

# William Andrews

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## EDUCATION

### The College of William & Mary - Computer Science GPA: 3.92

B.S. in Computer Science and Mathematics

Williamsburg, VA

Sept. 2023 – Expected May 2027

## RELEVANT COURSEWORK — GRADUATE CLASSES IN **Bold**

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

## PROJECTS

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

*The College of William & Mary*

Aug. 2025 – Dec. 2025

Williamsburg, VA

- Researched and implemented high-performance CPU/GPU algorithms with C/C++, **OpenMP**, and **MPI**, focused on numerical kernels, memory/cache efficiency, and multi-threading.
- Implemented **SIMD** vectorized matrix operations in C using **AVX/AVX-512**; benchmarked against auto-vectorization; improving code for CPU data pipelining to increase cache and bandwidth performance.
- Optimized C/C++ code for cache locality, memory bandwidth, and multi-thread scaling.
- 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

*Personal Project*

Aug. 2025

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++

*Personal Project*

May. 2025 – Aug. 2025

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.

## WORK EXPERIENCE

### Software Development Multi-Mission Planning Intern - Air & Missile Defense

*Johns Hopkins University Applied Physics Lab*

Incoming May 2026

Laurel, MD

- Will contribute to the development of C++ and Python software systems supporting air and missile defense research at the Johns Hopkins University Applied Physics Laboratory.
- Work will involve collaborating with multidisciplinary teams of software engineers, applied mathematicians, and domain scientists to design, implement, and test performance-critical systems.

### Software Engineer Intern

*DisinfoLab W&M*

Sept. 2024 – Dec. 2025

Williamsburg, VA

- Developed **Python** software tools using **Hugging Face transformer** models for sentiment analysis.
- Created backend components and data-processing pipelines using Python.
- Co-authored a research report analyzing public sentiment trends, **published** in *The Diplomatic Courier*.

## SKILLS & TOOLS

**Languages:** C, C++, Go, Python, Java, x86-64 Assembly (AT&T syntax; System V ABI; Linux).

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

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