Abhirath Agasanakoppa

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Education

Thomas S. Wootton High School Rockville, MD
High School Diploma (Expected) *Aug 2025 – Jun 2029*

- **Relevant Coursework:** AP Computer Science A, AP Computer Science Principles, AP Physics 1

Technical Skills

- **Languages:** Python, Java, C/C++, TypeScript, JavaScript, Rust, Go, Bash, SQL
- **Machine Learning:** PyTorch, scikit-learn, NumPy, pandas, OpenCV
- **Frameworks:** React, Astro, SvelteKit, FastAPI, Tauri
- **Developer Tools:** Git, Linux, NixOS, Docker, Podman, GitHub Actions, Nix, Caddy

Experience & Leadership

Co-Founder & Co-President Oct 2026 — Present
Applied AI Lab — Thomas S. Wootton High School *Rockville, MD*

- Co-founded a student organization focused on applied machine learning, providing hands-on technical instruction and collaborative project opportunities.
- Develop and teach lessons on Python, data preprocessing, supervised learning, and model evaluation using Jupyter notebooks and real datasets.
- Organize weekly meetings, technical demonstrations, and programming exercises for students with varying levels of experience.

Coding Instructor & Club Leader Nov 2025 — Present
mCode — Cabin John Middle School *Potomac, MD*

- Design and teach a Python programming curriculum covering fundamental syntax, algorithms, data structures, and problem solving.
- Develop differentiated programming assignments for beginner and advanced students, including algorithmic challenges and independent projects.
- Organize Codefest programming competitions and introduce students to competitive programming through timed challenges.

Web Developer Nov 2022 — Jun 2024
Shy Art & Co. *North Potomac, MD*

- Developed and maintained an e-commerce website for a custom digital art business, supporting product listings and customer order requests.
- Implemented custom order tracking functionality and managed frontend development, backend integration, and deployment.

Projects

GlyphNet — Real-Time Handwritten Digit Recognition Sep 2026 – Present

- Developed a desktop computer vision application using Python, PyTorch, OpenCV, and PySide6 to classify handwritten digits from a live camera feed.
- Trained convolutional neural networks on MNIST and implemented an image preprocessing pipeline using thresholding, morphological operations, contour detection, and normalization.
- Improved recognition consistency by refining digit extraction and alignment; integrated live predictions into an interactive desktop interface.

Oculog — Contact Lens Management Application 2026

- Developed a cross-platform mobile application using React Native, Expo, TypeScript, and PocketBase to help users manage contact lens replacement schedules and supplies.
- Implemented lens wear tracking, replacement reminders, inventory management, and educational content within a unified interface.
- Prototyped machine learning features for eye-image analysis and retrieval-augmented educational assistance.

Home Server — Declarative Self-Hosted Infrastructure (github.com/abhirath-a/home-server) Jan 2026 – Present

- Built a reproducible NixOS-based home server using Nix flakes and custom modules to configure and deploy self-hosted applications.
- Deployed containerized services with Podman and configured Caddy, DNS, and WireGuard for remote access and service routing.
- Managed system configuration, networking, and deployment on resource-constrained hardware with 4 GB RAM.

Keyframe — Desktop PDF Presentation Application (github.com/abhirath-a/keyframe) Jun 2026

- Built a lightweight desktop PDF presentation application using Tauri, Rust, and TypeScript with a minimal, presentation-focused interface.
- Configured reproducible development environments and application builds using Nix flakes and Bun.

Honors & Activities

American Computer Science League — Senior Division December 2025 - May 2026

- Qualified for the ACSL National Championship; compete in timed programming and computer science contests.
- Practice algorithmic problem solving in C++ with a focus on data structures, graph algorithms, and competitive programming.