 2D Gauss–Seidel solver in C for Laplace/Poisson PDEs, implement 5-point stencils, and OpenMP 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.
- Developed a multi-threaded, bidirectional A\* algorithm in **C++** 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-based 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.

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

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