ANMOL RATTAN SINGH SANDHU

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EDUCATION

Bachelor of Science in Computer Science, Olin College of Engineering Aug 2021 – May 2025

- **CGPA**: 3.88 / 4.00
- **Relevant Coursework**: Advanced Algorithms, Software Systems, Computational Robotics, Neurotechnology and ML, Data Science, Collaborative Design, Computer Architecture, Longer Term Software Development

SKILLS

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

EXPERIENCE

Research Assistant, MIT CSAIL *Jun 2024 – Present*

- Worked at Professor Neil Thompson's FutureTech lab on the **Algorithm Wiki project**, a comprehensive online resource on algorithms and their development.
- Conducted **literature reviews and surveys** to classify and quantify progress in solving **machine learning** problems.

Researcher, MIT Connection Science *Feb 2024 – Present*

- Worked with Professor Alex Pentland's Connection Science group to research interoperability of **verifiable credentials (VCs)** and **personal data stores.**
- Acquired in-depth knowledge of **W3C standards** for VCs and personal data stores, potentially contributing to the development of trustworthy digital ecosystems.

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

- Working on INJI, a decentralized mobile wallet of MOSIP that enables users to download, manage, share, and verify OpenID conforming **verifiable credentials**.
- 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.
- 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 *Jun 2023 – Dec 2023*

- Collaborated with the Non-Profit Community Knights to develop an accessible **ride-sharing platform** for individuals with disabilities, including an admin dashboard and mobile apps for riders and drivers.
- Utilized **ReactJS**, **React Native** and **Firebase** to create applications with **CRUD** operations, **role-based authentication**, access control, 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*

- Built data tools to assist public defenders mitigate possible convictions due to incidents of unlawful traffic stops resulting from racial profiling.
- Automated the generation of statistical PDF reports using **quarto**, **pandas**, and **numpy**.
- Built extensive testing frameworks using **pytest** for sensitive data cleaning functions used 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 a **SLAM** based path retracing app for blind and visually impaired users.
- Added **Protobuf** support for data logging using **Firebase** for the Clew **iOS** application.
- Used **Python** to develop LiDAR based infrastructure to benchmark various algorithms including the SuperGlue neural network and **OpenCV** image matching algorithms.

PROJECTS

- **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**.
- **Hole-in-the-camera**: digital version of the game show "Hole in the Wall" built using **OpenCV**, **PyGame**, and **OpenPose**.

EMPLOYMENT, LEADERSHIP AND INTERESTS

- **Teaching Assistant** - Agency, Ethics and Biology
- **Resident Advisor** - Olin College of Engineering
- **Sub-team Lead** - Public Interest Technologies club, Olin College of Engineering
- **Secretary** - Olin South Asian Student Organization
- **Student Worker** - Office of Strategic Communication, Olin College of Engineering
- **Interests -** Rock Climbing, Badminton and Swimming