

ESSEY ARAYA

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EDUCATION

Berea College

Bachelor of Science in Engineering Physics and Computer Science, GPA: **3.93/4.00**

Berea, KY

Expected Dec 2027

- Honors & Awards: 4-year tuition promise scholarship (\$285,000+ USD), Dean's List (All Semesters)
- Relevant Coursework: Classical Mechanics, Physics-Informed Machine Learning, Numerical Analysis, Differential Equations, Data Structures & Algorithms, Embedded Systems, Electromagnetism

EXPERIENCE

Machine Learning Engineer Intern

NASA × Break Through Tech

Sep 2026 – Present

Remote / New York, NY

- Developing a RAG and agentic AI system to automate software requirements auditing against NASA engineering standards, reducing compliance review time from weeks to minutes.

Machine Learning Research Intern

Vanderbilt School of Engineering

May 2026 – Aug 2026

Nashville, TN

- Built and integrated GP-PHS into NeuroMANCER using Python, PyTorch, and GPyTorch, enabling researchers to model dynamical systems with uncertainty-aware machine learning
- Created 250+ unit, integration, and end-to-end tests using Pytest to improve reliability
- Designed and implemented 9 modular components for data pipelines, matrix operations, and numerical computation using NumPy, Pandas, and SciPy, providing reusable infrastructure for ML training
- Held weekly Agile review meetings with a 6-member team, incorporating feedback to iteratively develop comprehensive API documentation and 5 tutorial notebooks

Mechanical Engineering Intern

Berea College

May 2025 – Jul 2025

Berea, KY

- Designed and fabricated a lightweight composite battery enclosure for Berea College's first solar car using Ansys ACP composite simulator and wet layup, reducing projected manufacturing cost by 50%
- Eliminated 80% of testing costs by designing composite layups and conducting FEA in Ansys Mechanical

PROJECTS & PUBLICATIONS

Gaussian Process Port-Hamiltonian Systems | Submitted to IFAC SYSID 2027

Sep 2026

Lumen - Team Lead | Next.js 16, TypeScript, PostgreSQL, Vercel AI SDK

[View Project](#)

- Built a greedy prerequisite-graph solver in TypeScript to automate 4-year scheduling for 1,500+ students
- Developed a course-ranking pipeline that translated students' career goals into 3 personalized degree pathways, helping students align coursework with their desired careers

SafeSource - Hackathon | Python, FastAPI, Gemini Vision API, Pydantic v2, Next.js 15

[View Project](#)

- Built a platform that analyzed environmental data to help users identify health risks by quantifying PFAS
- Developed a Google Gemini Vision + Pydantic pipeline to estimate PFAS exposure from grocery receipt images, helping users identify high-risk products in everyday purchases

Drone Vertical Dynamics Simulation | C++, Python, GitHub Actions (CI/CD)

[View Project](#)

- Built a C++ physics simulator modeling gravity, thrust, and drag, producing velocity and height data
- Implemented CI/CD with GitHub Actions to compile, run, validate, and deploy outputs automatically

Biscute | HTML, CSS, SCSS, JavaScript

[View Project](#)

- Built a website for a local small business expanding customer reach and increasing revenue by \$5,000

LEADERSHIP

President

Berea Engineering and Racing

Mar 2026 – Present

Berea, KY

- Led a 3-member team to optimize the chassis, reducing weight by 32% while meeting safety targets
- Led weekly meetings and organized hackathons and design competitions, reaching 100+ participants

TECHNICAL SKILLS

Languages: C++, Python, MATLAB, TypeScript, JavaScript, SQL

ML & Developer Tools: PyTorch, NumPy, SciPy, Pandas, Matplotlib, Git, Linux, Pytest, GitHub Actions