ANMOL RATTAN SINGH SANDHU

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EDUCATION

Bachelor of Science in Engineering (Computing), Olin College of Engineering (GPA 3.9/4.0) May 2025

- **Relevant Coursework:** Advanced Algorithms, Software Systems, Computational Robotics, Neurotechnology and ML, Data Science, Collaborative Design, Computer Architecture, Longer Term Software Development

SKILLS

- Python, Rust, Go, C, C++, Bash, JavaScript, SQL, Java, Kotlin, Dart, R, MATLAB
- Git, Github, Linux, Firebase, React.js, React Native, Ansible, Docker, ROS, AZ-900

PROFESSIONAL EXPERIENCE

Research Assistant, MIT CSAIL *Jun 2024 – Present*

- Collaborating with cross-functional teams on **literature reviews and surveys** to research various algorithms and establish metrics to **classify and quantify progress in machine learning**. This new project will help aid researchers in understanding trends and developing more efficient and scalable machine learning models.
- Working at Professor Neil Thompson's FutureTech lab on the **Algorithm Wiki project**, a comprehensive online resource on algorithms and their development.

Technical Lead, Senior Capstone Program in Engineering (SCOPE), Olin College *Sept 2024 - May 2025*

- Collaborating with Boston University and Red Hat to prototype **LLM-powered agents** that provide personalized reading comprehension tools for K-3 students.
- Built a full pipeline interfacing with **Llama 3.1** 8b on **TorchServe**, a **React/Next.js** front-end chat app, and **PostgreSQL** for user data and conversation context.

Researcher, MIT Connection Science *Feb 2024 – Present*

- Researching interoperability of **verifiable credentials (VCs)** and **personal data stores** with Professor Alex Pentland's Connection Science group.
- Acquiring in-depth knowledge of **W3C standards** for VCs. Aiming to shape standards for trustworthy and decentralized identity management.

Intern, Modular Open-Source Identification Platform (MOSIP) *Jan 2024 – May 2024*

- Improved the **open-source** Bluetooth credential exchange module (*Tuvali*) of INJI, allowing a presenter to select from a list of verifiers, enhancing the previous process of scanning QR codes to connect to verifiers.
- INJI is a decentralized mobile wallet of MOSIP that enables users to download, manage, share, and verify OpenID conforming **verifiable credentials**.
- MOSIP is an open-source version of the Aadhaar Technology Stack, and has helped issue digital IDs to more than **100 million people**, revolutionizing the delivery of social services and retail payments in the Global South.

Full Stack Developer (Volunteer), Community Knights (Non-Profit) *Jun 2023 – Dec 2023*

- Developed an accessible **ride-sharing platform** for vulnerable populations with Community Knights.
- Utilized **ReactJS**, **React Native** and **Firebase** to create applications with **CRUD** operations, **role-based authentication**, and Google Maps integration.
- Conducted **UX design** interviews to iteratively improve the applications.

Research Assistant, Affordable Design and Entrepreneurship, Olin College *Jun 2023 - Aug 2023*

- Assisted statewide public defender agency in MA to help reduce convictions from racially biased traffic stops.
- Automated statistical report generation with **quarto**, **pandas**, and **numpy.** Built **pytest** frameworks for sensitive data cleaning in parsing **thousands** of traffic stop records.

Research Assistant, Olin College Crowdsourcing and Machine Learning Lab *Jun 2022 – Aug 2023*

- Created pipeline to benchmark **image matching algorithms** on data collected from **50+ co-designers** for the Clew app, which is an indoor navigation app for visually impaired users.
- Added **Protobuf** support for data logging and built a **LiDAR**-based benchmarking infrastructure in **Python**.

PROJECTS

- **Rust-EDIS:** a scalable, distributed key-value store built in **Rust**, implementing a reader/writer **shard model**.
- **Clipboard-Transformer:** a simple tool to transform text in your clipboard. Built in **C++.**
- **Image Segmentation:** separate images into distinct segments using **graph cut algorithms** and **network flows**. Built in **Python** with **NetworkX** and **OpenCV**.
- **Huffman Encoding:** a compression algorithm implemented in **C++**.
- **CNN-MNIST:** classifies handwritten digits from the **MNIST** dataset using only **NumPy** and **Python**.
- **Sudoku Solver:** solves Sudoku puzzles using the Simulated Annealing algorithm. Implemented in **Python**.

EMPLOYMENT, LEADERSHIP AND INTERESTS

- **Instructor** - Advanced Algorithms (Student Led Course)
- **Resident Advisor** - Olin College of Engineering
- **Sub-team Lead** - Public Interest Technologies club, Olin College of Engineering
- **Vice President** - Olin South Asian Student Organization
- **Interests -** Rock Climbing, Badminton and Swimming