William Andrews

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Education

The College of William & Mary - GPA 3.8 — Williamsburg, VA
B.S. in Computer Science and Mathematics — *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 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 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: 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 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, SIMD (AVX/AVX-512), CUDA, MPI, Docker.

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