

# AIDEN CHANG

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**Research Interests:** Robot autonomy, hierarchical RL, multimodal reasoning, and planning under uncertainty in space exploration.

## EDUCATION

**University of Southern California** **GPA: 3.94/4.0** **Los Angeles, CA**  
*Master of Science in Computer Science (AI Specialization)* Aug 2023 - Aug 2025

**Carleton College** **Northfield, MN**  
*Bachelor of Arts in Computer Science* Sep 2019 - Jun 2023

## PROFESSIONAL EXPERIENCE

**NVIDIA - Incoming AI Solutions Architect** Aug 2025

- Rotating through five AI-focused sectors across aerospace, robotics, and high-performance computing. Will collaborate with engineering teams and government/industry partners to deploy real-world autonomous systems in **mission-critical environments**.

**U.S. Army Research Lab (DEVCOM) - AI/ML Research Fellowship** Aug 2024 - May 2025

- Built a task-driven **7B multimodal LLM** for long-horizon video reasoning with uncertainty-aware segmentation and temporal grounding, foundational for autonomous agents in extended missions (e.g., space exploration).
- Fine-tuned a 7B model on 3.7TB of video via **distributed cloud training** (8x A100 GPUs, DeepSpeed ZeRO-2, LoRA, AWS); leveraged uncertainty for autoregressive prediction, achieved SOTA on highlight precision, surpassing full-context baselines.
- Developed semantic segmentation pipelines (RAM++, DINO-X, SAM2) on CUI datasets, boosting object detection by 15% to enhance robotic perception in autonomous search-and-rescue and unstructured terrain for Army robotics.
- Evaluated **SLAM-based** and **Gaussian Splatting** CUI simulation environments to improve 3D navigation; awarded the **AEOP Fellowship** (<8% acceptance rate) to conduct real-world research on next-gen autonomous systems.

**Korea Advanced Institute of Science & Technology (KAIST) - AI/ML Visiting Student Researcher** May 2024 - Aug 2024

- Researched **Responsible AI**—specifically Multimodal Large Language Models (MLLMs) under the guidance of Prof. Steven Euijong Whang, focusing on **fairness** by analyzing biases and ensuring gender and skin tone equity in **T2I and I2T tasks**.
- Investigated **long-tailed biases** and their effects on protected attributes; proposed a framework for **grouping heterogeneous modalities** to enable the use of traditional group fairness techniques in abstract and high-dimensional domains.

## TECHNICAL PROJECTS

**SpaceY - (Team Lead | Sponsored by US Space Force | Finalist, \$100K MEPC Competition, USC)**

- Architected and led the development of an **AI-powered stealth launch detection system**, capable of predicting hostile rocket launches days in advance, a capability absent in current non-classified defense systems.
- Led **90+ interviews** with military, academic, and industry experts to identify gaps in U.S. Space Command's pre-launch visibility; validated our solution via a **real-world detection** of a stealth launch from China's Xichang Center three days prior to ignition.
- Built end-to-end **CUI satellite imagery** and **NOTAM analysis** pipelines using fine-tuned YOLOv9, rocket trajectory nominal prediction, and proprietary models, achieving a **20% boost** in detection precision and enabling real-time **stealth launch alerting**.
- Pitched to **70+ investors** and defense partners; **Finalist** in the \$100K MEPC, competing against PhD, MBA, and engineering teams, with proposals to SDA Tap Lab for **dual-use deployment** across government and commercial sectors.

**Multimodal Tactile Perception for Space Robotics — With Prof. Heather Culbertson (USC) & Wanli Qian (PhD, USC)**

- Built a VAE-based model to embed tactile textures into latent space using vision, tapping transients, and AR coefficients, enabling autonomous **understanding of material properties** on Earth, with applicability to **unknown materials** in space.
- Leveraged the HaTT dataset and custom sensory pipelines to reason over material relationships (e.g., "what lies between wood and steel?") and support **remote surface analysis**.
- Designed an algorithm to calibrate human preferences for texture perception, aligning robotic tactile sensing with human intuition, allowing Earth-based researchers to physically **"feel" textures** detected by remote robots.

## PUBLICATIONS

- A.S. Roman, **A. Chang**, G. Meza, I. R. Roman. *Generating Diverse Audio-Visual 360 Soundscapes for Sound Event Localization and Detection*. **DCASE 2025**. Conducted in collaboration with **Sony** and **Queen Mary University of London**.

## LEADERSHIP & ATHLETICS

- Carleton College Varsity Football Team** - Starting Running Back; led team in all-purpose yards; 2x All-Academic Athlete.
- President of the Korean Student Association** - Grew membership by 60%, enrolling 2% of the school; led inclusive cultural events reaching 80% of Korean students. Raised \$2,000 through cross-club collaborations.
- Northstar Freestyle Ski Team** - Nationally ranked #47 in Freestyle Skiing; trained with Olympic athletes at elite levels.

## TECHNICAL SKILLS

**Languages / Tools:** Python, C, SQL, TypeScript, JavaScript, HTML, CSS, R, Git, HPC, Linux, AWS, Agile, GraphQL, REST, React  
**AI & Libraries:** LLMs, PyTorch, Huggingface, TensorFlow, Langchain, LlamaIndex, ChatGPT, NumPy, Pandas, Matplotlib, Jupyter