Ankur Jai Sood

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EDUCATION

Artificial Intelligence Graduate Certificate **Jun 2025**
Stanford University, Stanford, CA, USA.

Bachelor of Engineering Science in Mechatronic Systems Engineering **Jun 2018**
University of Western Ontario, London, ON, Canada.

- Capstone Advisor: Dr. Michael Naish. Associate Professor; Director, Mechatronic Systems Engineering

Technological Entrepreneurship Certificate **Jun 2018**
University of Western Ontario, London, ON, Canada.

PUBLICATIONS

1. **Sood, A.J.*,** Viner, C.* & Hoffman, M.M. *DNAmod: the DNA modification database*. J Cheminform 11, 30 (2019). https://doi.org/10.1186/s13321-019-0349-4
    - Cited 108 times.

PATENTS & PATENT APPLICATIONS

US12430067B2: Data Flow Management For Computational Loads, *Atieva Inc* **Granted**: 09-30-2025

- Co-inventor of an end-to-end framework for deploying zero copy, high bandwidth, single-producer/multi-consumer data pipelines for autonomous systems. Producer nodes write sensor data into shared buffers while event streams in separate control buffers coordinate synchronized consumption by multiple downstream consumers.

US20250268582A1: System, Method and Device for Remote Ultrasonography, *Wosler Corp* **Pending**: 04-18-2023

- Co-inventor of a teleoperated and semi-autonomous robotic system that lets a remote sonographer control a multi-DOF robotic arm via a haptic input device. Enables diagnostic quality ultrasound scans in underserved locations with safety features including force feedback, patient monitoring, and automated collision avoidance.

US20250044413A1: Lidar Data Compression And Processing, *Atieva Inc* **Pending**: 10-27-2022

- Co-inventor of a non intrusive lidar data compression pipeline for autonomous systems that taps high bandwidth sensor streams, selects and compresses targeted subsets of data into a secondary buffer, and stores them for offline analysis without impacting the primary real time data path.

RESEARCH EXPERIENCE

Research Student **(Part-time) Sep 2015 – Apr 2019**
Hoffman Research Group, *Department of Medical Biophysics, University of Toronto* **May 2015 – Aug 2015**

- Worked alongside Dr. Michael Hoffman at the University of Toronto to develop the very first web accessible DNA modification database (https://dnamod.hoffmanlab.org/) using Python, SQL, and JavaScript.
- Co-first author on the DNAmod paper (*Journal of Cheminformatics*, April 2019), with 10,000+ reads and 108 citations.
- Provided ongoing part-time support and feature updates after returning to full-time studies at the University of Western Ontario (Sep 2015 – April 2019).

Research Student **May 2014 – Aug 2014**
STTARR, *University Health Network, University of Toronto*

- Worked alongside Dr. Trevor McKee at the University of Toronto to develop novel computer vision pipelines using C++, OpenCV, and MATLAB to segment high resolution multi-channel pathology images into more physiologically relevant subunits.
- Reduced manual processing time from 8 hours to 30 minutes per day resulting in significant resource savings.

WORK EXPERIENCE

Senior Software Engineer **Jul 2022 – Present**
Nvidia, *Santa Clara, CA, USA*

- Lead and point of contact for regulatory data recording at Nvidia for the autonomous driving L2, L2+, and L3 products.
- Developed (C++) data recording frameworks and applications which implement differing global regulatory data collection requirements across multiple countries and are required for driving enablement.
- Developed AI enabled data pipelines and reporting tools to detect personally identifiable information in collected data, identify root causes of leaks, monitor incident rates, and drive remediation efforts.

- Ported development fleet data collection feature to a new vehicle platform, optimized performance, and fixed critical bugs to ensure data collection quality and uptime.
- Re-architected and optimized boot time of rear view camera feature to meet < 6s regulatory requirement.

Advisor **Jan 2022 – Present**

Wosler Corp, *Calgary, AB, Canada*

- Led the software architecture for a robotic system focused on the teleoperation of 6 DOF robotic arms for specialized medical imaging tasks in remote environments.
- Advised a group of 5 engineers, resolving key technical issues, setting team priorities, and performing code reviews.

Senior Software Engineer **May 2022 – Jun 2022**

Software Engineer **Jun 2020 – May 2022**

Lucid Motors (Formerly Atieva)*, Newark, CA, USA*

- Led the design and development of platform software (C++) to stream vehicle sensor data (cameras, lidar, & radar) to downstream perception, motion planning, and data recording modules in real time.
- Developed system-level diagnostic modules to monitor the overall health of Lucid's ADAS stack in real time and ensure safe operation of level 2+ ADAS features.
- Integrated and optimized Lucid's 3D surround view monitoring and parking assist features for the Lucid Air.

Software Integration Engineer **Apr 2019 – Jun 2020**

Ford Motor Company (Contract via Insight Global Canada Inc.)*, Waterloo, ON, Canada*

- Developed automated tools and frameworks in Python utilizing libraries like slash and python-can to verify functionality of the central CAN gateway and expand test coverage for all vehicle ECUs.
- Reduced release software verification time from days to hours and improved overall software quality.
- Served as Interim Verification Lead for the CAN Gateway. Managed end-to-end test planning, execution, and defect life cycle. Drove cross-team triage efforts and release sign-off for CAN gateway team.

Application Engineer **May 2018 – Apr 2019**

Bluewrist Inc*, Markham, ON, Canada*

- Designed multi-robot and multi-camera solutions to tackle novel automation challenges in the automotive industry resulting in orders of magnitude cycle time savings for automated processes.
- Led teams to deploy these solutions across customer sites across North America, owned the end-to-end success of each deployment and was personally responsible for project sign off and success.

Development Engineering Associate (Intern) **May 2016 – Aug 2017**

Celestica Inc, *Toronto, ON, Canada*

- Designed industrial automation solutions for healthcare and aerospace/defense customers in Python and LabVIEW.
- Awarded best Toronto improvement (2017) and best North America improvement (2017) for a solution that increased throughput by 50-75%, reduced escapes by 90%, and saved over $100,000 CAD in its first year.
- 16-month internship as part of the Mechatronic Systems Engineering program at the University of Western Ontario

SELECTED ACADEMIC PROJECTS

Eye in the Sky: Live Blackjack Card Counting via Real-Time Video Analysis **Jun 2025**

CS231N, *Stanford University*

- Report: https://cs231n.stanford.edu/papers/text_file_840589501-CS231n_Final_Project.pdf
- Repository: https://github.com/ankurjaisood/cs231n_eye-in-the-sky
- Built two real-time pipelines: YOLOv5 detection+classification for card rank/suit and SegFormer segmentation for robust card masks under occlusion.
- Utilized DeepSORT for multi-object tracking with deduplication heuristics to maintain persistent IDs and prevent double counting.

Settling the Odds: AI Agents in Catan **Dec 2024**

AA228/CS238, *Stanford University*

- Report: https://drive.google.com/file/d/1CdxMFLdCIZrIL4xqppJCX6v679ycAd3b/view?usp=sharing
- Repository: https://github.com/ankurjaisood/SigmaCatan
- Framed 4-player Catan as an offline RL problem. Built a reproducible data/training/eval pipeline, engineered compact state encoding and discretized complex actions with invalid action masking.

- Implemented a DQN stack with soft target updates and Huber loss and added a consistent evaluation harness. Designed reward shaping plus lightweight heuristics to discourage premature passes by the agent.

Strategies for Optimization of minBERT for Multi-Task Learning **Jun 2024**

CS224N, *Stanford University*

- Report: https://web.stanford.edu/class/cs224n/final-reports/256971312.pdf
- Repository: https://github.com/citygyraffe/CS224N-FP
- Implemented multi-task minBERT with three heads for sentiment, paraphrase, similarity tasks and achieved significantly better aggregate performance than models fine tuned for single tasks.
- Implemented and compared different task schedulers to handle dataset imbalances. Implemented LoRA and Projected Attention Layers (PALs) from scratch to cut trainable parameters while improving task adaptation.

Variable Compliance Instrument for Laparoscopy **Jun 2018**

Mechatronic Systems Engineering Capstone, *University of Western Ontario*

- Developed a novel variable compliant laparoscopic surgical instrument which warns the operator when approaching obstacles and becomes compliant upon risk of harm to patient. Software developed in C for a PIC32 microcontroller.
- Awarded 3rd place in the 2018 Mechatronic Systems Engineering Capstone Design Showcase out of 15 teams.

SELECTED PERSONAL PROJECTS

Lookout: Marketplace Research Agent

- Repository: https://github.com/ankurjaisood/Lookout
- Created an AI powered marketplace assistant that evaluates and compares sets of listings for a single purchase decision (e.g., choosing among multiple cars, laptops, or electronics options) under user specified requirements.
- For each listing in a session, the agent assigns a 0-100 score with a discrete label and explains its reasoning in natural language, while enforcing shared per-session requirements, asking targeted clarifying questions, and updating a preference model that learns the user's priorities over time.
- Implemented a full stack system with a FastAPI plus SQLite backend and a Gemini based agent layer providing scoring, rationales, and persistent user preference and session memory over REST APIs.

Beeline: AI Powered Multimodal Route Planning

- Repository: https://github.com/ankurjaisood/Beeline
- Developed an AI powered multimodal routing assistant that combines driving, parking, biking, and public transit to decompose trips into their most efficient legs. Uses an LLM backend service to turn natural language queries into structured constraints (origins, destinations, arrival times, mode preferences) for multi-leg route planning.
- Implemented via a three tier architecture with a SvelteKit and Mapbox frontend, a Python FastAPI LLM parsing service that outputs structured JSON, and a backend planner contract that uses MCP style connectors (Google Maps, 511.org transit feeds, calendar data) to generate optimized multi-leg itineraries.

HALpdesk: AI Powered Terminal Assistant for Command Line Workflows

- Repository: https://github.com/asharalam11/HALpdesk
- Built an AI powered terminal assistant that converts natural language requests into bash commands. Also provides a chat mode for asking questions and getting explanations, color coded safety levels (safe / caution / dangerous), and a tmux-like session management interface.
- Implemented with a daemon plus CLI architecture with per-session context, multi-session management, and configurable LLM backends.

AWARDS & HONORS

Dean's Honor List, *University of Western Ontario*	**2014/2018**
Mechatronic Systems Engineering Capstone Design Showcase: **3rd Place**, *University of Western Ontario*	**2018**
Best of Region Improvement (North America) Q2 2017, *Celestica Inc.*	**2017**
Summer Studentship, *Undergraduate Research Opportunity Program (UROP), University of Toronto*	**2015**
The Western Scholarship of Distinction, *University of Western Ontario*	**2012**