Avigya Paudel

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EDUCATION

Union College — *Graduation Year: 2027*
Bachelor of Science in Computer Science, Mathematics, and Statistics — Schenectady, NY

- GPA: **4.0/4.0** | **Honors**: Union Scholar
- **Relevant Coursework:** Object Oriented Programming, Data Structures and Algorithms, Linear Algebra, Discrete Mathematics, Multivariable Calculus, Probability Theory, Differential Equations
- **Activities:** Union College ICPC Team Member, ACM-W Member, CodePath Advanced Technical Interview Prep, Goldman Sachs Possibilities Summit, FreeCodeCamp Hackathon, Andrew Ng Machine Learning Specialization

EXPERIENCE

Machine Learning Researcher — *June 2025 – Present*
Algoverse — Remote

- Identified and edited neuron activations responsible for sycophantic behavior in **Gemma-2B-2T** by training **Sparse Autoencoders (SAE)** on MLP activations and analyzing SAE features via causal tracing
- Ran activation patching experiments to evaluate how SAE feature interventions alter model outputs on preference-conditioned QA tasks, reducing sycophantic completions by over 20% on controlled prompts
- Implemented representation engineering pipeline based on the methodology in *Understanding Sycophancy in LLMs* and *Pinpoint Tuning*, adapting it for open-weight models using custom tracing tools

Undergraduate Research Assistant — *Jan 2025 – Present*
Union College Department of Computer Science — Schenectady, NY

- Reduced the theoretical computational complexity of matrix multiplication from $O(n^3)$ to $O(n^{2.81})$ by implementing Strassen's algorithm using a recursive divide-and-conquer method in **C++**.
- Conducted research into novel schemes for 3x3 matrix multiplication, exploring methods to achieve the known minimum of 23 multiplications by developing a custom **Python Tensor Class** for higher dimensions using NumPy.

Web Development Intern — *Jun 2024 – Aug 2024*
Nobel Navigators — Remote

- Co-developed **CognitoCanvas**, an AI-themed interactive web platform for EXPO, leveraging **React.js** for dynamic UIs, **Node.js** and **Express.js** for robust API services, and **MongoDB**.
- Integrated third-party AI APIs and implemented asynchronous data flows using **Axios** and **React Query**, enhancing application responsiveness and modularity
- Co-facilitated 5 training workshops for a cohort of 20+ engineering interns on **React hooks**, **API integration**, and **full-stack architecture**.

PROJECTS

CreateStory | [GitHub](#) | [Live Demo](#) | *Node.js, Express.js, EJS, MongoDB*

- Developed a full-stack collaborative story-writing platform, integrating **Socket.IO** for real-time synchronization, achieving sub-second response times for 10 concurrent users.
- Engineered a secure authentication system with **Passport.js** and **bcrypt**, implementing **JWT-based sessions** and **role-based access control**.

NLP-Powered Content Assistant | [GitHub](#) | *JavaScript, HTML/CSS, Tailwind CSS, OpenAI API*

- Built a Chrome extension that summarizes and translates web content across languages using the **OpenAI GPT-4o API**, enhancing accessibility and comprehension.
- Implemented a clean, responsive UI with **Tailwind CSS**, and integrated secure token management with rate limiting to improve performance and reduce costs.

TECHNICAL SKILLS

Languages: Python, C/C++, Java, JavaScript/TypeScript, SQL
Web Development: HTML/CSS, Tailwind CSS, React, Node.js, Express.js, RESTful APIs
Tools & Technologies: Git/GitHub, Arduino, Docker, MongoDB, MySQL, PostgreSQL